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Gross Motor Skills in Children with Autism Spectrum Disorder and Attention Deficit Hyperactive Disorder

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Abstract

Background: Movement plays an essential role in children’s lives. Typically developing children achieve motor skills effortlessly, while children with ASD and ADHD demonstrate a plethora of developmental challenges. In clinical practice, an explicit intervention module addressing motor deficits of these children has been greatly overlooked as they appear active and agile. Hence, this study intends to explore the gross motor skill deficits in children with ASD and ADHD.

Materials and Method: Children with ASD (n = 10) or ADHD (n = 10) belonging to the age group of 3-10 years were recruited for the study as per the inclusion criteria. All children were selected from Madurai Child Development Centre, a pediatric rehabilitation centre in Madurai, India. The Test of Gross Motor Development-2 was employed to analyze the gross motor dysfunctions in children with ASD and ADHD.

Results: Significant association between age and object control skills in ASD children was found between the ages 3-6 years & 7-10 years. Significant association between age and locomotor skills as well as object control skills was elucidated in ADHD children. A definite association in locomotor and object control skill performance between boys and girls among ASD and ADHD was found.

Conclusion: Children with ASD and ADHD demonstrate a plethora of gross motor skill challenges that subsequently thwarts their dexterity, self-care and overall function.

Keywords: Gross motor skill, Motor development, Autism Spectrum Disorder, Attention Deficit Hyperactive Disorder.
study of this kind would encourage parents, educators, therapists and clinical practitioners to be sensitive about early motor delays that could possibly point towards multiple complications at a later stage.

**Materials and Method**

**Aim:** To study the gross motor skills in children with Autism Spectrum Disorder and Attention Deficit Hyperactive Disorder

**Objectives:**
1. To analyze the locomotor and object manipulation skills of children with ASD and ADHD.
2. To compare the locomotor and object control skill performance in children with ASD and ADHD between the ages 3-6 years & 7-10 years
3. To compare the locomotor and object control skill performance between boys and girls among ASD and ADHD

The subject sample included 20 children with an established diagnosis of either ASD or ADHD as per DSM-5 diagnostic criteria. 10 boys and 10 girls belonging to the age group of 3-10 years formed the universe. The inclusion criteria for the study were children belonging to both genders having no history of any chronic disease or apparent ambulatory disability. They were able to follow simple 2 step instructions and had no visual or hearing impairment. Furthermore, all children attended some form of schooling and lived with their biological parents in either rural or urban family setups. None of them were on any prescribed psychotropic medication or intervention. All children were selected from Madurai Child Development Centre, a pediatric rehabilitation centre where the study was carried out. The centre is located in Madurai city in the state of Tamil Nadu, South India.

A quasi-experimental research design was adopted to recruit the sample. The Indian Scale for Assessment of Autism (ISAA), ADHD Rating Scale IV-Preschool (ADHD RS-IV-P), Vanderbilt ADHD Diagnostic Parent Rating Scale (VADPRS) were used for diagnostic screening of the subjects and the Test of Gross Motor Development-2 was employed to analyze the gross motor skills (Locomotor and Object control skills). Participants performed the test as described in the TGMD-2 Examiner’s Manual\(^{(13)}\). Scores were calculated from the sum of two trials of each subtest. Maximal possible score for locomotion and object control is 48. Raw scores were collected and subjected to statistical analysis.

**Findings**

**Results:** Recent studies, have pointed out that children with ASD and ADHD presented with problems in their gross motor performance \(^{(11-12)}\). The present study besides pointing out the presence of dysfunctions in locomotor and object control skills of children with ASD and ADHD, also categorizes them based on their performance level and compares them on parameters such as age and gender. Children with low performance on gross motor skills were found to score less than the median while scores of high performers fell on the median and above.

(1) To analyze the Locomotor and Object control skills in children with ASD and ADHD.

<table>
<thead>
<tr>
<th>Locomotor Skills</th>
<th>Diagnosis</th>
<th>Low Performance</th>
<th>High Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASD</td>
<td>20%</td>
<td>30%</td>
<td></td>
</tr>
<tr>
<td>ADHD</td>
<td>30%</td>
<td>20%</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Object Control Skills</th>
<th>Diagnosis</th>
<th>Low Performance</th>
<th>High Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASD</td>
<td>25%</td>
<td>25%</td>
<td></td>
</tr>
<tr>
<td>ADHD</td>
<td>25%</td>
<td>25%</td>
<td></td>
</tr>
</tbody>
</table>

**Association between children with ASD and ADHD with regard to Locomotor Skills**

<table>
<thead>
<tr>
<th>Pearson Chi-Square</th>
<th>Value</th>
<th>Df</th>
<th>Asymptotic Significance (2-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.800</td>
<td>2</td>
<td>.371</td>
</tr>
</tbody>
</table>

Children with ASD and ADHD showed no significance with regard to Locomotor Skills. Based on total percentage, ASD children’s locomotor skills are high when compared to ADHD. This could be related to the more number of low performers on the ADHD category and presence of co-morbid autistic features in these children.

**Association between children with ASD and ADHD with regard to Object Control Skills**

<table>
<thead>
<tr>
<th>Pearson Chi-Square</th>
<th>Value</th>
<th>Df</th>
<th>Asymptotic Significance (2-sided)</th>
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<td>0.00</td>
<td>1</td>
<td>1.0</td>
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</table>

Children with ASD and ADHD showed no association with regard to object control skills. It is interesting to note that both the ASD and ADHD children demonstrated similar performance on the Object Control Skills test category.
(2) To compare the Locomotor & Object Control Skills in Children with ASD and ADHD between 3-6 and 7-10 years of age

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Gross Motor Tasks</th>
<th>Age (years)</th>
<th>Low Performance</th>
<th>High Performance</th>
<th>Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ASD</strong></td>
<td>(a) Locomotor</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Run</td>
<td>3-6</td>
<td>40.0%</td>
<td>30.0%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Gallop</td>
<td>3-6</td>
<td>40.0%</td>
<td>30.0%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Hop</td>
<td>3-6</td>
<td>40.0%</td>
<td>30.0%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Leap</td>
<td>3-6</td>
<td>40.0%</td>
<td>30.0%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Horizontal Jump</td>
<td>3-6</td>
<td>40.0%</td>
<td>30.0%</td>
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</tr>
<tr>
<td></td>
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<td>3-6</td>
<td>40.0%</td>
<td>30.0%</td>
<td></td>
</tr>
<tr>
<td></td>
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<td>7-10</td>
<td>0.0%</td>
<td>30.0%</td>
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<tr>
<td></td>
<td>(b) Object Control</td>
<td></td>
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<tr>
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<td>20.0%</td>
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</tr>
<tr>
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<tr>
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<td>20.0%</td>
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<td>3-6</td>
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<tr>
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<td>3-6</td>
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<td>20.0%</td>
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</tr>
<tr>
<td></td>
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<td>20.0%</td>
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</tr>
<tr>
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<td></td>
<td>7-10</td>
<td>0.0%</td>
<td>30.0%</td>
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<tr>
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<tr>
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<td>10.0%</td>
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<tr>
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<td>3-6</td>
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<tr>
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<td>• Overhand Throw</td>
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<td>20.0%</td>
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<tr>
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<td>7-10</td>
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<td>30.0%</td>
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</table>

No association between age and locomotor skills in ASD children was noted. (P value = 0.91). Based on total percentage, all children in the age group of 7-10 years showed high performance (30%) in locomotor skills and more number of children in the age group of 3-6 years showed low performance (40%). This finding seems to disclose that children can show some degree of progress with age regardless of a definite intervention.

A significant association between age and locomotor skills in ADHD children (P value > 0.01) was found. Based on total percentage, more number of 3-6 years children demonstrated low performance (60%) while all children in the age group 7-10 years showed high performance (30%) in locomotor skills. This again underlines the pressing need for early intervention.

A significant association between age and object control skills in ASD children (P value < 0.05). Based on total percentage, all children in the age group of 7-10 years displayed high performance in object control skills while the younger population showed low performance. The result shows that object control skill progresses with age regardless of a definite intervention. This elucidates that children with ASD would show definite progress in motor skills with appropriate intervention.

A significant association between age and object control skills among ADHD children (P value = .038). Based on total percentage, all children in the age group 7-10 years showed high performance (30%) in object manipulation skills while more number of children belonging to 3-6 years children displayed low performance (50%). Parents’ denial of problem and delay in seeking intervention could also be viewed as a reason for this consequence.
3. To compare the locomotor and object control skill performance between boys and girls among ASD and ADHD

<table>
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<tr>
<th>Diagnosis</th>
<th>Skill</th>
<th>Gender</th>
<th>Mean</th>
<th>SD</th>
<th>Statistical Result</th>
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<td>Locomotor</td>
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<tr>
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<td>Female</td>
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<td>Locomotor</td>
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<td>20.40</td>
<td>8.385</td>
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<td>2.049</td>
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<tr>
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<td>8.136</td>
<td>'t'value = 2.601 P value = 0.032 Significant</td>
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<tr>
<td></td>
<td></td>
<td>Female</td>
<td>7.40</td>
<td>2.191</td>
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</table>

Among the ASD children, a significant difference between male and female was identified in locomotor skills (P value < 0.01). However, a small degree of insignificance was found in object control skills between the genders. This could be attributed to the small sample size and the heterogeneous complex nature of the condition. However, based on mean score, male children displayed better locomotor and object manipulation skills than female children. ADHD children showed a definite significant difference (‘P value’ < 0.05) between genders in both locomotor and object control skills. Based on mean score, male children have better locomotor and object control skills than female children.

**Discussion**

Gross motor skills are elementary for development of more complex and intricate movements. Typically, children develop motor skills naturally as they explore their environment but children with neuro-developmental disorders such as ASD and ADHD demonstrate poor sensory processing, motor and adaptive skills (14-15). The present study revealed no association between children with ASD and ADHD with regard to locomotor skills and object manipulation skills. However, based on total percentage, locomotor skills are high among children with ASD versus ADHD. This could be due to the increased distribution of high performers among the ASD group of children and presence of co-morbid autistic symptoms among the low performing group of ADHD children. Literature studies (16-17,9) elucidate that although these two disorders seemed quite distinct in terms of their description, they did present a variety of motor skills deficits.

Many researches carried out in the western countries have reported that motor delays in children with ASD become more pronounced with age (18). However, in this cross-sectional study, children belonging to an older age group demonstrated slightly better motor skills than the younger children. Older children with ASD performed better in tasks involving object control skills even without a specialized intervention module. Likewise, age was found to be significantly associated to both locomotion and object control among ADHD children. The researcher infers this finding to the educated and dedicated parents at MCDC with adequate internet accessibility. Further, fending for one’s own family is a norm in India owing to poor access to supports from the state (19). Significant association between age and gross motor skills in ADHD children displayed low performance (60%) among preschoolers. This again underlines the pressing need for early problem identification and early intervention during the developmental window that could ameliorate later symptoms of a range of conditions. On comparison of locomotor and object control skill performance, boys in general, performed significantly better than girls in both the ASD and ADHD groups. Literature (20) cites that boys tend to show higher levels of physical activity than girls from the time they are infants until later in life. Biological and hormonal influences begin in the womb when a foetus with an XY chromosome pattern develops an increased level of testosterone. Although both boys and girls produce testosterone and oestrogen, the quantities are different making the males stronger in nature. Besides boys in India being the preferred gender,
are generally fed and cared for much better than girls due to various beliefs linked to economic support and karmic duties.

**Conclusion**

This study concludes that significant gross motor skill deficits exist in children with Autism Spectrum Disorder and Attention Deficit Hyperactive Disorder that would subsequently impair their occupational performance in learning, play and self care. Neuroscience research reveals that the brain function and behaviour can be altered through neuroplasticity in response to enriched environmental experiences. Ayres Sensory Integration advocates that active engagement in carefully guided sensori-motor activities would promote adaptive changes in children- Thus, promising better progress and prognosis. Parents caring for these children also undergo much stress and confusion which could affect the entire family. An intervention module that would address both child-related as well as parent-related needs is proposed for future research. The investigator trusts that this study will enlighten both parents and the related health professionals to understand the gross motor dysfunction in children with ASD and ADHD and offer constructive prospects in future research to promote further elucidation on the topic.

**Ethical Clearance:** This study was undertaken with the consent from the parents of the participating families.

**Conflict of Interest:** Nil. However written parent’s consent was obtained from the children’s parents prior to the study.

**Source of Funding:** Self

**References**


The Evaluation of the Accuracy of a Completely Limiting Tooth Supported Stereolithographic Surgical Guide in Dental Implant Placement Using Superimposition Protocol of Pre-Operative and Post-Operative CBCT Data: A Clinical Study

Ajitha Suresh Kumar¹, Sanjna Nayar²

¹Post Graduate Student, ²HOD, Department of Prosthodontics, Crown and Bridge, Sree Balaji Dental College and Hospital, BIHER University

Abstract

The aim of this study was to evaluate the accuracy of a completely limiting tooth supported stereolithographic surgical guide, with sleeve structure incorporated into the design, for computer-guided dental implant placement in partially edentulous patients using the superimposition protocol using preoperative and postoperative CBCT data.

Materials and Method; 10 implants were placed in 8 consecutive patients using a stereolithographic surgical guide. Postoperative CBCT was taken 6 months after the surgery, 3D accuracy of implants position using a completely limiting tooth supporting surgical guide at the entry point, apex, and angle deviation was measured using an inspection tool software. Chi-square test was used to compare the accuracy of the planned and the placed implant positions. A value < .05 was considered significant.

Results: The mean coronal deviation was .4390°, the sagittal deviation was .2424° and the mesial shift was .1980mm with a standard deviation of .23459° in the coronal, .26632 in the sagittal and .16315mm in the mesial shift. The statistical analysis demonstrated no significant difference between the implants placed when comparing the bony entrance point and angulations in coronal, mesial and sagittal directions (p < 0.05)

Conclusions: The completely limiting tooth supported surgical guide used has proved high accuracy for implant insertion.

Keywords: Guided Implant Surgery; 3D Printing; Virtual Planning; Prosthetically driven implantology.

Introduction

Implant dentistry has gained vast prospective in our daily dental practice, its success depends upon correct designing and execution leading to its correct placement within the bone. This position and angulation of the implants should be done meticulously and the surgical guide aids in achieving perfection in executing this. A surgical guide should be translucent, rigid, stable, and may be simple to sterilize and to insert within the patient’s mouth. Thomas J. Balshi in 1987 explained that the employment of surgical guide stents greatly enhances the surgeon’s ability to quickly and accurately verify fixture location and long axis angulation¹.

These surgical guide designs vary in their design on whether or not they are for absolutely edentulous ridges or partly edentulous ridges or partly edentulous ridges. The design of the surgical guide conjointly depends on wherever the surgical guide takes support. Either it should be tooth supported, mucosa supported or a bone supported surgical guide².

Cone Beam computed axial tomography permits elaborated preparation for the surgical placement of dental implants beneath prosthetic concerns. Computer-
Aided surgery techniques were prompt for achieving an exact implant position\textsuperscript{3,4}. With the support of CBCT, medical care and rapid prototyping engineering a surgical guide that satisfies all the necessities may be factory-made. During this guide the implant is placed through the guide, thereby using laptop guided surgery in dentistry. CBCT has drastically modified the state of affairs in dental treatment planning\textsuperscript{5,6}.

There are several studies on guided implant surgery associated this was an observational study done using the Dio implants (DIO Digital Corporation Korea). This study involves placing implants in precise angulation, employing a flapless, fully limiting style of a stereolithographic surgical guide with an aim to achieve good osseointegration, excellent biologic seal of prosthetically driven implants, with less post-operative discomfort to the patient.

**Materials and Method**

This study was done in 8 consecutive partially edentulous patients (3 women and 5 men, age ranged between 25 and 35 years), who had Kennedy’s class III classification, requiring dental implant placement, were a total of 10 implants, This clinical study was conducted, between August 2017 and November 2018, in accordance with Institutional Ethical Committee Sree Balaji Dental College and Hospital with Ref No SBDCH/IEC/08/2017/2.

Patients with limited bone volume requiring a bone graft, limited mouth opening (impossibility of using a surgical template) were excluded in the study.

**Examination phase:** Patients examined in the outpatient screening were explained about the implant procedure. Ideal cases were selected and were briefed about the procedure. Written consent of each patient was obtained for participation in the study and also for implant placement.

**Pre-operative phase:**

- Impressions; An ideal polyvinyl siloxane impression (3M ESPE Express XT Putty Soft), was made of the maxillary and mandibular jaws of the patient
- Bite registration: Patient’s occlusion was registered using cad bite registration material (Virtual Cad Bite Registration Ivoclar Vivadent). Trios 3 shape scanner can also be used instead of impressions and models.
- CBCT; A CBCT of maxillary and mandibular jaws in disocclusion was made.
- Once the models were scanned both the STL and DICOM files were merged for virtual Planning. The die stone models were scanned using THE 3shape scanner. The DICOM file and the scanned data of the models are merged and a STL file was created. Virtual Planning of Implant Positions Using Implant Studio Software (3 Shape) was done. (figure1)
- 3D printing of the surgical guides: Once the planning was approved the 3D printing of the surgical guide was done using 3D Printer ProJet MJ 3600.

**Operative phase:** The surgical guide and the drilling protocol were followed as given by the manufacturer. Each implant planning comes with a drilling protocol as per the DIO NAVI master kit as this system has a specific sleeve incorporated drill. The protocols of the guided surgery were followed in the surgical phase. The surgical guide is sterilized with 2% chlorhexidine gluconate. The patient was prepared for surgery by swabbing the intraoral and extraoral sites with povidone iodine. The surgical guide was first placed in the patient’s mouth and checked for its fit (figure 2). The surgical procedure as given by the protocols of guided implant surgery were followed (figure 3, figure 4). The first drill was the tissue punch drill in which the tissue was punched out as in the tissue punched out verified in and then consecutive drilling was done and the sleeve was incorporated in few drills as specified in the drilling protocol given by the manufacturer. Abutment profile drill was the last drill before implant placement. The implant was placed and the torque was checked with the hand wrench. The gingival former was also placed through the surgical guide. Neither complications nor unexpected events occurred during implants insertion in all the cases.

**Analysing phase:** Loading protocol was performed as follows: all 10 implants were planned to be delayed loaded with screw-retained or cement - retained metal ceramic prosthesis (after 6 weeks’ healing period). No implant was lost at 6 months’ follow-up, meaning a 100% survival rate. Postoperative CBCT 6 months later to the preoperative CBCT after removing the gingival former was made. The analysis was done using superimposing pre - operative CBCT and post -operative CBCT and the software implant studio. The analysis was done in the mesial section (figure 5) and coronal section (figure 6) and in sagittal section (figure 7). Statistical analyses were performed using SPSS VERSION 21.
Results

Among the ten implants which were inserted in 10 partially edentulous patients: 5 in the maxilla and 5 in the mandible using tooth-supported surgical guide. All the variables involved in the study were expressed in terms of frequency and percentage. Cross tab was used to assess the statistical relationship between the coronal deviation, sagittal deviation and mesial deviation. Chi-square test was employed to assess the association. P = 0.05 was taken as significant. Among the mandible and the maxilla were compared in the. The mean coronal deviation was .4390°, sagittal deviation was .2424° and mesial shift was .1980mm with a standard deviation of .2345° in coronal, .2663° in sagittal and .1631mm in mesial shift (table 1) The statistical analysis demonstrated no significant difference in the implants in coronal sagittal and mesial directions (p < 0.05) (table 2).
Fig. 7: Coronal Deviation

Table 1: Basic Statistical Values

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<tr>
<th></th>
<th>Coronal Section Deviation in degrees</th>
<th>Sagittal Section Deviation in degrees</th>
<th>Mesial Deviation in mm</th>
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Table 2: Mean Standard Deviation Values

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* p value significant at < 0.05

Discussion

This study used a static guided surgery as explained by Jung et al. In this type, the surgical guide is manufactured and is used during the surgical phase while in the dynamic guided surgery the surgery is guided in real time. The only disadvantages are, when the patient had very less intraoral mouth opening, it was difficult to place the guide and to accommodate the handpiece without any interference. Many authors have supported this statement that it’s important to check for mouth opening particularly in dentate cases.

For tooth supported surgical guides all previous studies presented high accuracy while using a rapid-prototyped surgical guide. Gilbarto Sammartino et al (2004) considered using stereolithography in guide manufacturing. The current study also used a surgical guide which was manufactured with stereolithographic technology.
Immediate loading can be done as the guided surgery helps to determine the precise occlusion prior to surgery but this study followed a delayed loading protocol but the gingival former was used to create the gingival cuff. This was in order to facilitate postoperative -CBCT. Obviously, the absence of factors such as incision, flap reflection, determination of implant location, drill depth control, and suturing procedures contribute to reduced surgical time in the flapless computer -guided surgery. Corina Cristache et al published the superimposition protocol and has mentioned a validation study is required for comparing error analysis using post operative-CBCT versus intraoral optical scans should be performed in order to evaluate the potential errors arising from impression making (error of the optical scanner), superimposition of the surfaces, segmentation of implants in the software, error calculation algorithm, and so forth\(^9\). Thus, this study was done for evaluating planned and placed implants insertion was designed. In accordance with this, two STL files of pre and post CBCT were superimposed using the implant studio software, which then calculates the matrix, the treatment plan was set as the reference. This protocol was used by Turbush turkyilmaz et al. in an in vitro study. Literature presents a limited number of studies that discuss the variables capable of causing deviations\(^10\). Marlière, et al. studied the accuracy computer -guided surgery dental implant between the virtually planned position and implant placement using stereolithography guides and said that it can be emphasized that during acquisition, processing, and manipulation of images, an error of approximately 0.5 mm may occur, and incorrect configurations in software can generate slight deformations in surgical guides, varying from 0.1 to 0.2 mm.\(^11\)

Amaral, Daniel et al in 2018 in a systematic review addressed clinical studies, different computer -guided surgery systems and their clinical relevance which may be useful to warn the surgeon that safety margins to consider should refer to clinical situations\(^12\)

Some errors could also occur during the manufacturing of the surgical guide in the phase of surgical simulation on the software, in the precision of the prototyping machine, in the properties of the stereolithography material used, in the fit between the cylinders of the guide, Manufacturing errors of the guide can have a cumulative effect, which can generate unfavourable clinical results. However, errors are not exclusive of the workflow process and/or the product itself (stereolithographic surgical guide). The type of surgical guide (dento supported, muco supported with or without bone supported fixation), as well as morphological factors of the peri implant tissues (bone type: cortical or medullary, thickness of gingival mucosa), may interfere in the accuracy between what was planned and the actual outcomes of dental implants placement. Another important aspect to highlight is the bone structure itself, which if predominantly medullary (maxilla) would have a greater impact on the deviations between planning and execution. This is due probably to lower resistance to torque, when compared to cortical bone, which in turn causes more pronounced deviations in the position of the dental implants The use of completely limiting stereolithographic surgical guide along with shank modified drills and including sleeve while preparing the osteotomy site is an appropriate method in placing the implants in an accurate position to achieve a successful prosthetically driven prosthesis to be in harmony with the stomatognathic system.

**Conclusion**

It is concluded in this study that the guided implant surgery with proper planning gives significant options in different locations and angulations within safe limits when considering the anatomy. This method provides precise angulations in coronal, sagittal and in mesial sections for restoring a successful prosthetically driven implant rather than the conventional method. The surgical phase is very comfortable for the patient and to the dentist with consuming very little time. The quality of the bone influences the accuracy of the angulation. Some discrepancies are seen in the entry point which is clinically insignificant and also statistically it was insignificant. Further evidence on many levels of this guided implant surgery with site specificity is needed. Future studies can be focused on evaluating the accuracy, fine-tuning the process and assessing the success of guided implant surgery in larger scale can be done.

**Conflict of Interest:** Nil

**Source of Funding:** Self

**Acknowledgements:** DIO Digital Corporation

**References**


An Audit to Pain Management of Lower Segmental Caesarean Section in a Tertiary Care Hospital

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¹Associate Professor, Department of Anesthesiology, ²Assistant Professor, Department of Research and Publication Cell, Kalinga Institute of Medical Science, Bhubaneswar, Odisha

Abstract

**Background:** Women undergoing caesarean delivery present a unique set of challenges to the anesthesiologist in terms of postoperative pain management. The transversus abdominis plane block is an effective method of providing postoperative analgesia in patients undergoing abdominal wall incisions. Accordingly, this retrospective study was conducted and analyzed.

**Method:** Patients who underwent elective lower segment caesarean section under sub arachnoid block in last 3 months were scrutinized and 100 eligible records found. Categories into who received the transversus abdominis plane block (TAP Group) at the end of surgery and another was who did not receive the TAP block (Control group).

**Results:** From control group 26 patients complained of pain during first 4 hours, 43 during 8 hours and all 50 complained of pain within 12 hours. Similarly in TAP group 4 patients had complained of pain during first 4 hours, 16 within 8 hours, 29 within 12 hours, 42 within 16 hours. In TAP group 46 patients required rescue analgesics twice or less and 4 required thrice but none of them demanded more than three times whereas in the control group 7 patients demanded twice, 36 demanded three times and 7 of them demanded four times. The ‘p’ value < 0.01 was found to be statistically significant between all the groups.

**Conclusion:** TAP block is easy to perform under ultrasound guidance with minimal complications and side effects and it provides effective analgesia and holds good as part of a multimodal analgesia regime for patients undergoing lower segment caesarean section.

**Keywords:** Lower segmental caesarean, Postoperative pain management, Transversus abdominis plane block.

**Introduction**

Women undergoing Lower Segmental Caesarian Section (LSCS) delivery present a unique set of challenges to the anesthetist in terms of postoperative pain management. The aims of postoperative pain management are to provide subjective comfort, inhibit nociceptive impulses and blunt the neuroendocrine response to pain thus enhancing early restoration of function. Early mobilization is a key factor to prevent the risk of thromboembolic disease and the need to be pain free to take care of the newborn and breastfeed them effectively. The Transversus Abdominis Plane (TAP) block is a recently described approach to providing analgesia to the anterior abdominal wall. TAP block is a regional anesthetic technique that blocks abdominal somatic afferents, however the analgesic benefit of TAP block for LSCS delivery remains controversial. In considering of it was first reported by Rafi in 2001, the TAP block could be leading report as a peripheral nerve block to the anterior abdominal wall (T6-T11). The TAP block has been a subject of controversy with regarding to utility, indications and more fundamentally how best to place the block and its precise mechanism of action. Eventually, the outcome are encouraging and
most studies have demonstrated clinically significant reductions of postoperative opioid requirements and pain, as well as some effects on opioid related side-effects like sedation and postoperative nausea vomiting (7). In view of the continuing increase in LSCS rates identified around the world and the need to expand the knowledge on the occurrence and characteristics of pain experience in the immediate postoperative period, this present study was developed to make a research on the women’s perceived quality of pain during this time (5).

Methodology

A total number of 204 patients, who underwent elective lower segment caesarean section under SAB between September 18 to November 18, were considered for further analysis. Out of this 78 patients were without TAP block and 50 patients were given transversal abdominis plane block at the end of surgery. The patients who did not receive TAP block, of them 76 were given SAB without adjuvants 26 were ASA 3 and 2 refused SAB. These 28 patients were excluded from further analysis. As per the protocol of the institute in the postoperative ward patients were given 1 gram of paracetamol at 2 and 12 hours of sub-arachnoid block. If any patient complained of pain, the visual analogue score (VAS) was assessed and when it was more than 3 than 50 mg of tramadol was administered intra venously. This data was recorded independently by the two authors and analyzed retrospectively. The primary objective was to find out the association of field blocks with postoperative pain control in patients after LSCS. The time required for first rescue analgesic demand, the total requirement of rescue analgesics and the VAS score were taken as an indicator for this. The secondary objectives were to compare the side effects such as postoperative nausea vomiting, sedation and patient satisfaction among both the groups.

A 100 ASA-2 class patients between age group 18-40 years posted for elective LSCS were included in the study. The exclusion criteria were patients with known cardiovascular, hepatic, or renal dysfunction, patient refusal for regional anaesthesia, failed sub-arachnoid block (SAB), adjuvants used in SAB, any coagulopathy or known drug allergy or hypersensitive reaction. All the patients received standard premedication according to the institution protocol with ranitidine and metoclopramide intravenously before shifting the patient to the operating room for elective LSCS. Those patients in whom no adjuvants were used in SAB were included in the study. The time of SAB, the height of block, the surgical duration were noted for data analysis. At the end of the procedure only willing patients were given bilateral transversus abdominis plane block using 20 ml 0.2% ropivacaine on each side. In the postoperative ward patients received 1 gram of paracetamol at 2 and 12 hours of sub-arachnoid block. If any patient complained of pain, the visual analogue score (VAS) was assessed and when it was more than 3 than 50 mg of tramadol wa administered intra venously. All the patients were followed by an independent observer for a period of 24 hours duration at intervals of 0-4 hours, 4-8 hours, 8-12 hours, 12-16 hours, 16-20 hours and 20-24 hours. Pain scores were assessed as the primary outcome using the Visual Analogue Scale. The total cumulative amount of rescue analgesia and frequency of analgesic requirement on demand were noted. Incidence of postoperative nausea vomiting and sedation were noted.

Sample size and Statistical Analysis: Statistical analysis was done using chi square test. Differences were considered to be statistically significant when the ‘p’ value was found to be < 0.05.

Results

There was no significant difference in the demographic characteristics between both the groups with respect to age, weight, Height of SAB, and duration of surgery. That in the control group pain in patients without TAP block started early, out of fifty patients 26 complained of pain within first 4 hours, 43 patients within 8 hours and all 50 patients complained of pain within 12 hours. Similarly in the group where TAP block was given only 4 patients had complaints of pain within 4 hours, 16 patients within 8 hours, 29 patients within 12 hours, 42 patients within 16 hours. The ‘p’ value < 0.01 is highly significant between both the groups (Table 1). The mean VAS was lower in the block group as compared to the control group in the first 12 hours (Table 2). The frequency of analgesic requirements is low in the TAP group. During the first postoperative day 46 patients required twice or less time and 4 patients required thrice but none of them demanded more than three times in the group where block was given. Where as in the control group 7 patients demanded twice, 36 patients demanded analgesics three times and 7 of them demanded four times. The ‘p’ value < 0.01 was found to be statistically significant between both the groups (Table 3). Total rescue analgesia required during the first 24 hours showed a 36.42% decrease in the group of patients who received the block as compared to the control group. Two patients from control group were

(7)
having post-operative nausea and vomiting and were treated with metoclopramide. None of the patients complained of sedation from both the groups and no complications of procedure like bowel injury or femoral nerve palsy were noted. At least for the first 12 hours patients were more satisfied in the group who received the transversus abdominis plane block than those who did not (Table 4).

**Table 1: Comparison of number of patients complained pain**

<table>
<thead>
<tr>
<th></th>
<th>Tap Block</th>
<th>Control</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total no. of Participants</td>
<td>50</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Pain within 4 Hrs</td>
<td>4</td>
<td>26</td>
<td>p &lt; 0.01</td>
</tr>
<tr>
<td>Pain within 8 Hrs</td>
<td>16</td>
<td>43</td>
<td>p &lt; 0.01</td>
</tr>
<tr>
<td>Pain within 12 Hrs</td>
<td>29</td>
<td>50</td>
<td>p &lt; 0.01</td>
</tr>
<tr>
<td>Pain within 16 Hrs</td>
<td>42</td>
<td>50</td>
<td>p &lt; 0.01</td>
</tr>
<tr>
<td>Pain within 20 Hrs</td>
<td>50</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Pain within 24 Hrs</td>
<td>50</td>
<td>50</td>
<td></td>
</tr>
</tbody>
</table>

**Table 2: The mean VAS for two Groups**

<table>
<thead>
<tr>
<th></th>
<th>Tap Block</th>
<th>Control</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total no. of Participants</td>
<td>50</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Mean VAS at 4 Hrs</td>
<td>1.88 ± 1.39</td>
<td>3.6 ± 2.36</td>
<td></td>
</tr>
<tr>
<td>Mean VAS at 8 Hrs</td>
<td>3.14 ± 1.78</td>
<td>3.84 ± 1.5</td>
<td></td>
</tr>
<tr>
<td>Mean VAS at 12 Hrs</td>
<td>3.54 ± 1.89</td>
<td>4.16 ± 1.69</td>
<td></td>
</tr>
<tr>
<td>Mean VAS at 16 Hrs</td>
<td>3.96 ± 1.99</td>
<td>3.4 ± 1.44</td>
<td></td>
</tr>
<tr>
<td>Mean VAS at 20 Hrs</td>
<td>3.9 ± 1.33</td>
<td>3.4 ± 1.2</td>
<td></td>
</tr>
<tr>
<td>Mean VAS at 24 Hrs</td>
<td>2.98 ± 1.18</td>
<td>2.86 ± 1.48</td>
<td></td>
</tr>
</tbody>
</table>

**Table 3: Frequency of rescue analgesics required**

<table>
<thead>
<tr>
<th></th>
<th>Tap Block</th>
<th>Control</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total no. of Participants</td>
<td>50</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Required twice or less in First 24 Hrs</td>
<td>46</td>
<td>7</td>
<td>p &lt; 0.01</td>
</tr>
<tr>
<td>Required thrice or more in First 24 Hrs</td>
<td>4</td>
<td>43</td>
<td>p &lt; 0.01</td>
</tr>
</tbody>
</table>

**Table 4: Total rescue analgesia required during first 24 hrs**

<table>
<thead>
<tr>
<th></th>
<th>Tap Block</th>
<th>Control</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total no. of participants</td>
<td>50</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Total rescue analgesia required during first 24 hrs(mg)</td>
<td>96 ± 24.16</td>
<td>151 ± 27.37</td>
<td>36.42 % decreased in TAP group</td>
</tr>
</tbody>
</table>

**Discussion**

This work substantiates that patients complained of postoperative pain following lower segment caesarean section early in the group of patients where field block (transversus abdominis plane block) was not given as compared to those in which the block was given. Moreover, there was less number of patients who complained of postoperative pain in the early hours in the group where field block was administered as compared to the group where the block was not administered. In this study, the visual analogue pain scores were lower in the block group as compared to the control group in the first 12 hours. Furthermore, present results are quite similar to another study conducted by Sinha et al. where transversus abdominis plane block resulted in a significant reduction of pain visual analogue scores over the first 24 hours postoperatively(9). A study conducted by Ammar Mahmud et al pain Visual Analogue Pain score was significantly lower at the postoperative period of 2hours,4 hours and 12 hours which is similar to our results(10). Therefore the pain impulse following lower segment caesarean section may arise from two components mainly somatic and visceral(11). The somatic pain arises from the anterior abdominal wall due to incision. The peripheral nerves that carry signals following lower segment caesarean section are thoracolumbar nerves ranging from T10-L1 with varying contribution from T9-L2(12). Consequently, the regional analgesic technique that aims to provide parietal wall pain relief following lower segment caesarean section should block all these nerves. Thus, the transversus abdominis plane block performed at the midaxillary line in the sub costal area provided the conduction blockade of thoracolumbar nerves arising from T10-L1 during 50%of the time and T11-L1 in 100% of the time(13). In according, TAP block group of patients the parietal wall anesthesia was more complete as it blocked the pain impulse from both the skin and subcutaneous tissue and from the rectus muscle. The visceral pain impulse from the uterus reaches the spinal cord through the sympathetic fibres through the inferior hypogastric plexus which were not blocked by the regional anesthetic technique. Therefore, all the patients in both te groups required some dose of systemic analgesics to attenuate the visceral pain. Thus, the frequency of rescue analgesics required in the first 24 hours was low in the in the group with the block as compared to the control group. Also the number of patients who out demanded rescue analgesics was low in the block group as compared to the control group. The mean analgesic requirement in the block
group was lower than the control group and there was a 36.42% decrease in the analgesic requirement in the field block group during the first 24 hours of surgery. In this present study report is also quite similar to various other studies where there is decreased requirement of postoperative opioids like tramadol as shown by Sinha et al, Ammar Mahmoud et al\(^9, 10\) However, in a study conducted by Eslamian et al for postoperative analgesia in lower segment caesarean section patients, the maximum tramadol consumption was 150mg in the TAP block group and 400 mg in no block group. The mean tramadol consumption in a 24 hour period was only 75 mg in TAP block group while it was 250mg in patients who did not receive tramadol, as quite similar as to this study.\(^{14}\) There were no side effects such as, postoperative nausea vomiting and sedation among the patients of both the groups. There were no complications of the TAP block such as, bowel injury, trauma or femoral and nerve palsy or local anesthetic toxicity.

**Limitations of our study:** This is a retrospective analysis of recorded data so chances of missing vital data are excessive. In some cases feedback was collected after 3-4 months, so validation of satisfaction of data not reliable.

**Recommendation:** The authors would like to suggest that there is the a need to develop new and well designed randomized control trial to compare different approaches, drugs, doses and volumes for the same intervention, aiming to answer the current questions and assess the effects of transverses abdominis plane block in current routine clinical practice, as the clinical utility of the current approaches to the blockade of these nerve afferents, such as abdominal field blocks is limited and the degree of block achieved can be unpredictable.

**Conclusion**

TAP block is easy to perform under ultrasound guidance with minimal complications and side effects and it provides effective analgesia and holds good as part of a multimodal analgesia regime for patients undergoing lower segment caesarean section.

**Conflict of Interest:** There is no conflict of interest

**Ethical Clearance:** The ethical clearance is approved by Institutional Ethical Committee, KIMS Hospital, Bhubaneswar (KIIT/KIMS/IEC/15/2019)

**Source of Funding:** Nil

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**References**


Evaluation of Phytochemical Analysis and Antimicrobial Activity of Citrus Latifolia Peel Extract

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¹Associate Professor, ²III Year Biotechnology Students, ³Research Associate, Molecular Diagnostics and Bacterial Pathogenomics Research Laboratory, Department of Biotechnology, Bannari Amman Institute of Technology, Sathyamangalam, Erode District, Tamil Nadu, India

Abstract

Citrus latifolia accounts for its phytochemical activity, these bioactive compounds result in the antioxidative, anti-inflammatory, anti-microbial effects that can serve mankind. The aim of the present work investigates the presence of the bioactive components present in the Methanol extracts of the Citrus latifolia peel and examines its potent antimicrobial and antioxidant activity. The plant material was dried and extracted in the soxhlet extractor and was concentrated using rotary evaporator. The extract was then tested for the anti-oxidant activity using DPPH assay and antimicrobial activity using well diffusion method. The extract was then lyophilized and analyzed for the presence of potent bioactive compounds using GCMS technique. The DPPH antioxidant profiling of the methanol extract of Citrus latifolia peel showed maximum radical scavenging activity compared with the IC50 of Ascorbic acid. The extract showed inhibitory antimicrobial activity against Escherichia coli, Pseudomonas aeruginosa, streptococcus pyogenes, and Listeria monocytogenes. The GC-MS analysis reveals the presence of eighteen compounds such as alcohol, acid-esters, aromatic acids, furanone, polyester, coumarins, hypoxanthine, that is responsible for the anti-oxidation and anti-microbial effect of the Citrus latifolia. The investigation from this study has concluded that the methanol extract of Citrus latifolia will be the alternative medication to such threat full pathogens.

Keywords: Citrus latifolia, anti-microbial activity, anti-oxidant activity, GC-MS.

Introduction

Recent advancement in the plant technology provides a threshold for the development of different plant-dependent antimicrobial drugs against drug-resistant human pathogenic microorganism using different plant-derived extracts, one among them is citrus species identified with 80% of antioxidant profile. They are also rich in nutrients and active bio compounds which have a tendency of healing and pain-relieving ability. Most of the dietary antioxidants available in markets are derived from plant[2], The citrus fruits have a high content of various plant-derived secondary metabolites called phytochemicals which is responsible for the different medical properties like high aromatic content, antitoxic content, antioxidant profile, refreshing property and citric acid content, vitamin C content which can be formulated as a medicine for various disorders and disease occurrence.[3] The Eos of citrus latifolia specified to have anti-inflammatory property against the experimental mouse models.[4] The evaluation of cytotoxicity and genotoxicity of citrus latifolia are also provided a better result on the cancer cell lines so it is found to have the anticancer activity. [5] Their juices also act as an antidote to relieve pain and inflammation resulting from stinging corals, Bitting aroids Furthermore the citrus fruits are also been used in Ancient Ayurvedic field in many different countries like china, japan, Korea, India to treat indigestion, cough, inflammation, skin allergies, ringworm infection, maintain blood pressure, to reduce weight and also to treat nausea.[6] The phytochemicals like flavonoids,
The fresh strains, etc. fruits o mass spectroscopy which is used for the detection and spectrometry (GC-MS) is a diagnostics method that evaporator BUCHI Rotavapor® R-300. The concentrate cycles. The extract was then condensed by using rotary extraction and cycling conditions were 50°C for 7 minutes. The 80% Methanol is used as the solvent for the Aldrich and subjected to the soxhlet extractor apparatus. cellulose extraction thimbles purchased from Sigma-

of 10g was packed in a bag. and the fine powder was stored in a nontoxic polythene 40℃ for 36 hours, pulverized in a mixer grinder, sieved warm distilled water and air-dried in the hot air oven at collected fruits were transferred to the lab using sterile Whatman® high-performance cellulose extraction thimbles purchased from Sigma-Aldrich and subjected to the soxhlet extractor apparatus. The 80% Methanol is used as the solvent for the extraction and cycling conditions were 50°C for 7 cycles. The extract was then condensed by using rotary evaporator BUCHI Rotavapor® R-300. The concentrate is used for all the followed experiments. [11] GC-MS Analysis: Gas chromatography-mass spectrometry (GC-MS) is a diagnostics method that works under the principles of gas chromatography and mass spectroscopy which is used for the detection and quantification of different molecules and its structure within the test solution. The extracted samples were subjected to the GC–MS (Perkin Elmer model: Clarus 680) which is combined with the mass spectrometer (Clarus 600 (EI) analyzed using (TurboMassver 5.4.2) software. At a constant flow rate about 1ml/min, a carrier SSSSgas such as helium was used to separate the components. The temperature of the injector was adjusted to 260°C while performing the experiment. The extracted sample of 1µL was injected into the equipment the temperatures of the oven were 60°C (2 minutes); followed by 300°C at the rate of 10°Cmin⁻¹; and 300°C for 6mins. The conditions of the mass detector were: the temperature of the transfer line was 240°C; and ionization mode electron impact at 70eV, the duration time of scan interval is 0.2sec and scan interval is 0.1sec. The fragments from 40 to 600Da. The spectrum of components was corresponding to the database of the spectrum of established components gathered in the GC-MS NIST library. [12] Phytochemical Screening: Mayers reagent (1ml) was added to 3ml of extract and shaken well, the white precipitate at the bottom indicates the presence of alkaloids. 10ml of the extract of the plant was added with 1% HCl. The red precipitate deposition in the bottom indicates the presence of phlobatannins. Triterpenoids in the extract were indicated by Salkowski test in which 5 drops of concentrated sulphuric acid was added to the 2 ml of extract, shaken well allowed to stand. The appearance of the greenish-blue color indicates the presence of triterpenoids. Presence of flavonoids in the extract was indicated by alkaline reagent test. In this few drops (3 drops) of 10%, NaOH solution was added to 1ml of extract, indicated by an intense yellow color, which disappeared on the addition of a few drops of dilute acid. Lipid confirmation was carried out by adding 0.5 N alcoholic potassium hydroxide to 10ml extract along with a drop of Phenolphthalein. The mixture was heated on a water bath for 1 hour the confirmation of foam or soapy layer indicates the presence of lipids. 2ml of chloroform and few drops of concentrated sulphuric acid were added to the 5ml extract, the upper layer in the test tube appear red white. The sulphuric acid layer appears with greenish fluorescence, indicates the presence of steroids. Extract of 1ml was added with 1ml of chloroform, mixed well and left for 5 minutes, after 5 minutes 1ml of concentrated Sulphuric acid was added, the appearance of grayish layer indicates the presence of Terpenoids.
Antioxidant Profile

DPPH (free radical scavenging) Assay: DPPH (2, 2-diphenyl-1-picryl-hydrazyl-hydrate) is a method to find the antioxidant activity. It measures the radical scavenging of the plant extract through redox reaction, the violet color of the DPPH turns to pale yellow color due to the hydrogen donation by the antioxidants present in the extract, then the amount of antioxidant property is calibrated by the colorimeter, the 1.0 mM DPPH was added to the various concentrations of the samples, it was dark macerated for about 30 minutes, the respective color change from violet to yellow indicates the presence of antioxidants, which was later examined using spectrophotometer 517nM by using ascorbic acid as a standard.[13]

\[
\% \text{ of inhibition} = \frac{A_0-A_1}{A_0} \times 100
\]

A₀ is absorbance of control solution (the solution without sample)

A₁ is absorbance of sample/standard

Antibiogram Evaluation: The Antibiogram refers to an antibiotic sensitivity test. The antimicrobial activity of the extract was analyzed by using well diffusion tests. The four bacterial species were selected, two species which are gram-positive and two species which are gram-negative. The Agar well Diffusion antimicrobial Assays specified above was followed in order to get the better MIC values and its zone of inhibition. The preparation plates include the autoclaving agar stock (Mueller Hinton agar) purchased from Himedia laboratories. The sterile agar plates were inoculated with the bacterial strains of interest two gram-negative bacteria (Escherichia coli, Pseudomonas aeruginosa) and two gram-positive bacteria (Streptococcus pyogenes, Listeria monocytogenes) which was then streaked by a sterilized cotton swab with the respective strains, the agar plates were punctured by using a good puncture injector. The different concentrations of the extract were pipetted into the well and incubated for 24 hours at 37°C and Zones of inhibition values are calculated. [14]

Results and Discussion

The results have shown the Citrus latifolia antimicrobial activity and the antioxidant activity of Citrus latifolia has a potential role in the pharmaceutical world. Predominantly all the plants possess antioxidant activity that is responsible for the arresting of different reactive oxidative species from damaging the DNA. [15] The DPPH assay has demonstrated the potent results for the different concentration levels which the curvy increasing graph. Ascorbic acid was used as the standard to compare with the different concentration samples and IC50 (inhibitory concentration) was calculated for both sample and standard Graph shows the anti-oxidation property versus concentration of C.latifolia (sample). The capacity of extracts to scavenge the DPPH radical was estimated according to the procedure described. [16] The bacteria tested showed the positive results towards the antimicrobial susceptibility. Altogether, the results suggest that there is a possible contribution of the components present in C. latifolia with the antioxidant property is one of the factors that take part in the antimicrobial activity. [17] The minimum inhibitory concentration assay conducted in nutrient agar using solvent extract are reported in table 1 for Pseudomonas aeruginosa Streptococcus pyogenes, Listeria monocytogenes, Escherichia coli respectively, all the microbes showed the positive antimicrobial sensitivity[18]. The study shows that the peel of citrus latifolia is a potent antimicrobial agent against skin flora like Pseudomonas and Streptococcus is a skin microbiota, which can be furthermore implemented as a medication for the various skin infections. [19] Phytochemical screening of the methanol extracts of the Citrus latifolia is analyzed through various phytochemical assays to identify the presence of the respective phytochemicals in the extract. GCMS analysis of methanol extract of Citrus latifolia showed the presence of the following compounds as shown in table 2 respectively. [20] The analysis showed that the extract contains eighteen bioactive compounds that include mostly such as alcohol, acid-esters, aromatic acids, furanone, polyester, coumarins, hypoxanthine, that accounts for the anti-oxidation and anti-microbial effect of the Citrus latifolia species.[21]

Table 1: Antimicrobial Activity

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Test Organism</th>
<th>Zone of Inhibition in (Mm) for Different Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Negative Control 15μl 20μl 25μl 30μl</td>
</tr>
<tr>
<td>1.</td>
<td>Escherichia coli</td>
<td>C 10 11 13 12</td>
</tr>
<tr>
<td>2.</td>
<td>Pseudomonas aeruginosa</td>
<td>C 10 12 10 11</td>
</tr>
<tr>
<td>3.</td>
<td>Streptococcus pyogenes</td>
<td>C 15 16 15 15</td>
</tr>
<tr>
<td>4.</td>
<td>Listeria monocytogenes</td>
<td>C 10 11 10 13</td>
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</table>
Table 2 Shows the result of phytochemical screening of methanol extracts of *citrus latifolia*.

<table>
<thead>
<tr>
<th>Secondary metabolites</th>
<th>Inference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alkaloids</td>
<td>Negative</td>
</tr>
<tr>
<td>Phlobatannins</td>
<td>Positive</td>
</tr>
<tr>
<td>Triterpenoids</td>
<td>Negative</td>
</tr>
<tr>
<td>Flavonoids</td>
<td>Negative</td>
</tr>
<tr>
<td>Lipids</td>
<td>Positive</td>
</tr>
<tr>
<td>Steroids</td>
<td>Positive</td>
</tr>
<tr>
<td>Terpenoids</td>
<td>Negative</td>
</tr>
</tbody>
</table>

Table 3 GC-MS analysis of the methanol extract of the *C.latifolia*

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Compound Name</th>
<th>Compound Structure</th>
<th>Molecular Weight</th>
<th>Chemical formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>n-hexadecanoic acid</td>
<td></td>
<td>256</td>
<td>C_{16}H_{32}O_{2}</td>
</tr>
<tr>
<td>2.</td>
<td>n-hexadecanoic acid</td>
<td></td>
<td>256</td>
<td>C_{16}H_{32}O_{2}</td>
</tr>
<tr>
<td>3.</td>
<td>propanoic acid, 2-oxo-, trimethylsilyl ester</td>
<td></td>
<td>160</td>
<td>C_{6}H_{12}O_{3}Si</td>
</tr>
<tr>
<td>4.</td>
<td>tetracosanoic acid, trimethylsilyl ester</td>
<td></td>
<td>440</td>
<td>C_{27}H_{56}O_{2}Si</td>
</tr>
<tr>
<td>5.</td>
<td>11-eicosenoic acid, trimethylsilyl ester</td>
<td></td>
<td>382</td>
<td>C_{23}H_{46}O_{2}Si</td>
</tr>
<tr>
<td>6.</td>
<td>stigmastan-6,22-dien, 3,5-dedihydro</td>
<td></td>
<td>394</td>
<td>C_{29}H_{46}</td>
</tr>
<tr>
<td>7.</td>
<td>7-hydroxy-3-(1,1-dimethylprop-2-enyl)coumarin</td>
<td></td>
<td>230</td>
<td>C_{14}H_{10}O_{3}</td>
</tr>
<tr>
<td>8.</td>
<td>silane, [(3.beta.)-gorgost-5-en-3-yl]oxy]trimethyl</td>
<td></td>
<td>498</td>
<td>C_{33}H_{58}OSi</td>
</tr>
<tr>
<td>9.</td>
<td>dodecane, 1-chloro</td>
<td></td>
<td>204</td>
<td>C_{12}H_{23}Cl</td>
</tr>
</tbody>
</table>

Escherichia coli  Pseudomonas aeruginosa  Listeria monocytogenes  Streptococcus pyogenes

Figure -2 Anti-Microbial Susceptibility Test


## Conclusion

This study has revealed that the methanol extract of *Citrus latifolia* has a potential antimicrobial and antioxidant activity. The biomolecules of methanol extract of the peels of *citrus latifolia* were contrary to specific bacteria which can be supplemented as the potent drug for the various diseases. Meanwhile, the purification and identification technology of the plant photochemistry play a major role in the separating and identification of biomolecules that is responsible for the anti-oxidation property which can be a threshold for the development of anti-oxidant drugs.

**Declaration:** The author’s report no conflict of interest.

**Acknowledgment:** This research is a part of B.Tech. Project work of second, third and fourth authors. Authors gratefully acknowledge AICTE, New Delhi, sponsored Molecular Diagnostics and Bacterial Pathogenomics Research Laboratory of Bannari Amman Institute of Technology for providing an ambient environment for the successful completion of the project.

**Source of Funding:** Self

**Ethical Clearance:** Nil

**References**


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Prevalence of Autoantibodies and the Clinical Spectrum of Disease in an Indian Patient Subpopulation with Lichen Planus

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\textsuperscript{1}Assistant Professor, \textsuperscript{2}P.G. Resident, Department of Dermatology, Krishna Institute of Medical Sciences Deemed to be University, Karad

Abstract

\textbf{Background:} Lichen planus is a chronic mucocutaneous inflammatory disease which frequently involves the oral mucosa. The present study was conducted to assess prevalence of auto antibodies and clinical spectrum of lichen planus.

\textbf{Materials & Method:} The present study was conducted on 82 patients of lichen planus of both genders. A thorough clinical examination was performed. 5 ml of blood was drawn in a sterile syringe with all aseptic precautions. Antibodies including anti-nuclear antibody, anti-desmoglein 1 antibody, anti-desmoglein 3 antibody, anti-keratinocyte antibody, anti-mitochondrial antibody and anti-thyroglobulin antibody were assayed in serum samples by indirect immunofluorescence according to commercially available testing kits.

\textbf{Results:} Out of 82 patients, males were 24 and females were 58. Age group 11-20 years had 5 males and 15 females, 21-30 years had 8 males and 26 females, 31-40 years had 6 males and 10 females, 41-50 years had 3 males and 4 females and > 50 years had 2 males and 3 females. The difference was significant (P < 0.05). ANA was positive in 14, DSG- I in 15, DSG- III in 24, AKA in 27, AMA in 45 and TGA in 32. The difference was significant (P < 0.05).

\textbf{Conclusion:} Authors found that most common auto- antibodies found was AMA, AKA and DSG- III.

\textbf{Keywords:} Auto- antibodies, Desmoglein, Lichen planus.

Introduction

Lichen planus is a chronic mucocutaneous inflammatory disease which frequently involves the oral mucosa. In the majority of patients with oral lichen planus (OLP) there is no associated cutaneous lichen planus or lichen planus at other mucosal sites.\textsuperscript{1} This may be called “isolated” OLP. This disease has most often been reported in middle-aged patients 30-60 years of age and is more common in females than in males. OLP is also seen in children, although it is rare.\textsuperscript{2}

The etiology of lichen planus is poorly understood and autoimmunity is proposed. Recent evidence suggests the role of humoral immunity in the pathogenesis of lichen planus.\textsuperscript{3} This study mainly focuses on the immunological profile of lichen planus patients from western India to understand the etiopathogenesis of lichen planus from an autoimmune point of view by detecting various autoantibodies such as anti-nuclear antibody, antidesmoglein 1 antibody, anti-desmoglein 3 antibody, anti keratinocyte antibody, anti-mitochondrial antibodies and anti-thyroglobulin antibody.\textsuperscript{4}

OLP was first described clinically by Wilson in 1869 as a chronic mucocutaneous disorder. Cutaneous lichen planus is recurrent, itchy and not contagious. Concomitant disease involving the scalp, nails, esophageal mucosa, larynx and conjunctivae occurs much less frequently. In many patients, the onset of OLP is insidious, and patients are unaware of their oral condition.\textsuperscript{5} The present study was conducted to assess prevalence of auto antibodies and clinical spectrum of lichen planus.
Materials & Method

The present study was conducted in the department of Dermatology. It comprised of 82 patients of lichen planus of both genders. All were informed regarding the study and written consent was obtained. Ethical clearance was obtained prior to the study.

General data such as name, age, gender etc. was recorded. A thorough clinical examination was performed. 5 ml of blood was drawn in a sterile syringe with all aseptic precautions. Antibodies including anti-nuclear antibody, anti-desmoglein 1 antibody, anti-desmoglein 3 antibody, anti-keratinocyte antibody, anti-mitochondrial antibody and anti-thyroglobulin antibody were assayed in serum samples by indirect immunofluorescence according to commercially available testing kits. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

Results

Table I: Distribution of patients

<table>
<thead>
<tr>
<th>Gender</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>24</td>
<td>58</td>
</tr>
</tbody>
</table>

Table I shows that out of 82 patients, males were 24 and females were 58.

Table II: Age wise distribution of patients

<table>
<thead>
<tr>
<th>Age group (Years)</th>
<th>Males</th>
<th>Females</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>11-20</td>
<td>5</td>
<td>15</td>
<td>0.01</td>
</tr>
<tr>
<td>21-30</td>
<td>8</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>31-40</td>
<td>6</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>41-50</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>&gt;50</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

Table II shows that age group 11-20 years had 5 males and 15 females, 21-30 years had 8 males and 26 females, 31-40 years had 6 males and 10 females, 41-50 years had 3 males and 4 females and > 50 years had 2 males and 3 females. The difference was significant (P < 0.05).

Table III: Autoantibody positivity in patients

<table>
<thead>
<tr>
<th>Autoantibody</th>
<th>Positivity</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANA</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>DSG-I</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>DSG-III</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>AKA</td>
<td>27</td>
<td></td>
</tr>
<tr>
<td>AMA</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>TGA</td>
<td>32</td>
<td></td>
</tr>
</tbody>
</table>

Table III shows that ANA was positive in 14, DSG-I in 15, DSG-III in 24, AKA in 27, AMA in 45 and TGA in 32. The difference was significant (P < 0.05).

Discussion

The pathogenesis of lichen planus has not yet been fully elucidated. However, an autoimmune etiology with cellular immunity playing a role is postulated. The steps involved in the pathogenesis of lichen planus include recognition of the lichen planus specific antigen by CD4+ T cells and NK cells, cytotoxic T cell activation and keratinocyte apoptosis. Other mechanisms which may possibly be operative in the pathogenesis of lichen planus include activated fibrinogen cascade, neoangiogenesis and nonantigen- mediated mechanisms, including activation of matrix metalloproteinases and mast cell degranulation. Many studies hypothesizing the role of circulating antibodies have been described in lichen planus recently. The present study was conducted to assess prevalence of auto antibodies and clinical spectrum of lichen planus.

We found that out of 82 patients, males were 24 and females were 58.

Kinjyo et al found that 65 (65%) patients showed the presence of at least one of the six auto antibodies while 35 (35%) tested negative for all six of them. Positivity of anti-keratinocyte antibody in 26 (26%), anti-nuclear antibody in 22 (22%), anti-desmoglein 1 antibody in 19 (19%), anti-desmoglein 3 antibody in 16 (16%), anti-mitochondrial antibody in 9 (9%) and anti-thyroglobulin antibody in 6 (6%) patients was detected. It was observed that 55 (71.4%) patients of cutaneous lichen planus, 6 (46.1%) patients of mucosal lichen planus and 4 (40%) patients of cutaneous and mucosal lichen planus overlap showed presence of at least one autoantibody.

We found that age group 11-20 years had 5 males and 15 females, 21-30 years had 8 males and 26 females, 31-40 years had 6 males and 10 females, 41-50 years had 3 males and 4 females and > 50 years had 2 males and 3 females. ANA was positive in 14, DSG-I in 15, DSG-III in 24, AKA in 27, AMA in 45 and TGA in 32.

The clinical evaluation of the oral lesions is based on the six clinical forms described by Andreason as reticular, papular, plaque, atrophic, erosive, and bullous. Mucosal lesions, which are multiple, generally have a symmetrical distribution, particularly on the mucosa.
of the cheeks, adjacent to molars, and on the mucosa of the tongue, less frequently on the mucosa of the lips (lichenous cheilitis) and on the gums (the atrophic and erosive forms localized on the gums manifest as a desquamative gingivitis), more rarely on the palate and floor of the mouth. However, this clinical appearance of desquamative gingivitis. A study by Parodi et al described the prevalence of stratified epithelium-specific antinuclear antibodies directed to an antigen of 70 kd in patients with various forms of lichen planus. Carizossa, Elorza, Carnacho found anti-nuclear antibodies in high proportion (40% using rat esophagus as substrate and 27.6% using monkey esophagus). These anti-nuclear antibodies exhibited a speckled pattern and were more frequently encountered in erosive lichen planus patients.

Chang et al had reported the frequency of anti-mitochondrial antibody as 1.6%; anti-thyroglobulin antibody positivity as 21.3% among oral lichen planus patients. The presence of anti-nuclear antibody, anti-gastric parietal cell antibody, anti-thyroglobulin antibody and anti-thyroid microsomal antibody were also reported in oral lichen planus.

Conclusion

Authors found that most common auto-antibodies found was AMA, AKA and DSG- III.

Conflict of Interest: The authors declare that there is no conflict of interest regarding the publication of this paper.

Source of Funding: Self

Ethical Clearance: Ethical clearance has been taken from Institutional Ethical Committee

References

Patterns of Head Injury in Geriatric Eastern Indian Population in Computed Tomography: A Retrospective Study

Bikramaditya Swain1, Ranjan Kumar Sahoo2, Manoj Kumar G3

1Assistant Professor, 2Associate Professor, 3Junior Resident, Department of Radiology, KIMS Bhubaneswar, Odisha

Abstract

Background and Purpose: Head injury is the common cause of mortality and mobility in elderly in a developing country like India. Data of geriatric head injury epidemiology is scant in literature in Indian population. The purpose of the study was to assess the pattern of Computed Tomography (CT) findings in head injury patients at the tertiary referral centre in eastern India.

Method and Materials: CT image data of 234 geriatric patients (more than 60 years of age) with head injury between January 2016 to June 2019 duration were retrieved from radiology data storage and analysed by two radiologists for pattern of head injuries, anatomical distribution and age, sex predilection.

Results: Male to female ratio was 2.9:1 and common cause for trauma was road traffic accident (RTA) (65.8%) followed by falls (31%). Extra axial lesions (75.5%) were most common finding. SDH was the most common pattern among all (60%) followed by contusion (16%). Temporo-parietal bone was most commonly involved skull bone fracture.

Conclusion: The prevalence of traumatic head injury in elderly is high in the study. Head injuries more common in males than females. Extra axial lesions are most common findings with SDH as the most common pattern seen in elderly.

Keywords: Computed Tomography, subdural haemorrhage, trauma, brain, injury.

Introduction

Head injury is the commonest cause of morbidity and mortality worldwide including developing countries like India. Head trauma includes injury to scalp, skull, meninges and brain. National Centre for Injury Prevention and control, USA, reported that around 1.7 million people got treatment related to head injury in united states alone with high morbidity and mortality.

WHO stated that head injuries will cross many diseases to become the major cause of death and disability especially in elderly persons more than 60 years and account for 25% of all injury deaths and 30 % of injury related hospitalization and is estimated that it will become third largest cause of disability adjusted life years lost world wide by 2020.

Falls are responsible for more than one-third of all Traumatic Brain Injuries (TBIs) within the general population and more than 60% of all TBIs among people older than 65 years

Patients over age 75 years have the highest rates of both TBI-related hospitalization and death.

As India’s elderly population is increasing it is a significant public health importance to know various patterns of head injury, incidence, sex predilection and thus in determining appropriate treatment in timely manner.

It also challenges clinicians of various specialities, as head injury patients are commonly encountered in the emergency department and for healthcare providers in
primary care, surgical specialties, nonsurgical specialties, allied health. Thus nearly all medical professionals need to have a robust understanding of various patterns of head injury.

There is no sufficient data in India on the contribution of head injury to trauma-related mortality and morbidity especially in elderly and various imaging patterns.7

The frequent use of anticoagulants for comorbid conditions in this population leads to an increased risk of haemorrhage, even with low-velocity head trauma. A high index of suspicion for intracranial haemorrhage is thus warranted, as these patients may present with vague neurological complaints and a normal physical examination. This study done to know the patterns of traumatic head injuries (THI) in the Department of Radiology of our institution and common causes of the trauma, the age and sex distribution of the elderly patients. The study will also help in understanding the burden of head injury and help concerned public health bodies to take appropriate steps to control it.

Materials and Method

It is a retrospective and descriptive study done by retrieving the image data from Picture Archiving and Communication System (PACS) over a 4-year period (January 2016 to June 2019) in the department of Radiology of our institution, a tertiary referral centre in eastern India. All head injury patients of age more than 60 years referred to the Radiology Department for CT head during this period were included in the study.

CT head examinations were done using the General Electric (GE) 64-slice multidetector CT scanners. A multislice protocol with 3.5-4 mm slice thickness from the skull base to the vertex was utilized. Image data were analysed both in bone and brain parenchyma tissue windows, and images were reformatted into sagittal, coronal, and oblique plane with 3D reformation. The radiological features of the CT Images were assessed and documented. The demographic data of the patients were also recorded. Participants with congenital abnormalities of the head and face were excluded from the study. All the selected images were based on preselected inclusion criteria set for this study, such as presence of full identification parameters (age, sex, clinical indications, detailed diagnostic findings showing soft tissue and bony involvements). Images without the sufficient data were excluded.

The data were analysed by IBM SPSS (Statistical Package for Social Sciences) software version 22 for Microsoft windows. Descriptive frequency analysis was done with results presented in text, figures, and tables.

Results

234 CT Image data of patients who had head injury were evaluated. Males were commonly involved compared to females with a ratio of 2.29:1 (Table-1). Age group between 60-96 years were included in the study with mean age of 71.08 ± 8.27 (mean ± standard deviation). (Table-2). Road traffic accident (RTA) was the leading cause of head injury which constitutes 65.8%, followed by fall 31.6 %, violence (0.8%) and unknown in 1.7% cases. 55 % of patients presented to hospital for CT scan within 7 days. Out of which only only 18 (13%) patients had CT scan done within the first 24 h of the injury. Out of 234 patients 38 (16.23%) had mild scalp injury with no significant intracranial findings and considered as normal. 196 (83.7%) had intracranial findings which were mentioned in the Table-2. Skull bone fractures found in 71 patients (30.3%). Fracture of temporo-parietal bone, parietal, temporal, frontal and occipital bone were seen in 40.3%, 19.3%, 19.3%, 11.29% and 9.6% respectively.

Out of 234 cases, 148 (63.24%) cases had extra axial haemorrhage and 48 (20.51%) had intra axial haemorrhage. Subdural Haemorrhage (SDH) alone was found in 90 cases (38.4%), subarachnoid haemorrhage in 17 (7.2%), and extradural haemorrhage in 2 (0.8%) cases.

Brain parenchymal contusion alone seen in 33(14.1%) cases, contusion associated with SDH in 17(7.2%), combination of SDH and EDH in 1 (0.42%), contusion with EDH in 3 (1.28%), combination of contusion, SAH, SDH and IVH in 10 (4.27%) cases were seen out of 234 cases. 13(5.5%) patients had associated cerebral oedema and 25(10.68%) patients had pneumocranium. Paranasal and mastoid collection were seen in 12 (5.12.%) cases. Few patterns of intracranial hemorrhages and skull bone fractures are depicted in Figure-1.

<table>
<thead>
<tr>
<th>Table 1: Gender distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
</tr>
<tr>
<td>--------</td>
</tr>
<tr>
<td>Males</td>
</tr>
<tr>
<td>Females</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>
Table-2: Age Distribution

<table>
<thead>
<tr>
<th>Age group</th>
<th>No of cases</th>
<th>Percentage (%)</th>
<th>Mean age± standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>60-70</td>
<td>123</td>
<td>52.56</td>
<td>71.089± 8.2</td>
</tr>
<tr>
<td>71-80</td>
<td>76</td>
<td>32.47</td>
<td></td>
</tr>
<tr>
<td>81-96</td>
<td>35</td>
<td>14.95</td>
<td></td>
</tr>
</tbody>
</table>

Table 3: Frequency of Computed Tomography findings among 234 cases

<table>
<thead>
<tr>
<th>CT findings</th>
<th>Number of cases (in %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal brain with scalp injury</td>
<td>38 (16.23.3%)</td>
</tr>
<tr>
<td>Intracranial hemorrhage</td>
<td>196 (83.77%)</td>
</tr>
<tr>
<td>Extraxial-148 (63.24%)</td>
<td>SDH 90 (38.4.81%)</td>
</tr>
<tr>
<td></td>
<td>SAH 17 (7.2%)</td>
</tr>
<tr>
<td></td>
<td>EDH 2 (0.8%)</td>
</tr>
<tr>
<td>Intraxial- 48 (20.51%)</td>
<td>Contusion 33 (14.10 %)</td>
</tr>
<tr>
<td>Contusion associated with SDH</td>
<td>17 (7.26%)</td>
</tr>
<tr>
<td>Combination SDH and EDH</td>
<td>1 (0.42%)</td>
</tr>
<tr>
<td>Contusion with EDH</td>
<td>3 (1.28%)</td>
</tr>
<tr>
<td>Combination of contusion, SAH, SDH</td>
<td>10 (4.27%)</td>
</tr>
<tr>
<td></td>
<td>and IVH</td>
</tr>
<tr>
<td>cerebral oedema</td>
<td>13(5.5%)</td>
</tr>
<tr>
<td>pneumocranium.</td>
<td>25(10.68%)</td>
</tr>
<tr>
<td>Paranasal and mastoid collection</td>
<td>12 (5.12%)</td>
</tr>
</tbody>
</table>

Abbreviation- SDH-subdural hemorrhage. SAH- subarachnoid hemorrhage, EDH–Extradural Hemorrhage, IVH- Intraventricular hemorrhage

Table-4: Frequency of distribution of 71 (30% of head injury) cranial bones fractures

<table>
<thead>
<tr>
<th>Bone</th>
<th>Number of cases</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temporo parietal</td>
<td>25</td>
<td>40.3</td>
</tr>
<tr>
<td>Parietal</td>
<td>12</td>
<td>19.3</td>
</tr>
<tr>
<td>Temporal alone</td>
<td>12</td>
<td>19.3</td>
</tr>
<tr>
<td>Frontal alone</td>
<td>7</td>
<td>11.29</td>
</tr>
<tr>
<td>Occipital</td>
<td>6</td>
<td>9.6</td>
</tr>
<tr>
<td>Skull base</td>
<td>2</td>
<td>3.2</td>
</tr>
<tr>
<td>Mastoid</td>
<td>2</td>
<td>3.2</td>
</tr>
<tr>
<td>Sphenoid</td>
<td>5</td>
<td>8.0</td>
</tr>
</tbody>
</table>

Table-5: Etiology of head injury

<table>
<thead>
<tr>
<th>Etiology</th>
<th>No cases</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>74</td>
<td>31.6</td>
</tr>
<tr>
<td>RTA</td>
<td>154</td>
<td>65.81</td>
</tr>
<tr>
<td>Family violence and others</td>
<td>2</td>
<td>0.8</td>
</tr>
<tr>
<td>Unknown</td>
<td>4</td>
<td>1.7</td>
</tr>
</tbody>
</table>

Figure-1. Acute on chronic subdural hemorrhage over bilateral fronto-parietal convexity (A), intraventricular hemorrhage and bilateral sylvian fissures subarachnoid hemorrhage (B), left fronto-parietal acute extradural hemorrhage and pneumocephalus (C) with right temporal bone fracture (D) are noted in different patients.

Discussion

One-fourth of global deaths due to TBI occurs in India. In geriatric patients falls are the most common cause of hospital admission and intervention, most of them are secondary to intracranial injury. Elderly are more susceptible to trauma due to age-related comorbidities such as visual impairment, gait abnormalities, degenerative joint disease, and cognitive impairments. The prevalence of road traffic accidents is increasing in India and is due to poor and bad road conditions, bad driving, not following traffic rules, poor vehicle conditions. Driving under the influence of alcohol contributes to significant number of RTA. Many patients might be on numerous medications including antiplatelet agents and/or anticoagulants. Even trivial trauma causes intracranial injury. Out of all imaging modality, Computed Tomography (CT) remains the most useful initial imaging tool due to its sensitivity for acute haemorrhage and fractures. The average duration between the injury and CT scan was almost within 1 week in most of the patients. Very few patients underwent CT within 24 hr. This may be due to unaffordability, distance from the hospital and lack of
knowledge and awareness regarding the role of CT in the head injury by patients and relatives.

In the present study it is found that males are more affected (69.6%) than females (30.34%) and is probably due occupation and activities which predisposed to trauma and injuries compared to the females. The most common cause of head injury in our study are related to road traffic accidents (65%) followed by fall (31.6%), violence (0.8%) unknown in 1.7 % cases. Subdural hematoma was the most common pattern of intracranial hemorrhage in our study. Hawley et al.\textsuperscript{16} and Roe et al.\textsuperscript{18} opined that males were more affected than female and subdural hemorrhage was the most common pattern of intracranial hemorrhage but the fall at home was the most common cause of head injury in elderly people in their study.

In the present study around 83.7% had findings and 16.23% were having normal CT findings.

Intracranial haemorrhage was the most common finding. Extra axial haemorrhage corresponds to 63.24% of all cases and rest was intra axial haemorrhage. Adeyekun et al.\textsuperscript{14} studied patterns of injury in CT which included all age groups and opined that intracerebral haemorrhage is the most common form of intracranial bleed and Ohaegbulam et al.\textsuperscript{15} opined that cerebral contusion was the most common finding which is different to this study in elderly. This change in pattern might be due to inclusion of all age groups in their studies. Skull fractures were found in 71 patients (30.3%) of which temporo-parietal bone involvement was seen commonly. In few cases fracture of the skull base is seen and was associated with paranasal sinus collection. SDH is found out to be the most common pattern seen in elderly after trivial trauma, followed by brain parenchymal contusion in our study.

The limitation of the study: Our study included smaller number of geriatric cases. However, study with more number of sample is required for better analysis and statistical correlation.

**Conclusion**

Subdural hemorrhage was the common pattern of intracranial hemorrhage in elderly. Road traffic accident was the common etiology followed by fall at home. Male were more affected by head injury than female.

**Conflict of Interest:** None.

**Source of Funding:** Self.

**Ethical Clearance:** Due to retrospective and non-interventional nature of study, ethical clearance was not needed.

**References**


Evaluation of Antimicrobial Properties of Orthodontic Adhesive Mixed with Silver Nanoparticles: An in Vitro Study

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Abstract

Objective: The aim of the present study was to assess the antimicrobial activity of orthodontic adhesive mixed with silver nanoparticles (SNPs) in varying concentrations.

Material and method: SNPs were prepared by using the chemical reduction method and characterized using UV-Vis Spectrophotometer, Fourier Transform Infrared Spectroscopy, and Scanning Electron Microscopy. The synthesized SNPs were mixed with commercially available orthodontic adhesive Transbond™ XT in varying concentrations (1%, 5% and 10%, n = 20 each) w/w and were formed into disc shaped specimens and incubated with Streptococcus mutans MTCC 497 and Lactobacillus acidophilus MTCC10307. The Disc Diffusion test was performed to examine the growth inhibition zones. Adhesive discs without silver nanoparticles were used as control (n = 20). The data was interpreted statistically with Kruskal-Wallis test followed by Tukey's Post Hoc analysis and Mann Whitney U test. P < 0.05 was considered statistically significant.

Results: The characterization of reduced silver ions by UV spectroscopy showed surface plasma resonance band around 400nm. SEM study showed particles with roughly spherical shape with less than 100 nm size. The present study showed that the orthodontic bonding adhesive with SNPs showed higher antimicrobial activity against Streptococcus mutans and Lactobacillus acidophilus as compared to the control group even in low concentration of 1% (P < 0.05). The adhesive mixed with SNPs in varying concentrations exhibited higher zone of inhibition in Streptococcus mutans compared with Lactobacillus acidophilus (P < 0.05).

Conclusion: The present study showed that the orthodontic bonding adhesive with silver nanoparticles showed excellent antimicrobial activity against Streptococcus mutans and Lactobacillus acidophilus even in low concentrations.

Keywords: Antimicrobial, Lactobacillus acidophilus, nanoparticles, orthodontic, Streptococcus mutans.

Introduction

Nanotechnology is a riveting field of science that is concerned with manipulation of materials at an atomic scale, where in various disciplines of natural sciences interweave at nanoscale making it viable for interdisciplinary applications. When particles are created in nanometers remarkable changes in their properties are observed as a consequence of the quantum effectsof the nanoscale. Thus, evolutions in the field of
nanotechnology and nanomaterials have brought its benefits into the realm of medical and dental sciences.

Oral hygiene of patients undergoing fixed orthodontic therapy is usually compromised which increases cariogenic bacterial counts and decreases the salivary pH. The oral cavity of patients undergoing fixed orthodontic appliance therapy, exhibits new foci of plaque on the enamel in proximity to the orthodontic attachments with more colony forming units of *Streptococcus mutans* and *Lactobacilli*.[3,5,6] This may lead to post-orthodontic treatment decalcification, appearance of white spot lesions and caries. Study done by Lim et al.[7] demonstrated that there is an increased bacterium on the adhesive than on the bracket material itself. This has led to new research in the development of innovative orthodontic adhesives containing various nanomaterials intended to reduce bacterial colonization and thus inhibit formation of white spot lesions and caries.[8, 9]

Nanoparticles of silver, gold, hydroxyapatite have been identified to have superlative antimicrobial properties and their addition to dental or orthodontic materials have shown to be effective against oral pathogenic microbiota without compromising their physical properties.[10, 11] Addition of Silver Nanoparticles (SNPs) with the orthodontic adhesive paste[12,13] or primer system[14] have shown to produce inhibition zones against *Streptococcus mutans*, *Lactobacillus acidophilus*, *Streptococcus sanguinis*, proving their effectiveness as antibacterial agents.

Development of clinically admissible and efficient orthodontic bonding adhesives with anti microbial traits can be undertaken only if their antimicrobial efficacy in optimum concentrations can be established.

The aim of this study was to determine the effect of silver nanoparticles (SNPs) in varying concentrations on the antimicrobial properties of orthodontic adhesives and assess the concentration to be added to obtain maximum antibacterial effect against oral cariogenic pathogens like *Streptococcus mutans* and *Lactobacillus acidophilus*.

**Material and Method**

**Materials used:** Materials used were Silver Nitrate (HIMEDIA, India), Trisodium Citrate (COBA ChemiePvt.Ltd, India), Transbond™ XT (3M Unitek, USA) and Mueller Hinton Agar (HIMEDIA, India).

**Methodology**

**Preparation of Silver Nanoparticles in varying concentrations:** Chemical reduction method as proposed by Fang et al.[15] was used in this study for the preparation of silver nanoparticles. 1 mmol of silver nitrate was dissolved in double distilled water and boiled; to which 1% trisodium citrate was added drop wise and mixed vigorously. The solution was heated until the colour change to pale brown was observed. Silver nanoparticles thus obtained were dried and prepared for further study.

**Characterization of silver nanoparticles:** The characterizations of nanoparticles were done using UV-Vis-NIR Spectrophotometer (Shimadzu UV-3600), Scanning Electron Microscopy (EVO MA18 with Oxford EDS(X-act)) machine with magnification of 10.00K and FTIR Spectrometer (Thermo Scientific™ Nicolet™ iS20).

**Incorporation of silver nanoparticles into orthodontic adhesive and preparation of composite discs:** The synthesized silver nanoparticles were mixed with commercially available orthodontic adhesive Transbond™XT1%, 5% and 10% w/w concentrations (n = 20 each) using a Vortex Machine (REMI Cyclo/Vortex Mixer, CM-101). The minimum concentration (0.5µg/ml) of SNPs for effective antibacterial activity as recommended by Greulich et al.[16], Shahrokh et al.[17] was added to every 1mm orthodontic adhesive using a graduated pipette. The prepared paste was formed into disc shaped specimens. This was done by filling teflon molds of 5mmx 2mm dimensions which were placed on glass slides and light cured (3M ESPE Elipar™ S10, USA) for 20s from each side. Plain Transbond™ XT discs (n = 20) were also prepared. The obtained discs were sterilized using gamma radiation.

**Antimicrobial Activity**

**Preparation of the bacterial culture:** Freeze dried *Streptococcus mutans* MTCC 497 and *Lactobacillus acidophilus* MTCC 10307 were revived in specific media and incubated to obtain sub cultures.

**Disc Diffusion Method:** The disc diffusion test was performed to measure the inhibition zones produced by the antibacterial agents. Mueller Hinton Agar plates were swabbed with *Streptococcus mutans* and *Lactobacillus acidophilus* suspensions. Orthodontic adhesive discs
containing (0%, 1%, 5% and 10%, \textit{n} = 20 each) silver nanoparticles were placed on the plates equidistant from each other. Agar plates containing \textit{Lactobacillus acidophilus} were incubated anaerobically and plates containing \textit{Streptococcus mutans} were incubated at 37ºC for 24 hours following which growth inhibition zones were measured. The test was repeated three times.

**Statistical Data:** Statistical analyses of values were performed with descriptive statistics and inferential statistics like Kruskal-Wallis test followed by Tukey’s Post Hoc analysis. Mann Whitney U test was used to compare the efficacy of Silver Nanoparticles between the two organisms. The statistical analyses were performed using SPSS software version 16. \textit{P} < 0.05 was considered statistically significant.

**Results**

**Characterization of silver nanoparticles:** The characterization of reduced silver ions was determined by UV Spectroscopy showing surface plasma resonance band around 400nm (Figure 1).

The Scanning electron microscopy(SEM) study showed particles with roughly spherical shape with nanometer sizes(Figure 2).

The functional groups were studied with Fourier Transform Infrared Spectroscopy (FTIR) analysis. Symmetric bands at 1600 cm\(^{-1}\) to 1300 cm\(^{-1}\) indicated the presence of NO group (Figure 3).

**Antimicrobial activity:** Commercially available orthodontic adhesive was used as the control which did not produce any inhibition zones against both \textit{Streptococcus mutans} and \textit{Lactobacillus acidophilus}. These results are in conformity with the study done by Choi Kwonyong et al.\cite{18} Table I shows the statistical results of the antimicrobial activity of all the adhesive groups against \textit{Streptococcus mutans} as compared with the control group and among each other.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean Difference</th>
<th>STD Error</th>
<th>Lower 95% CI</th>
<th>P Value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 % SNPs</td>
<td>-7.75</td>
<td>0.288</td>
<td>-8.51 to -6.99</td>
<td>0.000*</td>
</tr>
<tr>
<td>5% SNPs</td>
<td>-6.70</td>
<td>0.288</td>
<td>-7.46 to -5.94</td>
<td>0.000*</td>
</tr>
<tr>
<td>10% SNPs</td>
<td>-6.95</td>
<td>0.288</td>
<td>-7.71 to -6.19</td>
<td>0.000*</td>
</tr>
<tr>
<td>1 % silver nanoparticles</td>
<td>7.75</td>
<td>0.288</td>
<td>6.99 to 8.51</td>
<td>0.000*</td>
</tr>
<tr>
<td>5% SNPs</td>
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<td>0.288</td>
<td>0.29 to 1.81</td>
<td>0.003*</td>
</tr>
<tr>
<td>10% SNPs</td>
<td>0.80</td>
<td>0.288</td>
<td>0.04 to 1.56</td>
<td>0.034*</td>
</tr>
<tr>
<td>5% silver nanoparticles</td>
<td>6.70</td>
<td>0.288</td>
<td>5.94 to 7.46</td>
<td>0.000*</td>
</tr>
<tr>
<td>1 % SNPs</td>
<td>-1.05</td>
<td>0.288</td>
<td>-1.81 to -0.29</td>
<td>0.003*</td>
</tr>
<tr>
<td>10% SNPs</td>
<td>-0.25</td>
<td>0.288</td>
<td>-1.01 to 0.51</td>
<td>0.821</td>
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<tr>
<td>10% silver nanoparticles</td>
<td>6.95</td>
<td>0.288</td>
<td>6.19 to 7.71</td>
<td>0.000*</td>
</tr>
<tr>
<td>1 % SNPs</td>
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<td>-1.56 to -0.04</td>
<td>0.034*</td>
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<tr>
<td>5% SNPs</td>
<td>0.25</td>
<td>0.288</td>
<td>-0.51 to 1.01</td>
<td>0.821</td>
</tr>
</tbody>
</table>

(*P < 0.05 statistically significant)

The statistical results of the antimicrobial activity of all the adhesive groups against \textit{Lactobacillus acidophilus} as compared with the control group and amongst each other are shown in Table II.

**Table II: Comparison of antimicrobial activity of different concentration SNPs against Lactobacillus acidophilus**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean Difference</th>
<th>Std Error</th>
<th>Lower 95% CI</th>
<th>P value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 % SNPs</td>
<td>-6.30</td>
<td>0.281</td>
<td>-7.04 to -5.56</td>
<td>0.000*</td>
</tr>
<tr>
<td>5% SNPs</td>
<td>-6.20</td>
<td>0.281</td>
<td>-6.94 to -5.46</td>
<td>0.000*</td>
</tr>
<tr>
<td>10%SNPs</td>
<td>-6.40</td>
<td>0.281</td>
<td>-7.14 to -5.66</td>
<td>0.000*</td>
</tr>
</tbody>
</table>
Variables | Mean Difference | Std Error | 95% CI Lower | 95% CI Upper | P value*  
---|---|---|---|---|---  
1% silver nanoparticles | Control | 6.300 | 0.281 | 5.56 | 7.04 | 0.000*  
| 5% SNPs | 0.100 | 0.281 | -0.64 | 0.84 | 0.985  
| 10% SNPs | -0.100 | 0.281 | -0.84 | 0.64 | 0.985  
5% silver nanoparticles | Control | 6.200 | 0.281 | 5.46 | 6.94 | 0.000*  
| 1% SNPs | -0.100 | 0.281 | -0.84 | 0.64 | 0.985  
| 10% SNPs | -0.200 | 0.281 | -0.94 | 0.54 | 0.893  
10% silver nanoparticles | Control | 6.400 | 0.281 | 5.66 | 7.14 | 0.000*  
| 1% SNPs | 0.100 | 0.281 | -0.64 | 0.84 | 0.985  
| 5% SNPs | 0.200 | 0.281 | -0.54 | 0.94 | 0.893  

(*P<0.05 statistically significant)

According to the Mann Whitney U Test when the efficacy of various concentrations of SNPs were tested against both the organisms, SNPs had an overall increased effect against *Streptococcus mutans* than *Lactobacillus acidophilus* with 1% and 10% showing statistically significant results (P<0.05).(Table III).

**Table III: Mann Whitney U Test Comparing the efficacy of various concentrations of SNPs between Streptococcus mutans and Lactobacillus acidophilus**

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>Std Deviation</th>
<th>Std Error</th>
<th>Mean Rank</th>
<th>Z</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1% SNPs</td>
<td>S Mutans</td>
<td>20</td>
<td>7.75</td>
<td>1.251</td>
<td>0.280</td>
<td>26.80</td>
<td>-3.518</td>
</tr>
<tr>
<td></td>
<td>Lactobacillus</td>
<td>20</td>
<td>6.30</td>
<td>0.979</td>
<td>0.219</td>
<td>14.20</td>
<td></td>
</tr>
<tr>
<td>5% SNPs</td>
<td>S Mutans</td>
<td>20</td>
<td>6.70</td>
<td>1.129</td>
<td>0.252</td>
<td>23.35</td>
<td>-1.632</td>
</tr>
<tr>
<td></td>
<td>Lactobacillus</td>
<td>20</td>
<td>6.20</td>
<td>1.196</td>
<td>0.268</td>
<td>17.65</td>
<td></td>
</tr>
<tr>
<td>10% SNPs</td>
<td>S Mutans</td>
<td>20</td>
<td>6.95</td>
<td>0.686</td>
<td>0.153</td>
<td>24.32</td>
<td>-2.208</td>
</tr>
<tr>
<td></td>
<td>Lactobacillus</td>
<td>20</td>
<td>6.40</td>
<td>0.883</td>
<td>0.197</td>
<td>16.68</td>
<td></td>
</tr>
</tbody>
</table>

Figure 1 UV-Vis spectrophotometer readings.
Discussion

Fixed orthodontic appliances have been shown to increase the risk of enamel decalcification, appearance of white spot lesions and subsequent caries development.\(^3,19\) Orthodontic adhesives have been reported to retain pathogenic bacteria like *Streptococci* and *Lactobacilli*.\(^7\) Addition of various antimicrobial agents to the orthodontic adhesive systems has proven to enhance their antimicrobial activity.\(^20\)

The use of nanotechnology and the quantum effect of nanomaterials in the field of orthodontics have brought a revolutionary change in the oral scenario of patients undergoing orthodontic therapy.
Over the years Silver Nanoparticles have been synthesized by both chemical and biologic method. Studies have proven their antimicrobial properties as they have larger surface area in spite of their small particle size making them potent antibacterial agents even in smaller concentrations.\textsuperscript{[21, 22]}

In this study we added silver nanoparticles in varying concentrations to commercially available orthodontic adhesive Transbond\textsuperscript{TM} XT in order to study their antimicrobial property against \textit{Streptococcus mutans} and \textit{Lactobacillus acidophilus}; and thereby assess the most effective concentration to be added. As Transbond\textsuperscript{TM} XT is considered the gold standard light cure orthodontic adhesive, it was selected as the control adhesive in this study.\textsuperscript{[23]}

The results of the disc agar diffusion test showed that addition of 1%, 5%, 10% SNPs to commercially available orthodontic adhesive not only showed inhibition zones against \textit{Streptococcus mutans} effectively, but also demonstrated a significant increase in the efficacy of adhesive with 1%SNPs thus exhibiting superior antibacterial effect in small concentrations. On the other hand all three concentrations of SNPs when added to adhesive provided antibacterial activity against \textit{Lactobacillus acidophilus} but there was no statistical significance seen among the groups. Previous studies show that Silver and Hydroxyapatite Nanoparticles (Ag/HA) in 1%, 5%, 10% concentration when added to orthodontic adhesive or primer, produced bacterial growth inhibition zone and particularly addition of 5% Ag/HA was effective from an antimicrobial aspect.\textsuperscript{[12,23]}

In the present study, adhesive containing 1% SNPs showed maximum inhibitory activity toward \textit{Streptococcus mutans} and \textit{Lactobacillus acidophilus} as compared with adhesive containing 5% and 10% SNPs. Comparing the efficacy of adhesives with SNPs against the two organisms showed that they are more effective towards \textit{Streptococcus mutans} as compared to \textit{Lactobacillus acidophilus}. These results are in conformity with Kasraei et al.\textsuperscript{[24]} The results of our study concur with previous literature that proves the effectiveness of SNPs as antibacterial agents,\textsuperscript{[25]} even after mixing with the composite resin or adhesives.\textsuperscript{[12-14]}

The present study proves the effectiveness of SNPs added in low concentrations to orthodontic adhesives as an antimicrobial agent, reducing any possibilities of dose related nanotoxicity and aiding in maintenance of good oral health in patients undergoing orthodontic therapy. The only drawback we observed on the of addition of SNPs to orthodontic adhesive is the colour change of the adhesive, hindering esthetics.

**Conclusion**

The present study displayed that the orthodontic bonding adhesive with Silver Nanoparticles showed higher antimicrobial activity against \textit{Streptococcus mutans} and \textit{Lactobacillus acidophilus} in low concentrations which in turn will avert the formation of white spot lesions and further progression of dental caries.

However these being an in-vitro study, further clinical studies are required to confirm the beneficial effects in terms of superior esthetics, mechanical properties and good antimicrobial properties before the product is made commercially available.

**Conflict of Interest:** Nil

**Funding:** Funded by the NITTE (Deemed-to-be) University.

**Ethical Clearance:** Obtained from the Institutional Ethical Clearance Committee.

**References**


Evaluation of Carbapenem-Resistant Genes and Colistin Susceptibility in Gram Negative Organisms from Clinically Significant Samples

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Abstract

Introduction: The rapid global spread of carbapenem-resistance in microorganisms is a threat to the health system. This study aims to evaluate carbapenem resistance in different bacterial isolates like E coli, Klebsiella pneumoniae, Acinetobacter and Pseudomonas species and detection of genes conferring the carbapenem resistance in bacteria using Multiplex PCR.

Materials and Method: A total of 101 clinically significant samples from the various patients such as blood, urine, pus, sputum, aspirates, and tissue were collected. Antibiotic susceptibility testing done by standard Kirby Bauer disc diffusion & Vitek 2 system. MIC values of Colistin for all the isolates was determined by Broth Microdilution method. Detection of carbapenemase genes was done by using Multiplex PCR.

Results: The most prevalent Carbapenem resistant organism was Klebsiella species(53%). NDM gene was the highest of all the other carbapenemase encoding genes detected constituting up to 68%. Out of these 15, 12 Klebsiella pneumoniae, 2 Acinetobacter species, and 1 Escherichia coli harbored the NDM gene. The prevalence of OXA-48, VIM and IMP genes were about 9%. There were 2 IMP and 2 OXA-48 genes each was found in Escherichia coli and Klebsiella species. The carbapenem resistance encoding gene KPC was found only in the single isolate of Acinetobacter isolated from blood culture. The organisms showed higher resistance to Colistin(56%).

Conclusion: Evaluation of bacterial resistance to carbapenems contributes to know the appropriate treatment available, and the reduction of morbidity, mortality and dissemination of resistance. Detection of the genes conferring Carbapenem resistance helps in the study of resistant mechanism.

Keywords: Carbapenem resistance, Klebsiella pneumoniae, Carbapenemases.

Introduction

Antimicrobial resistance (AMR) in Gram-negative bacteria (GNB) is a significant cause of severe infections across the world with increasing morbidity and mortality rates. The increasing resistance for beta-lactam groups of antimicrobials is a big concern¹. It is mainly due to the presence of beta-lactamases that are present on the mobile genetic elements, which causes its widespread². Carbapenem-resistant gram-negative bacilli especially

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those belonging to Enterobacteriaceae family, Acinetobacter baumannii and Pseudomonas aeruginosa are an emerging cause of nosocomial infections\(^3\). These bacteria are difficult to treat due to the high levels of antibiotic resistance they exhibit and thus are associated with high mortality. The production of carbapenemase enzyme is the most common method of resistance acquired.\(^4\) The presence of these resistant organisms has limited the choice of appropriate antibiotic therapy.\(^5\) Therefore it is important to monitor these resistant genes in different bacterial strains to prevent the spread of the resistance and thereby to prevent the infections. The objectives of the study are evaluation of the carbapenem resistance in Gram negative bacilli isolated from various clinically significant samples and detection of carbapenem resistance genes by using molecular method PCR.

**Materials and Method**

A 6-month cross-sectional study where a total of 101 samples were collected from November 2018 to April 2019. The samples such as blood, urine, pus, sputum, aspirates and tissue were collected from Kasturba Medical College Hospital, Attavar and Ambedkar circle. Only E.coli, Klebsiella pneumoniae, Acinetobacter, and Pseudomonas isolates resistant to carbapenems by disk diffusion & Vitek 2 system were considered in this study. The results were analyzed based on the recommendations of the Clinical Laboratory Standards Institute (CLSI 2018) guidelines\(^6\). The following antibiotic discs (Himedia, Mumbai) were used-Amikacin (10mcg), Cefazidime (30mcg), Cefaperazone / sublactum (75/30mcg), Ciprofloxacin (5mcg) Cotrimoxazole (25mcg), Gentamycin (10mcg), Piperacillin (100mcg), Piperacillin/Tazobactam (100/10mcg), Ertapenem (10mcg), Imipenem (10mcg), Meropenem (10mcg), Ticarcillin (75mcg), Tigecycline (15mcg), Netillin (30mcg), Nitrofurantoin (300mcg)

MIC values of Colistin were determined for all the isolates using Broth Micro dilution method.\(^6\,7\) Detection of carbapenem resistance genes in gram negative organisms was done using multiplex PCR. The presence of carbapenemase encoding genes was determined using primers VIM, IMP, OXA-48, KPC and NDM obtained from Sigma Aldrich Pvt.Ltd,(Table 1)

<table>
<thead>
<tr>
<th>Genes</th>
<th>Primer Sequence</th>
<th>Product size (bp)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMP</td>
<td>F- GGAATAGAGTGCTAAYTCTC</td>
<td>232</td>
</tr>
<tr>
<td></td>
<td>R- GGTGTAAAYAAAACACCC</td>
<td></td>
</tr>
<tr>
<td>VIM</td>
<td>F- GATGGTGTTGCTGTCATA</td>
<td>390</td>
</tr>
<tr>
<td></td>
<td>R- CGATTGCGGAGCACCAC</td>
<td></td>
</tr>
<tr>
<td>OXA-48</td>
<td>F- TATATTGCAATTAAGCAGG</td>
<td>800</td>
</tr>
<tr>
<td></td>
<td>R- CACACAAATACGGCCTAACC</td>
<td></td>
</tr>
<tr>
<td>KPC</td>
<td>F- TGTCACCTATCGCCGTC</td>
<td>538</td>
</tr>
<tr>
<td></td>
<td>R- CTGAGTGCTTCAGAAACC</td>
<td></td>
</tr>
<tr>
<td>NDM</td>
<td>F- CACCTCATGTTGATTGC</td>
<td>984</td>
</tr>
<tr>
<td></td>
<td>R- CTCTGTACATC GAAAATGC</td>
<td></td>
</tr>
</tbody>
</table>

The DNA from various clinical samples was extracted according to CDC protocol using boiling method.\(^9\) For the master mix - Ready mix Taq PCR reaction mix (Sigma Aldrich, US) with MgCl\(_2\), in which the respective primer sets i.e. Forward (F') as well as Reverse(R') added. Multiplex PCR reaction mix consisted of 12.5µl of ready to use mastermix, 2.5µl of primer mix, 7.5µl of nuclease water, and 2.5µl of DNA in a final volume of 25µl. Amplification was done using cycling conditions, initial 10 min denaturation step at 95°C followed by 35 cycles of 45 s of denaturation at 94°C, 45 s of primer annealing at respective temperature, and 50 s of primer extension at 72°C. Following the last cycle, an additional 7 min extension step at 72°C in Rotor gene-Q (Qiagen, Germany).The amplified product was detected by using 2% agarose gel electrophoresis in 1X Tris Acetate EDTA Buffer. The gel stained with 0.5mg/ml ethidium bromide and visualized under UV transilluminator. Quality control: Positive control: K. pneumonia ATCC BAA 1705 & K. pneumonia BAA 1706 (negative control) was used.

The study samples were collected from the samples that were received routinely in the laboratory. It was not collected separately for this project; hence, informed consent from the patients was not required, and Institutional Ethics Committee, Kasturba Medical College, Mangalore, approved to conduct this study.

Statistical analysis done by using Statistical package SPSS V.20.0 (SPSS Inc., Chicago, IL, USA). Results are summarized as frequency tables, and percentages were worked out. Antibiotic susceptibility percentage and association was calculated by descriptive study analysis and Chi-square test, respectively.
Results

Out of 101 various clinically significant samples received, Carbapenem resistance (CR) was seen highest in urinary tract infection (31.6%) followed by wound infection (21%) and respiratory tract infections constituting 22%. Blood stream infections comprised of upto 7.9%.

Table 2: Distribution of Carbapenem resistant Gram negative bacilli in various clinically significant samples.

<table>
<thead>
<tr>
<th>Nature of the sample</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urine</td>
<td>31.6%</td>
</tr>
<tr>
<td>Blood</td>
<td>7.9%</td>
</tr>
<tr>
<td>Swab</td>
<td>15%</td>
</tr>
<tr>
<td>ET Aspirates</td>
<td>14.8%</td>
</tr>
<tr>
<td>Central Venous catheter(CVC)</td>
<td>5.9%</td>
</tr>
<tr>
<td>Pus</td>
<td>5.9%</td>
</tr>
<tr>
<td>Sputum</td>
<td>7.9%</td>
</tr>
<tr>
<td>Tissue</td>
<td>2.9%</td>
</tr>
<tr>
<td>Others</td>
<td>6.9%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

Among 101 Gram negative bacilli isolates, Klebsiella was the major pathogen isolated constituting 53 (58%), 18 Acinetobacter species, 15 Escherichia coli and 16 Pseudomonas species. A male preponderance was seen among the patients constituting 62% of the total sample, females comprised of 38%. Maximum patients were from the age group 61-70 years, and broadly, most patients belonged to 21-80 years of age. The study used samples which are resistant to at least one of the carbapenems among Ertapenem, Imipenem, and Meropenem.

The antibiogram pattern in our study revealed that overall the organisms were more resistant to Ciprofloxacin, Gentamycin, Cefoperazone/sulbactam and moderately susceptible to Amikacin, Pipercillin and Pipercillin/Tazobactam, Ticarcillin, Tigecycline, Netillin. The Colistin MIC values were determined and highest resistance was found in Klebsiella species (57%). E.coli, Acinetobacter and Pseudomonas species were sensitive to Colistin (Table 3).

Table 3: Antibiogram profile of Carbenpem resistant gram negative bacilli in our study

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>Resistant</th>
<th>Sensitive</th>
<th>Intermediate</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMIKACIN</td>
<td>63.4%</td>
<td>23.8%</td>
<td>3%</td>
</tr>
<tr>
<td>CEFTAZIDIME</td>
<td>60.4%</td>
<td>6.9%</td>
<td>2%</td>
</tr>
<tr>
<td>CEFOTAXIME</td>
<td>88%</td>
<td>12%</td>
<td>0</td>
</tr>
<tr>
<td>CEFAPERAZONE/SULBACTUM</td>
<td>78.2%</td>
<td>16.8%</td>
<td>0</td>
</tr>
<tr>
<td>CIPROFLOXACIN</td>
<td>88.1%</td>
<td>9.9%</td>
<td>0</td>
</tr>
<tr>
<td>COTRIMOXAZOLE</td>
<td>63.4%</td>
<td>15.8%</td>
<td>0</td>
</tr>
<tr>
<td>GENTAMYCIN</td>
<td>78.2%</td>
<td>12.9%</td>
<td>0</td>
</tr>
<tr>
<td>PIPERACILLIN/TAZOBACTUM</td>
<td>79.2%</td>
<td>10.9%</td>
<td>2%</td>
</tr>
<tr>
<td>TICARCILLIN</td>
<td>50.8%</td>
<td>4%</td>
<td>0</td>
</tr>
<tr>
<td>TIGECYCLINE</td>
<td>20.8%</td>
<td>47.5%</td>
<td>5.9%</td>
</tr>
<tr>
<td>NETILLIN</td>
<td>50.5%</td>
<td>8.9%</td>
<td>-</td>
</tr>
<tr>
<td>NITROFURANTOIN</td>
<td>19.8%</td>
<td>5%</td>
<td>0</td>
</tr>
<tr>
<td>COLISTIN</td>
<td>57%</td>
<td>18%</td>
<td>12%</td>
</tr>
</tbody>
</table>

Out of the total, carbapenem resistance genes were detected in 22 samples (Table 4).

Table 4: Prevalence of carbapenem resistant genes in Gram-negative bacilli isolates

<table>
<thead>
<tr>
<th></th>
<th>Klebsiella spp</th>
<th>Escherichia coli</th>
<th>Pseudomonas spp</th>
<th>Acinetobacter spp</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMP</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>KPC</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>NDM</td>
<td>12</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>OXA</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>VIM</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

The prevalence of NDM gene was high when compared to the other carbapenemase encoding genes constituting up to 68%, i.e., 15 out of 22 isolates showed the presence of NDM genes. Out of these 15 strains, 12 were Klebsiella pneumoniae, 2 were Acinetobacter species and 1 Escherichia coli with the NDM gene. The presence of 2 IMP and 2 OXA-48 genes each was found in two different isolates Escherichia coli and Klebsiella species. The carbapenem resistance encoding gene KPC was found only in the single isolate of Acinetobacter isolated from blood culture. However, we could not find any carbapenem resistance genes in Pseudomonas species. The total mortality rate was 21% i.e., 21 out of 101 patients expired. Among which the mortality rate was higher in males.
Discussion

The incidence of carbapenem-resistant Gram-Negative bacilli is on the rise all along the globe, posing a huge public health threat. During the last 10 years, carbapenem resistance has escalated among Enterobacteriaceae bugs such as Klebsiella species and Escherichia coli apart from Pseudomonas and Acinetobacter species. Out of 101 Carbapenem resistance (CR) was seen highest in urinary tract infection (31.6%) followed by wound infection (21%) and respiratory tract infections constituting 22%. Blood stream infections comprised of up to 7.9% which was found to be similar in another study. In another study, E. coli, Klebsiella spp, P aeruginosa followed by Acinetobacter spp was the pattern seen. Maximum patients were from the age group 61-70 years, and broadly, most patients belonged to 21-80 years of age with male preponderance which was synchronous with a study conducted at Ghana hospital.

In an Indian multicentric study, amikacin & Carbapenems were the only agent which showed moderate activity. In a study performed by Solanki et al., Hyderabad, out of 100 carbapenem resistant isolates, were having NDM gene including 25 strains of Klebsiella spp and 12 strains of E.coli. This was synchronous with our results showing that the Klebsiella spp. harboring NDM gene outclassed the other isolates with NDM gene. On the other hand, they found only 1 KPC gene, which was an isolate of E.coli whereas our study showed the presence of KPC in a single isolate of Acinetobacter spp. isolated from blood culture. Another study performed by Atul Garg et al., in Lucknow, it was observed that among the 312 carbapenem-resistant bacteria the most common isolate was Pseudomonas aeruginosa (24%) which is in contrast to our study. On multiplex PCR, 90.3 percent carbapenem-resistant isolates were positive for carbapenemase gene NDM(63%) followed by VIM(18.4%). The KPC gene was not isolated in this study, NDM and OXA were co-observed in 20 per cent isolates.

However remaining organisms could be having other mechanisms of Carbapenem resistance like hyperproduction of AmpC and ESBL, porin loss and efflux pump mediated resistance and some of the isolates was susceptible to either of the Carbepenems. This study showed a slow rise of resistance in colistin and the mechanism of resistance being MCR-1 gene mediated or others which is out of scope from our study.

The total mortality rate of the patients diagnosed with Carbapenem resistant bacterial infections was 21%, i.e., 21 patients out of 101 expired, including 15 males and 6 females. Although the presence of carbapenem resistance genes was found in 5 expired cases, and the remaining cases showed recovery from the infections despite the presence of carbapenemases. A similar study conducted by Sahin et al., and the mortality rate was 58.1%. Prolonged ICU stay, diabetes mellitus, invasive procedures, Catheters are the risk factors associated with the Carbapenem resistant Gram negative bacilli infections. To get an indication of the association between the presence of carbapenem resistant genes in clinical isolates with mortality, simple association analysis between the two was conducted. The results showed that patients with any one of five carbapenem resistant genes in their specimens had a mortality rate of 24% (5 out of 21 cases). In comparison, the patients without any carbapenem resistant genes actually had a mortality rate of 76% (16 out of 21). The difference in the mortality between patients with and without the presence of the carbapenem resistance genes was not statistically significant.

Conclusion

Carbapenems are often considered last resort antibiotics in the treatment of infections due to multidrug-resistant organisms. It is therefore mandatory to maintain the clinical efficacy of carbapenems by early detection of various enzymes. Detection of carbapenemase producing organisms using different methodologies demonstrates variations in the sensitivity and specificity across different geographical regions. This genotypic study helps us in the evaluation of carbapenem resistance genes in Gram- negative bacilli isolated from various clinical samples from a tertiary health care setup in Mangalore and shows that NDM is the most prevalent gene found among various Carbapenem resistant Gram negative bacterial isolates especially in the Klebsiella species, and the rate of isolation of KPC gene was extremely low which indicates that the prevalence of the gene is lesser compared to other regions. This study signifies the importance of assessing the predominant carbapenemase enzymes seen in a specified geographical region. Also, other antibiotics such as colistin and tigecycline should be tested to provide alternative therapy. The rise in polymyxins resistance is of high concern. More studies should be done to determine the evolution and molecular epidemiology of these isolates.
Disclosure Statement: The authors report no conflicts of interest.

Ethical Clearance: Taken from the institutional ethics committee

Source of Funding: Self

References


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Abstract

Quality human resource is directly related to the economic development of a nation. Health care options with the rural poor are still highly inaccessible in India due to the economic condition of majority populations and inadequate public health care facilities. The study looks at the possibility of microfinance as an alternative option for financing health care in lower Brahmaputra valley of Assam. The study observes that there has been a considerable improvement in the health conditions of the Self Help Group beneficiaries in the study area. However, there is lots of scope to enhance the quality of manpower in the study area by broadening the health care options through microfinance. Setting up of a welfare fund at the SHG level is appreciable in order to make microfinance a medium of health care requirements.

Keywords: Health, Self Help Group, Human Resource Development, SHG Bank Linkage Programme.

Introduction

The economic prosperity of a nation is negatively affected by poverty. Poverty is directly related to poor health condition in a society. Department for International Development (UK) advocated for reducing the poverty rate in developing countries to enhance the quality of life as that will gradually lead to build strong human resource. Poverty and health inequalities are inextricably linked. Poverty impacts on individual’s health, including the ability and opportunity to engage in health-seeking and health promoting behaviour. Despite all the appreciable trends, in the context of aftermath of global economic momentum, escalation of health care costs and due to the inelastic nature of the fiscal resources of the state, the necessity of alternative sources of financing healthcare is inevitable.

Finance helps the poor to be at par with the rest of the economy as it grows. Microfinance is a powerful tool against poverty. Microfinance is one example of an intervention that can give a considerable impetus through poverty reduction and its associated vulnerabilities including the fundamental determinants of health disparities.

Microfinance includes savings, credits, insurance and remittance. Microfinance has the ability to increase the earnings of poor people and improve their health status. Non-availability of formal finance and exorbitant interest rate of informal finance made the entry of microfinance smooth in rural India. Various studies have analysed the relation between microfinance and health status of beneficiaries. However, so far as the knowledge of researcher goes no such study has tried to analyse the relation between microfinance and health status in the lower Brahmaputra valley of Assam. Therefore the current study is an attempt to analyse the role of microfinance in the health status of the beneficiaries in lower Brahmaputra valley of Assam.

The paper is divided into 5 sections. The first section is the introduction while the second section discusses the methodology. Section 3 discusses the measures of health and section 4 discusses the status of women health post joining SHG. And section 5 concludes the paper.

Methodology

The objective of this paper is sought to be fulfilled through the analysis of the primary data. The unit of
the study comprises of the selected members of Self Help Group (SHG) linked to Assam Gramin Vikash Bank (AGVB) under SHG Bank Linkage Programme (SBLP). A structured questionnaire is used for collecting responses and for drawing conclusions for the study. The samples for the study are selected from five districts namely Barpeta, Baksa, Nalbari, Kamrup (R), Kamrup (M) and of the Lower Brahmaputra Valley. A total of 340 samples are collected from 340 households from 170 SHG.

For analysing the objective, data from the questionnaire that is designed to analyse the health status of women post joining SHG are used. The health conditions of women SHG beneficiaries is analysed with the help of a few assertions. The respondents are asked to express their opinion (either agreement or disagreement) in a five-point Likert- Scale on the statements (assertions) on health status. These statements are checked for internal reliability and consistency using Cronbach’s Alpha Coefficient and then the exploratory factor analysis is used.

To measure whether microfinance through SBLP has enhanced the health condition of the rural poor, descriptive statistics is used. The percentage of people in agreement to better health condition post joining SHG is given in terms of frequency.

Findings of the Study

For the present study, the basic indicators of health are analysed. An analysis of the health status variables can give a picture of the physical health of people in rural India particularly in the context of the lower Brahmaputra Valley of Assam. As such the results for the same are presented in the sections that follow.

Measuring the Internal Consistency and Reliability of the Construct

In order to measure the consistency and reliability of the instruments used for the present study, Cronbach’s alpha (α) is calculated.

Table 1: Overall Reliability Statistics for Constructs for Health Indicators

<table>
<thead>
<tr>
<th>Reliability Statistics</th>
<th>Health Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cronbach’s Alpha</td>
<td>.815</td>
</tr>
<tr>
<td>No. of Items</td>
<td>12</td>
</tr>
<tr>
<td>No. of Cases</td>
<td>340</td>
</tr>
</tbody>
</table>

Source: Calculated by the author from Primary data

As seen from table 1 Cronbach Alpha (α) is estimated to be .815 for all the 12 assertions relating to Health Indicators. This can be considered to be in a very good range. The overall value of alpha (α) for Health Indicators indicates that the assertions made respectively for each form of health condition positively contribute to the overall reliability of the study. As such the assertions are retained for further analysis.

Exploratory factor analysis is used to club the assertions into meaningful conclusions. But before that as a part of preliminary analysis, some prerequisite tests to measure sampling adequacy and multicollinearity was done.

Table 2: Measures of Sampling Adequacy for Health Indicators

<table>
<thead>
<tr>
<th>Sampling Measure</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kaiser–Meyer–Olkin measure of sampling adequacy</td>
<td>.717</td>
</tr>
<tr>
<td>Bartlett’s test of Sphericity (Approx. Chi Square)</td>
<td>1.764***</td>
</tr>
<tr>
<td>Df</td>
<td>66</td>
</tr>
</tbody>
</table>

Source: Calculated by the author from Primary data

***. significant at the 0.01 level (2-tailed)

For the study the Kaiser–Meyer–Olkin measure of sampling adequacy for health variables is 0.717. This falls in the recommended values of minimum 0.5. Thus it can be concluded that the sample size is adequate. The Bartlett’s test of Sphericity tests the null hypothesis that the original correlation matrix is an identity matrix and has a significance value less than .05. The Bartlett’s test is significant ($p < .001$) for the data for all the forms of health status and thus factor analysis can be considered appropriate for the present study.

The results of exploratory factor analysis finds out the items that cluster on the same components suggest that component 1 represents “Children and Health”, component 2 represents “Obstetrics Health” and component 3 represents “Health and Hygiene”. Among these 3 factors, “Children and Health” explains the highest amount of total variance with a total variance of 24.529.

Amongst the four variables comprising “Children and Health” namely “Increase in regular vaccination”, “Reduction in falling sick of infants”, “Reduction in school absent days of children” and “Increase in
medical checkup”, “Increase in regular vaccination”, has the highest factor loading of .853 closely followed by “Reduction in falling sick of infants” with a loading of .800. Thus it can be inferred that SBLP can increase SHG member’s consciousness towards the importance of vaccination of their children’s as a result of the exposure they get after coming out of the house for various training programmes.

Health Status Post Joining SHG: The health status is measured through 12 variables with the help of descriptive statistics and it is seen that the overall respondents out of 340 who agreed to have been benefited with better health condition post joining SHG stands at 62%. However, the difference is observed between the 12 variables of health. Encouragingly, most of the respondents i.e. 320 out of 340 has stated that there has been a decrease in open defecation post joining SHG because of the increase in financial flow to the household and increased knowledge about health hazard. This change is also due to the exposure that women SHG members gets after coming out of the periphery of house for petty business. This is closely followed by 288 respondents (i.e.85%) respectively agreed about reduction in falling sick of infants post joining SHG. On contrary to this only 8% family members of the respondents have increased the use of sanitary pads post joining SHG. This suggests that use of sanitary napkin at the time of menstruation is still considered as a cost saving option in villages.

Conclusion

On the basis of exploratory factor analysis 4 factors are found to be important which can affect the health condition of SHG beneficiaries. Further under health conditions, “Children and Health” explains the highest amount of total variance. From this it can be inferred that SBLP has helped its members to increase awareness about the health of children’s. Majority of respondents have also revealed that they have become more health conscious after joining SBLP.

The study has found that there has been a positive impact of microfinance on the health condition of SHG members. However the Government should provide more subsidised loans through SBLP to the members for further improvement in the quality of human resources in India through better health conditions. Additionally, setting up of a welfare fund at the SHG level will be highly beneficial for the SHG members.

Ethical Clearance: It is a research article.

Source of Fund: Self.

Conflict of Interest: Nil.

Reference

Correlation of Age, Sex, Waist Circumferences with Thyroid Disorders in Metabolic Syndrome Patients

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Abstract

Objectives: Metabolic syndrome (MetS) is a cluster of several metabolic disorders including hyperglycemia, reduced high density lipoprotein cholesterol, raised triglyceride level in serum, hypertension and abdominal obesity. Thyroid dysfunction (TD) was found to be more frequent between patients with metabolic syndrome. MetS and its related components are associated with functional and morphological alteration of the thyroid gland.

Method: The present study was conducted at the MM Institute of Medical Sciences and Research. The study includes 300 patients with MetS as a case and 300 healthy volunteers as a control. MetS was diagnosed according to international diabetes federation. Thyroid status was correlated with age, sex and waist circumference (WC) amongst metabolic syndrome patients.

Results: In our study thyroid disorder are common in the age group between 51 and 60 years of age of MetS patient and are very common in females MetS patients. WC between 100-109 cm are more common in MetS patients having thyroid disorder.

Conclusions: Our study found that females had higher risk of thyroid disorders in MetS patients. More over aging and increase in waist circumferences is an important risk factor for thyroid disorder in MetS patients.

Keywords: Age, Sex, Waist circumference, Metabolic syndrome, Thyroid disorders.

Introduction

MetS is a group of signs and symptoms which include abdominal obesity, insulin resistance, and elevated blood pressure (BP). It is related to cause risk of chronic kidney disease, Type 2 Diabetes Mellitus, cardiovascular disease (CVD) and these diseases are important cause of mortality ¹. Early identification of MetS is important because it raises the risk of CVD between 1.5 to 1.8 times more and raise relative risk of coronary artery disease and 4.2 fold a death ². In persons with MetS, the prevalence of CVD increases 2-3 folds³.

International Diabetes Federation (IDF) defines MetS, as central obesity (defined as WC ≥ 90 cm for men and ≥ 80 cm for women) along with presence of any two of the following ⁴.
- Systolic blood pressure (SBP) ≥ 130 mm Hg or diastolic blood pressure (DBP) ≥ 85 mm Hg.
- Increased fasting blood Sugar (FBS) ≥ 100 mg/dl.
- Increased triglyceride: ≥ 150 mg/dl.
- Decreased high density lipoprotein cholesterol (HDL-C): < 40 mg/dl in men, < 50 mg/dl in women.

Fast economic development with accelerating change in lifestyle, urbanization, nutrition, reduced physical activity and socio-economic status play key roles in the dramatic acceleration of MetS ⁵. Age, sex, and WC are important factors, involved in the development of MetS. Sex wise variation of MetS prevalence has been noticed. According to some reports increased prevalence occurs
in men, whereas other showed increased prevalence in females. Increased MetS prevalence has been observed with increase of age. Prevalence of thyroid disorder has been observed in female MetS patients and the prevalence increases with increase of age.

WC provides a simple and practical anthropometric measure for assessing central adiposity and significant number of studies have reported strong relations between WC, obesity related health risk. Lately it has been reported that WC is better predictor of metabolic abnormalities than percent fat measured by bio-impedance method in elderly whites. It is important to further investigation whether WC is a better anthropometric marker than accurately measured percent fat for adiposity related health risks in different ethnic groups.

**AIMS and Objectives:**

1. Measurement of waist circumference of MetS patients of different age and sex.
2. Investigation of serum T₃, T₄, TSH, FT₃, FT₄ levels in (age and sex matched) MetS patients.

**Materials and Method**

The study has been conducted between February 2017 to August 2018

**Study Area:** The present study was conducted in the Department of Biochemistry in collaboration with Department of Medicine, Maharishi Markandeshwar Institute of Medical Sciences and Researches, Mullana, Ambala, Haryana, India.

**Study Population:**

Group 1: 300 subjects with metabolic syndrome.

Group 2: 300 healthy Volunteers controls (age and sex matched) without metabolic syndrome.

Informed consent has been taken from the participants included in the study.

**Inclusion Criteria:**

- Patients with Metabolic syndrome above 18 years of age.

**Exclusion Criteria:**

- Thyroid disease
- Familial hyperlipidemia
- Renal disease
- Pregnancy
- Any history of liver disease
- Lactation
- Oral contraceptives
- Recovery from non thyroidal illness
- Cushing disease
- Patients with history of chronic drug use (steroid treatment, antidepressant and anti psychotic drug user)

**Waist Circumference Measurement:** WC was measured with a tape in a horizontal plane, mid way between the inferior margin of the ribs and the superior border of the iliac crest.

**Sample Collection:** 5 ml of blood sample was aseptically collected as per the standard guidelines and protocol. Serum was allowed to separate and subsequently analyzed for various parameters.

Serum T₃, T₄, TSH, FT₃, FT₄ was assayed by chemiluminescence immunoassay Method.

**Statistical Analysis:** Data obtained was analysed by using SPSS 21 version software and results was compared in cases and controls. P value < 0.05 was taken as significant at 95% confidence intervals. Student’s t-test and pearsons correlation coefficient was used to find the association between thyroid profile and various components of MetS.

**Result**

The total number of patients in our study were 600 (100%) out of which 300 (50%) were healthy controls subjects and 300 (50%) were MetS patients. Among 300 patients with MetS in the study, 102 (34.0 %) were male and 198 (66.0 %) were female. Similarly there were 300 control subjects, out of which 102 (34.0 %) were male and 198 (66.0 %) were female.
Table 1: Correlation of thyroid status with age distribution amongst metabolic syndrome patients

<table>
<thead>
<tr>
<th>Age group (Yrs)</th>
<th>Normal (Euthyroid)</th>
<th>Hypothyroidism</th>
<th>Hyperthyroidism</th>
<th>Subclinical Hypothyroidism</th>
<th>Subclinical Hyperthyroidism</th>
</tr>
</thead>
<tbody>
<tr>
<td>21-30 (n = 04)</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>31-40 (n = 50)</td>
<td>25</td>
<td>5</td>
<td>5</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>41-50 (n = 82)</td>
<td>49</td>
<td>15</td>
<td>3</td>
<td>14</td>
<td>1</td>
</tr>
<tr>
<td>51-60 (n = 89)</td>
<td>52</td>
<td>13</td>
<td>7</td>
<td>16</td>
<td>1</td>
</tr>
<tr>
<td>61-70 (n = 65)</td>
<td>35</td>
<td>10</td>
<td>3</td>
<td>17</td>
<td>0</td>
</tr>
<tr>
<td>71-80 (n = 09)</td>
<td>5</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>81-90 (n = 01)</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total (n = 300)</td>
<td>171</td>
<td>46</td>
<td>18</td>
<td>58</td>
<td>7</td>
</tr>
</tbody>
</table>

The table 1 shows that in MetS patients in age group of 21-30 years, 4 patients are in euthyroid state, in age group of 31-40 years, 25 patients are in euthyroid state, 5 patients have hypothyroidism, 5 patients have hyperthyroidism, 10 patients have subclinical hypothyroidism and 5 patients have subclinical hyperthyroidism. In the age group of 41-50 years, 49 patients are in euthyroid state, 15 patients have hypothyroidism, 3 patients have hyperthyroidism, 14 patients have subclinical hypothyroidism and 1 patient have subclinical hyperthyroidism. In the age group of 51-60 years, 52 patients are in euthyroid state, 13 patients have hypothyroidism, 3 patients have hyperthyroidism, 14 patients have subclinical hypothyroidism and 1 patient have subclinical hyperthyroidism. In the age group of 61-70 years, 35 patients are in euthyroid state, 10 patients have hypothyroidism, 3 patients have hyperthyroidism and 17 patients have subclinical hypothyroidism. In the age group of 71-80 years, 5 patients are in euthyroid state, 10 patients have hypothyroidism, 1 patient have subclinical hypothyroidism and 1 patient have subclinical hyperthyroidism. In the age group 81-90 years 1 patient are in euthyroid state.

Table 2: Correlation of thyroid status with sex distribution amongst metabolic syndrome patients:

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal (Euthyroid)</td>
<td>61</td>
<td>110</td>
<td>171</td>
</tr>
<tr>
<td>Hypothyroidism</td>
<td>20</td>
<td>26</td>
<td>46</td>
</tr>
<tr>
<td>Hyperthyroidism</td>
<td>5</td>
<td>13</td>
<td>18</td>
</tr>
<tr>
<td>Subclinical Hypothyroid</td>
<td>16</td>
<td>42</td>
<td>58</td>
</tr>
<tr>
<td>Subclinical Hyperthyroid</td>
<td>0</td>
<td>7</td>
<td>7</td>
</tr>
</tbody>
</table>

The table 2 shows the sex wise thyroid status in MetS patients. From the table it is evident that, in male group, 61 patients are in euthyroid state, 20 patients have hypothyroidism, 5 patients have hyperthyroidism and 16 patients have subclinical hypothyroidism. Similarly in female group, 110 patients are in euthyroid state, 26 patients have hypothyroidism, 13 patients have hyperthyroidism, 42 patients have subclinical hypothyroidism and 7 patients have subclinical hyperthyroidism.
Table 3: Correlation of thyroid status with waist circumferences in metabolic syndrome patients.

<table>
<thead>
<tr>
<th>Waist Circumference (cm)</th>
<th>Normal (Euthyroid)</th>
<th>Hypothyroidism</th>
<th>Hyperthyroidism</th>
<th>Subclinical Hypothyroidism</th>
<th>Subclinical Hyperthyroidism</th>
</tr>
</thead>
<tbody>
<tr>
<td>80-89 (n = 17)</td>
<td>9</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>90-99 (n = 94)</td>
<td>54</td>
<td>13</td>
<td>6</td>
<td>19</td>
<td>2</td>
</tr>
<tr>
<td>100-109 (n = 141)</td>
<td>85</td>
<td>21</td>
<td>5</td>
<td>27</td>
<td>3</td>
</tr>
<tr>
<td>110-119 (n = 41)</td>
<td>18</td>
<td>9</td>
<td>5</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>120-125 (n = 7)</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Total (n = 300)</td>
<td>171</td>
<td>46</td>
<td>18</td>
<td>58</td>
<td>7</td>
</tr>
</tbody>
</table>

The table 3 shows that in MetS patients having waist circumferences between 80 and 89 cm, 9 patients are in euthyroid state, 3 patients have hypothyroidism, 2 patients have hyperthyroidism, 1 patient have subclinical hypothyroidism and 2 patients have subclinical hyperthyroidism.

In patients having waist circumferences between 90 and 99 cm, 54 patients are in euthyroid state, 13 patients have hypothyroidism, 19 patients have subclinical hypothyroidism and 2 patients have subclinical hyperthyroidism.

In patients having waist circumferences between 100 and 109 cm, 85 patients are in euthyroid state, 21 patients have hypothyroidism, 5 patients have hyperthyroidism, 27 patients have subclinical hypothyroidism and 3 patients have subclinical hyperthyroidism.

In patients having waist circumferences between 110 and 119 cm, 18 patients are in euthyroid state, 9 patients have hypothyroidism, 5 patients have hyperthyroidism and 9 patients have subclinical hypothyroidism.

In patients having waist circumferences between 120 and 125 cm, 5 patients are in euthyroid state, and 2 patients have subclinical hypothyroidism.

Discussion

It was noted from the results that among 102 male patients, 61 patients have euthyroid state, 20 patients have hypothyroidism, 5 patients have hyperthyroidism and 16 patients have subclinical hypothyroidism.

Thyroid dysfunction was predominantly seen in female patients. Out of 198 female patients, 110 patients are in euthyroid state, 26 patients have hypothyroidism, 13 patients have hyperthyroidism, 42 patients have subclinical hypothyroidism and 7 patients have subclinical hyperthyroidism.

The two groups were similar in their distribution of age. Our study shows that in MetS patients of age group from 21-30 years have no thyroid disorder. In age group of 31-40 years, 25 patients have thyroid disorder, out of which, 5 patients have hypothyroidism, 5 patients have hyperthyroidism, 10 patients have subclinical hypothyroidism and 5 patients have subclinical hyperthyroidism. In age group of 41-50 years 33 patients have thyroid disorder, out of which, 15 patients have hypothyroidism, 3 patients have hyperthyroidism, 14 patients have subclinical hypothyroidism and 1 patient has subclinical hyperthyroidism. In age group of 51-60 years, 37 patients have thyroid disorder, out of which, 15 patients have hypothyroidism, 3 patients have hyperthyroidism, 14 patients have subclinical hypothyroidism and 1 patient has subclinical hyperthyroidism. In age group of 61-70 years, 30 patients have thyroid disorder, out of which, 10 patients have hypothyroidism, 3 patients have hyperthyroidism, 17 patients have subclinical hypothyroidism. In age group of 61-70 years 30 patients have thyroid disorder, out of which, 10 patients have hypothyroidism, 3 patients have hyperthyroidism, 17 patients have subclinical hypothyroidism. In age group of 71-80 years, 4 patients have thyroid disorder, out of which, 3 patients have hypothyroidism and 1 patient has subclinical hypothyroidism.

Our study shows that metabolic syndrome occurs most commonly in 51-60 years of age. In this age group 29.7% patients (89 patients) have MetS and in this age
group thyroid disorder are also very common in our study. In H K Tamang et al study showed that the people of age group of 40-60 years, had a higher prevalence of MetS which is in accordance with other study done in south Asian 9. Our study shows that subjects of age group of 41-50 years suffering from MetS occupy the second position in respect of prevalence. In this age group 27.3% (82 patients) have MetS. MetS patient in the age group of 61-70 years occupy the third position in order of prevalence. In this age group 21.7% (65 patients) have MetS. Subjects (patients) of age group of 21-30 years, 71-80 years and 81-90 years suffer less from MetS. In the age group of 71-80 years, 9 patients (3%) have MetS. In the age group of 21-30 years, 4 (1.3%) patients have MetS and in the age group of 81-90 years, 1 (0.3%) patients has MetS.

In our study 141 metabolic syndrome patients had WC between 100-109 cm, 94 patients had WC between 90-99 cm, 41 patients had WC between 110-119 cm, 17 patients had WC between 80-89 cm and 7 patients had waist circumference between 120-125 cm.

In our study, out of total MetS patients having WC between 80-89 cm, 8 patients have thyroid disorder. Out of this 8 patients, 3 patients have hypothyroidism, 2 patients have hyperthyroidism, 1 patient has subclinical hypothyroidism and 2 patients have subclinical hyperthyroidism. Out of total MetS patients having WC between 90-99 cm, 40 patients have thyroid disorder, out of which 13 patients have hypothyroidism, 6 patients have hyperthyroidism, 19 patients have subclinical hypothyroidism and 2 patients have subclinical hyperthyroidism. Out of total MetS patients having WC between 100-109 cm, 56 patients have thyroid disorder, out of which 21 patients have hypothyroidism, 5 patients have hyperthyroidism, 27 patients have subclinical hypothyroidism and 3 patients have subclinical hyperthyroidism. Out of total MetS patients having WC between 110-119 cm, 23 patients have thyroid disorder, out of which 9 patients have a hypothyroidism, 5 patients have hyperthyroidism and 9 patients have subclinical hypothyroidism and out of 2 MetS patients having WC between 120-125 cm, have subclinical hypothyroidism.

**Conclusion**

Our study advocate that age, sex, WC is directly related to thyroid disorder in metabolic syndrome patients. In our study, it is evident that thyroid disorder and MetS are correlated and thyroid disorder (hypothyroidism or hypothyroidism developed in 43% MetS patients. Our study found that females had higher risk than male. More over aging is an important risk factor for MetS. Our result suggests the necessity of monitoring thyroid function test in MetS populations, especially elder women. For prevention of the dreadful diseases like DM, CV disease etc and better management of MetS patients.

**Ethical Clearance:** Taken from Institutional Ethics Committee vide letter no. 904 date 17.12.2016.

**Source of Funding:** Self

**Conflict of Interest:** Nil

**References**

Emotional Intelligence and its Correlation with Academic Performance of Dental Undergraduates

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Abstract

Background: Now days, Emotional intelligence (EI) has been strongly associated parameter for the health care providers, which includes dental practitioners also. EI have been inter-linked with variables such as Psychiatric, Physical and Satisfaction levels.

Aim & Objectives: The aim of this study was to determine and correlate EI scores and academic performance(AP) among undergraduate dental students.

Material & Method: This was a quantitative cross sectional study among total of 260 1st to 4th year BDS students enrolled at school of dental sciences, Krishna Institute of Medical Sciences “Deemed To Be University”, Karad (KIMSDU), in the academic year 2018-2019. The study tool used was Emotional Intelligence Scale (Situational) by Dr. P. Srinivasan and Mr. K. Murugesan which included demographic and EI based questions. The response rate was almost 92% that affects quality of results.

Result: It was found that EI was significantly associated with AP with p < 0.05.

Conclusion: This study proves that emotional skills development will enhance AP of medical undergraduates in Western Maharashtra.

Keywords: Emotional intelligence, emotional intelligence scale, dental students, dental education, academic performance.

Introduction

Emotional intelligence (EI) is defined as the ability to monitor one’s own and other people’s emotions, to discriminate between different emotions and label them appropriately, and to use emotional information to guide thinking and behaviour and to manage and/or adjust emotions to adapt to environments or achieve one’s goals. [1] EI constitute of interpersonal and intrapersonal intelligence. Differentiating between emotions has been found to help guide people’s actions and enhance their problem-solving skills. Interpersonal intelligence is the outer intelligence one uses to understand and manage relationships with the other people. This is important for developing qualities like empathy and building up effective relationships. Intrapersonal intelligence is the inner intelligence one uses to know and understand oneself which is important for self-awareness, self-regulation and self-motivation. It can be postulated that management of interpersonal and intrapersonal emotions is vital for an individual’s success in academic and professional fields. Those with higher EI have greater mental health, job performance and leadership skills and therefore are more likely to understand, regulate and manage emotions better both in themselves and in the others. [10] Improving EI has beneficial effect on academic, social and personal well-being of an individual. It constitutes of over-all development of an individual.

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In the evaluation of EI, the following six components have been identified: self-awareness, self-confidence, self-control, empathy, motivation, and social competence. [2, 3, 4] Self-awareness refers to individuals’ ability to recognize their own feelings and how their actions could potentially affect others. Self-confidence gives individuals the assurance that they are smart and professional, while individuals’ confidence that they can accomplish their goals, maintain their composure, and stay collected even in frustrating situations comes from self-control.[2,3] Empathy allows someone to understand the feelings of another and know how to appropriately respond.[2] Having motivation contributes to the continual pursuit of success not only in individuals’ careers, but in their personal endeavours as well. With social competence, effective and appropriate communication occurs due to enhanced social skills. The combination of these components provides an overall evaluation of EI. [2, 3]

Evidence indicates that in clinical practice, EI is related to improved empathy in medical consultation, [5] better doctor-patient relationships, [5] better clinical performance [6, 7] and higher patient satisfaction. [8] These findings highlight that EI plays a critical role in making a balanced doctor who is competent in practicing both the art and the science of medicine and thus preventing them from becoming victims of the inevitable stress associated with the medical profession.

Since dental students are expected to acquire diverse academic and clinical competencies and interpersonal skills, in the five-year dental education program in India, dental students pursue four years of study, followed by a clinical internship in the final year. [4] In this study we decided to focus on the relationship between EI and AP of students from first to final year examination, for two reasons. Firstly the exams are considered to be the most emotionally demanding period for dental student. Secondly a higher level of EI is more likely to enhance AP at the examination.

The aim of this study was to assess students’ EI and its associated factors and to determine if there was an association between their EI and AP.

**Materials and Method**

The Study was conducted during the period of September 2017 to January 2017 in school of dental sciences (SDS), KIMSDU, Karad, Maharashtra, India. The study was approved by Institutional Ethics Committee of KIMSDU, Karad. Permission was obtained from the head of the institution of SDS, KIMSDU, Karad. The study used a quantitative cross-sectional research design. All first to fourth year undergraduate dental students of SDS were invited to participate in the study. After participants were provided with detailed information about the voluntary research study and an opportunity to ask questions, participants provided written consent.

The study tool used was Emotional Intelligence Scale (Situational) by Dr. P. Srinivasan and Mr. K. Murugesan [9] which consisted of a questionnaire with two parts. The first part addressed demographic factors. Demographic variables were age, gender, Living area, marital status, educational Qualification and AP. The second part included a structured questionnaire on EI. It consisted of 40 questions, to assess domains of EI which are self-awareness, social awareness, self-management, and relationship-management. The questions consisted of different situations and the options were different reactions to these situations. There was no time limit for completing the scale. It was emphasized that there is no right or wrong answers to the statements. The statements were designed to understand the differences in individual reactions to various situations. No statements were to be unanswered as it would cause errors in interpretation of the EI. From the answer scale Raw score was obtained which was checked with Z-score and by the Z-score interpretation helped to obtain Grade and level of EI which ranged from A to G(Extremely High to Extremely low). The reliability was established by split half method and Cronbach’s alpha method and was found 0.62 and 0.71 respectively and validity was established by comparing two EI scales and 0.92 was significance between both scores.

Total 260 students from first to final year participated in the survey. A self-administered questionnaire was distributed after the students were informed about the nature of the study and assured that their responses would be confidential. Participation was voluntary and no other incentive was given. Participants took about 15 minutes to 20 minutes to complete the questionnaire but there was no time limit. For analysis of EI score of all the four domains were added to get the raw score which was checked with the z-score to get the grade and level of EI. For Academic score analysis, marks of the university exams were recorded which were converted to percentage so all the participants can be analysed equally and a fair result was obtained.
Statistical Analysis: All data were in form of hard copy was entered in Excel data sheets. Then all excel data were cooked in IBM SPSS (Statistical Packages for Social Sciences) 20.0 software for analysis and drawing conclusions. Here the correlation between academic performance and Emotional Intelligence was calculated by using Pearson’s correlation. Also the various parameters of emotional intelligence comparisons year wise were done by using ANOVA (Analysis of Variance). For comparing two independent groups we used unpaired t-test.

Hypothesis: There is a significant relationship between the emotional intelligence and academic performance of students

Table 1: Sex-wise distribution of participant’s in the study

<table>
<thead>
<tr>
<th>BDS</th>
<th>Males (%)</th>
<th>Females (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st year</td>
<td>22 (8.46)</td>
<td>56(21.54)</td>
<td>78(30)</td>
</tr>
<tr>
<td>2nd year</td>
<td>12 (4.62)</td>
<td>59(22.69)</td>
<td>71(27.31)</td>
</tr>
<tr>
<td>3rd year</td>
<td>10 (3.85)</td>
<td>59(22.69)</td>
<td>69(26.54)</td>
</tr>
<tr>
<td>4th year</td>
<td>8(3.07)</td>
<td>34(13.08)</td>
<td>42(16.15)</td>
</tr>
<tr>
<td>Total</td>
<td>52(20)</td>
<td>208(80)</td>
<td>260(100)</td>
</tr>
</tbody>
</table>

BDS: Bachelor of Dental Sciences.

Result

Total 260 BDS students participated in this study, out of that 52 were males and 208 were females. Proportion of participation of female students were higher as compared with males, out of 52(100%) male students max. 22(43%) students were perusing 1st year of BDS, 12(23%) students were perusing 2nd year of BDS, while 10(19%) students were perusing 3rd year of BDS and 8(15%) students were perusing 4th year of BDS. Among 208(100%) female students’ 56(27%) students perusing 1st year of BDS, 59(28%) students were perusing 2nd year of BDS, while 10(19%) students were perusing 3rd year of BDS and also 34(17%) students were perusing 4th year of BDS. [See in Table 1]

Table 2: Pearson’s correlation between academic performance and emotional intelligence.

<table>
<thead>
<tr>
<th>BDS</th>
<th>Correlation Coefficient (r)</th>
<th>Coefficient of Determination (r^2)</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st year</td>
<td>0.01828</td>
<td>0.0003341</td>
<td>-0.2051 to 0.2399</td>
</tr>
<tr>
<td>2nd year</td>
<td>0.01125</td>
<td>0.0001266</td>
<td>-0.2227 to 0.2440</td>
</tr>
<tr>
<td>3rd year</td>
<td>-0.1117</td>
<td>0.01248</td>
<td>-0.3395 to 0.1284</td>
</tr>
<tr>
<td>4th year</td>
<td>0.2543</td>
<td>0.06464</td>
<td>-0.05392 to 0.5182</td>
</tr>
</tbody>
</table>

* Significant when P < 0.05

About 1st year students it (r = 0.01828, p > 0.05) means there was no statistically significant difference of academic score and EI. According to 2nd year students (r = 0.01125, p > 0.05) there was no statistically significant difference of academic score and EI, also in 3rd & 4th year students (r = -0.1117, P > 0.05) and (r = 0.2543, p > 0.05) respectively, In 3rd and 4th year students there was no statistically significant difference of academic score and EI. Positive value of correlation shows that academic score increased if score of EI increased. [See in Table 2]

Table 3: Comparison between academic performance and emotional intelligence by unpaired t-test

<table>
<thead>
<tr>
<th>BDS</th>
<th>Performance</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>t-value</th>
<th>p-value</th>
<th>Inference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st year</td>
<td>EI</td>
<td>78</td>
<td>53.59</td>
<td>11.813</td>
<td>4.244</td>
<td>0.0001</td>
<td>significant</td>
</tr>
<tr>
<td></td>
<td>AP</td>
<td>78</td>
<td>60.37</td>
<td>7.723</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd year</td>
<td>EI</td>
<td>71</td>
<td>52.53</td>
<td>9.824</td>
<td>5.474</td>
<td>0.0001</td>
<td>significant</td>
</tr>
<tr>
<td></td>
<td>AP</td>
<td>71</td>
<td>60.74</td>
<td>7.85</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd year</td>
<td>EI</td>
<td>69</td>
<td>53.94</td>
<td>10.113</td>
<td>4.834</td>
<td>0.0001</td>
<td>significant</td>
</tr>
<tr>
<td></td>
<td>AP</td>
<td>69</td>
<td>60.29</td>
<td>4.055</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4th year</td>
<td>EI</td>
<td>42</td>
<td>48.93</td>
<td>10.934</td>
<td>9.657</td>
<td>0.0001</td>
<td>significant</td>
</tr>
<tr>
<td></td>
<td>AP</td>
<td>42</td>
<td>66</td>
<td>3.422</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

EI-Emotional Intelligence *Significant when p < 0.05,
AP-Academic Performance

By mean values we can predict that AP score was more as compared to EI but there was statistically significant association between AP and EI. It was statistically significance where p < 0.05. [See in Table 3]
Table 4: Results of regression analysis of the academic performance and predictive variable of emotional intelligence that is self-management.

<table>
<thead>
<tr>
<th>Model</th>
<th>Degree of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Squares</th>
<th>F</th>
<th>Significance Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>3</td>
<td>27.198</td>
<td>9.066</td>
<td>2.520</td>
<td>0.0585</td>
</tr>
<tr>
<td>Residual</td>
<td>256</td>
<td>921.05</td>
<td>3.598</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>259</td>
<td>948.25</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*significant when p < 0.05

The $F_{3, 256}$ with value 2.520 was not significant at 0.0001 error level, so self-management has remarkable role in explaining AP. [See in Table 4]

Table 5: Sex wise distribution of Emotional Intelligence.

<table>
<thead>
<tr>
<th>BDS</th>
<th>Sex</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>t-value</th>
<th>p-value</th>
<th>Inference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st year</td>
<td>Male</td>
<td>22</td>
<td>49.54</td>
<td>11.53</td>
<td>1.928</td>
<td>0.0575</td>
<td>Not Significant</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>56</td>
<td>55.17</td>
<td>11.63</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd year</td>
<td>Male</td>
<td>12</td>
<td>54.58</td>
<td>11.86</td>
<td>0.7901</td>
<td>0.4322</td>
<td>Not Significant</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>59</td>
<td>52.11</td>
<td>9.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd year</td>
<td>Male</td>
<td>10</td>
<td>53.25</td>
<td>15.64</td>
<td>0.2648</td>
<td>0.8151</td>
<td>Not Significant</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>59</td>
<td>54.06</td>
<td>9.05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4th year</td>
<td>Male</td>
<td>8</td>
<td>41.88</td>
<td>15.51</td>
<td>2.112</td>
<td>0.041*</td>
<td>Significant</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>34</td>
<td>50.58</td>
<td>9.09</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significant when p < 0.05

Here from 1st to 4th year of BDS the mean score of EI of female students was high as compare to male students. There was no statistically significance difference among males and females students from 1st to 3rd year as p > 0.05. This suggests there was no relation between EI of male and female students of 1st, 2nd, 3rd year BDS Students. For 4th year BDS student we can say mean EI score of female students was statistically significant while compared to male students. The p < 0.05 shows there was statistically significance difference in 4th year BDS students between males and females in EI. [See in Table 5]

Table 6: Sex wise distribution of Academic Performance.

<table>
<thead>
<tr>
<th>BDS</th>
<th>Sex</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>t-value</th>
<th>p-value</th>
<th>Inference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st year</td>
<td>Male</td>
<td>22</td>
<td>59.77</td>
<td>6.66</td>
<td>0.4271</td>
<td>0.6705</td>
<td>Not Significant</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>56</td>
<td>60.6</td>
<td>8.1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd year</td>
<td>Male</td>
<td>12</td>
<td>60.91</td>
<td>5.69</td>
<td>0.1021</td>
<td>0.919</td>
<td>Not Significant</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>59</td>
<td>60.66</td>
<td>8.26</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd year</td>
<td>Male</td>
<td>10</td>
<td>59</td>
<td>2.72</td>
<td>1.153</td>
<td>0.2528</td>
<td>Not Significant</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>59</td>
<td>60.53</td>
<td>4.24</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4th year</td>
<td>Male</td>
<td>8</td>
<td>64.25</td>
<td>3.28</td>
<td>1.641</td>
<td>0.1087</td>
<td>Not Significant</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>34</td>
<td>66.41</td>
<td>3.336</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significant when p < 0.05

While comparing AP of 1st to 4th year among male and female students in BDS, here by above table (p > 0.05) hence we can say that there was no significant difference in their AP. [See in Table 6]
Discussion

The healthcare practitioners have specified as concoction of expertise clinician and a server directorate towards care givers. One’s EI may reflected by aptitudes for a service and caring. [11] This study revealed that EI was an associated predictor of AP at BDS examination amongst SDS, Karad, Western Maharashtra which may be due to the huge size of data. On the other hand, Wijekoon CN et al. [11] in their study has observed EI was independent variable for AP. But it was nearly same a response rate by Wijekoon CN et al. [12] almost 92% which increases efficacy and quality of study. The other strength of this study is the concept EI performance which gives deeper encyclopaedia about a behaviour of student’s towards real life settings. We considered the 1st to 4th BDS examination results as our main study objective because it is considered to be the major summative assessment faced by the dental undergraduates. This result could indicate the significant presence of a direct EI effect on AP in dental education. Our study confirmed that EI was positively associated with AP. Similarly, our study suggests that certain parameters of EI are related to AP. Our study results highlighted the important link between the EI and AP of dental undergraduate. A very few number of study published before in India especially in western Maharashtra and also in Asian countries on this theme and it has found an association between higher EI and better performance during examinations.[13]

This study revealed that out of 260 participants 52 were males and 208 were females. Proportion of participation of female students was higher as compared with males. Majority of the study had shown that the female student participant was more in such studies. Similarly, Kumar Amit et al. [4] in their study male to female ration were 1:1.9. In our study the Pearson’s correlation between EI and AP was positive means there was definite functional relationship between EI and AP. But, statistically not significant likewise almost all of the study done in the past reflected this result. The findings of this study done in dental students strengthen the findings of the previous study which discussed about the fact of the link between EI and AP. Higher EI may count several reasons for the better AP. Ranasinghe et al. reported that among medical undergraduates from a different university in Sri Lanka, self-perceived stress score was lower in those with higher EI. [12] Joseph et al. has reported that EI positively predicts performance in emotionally demanding situations.[13]

Interpersonal EI is also important for nurturing positive relationships with the health care providers in the hospital, which in turn facilitates a smooth process of learning. Our findings with regard to the relationship between EI and AP are in keeping with the findings of several previous studies from different countries including India, USA, and Malaysia [4,14–15]. The study done by Ranasinghe et al. has demonstrated the same trend. [12] It is also worth mentioning that we did not use longitudinal data in our analyses of AP.

Conclusion

Among the dental undergraduates of the selected SDS, both EI and AP from 1st to 4th year BDS examination were higher among females as compared to males. Independent of gender, AP was better in those who were more emotionally intelligent. This study proves that emotional skills development will enhance academic performance of medical undergraduates. This proves our hypothesis that there is a significant relationship between EI and AP of students. Hence it is suggested to enhance EI of students by various techniques.

Ethical Clearance: Taken from institutional ethical committee from KIMSDU, Karad.

Source of Funding: KIMSDU, Karad.

Conflict of Interest: None.

References


Influence of Aging on Cardiovascular System in Elderly Male and Female Healthy Subjects

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Abstract

Objective: This Study Helps to find out the Significant changes of cardiovascular functions in Case of Male and Female Subjects with advancing age.

Material and Method: The Present Study Was Undertaken On Elderly 65 Years and Above Healthy, Non Smoker Subjects of Both Sexes. Subjects Were Selected Randomly From Puran Hospital OPD at Medicine Department. Paonta Sahib, H.P and MMIMSR Hospital, Mullana, Ambala, Haryana. The Cross Sectional Study Was Conducted On 1000 Subjects With Equal Number of Male and Female. The Mean Age of Male was 74.46 ± 8.41 And Mean Age of Female Was 73.59 ± 8.32. We Have Taken Healthy and Clinically Fit Subjects Those Who are 65 Years and above age. Cardiovascular Parameter Like - Blood Pressure that is Systolic Blood Pressure, Diastolic Blood Pressure, Pulse Pressure, Mean Blood Pressure and Heart Rate was Taken to conduct the Study.

Result: There Was Significant Correlation of age with Blood Pressure that is Systolic Blood Pressure, Diastolic Blood Pressure, Pulse Pressure, Mean Blood Pressure and Heart Rate.

Conclusion: All These Cardiovascular Parameter Correlate Significantly with advancing age.

Keywords: Aging Related Changes, Myocardium, Blood Vessels, Vascular Function, Blood Pressure, Heart Rate.

Introduction

Physiological declines in multiple systems in older adults is a new field of geriatric research. Ageing process is associated with progressive constriction of the homeostatic reserve of every organ. Aging can be defined as progressive accumulation of random molecular defects within tissues and cells. Physiological changes occur with aging in all organ systems. Growing older related modifications to cardiovascular concerned in particular lower in rates of the heart, extraction of oxygen, stiffening of the arteries, vasoconstriction, systolic blood pressure elevation, myocardial thickening, diastolic filling rate, discount in rhythmic rates alterations, and prolongation of movement capacity had been described in advance by exclusive researcher.¹

Getting older has usually been associated with accelerated casual Systolic Blood Pressure (SBP) and Diastolic Blood Pressure (DBP) and with reduced Heart rate (HR). In research of BP using intra-arterial and non-invasive ambulatory tracking techniques, older hypertensive and normotensive subjects have been observed to show extra variability for BP.²,³ It’s miles concept that the age-associated modifications in variability are related to changes inside the baroreflex and sympathetic/parasympathetic manipulate of the cardiovascular device. BP variability has been discovered to be an independence chance issue for cardiovascular morbidity and the price and severity of target-organ damage.⁴,⁵

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The “physiological” age-related increase in blood pressure can be a confounding element inside the dedication of age consequences on blood pressure variability. Definitely, incidence of hypertension with a conservative definition of blood pressure above 140/90mm Hg in patients aged above 65 years is better than 40%.6,7

Many studies have proven that the maximum exercising coronary heart rate declines with age.8,9 Getting old is associated with adjustments in pacemaker tissue, a decrease in the responsiveness of autonomic cardiovascular reflexes, a decline in the intrinsic heart rate, and reduced adrenergic receptor sensitivity.10-12

Results of cross-sectional studies, blood pressure increases with age. Each systolic and diastolic blood pressure tended to grow with age.13,14 The upward push of blood pressure with age is not an integral part of the aging process.

Presently, the aged represent a big and fast-growing percentage of the population that demanding situations cardiovascular research. Like hypertension, ageing has been shown to boost blood pressure variability. Coronary heart rate variability, however, decreases with increasing age and blood pressure. Because blood pressure rises with getting older.15

The most important physiological changes associated with aging are of increase in Diastolic and Systolic Myocardial stiffness, perhaps due to increased interstitial decrease interstitial fibrosis in the myocardium. There is a increased stiffening of arteries with age, especially of the thoracic aorta, leading to an increased after load of the heart.16

A progressive increase in blood stress after the first decade of life has long been seemed as a normal effect of ageing and was the foundation for ignoring the presence of hypertension in the elderly. Moreover cardiovascular disease was more frequent cause of death and morbidity in the hypertensive subjects older than 65 years of age than in the younger subjects.

Atherosclerosis clearly increases with aging. Raised fibrous plaques that contain lipid, atheromas, of the abdominal aorta increase linearly from onset by age 70 years. Myocardial infarction from coronary artery disease will increase with age and despite the fact that many risk factors are recognized, but age itself is probably the most significant.17

The aim of this study was to establish cardiovascular values for normal, healthy elderly male and female people aged 65 and above population.

Material and Method

The present study was undertaken on elderly 65 years and above healthy subjects of both male and female. Subjects were selected randomly from Puran Hospital OPD at medicine department. Paonta Sahib, H.P. and MMIMSR Hospital, Mullana, Ambala, Haryana.

Cardiovascular Parameter like - Blood Pressure that is Systolic Blood Pressure, Diastolic Blood Pressure, Pulse Pressure, Mean Blood Pressure and Heart Rate was taken to conduct the study. The cross sectional study was conducted on 500 male and 500 female elderly equally healthy subjects, those who were 65 years and above age. A written informed consent was obtained.

Inclusion Criteria:
1. Healthy individual without athletic training
2. Aged population 65 years and above age but clinically fit.

Exclusion Criteria:
1. All the subjects 65 years and above age with sign and symptoms of disease.
2. Subjects having on medication but clinically not healthy.

Result

The data was analysed by using SPSS version 20.0 for windows. Mean and standard deviation (SD) was calculated and reported for quantitative variables. The Spearman correlation coefficient was calculated of cardiovascular function parameters Systolic Blood Pressure, Diastolic Blood Pressure, Pulse Pressure, Mean Blood Pressure and Heart Rate. A p-value of < 0.01 was considered statistically highly significant, value < 0.05 was considered statistically significant and that > 0.05 was considered statistically non-significant.

There is positive correlation found in between age and systolic Blood Pressure, Diastolic Blood Pressure, Pulse Pressure, Mean Blood Pressure and Heart Rate. All these cardiovascular parameters significantly altered with age (Table 1 and Table 2).
Table 1: Descriptive Statistics

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systolic Blood Pressure</td>
<td>129.02</td>
<td>13.554</td>
</tr>
<tr>
<td>Diastolic Blood Pressure</td>
<td>83.84</td>
<td>8.535</td>
</tr>
<tr>
<td>Pulse Pressure</td>
<td>45.48</td>
<td>11.593</td>
</tr>
<tr>
<td>Mean Blood Pressure</td>
<td>98.275</td>
<td>9.131</td>
</tr>
<tr>
<td>Heart Rate</td>
<td>76.74</td>
<td>8.181</td>
</tr>
</tbody>
</table>

Table 2: Correlation of Age With Cardiovascular Parameter

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Pearson Correlation</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systolic Blood Pressure</td>
<td>0.243**</td>
<td>0.000</td>
</tr>
<tr>
<td>Diastolic Blood Pressure</td>
<td>0.168**</td>
<td>0.000</td>
</tr>
<tr>
<td>Pulse Pressure</td>
<td>0.129**</td>
<td>0.000</td>
</tr>
<tr>
<td>Mean Blood Pressure</td>
<td>0.228**</td>
<td>0.000</td>
</tr>
<tr>
<td>Heart Rate</td>
<td>0.028</td>
<td>0.378</td>
</tr>
</tbody>
</table>

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Fig. 1 - +ve Linear correlation between Age & SBP
Fig. 2 - +ve Linear correlation between Age & DBP

Fig. 3 - +ve Linear correlation between Age & PP
Fig. 4 - +ve Linear correlation between Age & MBP

Discussion

Aging is a progressive failure of body's homeostatic adaptive response resulting in increased vulnerability to environmental stress and disease. The physiological sign of aging are gradual deterioration in function and capacity to respond to environmental stress. Aging is a general physiological on-going process and despite intensive research the mechanism of aging are still to be explored.\(^{18}\)

In this study the positively correlation was found between cardiovascular parameter like Systolic Blood Pressure, Diastolic Blood Pressure, Pulse Pressure and Mean Blood Pressure with age, and significant. Heart rate is not significantly correlated with age. These findings are similar to those of F Jaquet, IB Glodstein and D Shapiro, University of California, Los Angeles, CA, USA. According to their study SBP and DBP levels were significantly higher in the elderly group compare to normal. Age has been associated with increased blood pressure variability.\(^{19}\)

In our study Heart rate is not correlated with age significantly. This study is also similar with a study conducted by Laurence Fluckiger, Jean –Marc-Boivin, et al. those who reported that there was short term heart rate variability is impaired whereas Blood pressure variability is little affected by the aging process subject with normal blood pressure. This study also shows continuous negative correlation between age and spectral component of heart rate variability. The result suggest that the sympathetic and vagal components of heart rate are equally affected by aging.\(^{20}\)

The aspect of study by John B. Kostis, M.D., Abel E. Moreyra, M.D. et al, suggest that the fat that age did not affect the difference in heart rate between day and night also implies that variation in activity were not the only reason for the decline of maximum heart rate with age. Another cause may be decline in the capacity of the sinus node to increase the heart rate.\(^{21}\)

Overall blood pressure variability at rest does not increase with aging. This study is suggested by Dark P. Veerman, Ben P.M. Imholz et al., In other studies it has been found that ambulatory blood pressure variability is increased in the elderly. In their study the difference between the antioscillatory influence of heart rate which decreases with aging is less important at rest than in ambulatory conditions.\(^{22}\)

Other study by Mohamed Nabil Alama, who measured cardiovascular efficiency by blood pressure. According to their study with aging the baroreceptors become less sensitive which clear that many older people have hypertension.\(^{23}\)
Conclusion

The outcome of present study indicates that SBP, DBP, PP and MBP are significantly correlated with age but heart rate is not significantly changes with increase age. It indicates that cardiovascular function were dependent or number of factors. The results obtained have both clinical and public health significance for evaluating the changes due to aging.

CVS is associated with many complex changes during aging both in structure and function. Which leads to alterations in of the cardiovascular physiology CVD and cardiac reserve diminishing, heart thickened and stiffens were increased by aging. There little diminishing in contractility of myocardium.

Ethical Consideration: The proposal has been approved by IEC-MMU on 8/04/2015.

Conflict of Interest: We declare that we have no conflict of interest. The authors alone are responsible for the content and writing of the paper.

Source of Support: Nil

References

19. F Jaquet, IB Glodstein and D Shapiro, University of California, Los Angeles, CA, USA; Effect of


Incidence and Profile of Gross Congenital Malformations in a Tertiary Care Hospital in North India

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Abstract

Background: With better management of nutritional deficiency and infectious diseases, congenital malformations are becoming important cause of perinatal and infant mortality and morbidity in developing world. Due to lack of National Birth Defect surveillance the true magnitude of births affected by congenital anomalies in India is unknown. Need for data regarding congenital malformations arises so as to get the burden and to assess their impact on health and rehabilitation services in a developing country like India.

Objectives: To determine the incidence and profile of congenital malformations among live births at a tertiary care hospital in North India.

Method: A prospective analysis was carried from November 2016 to October 2018. All live borns during study period were included. Diagnosis of congenital malformations was based on clinical examination of newborn. Other investigations like Xray, ultrasonography of skull and abdomen and two dimensional echocardiography were done where required to rule out other associated anomalies.

Results: During the study period, there were 22,460 live births. Among them, 265 had congenital malformations resulting in an incidence of 11.8 per 1000 live births. Out of these, 245 babies had single and 20 babies had multiple congenital malformations. Out of these, 54.71% babies were males and 30.9% were preterm. Most of the mothers were multiparous (75%) and in the age group of 20-30 years (81.3%). The most common system involved was central Nervous system (20.75%) followed by cardiovascular system (17.35%) and gastrointestinal system (15.84%). Meningomyelocele (10.5%) was the commonest anomaly in central nervous system.

Conclusions: The incidence of congenital malformations in our study was found to be 11.8 per 1000 live births. The most common system involved was central nervous system

Keywords: Gross Congenital Malformations, Incidence, tertiary care hospital, Neonate.

Introduction

With improved control and better management of infections and nutritional deficiency diseases, congenital malformations are now becoming major cause of perinatal and neonatal morbidity and mortality in developing countries¹². According to CDC report, about 3 % of all live births in USA are born with congenital malformations.³ True burden of the number of births affected by congenital malformations in India is unknown due to lack of a National Birth Defect surveillance. Worldwide, incidence of congenital malformations is 3-7 %, however, geographic and ethnic variations exist between countries. In India, 2.5 % infants are affected at birth accounting for 8-15 % of perinatal and 13-16 % of neonatal mortality⁴. Congenital anomalies constituted the fifth largest cause, being responsible for an estimated 9% of neonatal deaths in the year 2010⁵
Need for data regarding congenital malformations arises so as to derive the estimates of their magnitude and to assess their impact on health and rehabilitation services in a resource limited country like India. Many of these conditions may be potentially preventable or treatable through simple low cost interventions like folic acid supplementation.

**Aims and Objectives**

To determine the incidence and profile of congenital malformations among live births at a tertiary care hospital in North India.

**Material and Method**

A prospective analysis was carried out in Neonatal Services from November 2016 to October 2018. All live born during study period were included. Diagnosis of congenital malformations was based on clinical examination of newborn done by pediatrician at the time of birth. Detailed history and physical examination was done. Various imaging modalities like radiography, ultrasound and MRI were done as per requirement. The anomalies diagnosed on pre-natal ultrasonography were confirmed clinically or by appropriate radiodiagnostic method soon after birth. Other investigations like radiography, ultrasonography of viscera, skull and 2D-echocardiography as and when required were done to rule out other associated anomalies. The neonates were managed accordingly either medically or surgically. Congenital malformations were divided into central nervous system (CNS), musculoskeletal, gastrointestinal, genitourinary, cardiovascular (CVS), respiratory, ear/eye/nose and multisystem disorders.

**Results**

During the study period, there were 22,460 live births. Among them, 265 had congenital malformations resulting in an incidence of 11.8 per 1000 live births. Out of these, 245 babies had single and 20 babies had multiple congenital malformations. Out of these, 54.71% babies were males and 30.9% were preterm. Most of the mothers were multiparous (75%) and in the age group of 20-30 years (81.3%). The most common system involved was Central Nervous system (20.75%) followed by Cardiovascular system (17.35%) and Gastrointestinal system (15.84%). Meningomyelocele (10.5%) was the commonest anomaly in central nervous system (Table 1).

**Table 1: Incidence and Profile of Gross congenital malformations**

<table>
<thead>
<tr>
<th>System</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central nervous system</td>
<td>55</td>
<td>20.75%</td>
</tr>
<tr>
<td>Meningomyelocele</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>Hydrocephalus</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Microcephaly</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Anencephaly</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Arnold Chiari malformations</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Arachnoid cyst</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Cardiovascular system</td>
<td>46</td>
<td>17.35%</td>
</tr>
<tr>
<td>Cyanotic CHD</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Acyanotic CHD</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>Single Umbilical Artery</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Gastrointestinal system</td>
<td>42</td>
<td>15.84%</td>
</tr>
<tr>
<td>Cleft Lip and Palate</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>Tracheoesophageal fistula</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Imperforate anus</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Exomphalos</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Duodenal atresia</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Musculoskeletal system</td>
<td>30</td>
<td>11.32%</td>
</tr>
<tr>
<td>CTEV</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>Polydactyly</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Congenital Diaphragmatic Hernia</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Absent sternoclidomastoid</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Urogenital system</td>
<td>38</td>
<td>14.33%</td>
</tr>
<tr>
<td>Hydronephrosis</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Renal cyst</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Ambiguous Genitalia</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Hypospadiasis</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Respiratory system</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pulmonary atresia</td>
<td>9</td>
<td>3.39%</td>
</tr>
<tr>
<td>Facial dysmorphism</td>
<td>16</td>
<td>6.03%</td>
</tr>
<tr>
<td>Eye/ear/neck</td>
<td>9</td>
<td>3.39%</td>
</tr>
<tr>
<td>Multiple system involvement</td>
<td>20</td>
<td>7.54%</td>
</tr>
</tbody>
</table>

**Discussion**

Increased incidence of anomalies in countries like India may be contributed by causes like inadequate periconceptional folic acid, low birth weight or intake of teratogenic drugs in pregnancy and consanguineous marriage. The causes of congenital abnormality may be genetic in 30–40% and environmental in 5–10% cases. Chromosomal abnormality constitutes around 6% of the genetic causes, single gene disorders constitutes about 25%, and multifactorial factors in about 20-30%. The cause is not known in about 50%. A previous study from north India reported GCMF in 47 (1.64%) births with incidence of anencephaly (44.68%), talipes equinovarus (17.02%) and meningomyelocele.

Un-booked (2.07%) mothers had higher risk of malformation in-comparison to booked (1.01%); pre-term birth (5.13%) vs. term (0.73%); cesarean section (4.36%) versus vaginal delivery (0.62%). Also malformation was slightly higher in females, female: male ratio of 1.35:1. Our study included only live births they included all cases.

Congenital anomalies in babies were significantly associated with maternal factors like consanguinity, maternal age, previous child with gross congenital malformation, severe anemia and history of previous abortions. CTEV is the commonest congenital anomaly observed in musculoskeletal malformations. One study from east India reported incidence of musculoskeletal anomalies 4.4/1000 live birth. The incidence of CTEV in this study was 3 per 1000 live births, which was slightly higher than other Indian studies. Our study also shows CTEV as most common musculoskeletal anomaly. The Incidence was 0.84 per 1000 live birth. As per systemic review the live birth prevalence of hospital based studies in India for central nervous system 28.93 (95% CI 13.64–44.22), Musculoskeletal system 79.38 (95% CI 32.32–126.44), Cardiovascular system 23.04 (95% CI 4.69–41.39), Gastrointestinal system 37.72 (95% CI 26.41–49.03), Genitourinary system 28.41 (95% CI 16.18–40.65). The incidence of congenital malformations in our study was found to be 11.8 per 1000 live births, which is consistent with studies conducted in various parts of our country.

In our study, out of all malformations central nervous system anomalies constituted around 20.75% followed by Cardiovascular system (17.35%) and Gastrointestinal system (15.84%). The incidence of congenital malformations was found to be higher in multiparous females (75%). Our study had a limitation of being an exclusive hospital based study specially dealing with risk pregnancies. Big population based studies are required to know the actual prevalence and profile of congenital malformations in the population. The high rates of neural tube defect are noteworthy. To reduce neonatal and infant mortality, interventions should include pre-conceptional supplementation of folic acid, particularly in high-performing states. Designing of public health programs that incorporate folic acid supplementation into newly married couple counselling as well as those planning families has a role. Simultaneously, we must maintain a Birth Defects Registry which will be easily accessible. Knowledge about essential maternal care during pregnancy, fortification of food products of daily use, increasing awareness about congenital malformations and knowledge about the consequences of consanguineous marriages need to be enlightened to reduce the incidence of congenital malformations.

Conclusion

The incidence of congenital malformations in our study was found to be 11.8 per 1000 live births. The most common system involved is central nervous system followed by cardiovascular and gastrointestinal.

Conflict of Interest: statement: None declared

Ethical Clearance: The study was cleared by the institutional ethical committee.

Funding: None

References


Attitude Towards Mental Illness among the Adolescents in Selected Colleges of Udupi District

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Abstract

Introduction: Mental illness refers to a group of disorders that affect the way a person thinks, feels and acts. The attitudes of the general public towards people with mental illnesses have been described as negative, stigmatizing, uninformed and fearful.

Objective: To determine the attitude of college students towards mental illness as measured by rating scale, to find the association between attitude and selected demographic variables like age, gender, religion, type of family, source of information and mental illness among the family members and to find the opinion about the informational leaflet on mental illness.

Methodology: The study was carried out among 173 adolescents aged between 16-19 years from selected Colleges. The colleges were selected by simple random technique and subjects by convenient sampling.

Results: Out of 173 subjects, (41.0%) were of 17 years old. Majority (52.0%) of the subjects were females and (90.8%) of them belongs to the Hindu religion. Majority (63.6%) were from nuclear family and all of them were from rural area. Most (39.3%) of them reported health personnel as the source of information. Only 2.3% subjects reported having mentally ill client in their family. Among 173 subjects, majority (54.9 %) had moderately favorable attitude and (45.10%) had favorable attitude. None of the subjects had unfavorable attitude. There was no significant association between mental illness and age (χ² = 4.669; p > 0.05), gender (χ² = 0.031; p > 0.05), type of family (χ² = 0.119; p > 0.05), religion (χ² = 0.554; p > 0.05), source of information (χ² = 0.904; p > 0.05), and any family members suffering from mental illness (χ² = 0.040; p > 0.05). Opinionaire on leaflet on prevention and management of mental illness revealed that, 57.4% of them strongly agreed that it is a good source of learning, agreed that the leaflet gave them sufficient knowledge(61.8%) and the information was very useful(61.3%).

Conclusion: The attitude of the adolescents were favorable towards caring for mentally ill people. Information leaflet will help in improving the attitude of adolescents towards mental illness.

Keywords: Attitude, Mental illness, Adolescents and Informational leaflet.

Introduction

Mental illness refers to a group of disorders that affect the way a person thinks, feels and acts. Attitude has long been known to influence behavior. The attitudes of the general public towards people with mental illnesses have been described as negative, stigmatizing, uninformed and fearful. More disturbing are the researchers indicating the societal knowledge and the attitudes towards people with mental illness may not have changed substantially in the past 30 or more years. Mental illness is estimated to affect approximately one
in five persons in the United States. Depression ranks first among illnesses that cause disability in the United States. It is a chronic, debilitating illness that occurs 2 to 3 times more frequently in women than in men and has a peak onset during the child bearing years. Depression is the second leading cause of hospitalization for women of childbearing age in the United States. Anxiety and substance abuse commonly precede the onset of major depressive disorder and can be an indication for depression screening[1].Gureje O, Lasebikan VO, Oluwanuga OE, Olley BO, Kola conducted a community survey to determine the knowledge and attitude in Nigeria among 2040 participants who were selected using multi-stage cluster sampling technique. The respondents commonly endorsed cause of mental illness was a belief that it could be due to possession by evil spirits (t = 30.2%) following this trauma (t = 29.9%), stress (t = 29.2%) and hereditary (t = 26.5%) were the possible causes. The study concluded that the stigma of mental illness is widely spread in Nigeria and the attitude towards mental illness is greatly fueled by notions of causations that suggest that the affected people are responsible for their illness and by fear.[2] Mental illness still generates misunderstanding, prejudice, confusion and fear. People may be less willing to offer support and empathy if someone is suffering from mental illness rather than a physical health problem. The stigma is at times worse than the illness itself and to provide this knowledge to the adolescents the stigmatizing attitude can be reduced to some extent.[3]

**Materials and Method**

In this study, the colleges were selected by simple random sampling and subjects by convenient sampling. The research tools used were, Tool 1: Demographic Proforma and Tool 2: Rating scale on attitude towards mental illness. Content validity of the tools was established by obtaining suggestions from seven experts. Reliability of the attitude scale was established by using Chronbach’s alpha. The tool was found to be reliable with value \( r = 0.8 \). Pilot study was conducted to assess the feasibility of the study. Data were collected in selected colleges of Udupi district after taking the administrative permission. An informed consent was taken from the participants before administering the tool. The analysis was done based on the objectives of the study.

**Ethical consideration:** Administrative permission and ethical clearance were obtained before data collection. Informed consent from the participants obtained before conducting the study.

**Statistical Analysis:** The data were analysed using Statistical Package for the Social Sciences (SPSS) version 16.0. Frequency and percentage was computed to analyse the sample characteristics. The Chi-square test was used to find out the association between attitude scores and the demographic proforma.

**Results**

Out of 173 subjects, (41.0%) were of 17 years of age. Majority (52.0%) of the subjects were females and (90.8%) of them belongs to the Hindu religion. Majority (63.6%) were from nuclear family and all of them were from rural area. Most (39.3%) of the subjects reported health personnel as the source of information. Only 2.3% subjects reported having mentally ill client in their family. Among 173 subjects, majority (54.9%) had moderately favorable attitude and (45.10%) had favorable attitude. None of the subjects had unfavorable attitude.

There was no significant association between mental illness and age (\( \chi^2 = 4.669; p > 0.05 \)), gender (\( \chi^2 = 0.031; p > 0.05 \)), type of family (\( \chi^2 = 0.119; p > 0.05 \)), religion (\( \chi^2 = 0.554; p > 0.05 \)), source of information (\( \chi^2 = 0.904; p > 0.05 \)), family members suffering from mental illness (\( \chi^2 = 0.040; p > 0.05 \)).

Among 173 subjects, most (57.4%) of the subjects strongly agreed that the information leaflet on prevention and management of mental illness is a good source of learning. Majority of them agreed that it’s interesting to read (64.2%) and is very useful (61.3%).

**Table 1: Frequency and percentage distribution of sample characteristics N = 173**

<table>
<thead>
<tr>
<th>Sample characteristics</th>
<th>Frequency (f)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age (in years)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>60</td>
<td>34.7</td>
</tr>
<tr>
<td>17</td>
<td>71</td>
<td>41.0</td>
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<tr>
<td>18</td>
<td>29</td>
<td>16.8</td>
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<td>19</td>
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<td>7.5</td>
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<td><strong>Gender</strong></td>
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<td></td>
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<tr>
<td>Male</td>
<td>83</td>
<td>48.0</td>
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<tr>
<td>Female</td>
<td>90</td>
<td>52.0</td>
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<td><strong>Type of family</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nuclear</td>
<td>110</td>
<td>63.6</td>
</tr>
<tr>
<td>Joint</td>
<td>63</td>
<td>36.4</td>
</tr>
<tr>
<td><strong>Religion</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

...
Sample characteristics | Frequency (f) | Percentage (%)
--- | --- | ---
Hindu | 157 | 90.8
Christian | 9 | 5.2
Muslim | 7 | 4.0

Source of information
- Books and magazines: 62 (35.8%)
- Radio and television: 16 (9.2%)
- Friend or a relative: 27 (15.6%)
- Health personnel: 68 (39.3%)

Place of living
- Rural: 173 (100%)
- Urban: -

Is any family member suffering from mental illness?
- Yes: 4 (2.3%)
- No: 169 (97.7%)

N = 173

**Fig 1:** Pie diagram showing the attitude of the adolescents towards mental illness.

<table>
<thead>
<tr>
<th>Sample characteristics</th>
<th>Poor</th>
<th>Average &amp; good</th>
<th>$\chi^2$</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (in years)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>32</td>
<td>28</td>
<td>4.669</td>
<td>3</td>
<td>0.198</td>
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<tr>
<td>17</td>
<td>27</td>
<td>44</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
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<td></td>
<td></td>
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<tr>
<td>19</td>
<td>4</td>
<td>9</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>38</td>
<td>45</td>
<td>0.031</td>
<td>1</td>
<td>0.860</td>
</tr>
<tr>
<td>Female</td>
<td>40</td>
<td>50</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Religion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hindu</td>
<td>72</td>
<td>85</td>
<td>0.554</td>
<td>2</td>
<td>0.791</td>
</tr>
<tr>
<td>Christian</td>
<td>3</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Muslim</td>
<td>3</td>
<td>4</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Type of family</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nuclear</td>
<td>51</td>
<td>59</td>
<td>0.199</td>
<td>1</td>
<td>0.656</td>
</tr>
<tr>
<td>Joint</td>
<td>27</td>
<td>36</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Source of information</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
- Books and magazines: 28 (34%)
- Radio and television: 6 (10%)
- Friend or a relative: 11 (16%)
- Health personnel: 33 (35%)

Is any family member suffering from mental illness?
- Yes: 2 (2%)
- No: 76 (93%)

**Table 3:** Opinionnaire on leaflet on prevention and management of mental illness N = 173

<table>
<thead>
<tr>
<th>Content</th>
<th>Strongly Agree</th>
<th></th>
<th>Agree</th>
<th></th>
<th>Disagree</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency (f)</td>
<td>Percentage (%)</td>
<td>Frequency (f)</td>
<td>Percentage (%)</td>
<td>Frequency (f)</td>
<td>Percentage (%)</td>
<td></td>
</tr>
<tr>
<td>This information leaflet is a good source of learning</td>
<td>87</td>
<td>57.4</td>
<td>86</td>
<td>49.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The language used in the informational leaflet is simple</td>
<td>53</td>
<td>30.6</td>
<td>112</td>
<td>64.7</td>
<td>8</td>
<td>4.6</td>
</tr>
<tr>
<td>This informational leaflet helped me to share this knowledge about the care of mentally ill</td>
<td>49</td>
<td>28.3</td>
<td>116</td>
<td>67.1</td>
<td>8</td>
<td>4.6</td>
</tr>
<tr>
<td>The pictures used in this leaflet helped me to understand the content better</td>
<td>55</td>
<td>31.8</td>
<td>104</td>
<td>60.1</td>
<td>14</td>
<td>8.1</td>
</tr>
<tr>
<td>This leaflet helped me to learn in my own free time</td>
<td>42</td>
<td>24.2</td>
<td>115</td>
<td>66.5</td>
<td>16</td>
<td>9.2</td>
</tr>
<tr>
<td>This informational leaflet is interesting to read</td>
<td>48</td>
<td>27.7</td>
<td>111</td>
<td>64.2</td>
<td>14</td>
<td>8.1</td>
</tr>
<tr>
<td>This informational leaflet has given me sufficient knowledge on mental illness</td>
<td>45</td>
<td>26.0</td>
<td>107</td>
<td>61.8</td>
<td>21</td>
<td>12.5</td>
</tr>
<tr>
<td>This informational leaflet is very useful</td>
<td>61</td>
<td>35.3</td>
<td>106</td>
<td>61.3</td>
<td>16</td>
<td>3.5</td>
</tr>
</tbody>
</table>
Discussion

The present study findings showed that, among 173 subjects, majority (54.90%) had moderately favorable attitude. None of the subjects had an unfavorable attitude. Singh AJ et al, conducted a study to assess the attitude of Indian urban adults towards mental illness and found that 73% considered mental patients as dangerous and difficult to understand, 79% considered as botheration in the neighborhood. Only one third of the respondents agreed that mentally ill patients can be of some use to the society, 85% favored the assignment of the jobs to the ex mental patients, 84% asserted that they have no hesitation in working with such people, 55% did not favor to have marital alliance and 64% did not favor ex mental patients to be tutors to their children. The study further revealed that 88% had a sympathetic attitude towards the patients and 74% were against harsh treatment or stern attitude towards mental patients. These findings support the findings of the present study. [4]

Gureje OS et al conducted a study to assess the attitude towards people with mental illness and the study revealed that most of the people were afraid to have a conversation with someone known to have a mental illness and a few would consider such a person for friendship. The closer the intimacy required for the interaction, the stronger the communities desire to keep a safe distance. Thus less than 4% considered marrying anyone with mental illness. These findings support the findings of the present study. [2]

Chiu MYL and Chan KKL, conducted a study to assess the discrimination with people with severe mental illness (SMI) revealed that more than half of all the respondents (55%) believed that the behavior and thinking of family members of the people with SMI were weird, 38% thought that siblings of people with SMI would also developed psychiatric problems while 41% thought that this would also be the case for their spouses, 74% thought that people with SMI should see a psychiatrist. [5]

Jane K, Calton T, Caroline F, conducted an exploratory study to explore the feasibility of a randomized controlled trial of the effects of two anti-stigma films on attitudes to serious mental illness and psychiatry among 82 medical students in Nottingham. The study findings revealed that, majority (n = 37; 80%) were White European; 28 (60%) had previous contact with a person diagnosed with a serious mental illness. there was a significant change in score in the intervention group over the three time points (n = 23, d.f. = 2, P = 0.026), with scores demonstrating a significant decrease from baseline to post-intervention (z = –2.614, P = 0.009) suggesting that students’ attitudes were less stigmatizing after the intervention. The study concluded that, Intervention films significantly improved general attitudes to serious mental illness and social distance, with a trend towards reducing perceived dangerousness. These effects appeared to attenuate during the students’ clinical placements, suggesting a possible interaction with their clinical experiences. [6]

Limitation of the Study: The study is limited to selected colleges of Udupi district. Therefore generalization of the study can be done only to the similar population.

Conclusion

The attitudes of the adolescents were favorable towards caring for mentally ill people. Information leaflet or any intervention will help in improving the attitude.

Ethical Clearance: Obtained from Institutional Ethics Committee of Kasturba Hospital, Manipal.

Source of Funding: Self

Conflict of Interest: Nil

References

A Clinico-Epidemiological Analysis of Seropositive Cases of Tropical Infections and their Co-Infection in Tertiary Care Hospital in South India

Kristel Bhalla¹, Pooja Rao², Radhakrishna Manipura²

¹Undergraduate, ²Associate Professor, Department of Microbiology, Kasturba Medical College, Mangalore, Manipal Academy of Higher Education, Manipal

Abstract

Aim of the study: Tropical infections with similar presentations, makes diagnosis difficult. To determine the seroprevalence and clinic-epidemiological profile of malaria, dengue, typhoid, rickettsia and leptospirosis in clinically suspected patients and their co-infection to ease in the diagnosis and treatment.

Material & Method: The laboratory information system and medical records was accessed to find the rates of seropositivity and clinical epidemiological records for the above diseases during the study period. The data was entered and analyzed using statistical software Statistical Package for Social Sciences (SPSS) Version 11.5 and any significant associations were analyzed by using the Chi-square test.

Results: Dengue had the largest number of patients that tested positive (30%), and malaria had the least number (7%). A significant association (p < 0.05) was found for dengue for sex, place and residence and malaria for the place and residence and leptospirosis for age and sex. The most common symptoms these patients presented with were fever (98.7%), vomiting (33.6%), myalgia (49.5%) and headache (47.6%). Coinfections found in 16 patients (2.6%).

Conclusion: Among the 5 infections, dengue had the highest prevalence, and co-infections were seen mostly with dengue and other infections. Given the burden of these diseases, research for better and more accurate diagnostic modalities is required.

Keywords: Tropical infections, Co-infections, dengue, clinico-epidemiological.

Introduction

Malaria, dengue, typhoid, rickettsia, and leptospirosis are major health problems in tropical countries and are particularly endemic in South India. These infections present with acute undifferentiated fever and significant overlap of clinical symptoms which makes diagnosis difficult. Moreover, co-infections can occur.¹, ²

Serological method for diagnosis of these diseases remains the mainstay.¹, ³ The study was taken up to determine the prevalence and the varied clinical presentations and the chances of existence of co-infections among these diseases.

With this background, this study was designed for a better understanding of these diseases and their diagnosis.

Materials and Method

This descriptive cross-sectional study was carried out from June 2018 to December 2018 in a study population of in patient department of clinically suspected cases of malaria, dengue, leptospirosis, typhoid and rickettsia that were admitted to the hospital.
The data collection was carried out from the laboratory information system to find the rates of seropositivity out of the total number of patients tested for the above diseases. Detection method used for malaria was Quantitative Buffy Coat, observed for presence of the Plasmodium spp. Thick and thin smears prepared from the above suspension for differentiating the Plasmodium species. Rickettsial infections detected by the Weil Felix test (PROGEN, Tulip diagnostics Pvt Ltd. Goa) Proteus antigen kit which contains Proteus OX2, OXK, and OX19 antigens. The patient's serum was serially diluted and mixed with the progen suspension at room temperature and observed for agglutination. A titer of 1:80 and above indicates a positive test for typhoid. Widal tube agglutination test (Span diagnostic Pvt. Ltd. Bengaluru, India) was performed. Lastly, Leptospirosis and Dengue diagnosed by using PANBIO IgM ELISA (PANBIO diagnostics, Korea) in which antibodies against Dengue or Leptospira antigens in the patient sera are detected and value more than 11 panbio units are considered positive.

Next, the patient records from the medical records departments at the 2 hospitals of the clinically suspected cases of the above diseases analyzed for sociodemographic details, clinical manifestations, platelet count, creatinine, urea, AST and ALT levels as well as the prevalence of co-infections.

The data was entered and analyzed using statistical software Statistical Package for Social Sciences (SPSS) Version 11.5 and any significant associations analyzed by using the Chi-square test with a \( P \) value < 0.05 considered statistically significant.

Results

Out of a total of 6818 samples, 891, 5155, 341, 319, and 110 were tested for dengue, malaria, leptospirosis, and typhoid and rickettsia diseases respectively. Dengue had the highest number of patients that tested positive (30%), and malaria had the least. (7%). (Table 1)

Out of all the malaria cases admitted, 80.3% had vivax malaria, 11.8% falciparum malaria and 7.9% had mixed malaria with both the species being prevalent. While among the enteric fever cases, 86.4% of cases caused by Salmonella Typhi while the remaining 13.6% were due to Salmonella Paratyphi A. All the rickettsia cases were of Scrub typhus type.

Maximum dengue cases were reported in July (50.7%), Malaria (23% in July) and leptospirosis (32.7% in July). Cases throughout the 6 months with a slightly higher number of cases reported in July and August. Rickettsia and typhoid hardly showed any variation. (Figure 1)

Most of the dengue (43%), malaria (38%) and typhoid (50%) cases were seen in the age group of 26-45 years while most of the leptospirosis (51%) and rickettsia (60%) cases seen in the older age group of above 46 yrs. (Figure 2)

The study sample included 383 males (63%) and 224 females (37%). Dengue (60.9%), malaria (71.4%), leptospirosis (67.7%) and typhoid (54.5%) seem to have a more common occurrence in males, while rickettsia (40%) is seen more commonly in females.

41.5% of the cases reported were from Mangalore while the remaining 58.5 percent belonged to other parts of South Canara, North Canara, Kerala, and other states and 55.2% of the population was urban the remaining 44.8% was rural.

A significant association (p < 0.05) was found for dengue for sex, place and residence and malaria for the place and residence and leptospirosis for age and sex. No associations found for typhoid and rickettsia. (Figure 2 & Table 2)

The most common symptoms these patients presented with were fever (98.7%), vomiting (33.6%), myalgia (49.5%) and headache (47.6%). The fever was mostly intermittent (79.1%) and high grade (77.6%), except in case of typhoid which mostly presented with low-grade fever.

Bleeding manifestations mostly seen as conjunctival injection (22%), black/bloody stools (15%), hematuria (11%) and petechiae (10%).

The chief urinary complaint the patients presented with was oliguria (29% cases). The others had discoloration of urine (20%), burning micturition (17%) and hematuria (8%)

On examination, hypotension found in cases of Dengue, Malaria, and Leptospirosis in 6.3%, 8.6% and 4.1% of the cases, respectively. Icterus was seen in 24.5% of cases of Leptospirosis and 40% Rickettsia, while it was seen in only 0.8% and 6% of cases of Typhoid and Malaria respectively.
Per abdomen examination showed that tenderness was the maximum in leptospirosis cases (18.4%), hepatomegaly and hepatosplenomegaly were commonly seen in Rickettsia cases 20% each, and splenomegaly was most common among malaria cases (0.6%). Thrombocytopenia was high in number in cases of Dengue (72.3%), Malaria (82.9%), Leptospirosis (81.6%) and Rickettsia (80%) but only 13.6% of typhoid cases.

Highest creatinine (3) and urea (78) values were found in leptospirosis indicating deranged RFT, and highest AST (207) and ALT (172) values were found in rickettsia (172) indicating deranged LFT(Table 3).

Complications mainly seen in Rickettsia and Leptospirosis were 80% and 61.2%, respectively. Whereas Dengue (9%), Malaria (13.2%) and Typhoid(13.6%) presented with complications in very few cases.

The complications seen in Rickettsia were pleural effusion (33%), pulmonary edema(17%), Acute Renal Failure (17%), Myocarditis(17%) & pneumonia(16%). In Leptospirosis, acute Renal Failure (52%), multi-organ dysfunction (14%), Septicemia (10%), Pancreatitis(10%), Pleural effusion(7%), ARDS (7%).

Out of the 607 patients admitted, coinfections found in 16 patients (2.6 %), and most coinfections found with malaria and dengue followed by dengue and leptospirosis. (Table 4)

Table 1. Distribution of cases in Dengue, Malaria, Leptospirosis, Typhoid, Rickettsia infections.

<table>
<thead>
<tr>
<th>Results</th>
<th>Dengue</th>
<th>Malaria</th>
<th>Leptospirosis</th>
<th>Typhoid</th>
<th>Rickettsia</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of patients tested</td>
<td>891</td>
<td>5155</td>
<td>341</td>
<td>319</td>
<td>110</td>
<td>6816</td>
</tr>
<tr>
<td>No. of positives</td>
<td>267 (30%)</td>
<td>372 (7%)</td>
<td>66(19%)</td>
<td>46 (14%)</td>
<td>15 (13%)</td>
<td>766</td>
</tr>
<tr>
<td>No. of negatives</td>
<td>624 (70%)</td>
<td>4783 (93%)</td>
<td>275 (81%)</td>
<td>273 (86%)</td>
<td>95 (87%)</td>
<td>6050</td>
</tr>
</tbody>
</table>

Table 2: Statistical associations for epidemiological details

<table>
<thead>
<tr>
<th></th>
<th>Dengue</th>
<th>Malaria</th>
<th>Leptospirosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Place</td>
<td>POS</td>
<td>NEG</td>
<td>POS</td>
</tr>
<tr>
<td>South Kanara</td>
<td>NO. (%)</td>
<td>NO. (%)</td>
<td>NO. (%)</td>
</tr>
<tr>
<td>No. (%)</td>
<td>267 (60.1)</td>
<td>177 (39.9)</td>
<td>129 (29.1)</td>
</tr>
<tr>
<td>North Kanara</td>
<td>13 (56.5)</td>
<td>16 (43.5)</td>
<td>12 (41.3)</td>
</tr>
<tr>
<td>Kerala</td>
<td>89 (73)</td>
<td>33 (17)</td>
<td>10 (8.2)</td>
</tr>
<tr>
<td>Other States</td>
<td>10 (83.3)</td>
<td>2 (16.7)</td>
<td>1 (8.3)</td>
</tr>
<tr>
<td>P-Value</td>
<td>0.005</td>
<td></td>
<td>3.36E-06</td>
</tr>
<tr>
<td>Residence</td>
<td>NO. (%)</td>
<td>NO. (%)</td>
<td>NO. (%)</td>
</tr>
<tr>
<td>Urban</td>
<td>NO. (%)</td>
<td>NO. (%)</td>
<td>NO. (%)</td>
</tr>
<tr>
<td>Rural</td>
<td>179 (53.4)</td>
<td>156 (46.6)</td>
<td>115 (34.3)</td>
</tr>
<tr>
<td>P-Value</td>
<td>3.68E-07</td>
<td></td>
<td>4.59E-09</td>
</tr>
</tbody>
</table>

Table 3: Serum markers of Renal functions & Liver enzymes of patients in each disease.

<table>
<thead>
<tr>
<th>Serum markers</th>
<th>Dengue</th>
<th>Malaria</th>
<th>Leptospirosis</th>
<th>Typhoid</th>
<th>Rickettsia</th>
</tr>
</thead>
<tbody>
<tr>
<td>CREATININE</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>2.1</td>
<td>NA</td>
</tr>
<tr>
<td>UREA</td>
<td>34</td>
<td>38</td>
<td>78</td>
<td>24</td>
<td>39</td>
</tr>
<tr>
<td>AST</td>
<td>198</td>
<td>92</td>
<td>107</td>
<td>72</td>
<td>207</td>
</tr>
<tr>
<td>ALT</td>
<td>164</td>
<td>102</td>
<td>100</td>
<td>78</td>
<td>172</td>
</tr>
</tbody>
</table>
Table 4: Frequency distribution of various co-infections.

<table>
<thead>
<tr>
<th>Coinfection</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dengue + Malaria</td>
<td>6</td>
</tr>
<tr>
<td>Dengue + Leptospirosis</td>
<td>5</td>
</tr>
<tr>
<td>Dengue + Tyhoid</td>
<td>2</td>
</tr>
<tr>
<td>Dengue + Rickettsia</td>
<td>2</td>
</tr>
<tr>
<td>Malaria + Tyhoid</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>16</strong></td>
</tr>
</tbody>
</table>

**Discussion**

In our study, the most seroprevalent infection was dengue (30%), which is much more than the study carried out by Sushi et al. probably because the study was carried out during different years and our sample size (607) was larger than this study (100). Least seroprevalent is malaria (7%) lesser than the study conducted by Birhanie et al. these differences are probably because of a high degree of suspicion for malaria among clinicians because of its endemicity in Mangalore.
Out of the seropositive cases, the most common etiology was dengue (62.4%), followed by malaria (25%) leptospirosis (8.1%), typhoid (3.6%), rickettsia (0.8%). However, the study by Sushi et al. showed that leptospirosis (46%) was a much more common etiology than dengue (17.4%).[2] This difference is probably because our study was conducted from July to December while this study was conducted from March to August. The study by Abrahamsen SK et al., shows that the frequency of typhoid cases is similar to our study, however, malaria cases were much lower and rickettsia cases higher in frequency.[4] This is probably once again because of the difference in the study period as this study was conducted from July to August.

In our study among the malaria cases, Plasmodium vivax (80.3%) was most prevalent followed by P. falciparum and mixed malaria. This was different from the study conducted by Birhanie et al. in Ethiopia, in which P falciparum and Vivax malaria were detected in almost equal number followed by mixed malaria (15.1%).[1] This can be attributed to geographical and seasonal variations. The same study shows 100% prevalence of S. Typhi cases, and no Paratyphi cases incase of patients diagnosed with enteric fever, which is comparable to our study in which 86.4% cases are of S Typhi and remaining 13.6% were S Paratyphi.[1]

Our study showed that maximum dengue cases reported in July during the rainy season when mosquito breeding increases whereas the study by Leelarasamee et al. suggested that dengue cases peaked in December and Leptospirosis detected throughout the year similar to our study. This is probably because outbreaks of dengue occurred at different periods in the two studies, during the monsoon in our study and during winter in their study.[6]

Dengue was mostly found in with the male population, South Canara district and rural areas probably because this region is endemic for dengue and exposure of males to Aedes mosquito at their work place or while traveling. This is in similarity with the study by Anker M et al[7] that showed significantly more males getting affected by dengue but is contradicted by the study conducted by Yew et al.[8] Malaria was associated with South Canara and urban population due to its endemcity in the area. Leptospirosis mostly occurred in the male population and age group of above 46 yrs which might be because males are more involved in agricultural activities and an older age group would be associated with decreasing immunity and increased susceptibility to getting infected. The middle age group seems to be more susceptible to various tropical infections.

The most common symptoms these patients came with were fever, vomit, myalgia, and headache the warning signs in Dengue which is similar to another study by Leelarasamee et al.[6] Fever was present in almost all patients which are in accordance with the other studies. Also similar to the study by Sushi SK et al. fever was mostly intermittent (79.1%) and high grade (77.6%).[21%]. Except in case of typhoid where in low-grade fever is most common feature. In our study, dengue presented with cough (15%) and typhoid with abdominal pain (36.4%), the warning signs in Dengue which is similar to another study conducted by Sushi et al.[2] Rickettsia cases present with diarrhea (40%) which is similar to the study by Phongmany et al in which it is 35% but urinary manifestations in our study are in 60% whereas in this study they are 3% of the cases probably because of the huge difference in sample size of both the studies and also because the only urinary symptom this study has considered is dysuria where as our study encompasses burning micturition, hematuria, oliguria and discoloration of urine.[5]

Hepatomegaly was present in 20% rickettsia cases in our study while in 30% cases in the study by Phongmany et al which might again be due to difference in the sample size. However both studies showed hepatomegaly in a large number of cases.[5] Thrombocytopenia is mainly found in dengue (72.3%) and malaria patients (82.9%) which was also a common finding in Dengue in another study.[9] While the most deranged RFT was seen in leptospirosis and LFT in rickettsia.

Maximum Complications were seen in Rickettsia and leptospirosis cases – as high as 80% and 61.2% respectively. The main complication in rickettsia was pleural effusion (33%) and in leptospirosis was acute renal failure (52%) similar to the study by Ramesh HK et al. in which ARF was the main complication.[10]

In our study, the prevalence of coinfection was 2.6%. Out of which maximum coinfection was seen with dengue and malaria unlike the study by Sushi SK et al in which maximum coinfection occurred with leptospirosis and typhoid.[2] Our study also had a case of malaria and typhoid coinfection, but the prevalence was much lesser than the study conducted by Birhanie et al. this is probably because of the much larger prevalence.
of dengue patients in our study as compared to other diseases.\textsuperscript{[1]} Co-infection of Dengue with malaria and leptospirosis was elaborated in another study. \textsuperscript{[11]} Studies have shown a high incidence of Dengue prevalence along with Typhoid illness.\textsuperscript{[12]}

**Conclusion**

Among the 5 infections, dengue had the highest prevalence. \textit{P. vivax} was the most common etiological agent for malaria and \textit{S.typhi} for enteric fever.

Main presenting symptoms were fever, vomiting, headache, and myalgia for all the diseases. Malaria presented with a good number of cases of weakness and abdominal pain, whereas dengue presented with cough and bleeding manifestations, typhoid with abdominal pain and low-grade fever, rickettsia with diarrhea and abdominal pain and leptospirosis with bleeding manifestations.

Confections were seen mostly with dengue and other infections (most commonly dengue and malaria). Co-infection was also seen with malaria and typhoid. No deaths were reported.

The results of this study are similar to other studies but are also contraindicated by some, which means that more thorough research is still required in this area. Given the burden of these diseases, research for better and more accurate diagnostic modalities is required for prompt diagnosis and early treatment.

**Conflict of Interests:** Nil

**Source of Funding:** We are grateful to Indian Council of Medical Research (ICMR) for funding this study

**Ethical Clearance:** Has been taken from Institutional ethics committee.

**References**


Correlation between Neutrophil-Lymphocyte Ratio and Proteinuria in Diabetes

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Abstract

Introduction: To study the relationship between Neutrophil-lymphocyte ratio and proteinuria in diabetes.

Materials and Method: This was a cross sectional study 196 diabetic subjects. They were divided into no nephropathy, incipient nephropathy and overt nephropathy. The Neutrophil lymphocyte ratio was compared between the three groups using Mann Whitney U test. Pearsons correlation was used to compare the other parameters between the three groups.

Results: There was significant difference between the median Neutrophil lymphocyte ratios in the three groups. The median NLR in patients with ‘no nephropathy’ was 2.69 (1.64-2.53). In patients with ‘incipient nephropathy’ was 2.77 (1.81-4.65). In patients with ‘overt nephropathy’ was 3.77 (2.01-5.39). A value of 2.752 of NLR can be taken as a cut off for predicting Overt Nephropathy with 74% sensitivity and 50% specificity.

Conclusion: Being a commonly available and cheap test, NLR can be advocated as a useful screening test in diabetics to predict the development or presence of diabetic nephropathy.

Keywords: Neutrophil, lymphocyte, Ratio, diabetes mellitus, nephropathy.

Introduction

Diabetic nephropathy is one of the most common microvascular complication of long standing Diabetes Mellitus. It is imperative to develop tools and strategies that can detect proteinuria in diabetics at an early stage so that interventions to reduce the risk of progression of incipient nephropathy to overt diabetic kidney disease can be undertaken. Inflammation has an important role in the pathophysiology of diabetic nephropathy. An index has been recently generated, Neutrophil to Lymphocyte ratio (NLR) to reflect both neutrophil elevation, due to the acute state of inflammation, and lymphopenia, which happens following physiological stress. Neutrophil to Lymphocyte ratio (NLR) is the ratio of neutrophils to lymphocyte in the peripheral blood. It has been studied as a marker of inflammatory state in the body.¹ Neutrophil to Lymphocyte ratio (NLR) can be used as an inexpensive screening test in diabetics if it shows a relationship with proteinuria in diabetics. Our study aims at consideration of NLR as an inflammatory marker that can be correlated with the severity of diabetic nephropathy.

Materials and Method

The main aim of this study was to study the relationship between NLR and proteinuria in diabetic patients. The primary objective was to divide the diabetics into three groups as No nephropathy, incipient nephropathy and overt nephropathy and to compare the NLR between these three groups. The secondary objective of this study was to assess the utility of NLR as a predictive tool for diabetic nephropathy. This was a cross-sectional study done on patients with Type 2 diabetes. The sample size calculation with 90% power and 95% confidence interval came to 117 (39 in each
group). Clearance was obtained from the Institutional ethics committee. Informed consent was obtained from all the participants. People with Active infection, chronic inflammatory disorders, urolithiasis and on drugs (Angiotensin converting enzyme inhibitors and Angiotensin receptor blockers) were excluded. A detailed history and examination was done on all participants. HbA1c, serum creatinine, Urine Protein-creatinine ratio, urine routine, ECG and complete blood picture were performed on all subjects. The patients were divided into three groups: 1. No nephropathy: Spot Urine Protein: Creatinine ratio ≤150 mcg/mg of creatinine. 2. Incipient Nephropathy: Spot Urine Protein: Creatinine ratio 150-500mcg/mg of creatinine. 3. Overt Nephropathy: Spot Urine Protein: Creatinine ratio > 500mcg/ mg of creatinine.

Statistics: For Primary objective Kruskall Wallis test and Mann Whitney U test were used as tests for statistical significance. For secondary objective ROC curve was plotted and Area under curve calculated. Pearsons correlation test was done to see the degree of correlation between NLR and Proteinuria.

Results

A total of 196 participants participated in the study. 62.8% patients were males in the study. 37.2% patients were females in the study. The maximum number of patients in our study were between the ages of 51-60 years accounting for 27% of the total studied population. 25% patients were in the age group 41-50 years which formed the second largest age group in our study. 31.6% of participants had diabetes for 6-10 years and 23% had diabetes of 11-15 years prior to the study. The maximum number of participants, 112(57.1%) were on treatment with oral hypoglycemic agents alone. This was followed by treatment with Insulin alone with 59 participants (30.1%) 23 participants were on combination of Insulin and Oral hypoglycemic agents. 40 (20.4%) patients did not have nephropathy. 78 (39.8%) patients had incipient nephropathy. 78 (38.8%) patients had overt nephropathy. There was significant difference between the median NLR values in the three groups, Kruskall Wallis test (p = 0.03). The median NLR in patients with ‘no nephropathy’ was 2.69 (1.64-2.53). In patients with ‘incipient nephropathy’ was 2.77 (1.81-4.65). In patients with ‘overt nephropathy’ was 3.77 (2.01-5.39). When compared individually (Mann Whitney U test), there was no significant difference between median NLR values of ‘no nephropathy’ and ‘incipient nephropathy’ groups (p = 0.391). However, there was significant difference in median NLR values between ‘no nephropathy’ and ‘overt nephropathy’ groups (p = 0.02), and also between ‘incipient nephropathy’ and ‘overt nephropathy’ groups (p = 0.04). Pearsons correlation was used to check for the correlation between various parameters and urine protein creatinine ratio as seen in Table 1. As NLR increased, Urine Protein creatinine ratio increased with a correlation coefficient of 0.141 which was statistically significant (p = 0.048). As creatinine increased, Urine Protein creatinine ratio increased with a correlation of 0.455 which was also statistically significant (p = 0.006). There was significant difference in serum creatinine levels in the three groups, the mean serum creatinine being 0.91(±0.31) in patients without diabetic nephropathy, 1.08(±0.45) in patients with incipient nephropathy and 2.91(±3.17) in patients with overt nephropathy. There was no significant difference between Glycated Hemoglobin levels in the three groups in our study. The mean HbA1C was 8.05(±1.68) in patients without diabetic nephropathy, 8.16(±1.75) in patients with incipient diabetic nephropathy and 8.31(±1.68) in patients with overt nephropathy. When an ROC curve was plotted between NLR and patients with Overt Nephropathy, with 95% confidence interval, lower bound of 0.597 to upper bound of 0.749 was observed with area under the curve 0.673 and was significant. A value of 2.752 of NLR could be taken as a cut off for predicting Overt Nephropathy with 74% sensitivity and 50% specificity. So, NLR can be considered as fair test for predicting overt Nephropathy in diabetic patients.

Table 1. Correlation of urine Protein creatinine ratio with other parameters.

<table>
<thead>
<tr>
<th></th>
<th>Pearson Correlation</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>NLR</td>
<td>0.141</td>
<td>0.048</td>
</tr>
<tr>
<td>HbA1c</td>
<td>0.024</td>
<td>0.734</td>
</tr>
<tr>
<td>creatinine</td>
<td>0.455</td>
<td>0.006</td>
</tr>
<tr>
<td>Duration of diabetes</td>
<td>0.055</td>
<td>0.447</td>
</tr>
</tbody>
</table>

Discussion

The study was started with the premise of considering Neutrophil Lymphocyte Ratio as a useful screening test for detecting Diabetic Nephropathy. Our study showed that there was no significant difference in the NLR value when comparing patients with No diabetic nephropathy to Incipient nephropathy. However, there was significant difference in median NLR values when comparing Overt Nephropathy with the other groups. Kahraman et al.,
in their study also found a linear increase in NLR in comparison to the urinary albumin excretion. However, their study was a retrospective study. In a study done by Moursy EY et al., they found that Diabetic patients with microvascular complications had higher median NLR values when compared to Diabetic patients without microvascular complications. Khandre SA et al., studied 115 diabetic patients and found that NLR had significant correlation with urinary albumin excretion. In our study a cut off of NLR value above 2.752 was useful in predicting the presence of nephropathy. Lingling Huang et al., in their study found that a NLR above 1.758 was found to correlate with the presence of diabetic microvascular complications. There was no significant difference between Glycated Hemoglobin levels in the three groups in our study. This is consistent with previous studies done by Cüneyt K et al., which also showed no significant difference between the mean HbA1C values in patients with normoalbuminuria, microalbuminuria and macroalbuminuria. There was significant difference in serum creatinine levels between the three groups in our study. This was similar to earlier studies done by Cüneyt k et al., which also showed a worsening of serum creatinine as there was increase in degree of proteinuria.

**Conclusions**

There was no significant difference in the median NLR values between the ‘no nephropathy’ and ‘incipient nephropathy’ groups. However, there was significant difference in median NLR values between ‘no nephropathy’ and ‘overt nephropathy’ groups and also between ‘incipient nephropathy’ and ‘overt nephropathy’ groups. A value of 2.752 of NLR can be taken as a cut off for predicting Overt Nephropathy.

**Ethical Clearance:** Taken from the institutional local ethics committee before the start of the study.

**Source of Funding:** Self

**Conflict of Interest:** Nil

**References**


Changes in the Brainstem Auditory Evoked Potentials in the Chronic Obstructive Pulmonary Disease

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Abstract

Chronic obstructive pulmonary disease is characterized by progressive and irreversible pulmonary airway obstruction. Brainstem auditory evoked potentials (BAEPs) are the voltage changes generated in the brain. BAEPs are recorded from the ear and vertex after application of auditory click stimuli to the auditory pathway.

Aims and objectives: To find out the changes in the Brainstem Auditory Evoked Potential values in the Chronic obstructive pulmonary disorder (COPD) patients and to know the effect of severity of COPD on the same.

Materials and Method: The study was conducted in the department of Physiology, Maharishi Markandeshwar Institute of Medical sciences and research, Mullana (Ambala). There are total number of 150 subjects in our study in between the age group of 35-65yr. There are two groups: 1. Control group 2. Study group. Each group consists of 75 subjects containing both males and females.

Result and analysis: There was no significant difference in the age in control and study group. PFT parameters showed highly significant changes in the COPD as compared to control group. Wave-V shows significant prolongation in left ear (p-value 0.04) and highly significant prolongation in right ear (p-value 0.006) in COPD patients. Interpeak latency I-III of right ear showed significant prolongation (p-value 0.01) in COPD patients. I-V interpeak latency of left and right ear showed highly significant prolongation (p-value less than .001) and amplitude of wave I-Ia also showed significant reduction in COPD group (p-value 0.04). There is significant delay in latency of wave-I of left side (p-value 0.03) with increasing degree of severity of COPD. None of the other absolute wave latencies and interpeak latencies show any significant change with degree of severity of the disease.

Conclusion: In our study, there are significant changes are seen in the BAEP values in COPD patients. These significant results may be due to excessive smoking induced hypoxia which inturn affects the auditory mechanism and hence BAEP values.

Keywords: COPD, BAEP, PFT, Wave-V, p-value.

Introduction

Chronic obstructive pulmonary disease is characterized by progressive pulmonary airway obstruction. Recurrent and progressive episodes of COPD effects the normal \( \text{O}_2/\text{CO}_2 \) exchange. With advancement of age, it gets more worse. It is a major public health challenge worldwide. Globally, due to increased exposure to risk factors and aging of the population, the burden of the disease is increasing[1].
COPD is the 4th leading cause of death in the world. In 2012, more than 3 millions people died due to COPD. By 2030, it will be the 3rd leading cause of death. A step has been taken by the US National heart, lung and blood institute and world health organisation to form a Global Initiative for Chronic Obstructive Lung Disease (GOLD)\^[2]. The disease is associated with various extrapulmonary manifestations like various cardiovascular, neurological and metabolic disorders. It also leads to the anxiety and depression\^[3]. Excess cigarette smoking may lead to neuropathy in COPD patients due to hypoxic damage to the receptors\^[4]. Auditory receptors also gets affected with developing hypoxia in COPD\^[5].

Brainstem auditory evoked potentials (BAEPs) are the voltage changes generated in the brain. BAEPs are recorded from the ear and vertex after application of auditory click stimuli to the auditory system. BERA comprises of five or more waveforms generating within 10msec after acoustic stimulation\^[6]. These auditory click stimuli are given to assess the conduction via auditory nerve upto the midbarin. They measure the functional integrity of the auditory pathway\^[7].

COPD leads to the hypoxia, hypercarbia and acidosis which further causing polyneuropthy\^[8]. Recurrent and progressive episodes of COPD may lead to the non-arteritic anterior ischaemic neuropathy in middle aged people\^[9]. Excess smoking affects the pontomedullary region of the brain. Smoking leads to the production of more nicotine and carbon-monoxide which affects the oxygen level to the cochlea\^[10].

BERA findings have much clinical importance in various disease like multiple sclerosis, neuropathy, diabetes mellitus etc. Many studies have evaluated the association of BERA abnormalities with COPD, but these have given variable data. There is also a lack of adequate data on BERA changes in COPD in India because of less studies have been done here. The present study was done to determine the effect of chronic obstructive pulmonary disease in BAEP findings i.e. wave latencies in ms and amplitude in μv and to study the correlation of the observed abnormalities with the severity of COPD.

Material and Method

The study was conducted in the department of Physiology, Maharishi Markandeshwar Institute of Medical sciences and research, Mullana (Ambala). Institutional ethics committee approval had been taken.

There are total number of 150 subjects in our study in between the age group of 35-65yr.There are two groups:1. Control group 2. Study group

Each group consists of 75 subjects containing both males and females. Study group have 75 COPD patients containing both males and females and control group have 75 healthy subjects.

Written consent was obtained from all the subjects after explaining them the details of the study in their own language.

**Inclusion Criteria:** In the study group, those with COPD, aged 35-65 years with no past/present or family history of ear disease and deafness were included. The diagnostic method of COPD was based on GOLD criteria. In the control group, non- COPD, age matched subjects who had no past/present or family history of ear disease and deafness and who were apparently healthy were included.

**Exclusion Criteria:** Those having a positive personal/family history of any kind of ear surgery, any trauma,and disorders(e.g. Multiple sclerosis, Vitamin B12 deficiency etc), diabetes mellitus, hypertension, malnutrition, head trauma, chronic alcholism, CNS disorders (e.g. stroke, parkinsonism, epilepsy etc), any history of medication that can effect the normal functioning of CNS (antidepressants, antipsuchotic, antiepileptic, sedatives, ototoxic drugs,) will be excluded from the study.

**Study Tools:** The equipment used was Allengers Scorpio EMG EP NCS software.

**Procedure:** Preliminary examination: Prior to BERA recording, history will be taken from all the participants after which they will be subjected to a complete General Physical Examination including a full ear check up. All the relevant details of the subjects will be noted in a proforma. Pulmonary function test were performed in all the subjects. Lung volumes and capacities were determined by the spirometry. The parameters assessed are FVC, FEV1, FEV1/FVC by computerized helios software. Pure tone audiometry was done prior to the recording. Complete external ear examination was done for both ears by physician. Anthropometric data was recorded and subjects were screened for any history of drug intake or medical illness which are likely to affect the BAEP study parameters based on clinical history and physical examinations including detail auditory assessment.
Recording: The subjects will be instructed to take a sound sleep in the previous night and to avoid using mydriatic/meiotic drops, at least 12 hours before the test. BERA was performed using a standardised procedure. Skin electrodes were used. Skin was prepared by cleaning. Conduction jelly was used to ensure good, stable electric connection. Left and right ears were tested separately. The scalp electrodes will be placed relative to bony landmarks, in proportion to the size of the head, according to the International 10/20 system.

Placement of electrodes: Reference electrode (Cz) - at vertex, Recording electrode (E) - at mastoid bone, Ground electrode (Fz) - at forehead or connected to the right forearm.

Automatic artifact rejection was used. Sweep velocity was 1ms. Click acoustic stimuli at a rate of 11 pulse per second at an intensity of 90 db hearing level to the ear stimulated and masking sound of 40dB in non stimulated ear was given through head phones. Electrical activity had low cut filters 100 Hz and high cut filters 3000Hz to avoid any electrostatic and electromagnetic interferences. 1000 auditory clicks were averaged. Rarefaction was chosen in those side of head phone in which diaphragm moves away during auditory clicks.

Statistical analysis: Data was analysed with the help of unpaired t-test statically and data is expressed as mean ± standard deviation. To analyse the data according to the severity of COPD, one way ANOVA has been done.

Result and analysis: Our study comprised of 150 subjects including both males and females of age group 35-65 yrs. Subjects are divided into 2 groups- Study (COPD) group and Control group. PFT values in control group and study group with P value are shown in Table-1.

Table-1: PFT values in Control and COPD group with p-values.

<table>
<thead>
<tr>
<th></th>
<th>Control group Mean±SD (n=75)</th>
<th>COPD group Mean±SD (n=75)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>46.93±8.37</td>
<td>49.34±8.14</td>
<td>0.07</td>
</tr>
<tr>
<td>FVC(lts)</td>
<td>3.34±0.81</td>
<td>2.26±0.71</td>
<td>&lt;.001*</td>
</tr>
<tr>
<td>FEV1(lts)</td>
<td>2.83±0.71</td>
<td>1.14±0.37</td>
<td>&lt;.001*</td>
</tr>
<tr>
<td>FEV1/FVC(%)</td>
<td>84.61±6.66</td>
<td>51.02±7.69</td>
<td>&lt;.001*</td>
</tr>
</tbody>
</table>

n- number of subjects; SD- standard deviation; *-significant result at the 0.05 level.

There was no significant difference in the age in control and COPD group. PFT parameters showed highly significant changes in the COPD as compared to control group. FVC, FEV1, FEV1/FVC showed highly significant reduction in COPD group with p-value <.001.

Table 2: BERA values with respect to the degree of severity of COPD with p-value.

<table>
<thead>
<tr>
<th></th>
<th>Moderate COPD Mean±SD (n = 2)</th>
<th>Severe COPD Mean±SD (n = 30)</th>
<th>Very severe COPD Mean±SD (n = 43)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wave-I</td>
<td>1.43±0.01</td>
<td>1.74±0.20</td>
<td>1.67±0.16</td>
<td>.03*</td>
</tr>
<tr>
<td>Left</td>
<td>1.72±0.09</td>
<td>1.71±0.81</td>
<td>1.66±0.14</td>
<td>.38</td>
</tr>
<tr>
<td>Right</td>
<td>1.72±0.09</td>
<td>1.71±0.81</td>
<td>1.66±0.14</td>
<td>.38</td>
</tr>
<tr>
<td>Wave-V</td>
<td>5.39±0.23</td>
<td>5.66±0.37</td>
<td>5.65±0.25</td>
<td>.48</td>
</tr>
<tr>
<td>Left</td>
<td>5.82±0.21</td>
<td>5.71±0.27</td>
<td>5.65±0.26</td>
<td>.45</td>
</tr>
<tr>
<td>Right</td>
<td>5.82±0.21</td>
<td>5.71±0.27</td>
<td>5.65±0.26</td>
<td>.45</td>
</tr>
<tr>
<td>IPL I-III</td>
<td>2.14±0.12</td>
<td>2.01±0.35</td>
<td>1.97±0.27</td>
<td>.74</td>
</tr>
<tr>
<td>Left</td>
<td>2.05±0.21</td>
<td>2.01±0.21</td>
<td>2.03±0.18</td>
<td>.82</td>
</tr>
<tr>
<td>Right</td>
<td>2.05±0.21</td>
<td>2.01±0.21</td>
<td>2.03±0.18</td>
<td>.82</td>
</tr>
<tr>
<td>IPL I-V</td>
<td>3.97±0.22</td>
<td>3.88±0.36</td>
<td>3.98±0.28</td>
<td>.47</td>
</tr>
<tr>
<td>Left</td>
<td>4.10±0.31</td>
<td>4.02±0.25</td>
<td>4.02±0.22</td>
<td>.82</td>
</tr>
<tr>
<td>Right</td>
<td>4.10±0.31</td>
<td>4.02±0.25</td>
<td>4.02±0.22</td>
<td>.82</td>
</tr>
</tbody>
</table>

n- number of subjects; SD- standard deviation; *-significant result at the level of 0.05

SD- standard deviation; n = number of subjects; *-significant result at the level of 0.05

In our study, there is significant delay in latency of wave-I of left side (p-value 0.03) with increasing degree of severity of COPD. None of the other absolute wave latencies and interpeak latencies show any significant change with degree of severity of the disease.

BERA values i.e. absolute wave latencies I-V in ms, Interpeak latencies I-III, III-V, I-V in ms, I-Ia amplitude, V-Va amplitude in μv in control and COPD group in left and right ears with p-value are shown in tables- 3& 4 respectively.

Table 3: Absolute wave I-V latencies, IPLs and amplitudes in control and COPD group of left ear with p-value

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Control group Mean±SD (n = 75)</th>
<th>COPD group Mean±SD (n = 75)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wave-I</td>
<td>150</td>
<td>1.74±0.16</td>
<td>1.69±0.18</td>
<td>0.09</td>
</tr>
<tr>
<td>Wave-II</td>
<td>150</td>
<td>2.76±0.20</td>
<td>2.81±0.19</td>
<td>0.13</td>
</tr>
<tr>
<td>Wave-III</td>
<td>150</td>
<td>3.68±0.22</td>
<td>3.69±0.22</td>
<td>0.72</td>
</tr>
<tr>
<td>Wave-IV</td>
<td>150</td>
<td>4.86±0.26</td>
<td>4.88±0.23</td>
<td>0.69</td>
</tr>
<tr>
<td>Wave-V</td>
<td>150</td>
<td>5.55±0.30</td>
<td>5.65±0.30</td>
<td>0.04*</td>
</tr>
<tr>
<td>IPL I-III</td>
<td>150</td>
<td>1.92±0.24</td>
<td>2.02±0.19</td>
<td>0.15</td>
</tr>
<tr>
<td>IPL III-V</td>
<td>150</td>
<td>1.87±0.27</td>
<td>1.93±0.32</td>
<td>0.18</td>
</tr>
</tbody>
</table>
In our study there is no significant prolongation of absolute latency of wave-I,II,III,IV in COPD patients in both left and right ears. Wave-V shows significant prolongation in left ear (p-value 0.04) and highly significant prolongation in right ear (p-value 0.006) in COPD patients.

Interpeak latency I-III of right ear showed significant prolongation (p-value 0.01) in COPD patients. I-V interpeak latency of left and right ear showed highly significant prolongation (p-value less than .001) in COPD patients. In our study amplitude of wave I-Ia also showed significant reduction in COPD group (p-value 0.04) and V-Va did not show any significant reduction in COPD patients.

Table-4: Absolute wave I-V latencies, IPLs, Amplitude in control and COPD group of right ear with p-value.

<table>
<thead>
<tr>
<th></th>
<th>Control group Mean±SD (n = 75)</th>
<th>COPD group Mean±SD (n = 75)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wave-I</td>
<td>1.71±0.21</td>
<td>1.68±0.16</td>
<td>0.42</td>
</tr>
<tr>
<td>Wave-II</td>
<td>2.79±0.24</td>
<td>2.82±0.19</td>
<td>0.50</td>
</tr>
<tr>
<td>Wave-III</td>
<td>3.64±0.25</td>
<td>3.69±0.16</td>
<td>0.15</td>
</tr>
<tr>
<td>Wave IV</td>
<td>4.87±0.23</td>
<td>4.89±0.23</td>
<td>0.63</td>
</tr>
<tr>
<td>Wave-V</td>
<td>5.55±0.30</td>
<td>5.68±0.26</td>
<td>0.006*</td>
</tr>
<tr>
<td>IPL I-III</td>
<td>1.92±0.24</td>
<td>2.02±0.19</td>
<td>0.01*</td>
</tr>
<tr>
<td>IPL III-V</td>
<td>1.91±0.31</td>
<td>1.99±0.25</td>
<td>0.11</td>
</tr>
<tr>
<td>IPL I-V</td>
<td>3.83±0.29</td>
<td>4.01±0.23</td>
<td>0.0001*</td>
</tr>
<tr>
<td>Amp I-Ia</td>
<td>0.63±1.10</td>
<td>0.37±0.27</td>
<td>0.04*</td>
</tr>
<tr>
<td>Amp V-Va</td>
<td>0.65±0.37</td>
<td>0.55±0.32</td>
<td>0.09</td>
</tr>
</tbody>
</table>

Discussion

In our study there are significant changes in BERA values in COPD patients. COPD and chronic hypoxia affect the functional integrity of auditory pathway. These effects are due to hypercarbia, hypoxemia and acidosis which further causing the damage to the vasa-nervosum and further leading to polynéuropathy[8].

Study done by Hafez et al[11] and singh et al[12] also favor our study who found delayed latencies in BAEP in hypoxic conditions. Our study results are also in accordance with the study done by Shabina et al[13] who found BAEP abnormalities in COPD patients. These results are due to damage in ponto-medullary region of brain by excess smoking. Atis et al[14] also found abnormal BAEP pattern in severe COPD patients. They showed the involvement of auditory component of 8th cranial nerve and impaired brainstem function in severe COPD. Our results are in contrast to the study done by Martins et al[15] and Nakano et al[16] who found no significant difference in inter-peak latencies I-V in smokers and non-smokers and in chronic respiratory insufficiency patients in their study.

El-kady et al also favors our study who found significant changes in audiological parameters between control and COPD subgroups[17]. Study done by Howard et al also favors our study who stated atherosclerotic damage in the central nervous system due to excess smoking.[18]

Conclusion: In our study there are significant effects are present in BAEP values in COPD patients. These significant results are due to excessive smoking induced hypoxia which in turn affects the auditory mechanism and hence BAEP values. Hypoxia produced by excessive smoking may also leading to the slowing of processing of information with in the brain.

Ethical Clearance: Taken from IEC committee of Maharishi Markandeshwar University.

Source of Funding: Self

Conflict of Interest: Nil

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Emotional Intelligence and Happiness

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Abstract

Emotional intelligence refers to understanding and managing one’s own and others’ emotions effectively. It is linked to a wide range of positive outcomes like higher academic achievement and better work performance. Furthermore, theory also suggests that emotionally intelligent individuals are most likely to experience a higher level of psychological Wellbeing. Thus, emotional intelligence has become an important topic of research worldwide in relation to various variables like personality, empathy, self-efficacy, interest, achievement, performance etc. The present study aimed at understanding the relationship between emotional intelligence and happiness as well as to find out the profession-wise differences in these variables. Since emotional intelligence and happiness are getting extremely important with reference to today’s workplace contexts, in this study individuals from the Army, Teaching and Creative field were studied. Also, to get an increased and better understanding, a sample of college students was also included. A total of 88 participants were studied using The Assessing Emotions Scale (Schutte et al., 1998), Subjective Happiness Scale (Lyubomirsky & Lepper, 1999) and a structured open ended questionnaire prepared by the research. In the current time, where we are living in a global village, being sensitive towards ourselves as well as to our surroundings is a crucial need. Thus, this study provides various implications for enhancing emotional intelligence and happiness.

Keywords: Emotional Intelligence, Happiness, Profession.

Introduction

Emotional Intelligence: The concept of emotional intelligence first emerged during the 1990s breaking away from the rigid notions of IQ being the sole determinant of success in one’s life. The term “emotional intelligence” was coined by Mayer and Salovey in 1990.

Emotional intelligence is the ability to perceive emotions, to access and generate emotions so as to assist thought, to understand emotions and emotional knowledge, and to reflectively regulate emotions so as to promote emotional and intellectual growth” (Mayer & Salovey, 1997)\(^1\).

According to (Mayer and Salovey 1990)\(^2\), emotional intelligence refers to a set of skills that is instrumental in understanding emotions and its effective regulation in oneself and others, and the use of feelings to motivate one-self, plan and achieve greater heights in life.

Happiness: In earlier times, happiness was understood in the context of need or goal satisfaction but with changing times, the focus has shifted on the positive aspects and ways in which the positive affect can be enhanced to maintain a state of happiness.

The concept of happiness can be studied under two constructs given by Aristotle:

1. Hedonistic Approach wherein the focus is on the basic nature of happiness i.e. attaining pleasure and avoiding pain.
2. Eudaimonic Approach wherein the focus is on meaning in life and self-realization.

Relationship between Emotional Intelligence And Happiness: Emotional Intelligence and Happiness, both are positive psychology constructs. Various studies have also helped in determining a positive relationship between emotional intelligence and happiness. A study by (Chamorro-Premuzic, Bennett and Furnham (2007))\(^3\) aimed at examining the relationship between emotional intelligence, the big five personality factors and happiness. Results revealed that stability, extraversion, agreeableness and conscientiousness positively correlated with happiness and trait emotional intelligence. Also, trait emotional intelligence explained shared variance between happiness and the big five personality factors. Similar results were also obtained by (Furnham and Petrides 2003)\(^4\) in their study as they...
found that there exists a positive relationship between trait emotional intelligence and happiness in the presence of the big five personality factors.

The Present Study: Theory and research have illustrated the importance of emotional intelligence. Emotional intelligence has implications in various domains of life as academics, health, wellbeing, workplace performance, etc. Emotional intelligence also plays a crucial role in happiness. Although the relationship between emotional intelligence and happiness has been explored before yet it has not been studied in relation to the waste context. Since various professions have distinct profile, duties and challenges hence they might also bring in differences in individuals in terms of emotional intelligence, happiness as well as the relationship between these variables. Also very few such studies have been done in the Indian context with respect to emotional intelligence and happiness especially in the context of various professions. In today’s developing world, where the world is becoming a global village, it is a priority to sort oneself emotionally and get ready to face the life stressors especially at the workplace where competition is immense. Hence, this study was carried out to find out the relationship between emotional intelligence and happiness among various professions.

Objectives:

1. To study the differences in emotional intelligence and happiness of people belonging to different professions.
2. To study the relationship between happiness and emotional intelligence in people belonging to different professions.

Hypotheses:

H1. There are no differences in emotional intelligence of people belonging to different professions.

H2. There are no differences in happiness of people belonging to different professions.

H3. There is no significant relationship between happiness and emotional intelligence in people belonging to different professions.

Method

Design: Mixed method approach was undertaken to better understand the variables of the study. Questionnaires were administered to the sample to assess the variables. An open-ended structured questionnaire was also administered. Correlation analysis, ANOVA and post-hoc analysis were carried out. Thematic analysis was carried out to analyze the qualitative data obtained from the open-ended structured questionnaire.

Sample: For the present study, a sample of 20 army officers, 18 teachers, 34 students, 16 individuals from the creative field were selected. A total of 88 participants were taken. Purposive sampling technique was used.

Measures

Assessing Emotions Scale: This scale is also called the Self-Report Emotional Intelligence Test, or the Schutte Emotional Intelligence Scale (Schutte et al., 1998). The Assessing Emotions Scale assesses characteristic, or trait emotional intelligence. It is a 33-item self-report inventory consisting of positively and negatively keyed items. Respondents rate themselves on the items using a five-point Likert type scale with one denoting strongly disagree and five denoting strongly agree.

Subjective Happiness Scale: The Subjective Happiness Scale (SHS) (Lyubomirsky & Lepper, 1999) is a 4-item scale of global subjective happiness. Two items ask respondents to characterize themselves using both absolute ratings and ratings relative to peers, whereas the other two items offer brief descriptions of happy and unhappy individuals and ask respondents the extent to which each characterization describes them. The SHS has been validated in 14 studies with a total of 2,732 participants. Results have indicated that the SHS has high internal consistency, which has been found to be stable across samples. Test-retest and self-peer correlations have suggested good to excellent reliability, and construct validation studies of convergent and discriminate validity have confirmed the use of this scale to measure the construct of subjective happiness.

Structured Open-Ended Questionnaire: A structured open-ended questionnaire was constructed by the researchers to study the variables in the study in detail. Four questions were formulated:

1. According to you what is happiness?
2. How important it is to understand and manage one’s emotions? Explain.
3. Do you think that how you manage your emotions influences your happiness?
4. Do you think your career/profession has an influence on your emotion?

Procedure: The questionnaires were administered to the participants from various professional fields i.e. army personnel, teachers, individuals from the creative field and students. After the data collection, quantitative and qualitative analysis was done.

Results

Correlation analysis, ANOVA and post-hoc analysis were carried out. Thematic analysis was carried out to analyze the qualitative data obtained from it. The results are presented in the tables below.

Table 1: Showing Descriptive Statistics for the Variables of the Study

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotional Intelligence (EI)</td>
<td>88</td>
<td>132.51</td>
<td>15.25</td>
</tr>
<tr>
<td>Happiness (H)</td>
<td>88</td>
<td>12.65</td>
<td>7.98</td>
</tr>
<tr>
<td>Creative (EI)</td>
<td>16</td>
<td>132.81</td>
<td>17.81</td>
</tr>
<tr>
<td>Creative (H)</td>
<td>16</td>
<td>12.03</td>
<td>7.37</td>
</tr>
<tr>
<td>Teacher (EI)</td>
<td>18</td>
<td>131.77</td>
<td>13.71</td>
</tr>
<tr>
<td>Teacher (EI)</td>
<td>18</td>
<td>7.62</td>
<td>5.97</td>
</tr>
<tr>
<td>Army (EI)</td>
<td>20</td>
<td>127.10</td>
<td>8.22</td>
</tr>
<tr>
<td>Army (EI)</td>
<td>20</td>
<td>4.96</td>
<td>.61</td>
</tr>
<tr>
<td>Student (EI)</td>
<td>34</td>
<td>135.94</td>
<td>17.41</td>
</tr>
<tr>
<td>Student (EI)</td>
<td>34</td>
<td>20.14</td>
<td>4.13</td>
</tr>
</tbody>
</table>

Table 2: Showing the Correlations between the Variables

<table>
<thead>
<tr>
<th></th>
<th>EI</th>
<th>Happiness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Correlation</td>
<td>1</td>
<td>.259</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.015</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>88</td>
<td>88</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>EI</th>
<th>Happiness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Correlation</td>
<td>.259</td>
<td>1</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.015</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>88</td>
<td>88</td>
</tr>
</tbody>
</table>

*Correlation is significant at the 0.05 level (2-tailed).

Table 3: Showing the Results of One Way ANOVA for Profession-wise Differences

<table>
<thead>
<tr>
<th>Variables</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>EI</td>
<td>Between Groups</td>
<td>996.75</td>
<td>3</td>
<td>322.25</td>
<td>1.45</td>
</tr>
<tr>
<td></td>
<td>Within Groups</td>
<td>19253.23</td>
<td>84</td>
<td>229.20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>20249.98</td>
<td>87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Happiness</td>
<td>Between Groups</td>
<td>3553.58</td>
<td>3</td>
<td>1154.52</td>
<td>49.91</td>
</tr>
<tr>
<td></td>
<td>Within Groups</td>
<td>1993.44</td>
<td>84</td>
<td>23.73</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>5547.02</td>
<td>87</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4: Showing Post-hoc Analysis Results

<table>
<thead>
<tr>
<th>Variables</th>
<th>Prof</th>
<th>Mean Difference</th>
<th>Std. Error</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotional Intelligence</td>
<td>1.00</td>
<td>-.4677</td>
<td>4.91</td>
<td>.77</td>
</tr>
<tr>
<td></td>
<td>3.00</td>
<td>-.571</td>
<td>5.07</td>
<td>.67</td>
</tr>
<tr>
<td></td>
<td>4.00</td>
<td>-.84</td>
<td>4.26</td>
<td>.17</td>
</tr>
<tr>
<td></td>
<td>2.00</td>
<td>4.67</td>
<td>4.91</td>
<td>.77</td>
</tr>
<tr>
<td></td>
<td>3.00</td>
<td>-.123</td>
<td>5.20</td>
<td>.99</td>
</tr>
<tr>
<td></td>
<td>4.00</td>
<td>-.416</td>
<td>4.41</td>
<td>.78</td>
</tr>
<tr>
<td></td>
<td>3.00</td>
<td>5.71</td>
<td>5.07</td>
<td>.67</td>
</tr>
<tr>
<td></td>
<td>2.00</td>
<td>1.03</td>
<td>5.20</td>
<td>.99</td>
</tr>
<tr>
<td></td>
<td>4.00</td>
<td>-.312</td>
<td>4.58</td>
<td>.90</td>
</tr>
<tr>
<td></td>
<td>2.00</td>
<td>8.84</td>
<td>4.26</td>
<td>.17</td>
</tr>
<tr>
<td></td>
<td>4.00</td>
<td>4.16</td>
<td>4.41</td>
<td>.78</td>
</tr>
<tr>
<td></td>
<td>3.00</td>
<td>3.12</td>
<td>4.58</td>
<td>.90</td>
</tr>
<tr>
<td>Happiness</td>
<td>1.00</td>
<td>-2.66</td>
<td>1.58</td>
<td>.33</td>
</tr>
<tr>
<td></td>
<td>3.00</td>
<td>-7.06*</td>
<td>1.63</td>
<td>.00</td>
</tr>
<tr>
<td></td>
<td>4.00</td>
<td>-15.18*</td>
<td>1.37</td>
<td>.00</td>
</tr>
<tr>
<td></td>
<td>2.00</td>
<td>2.66</td>
<td>1.58</td>
<td>.33</td>
</tr>
<tr>
<td></td>
<td>3.00</td>
<td>4.40</td>
<td>1.67</td>
<td>.04</td>
</tr>
<tr>
<td></td>
<td>4.00</td>
<td>-12.52*</td>
<td>1.42</td>
<td>.00</td>
</tr>
<tr>
<td></td>
<td>3.00</td>
<td>7.06*</td>
<td>1.63</td>
<td>.00</td>
</tr>
<tr>
<td></td>
<td>2.00</td>
<td>4.40*</td>
<td>1.67</td>
<td>.04</td>
</tr>
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<td></td>
<td>4.00</td>
<td>-8.11*</td>
<td>1.47</td>
<td>.00</td>
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<tr>
<td></td>
<td>4.00</td>
<td>15.18*</td>
<td>1.37</td>
<td>.00</td>
</tr>
<tr>
<td></td>
<td>2.00</td>
<td>12.52*</td>
<td>1.42</td>
<td>.00</td>
</tr>
<tr>
<td></td>
<td>3.00</td>
<td>8.11</td>
<td>1.47</td>
<td>.00</td>
</tr>
</tbody>
</table>

*Correlation is significant at the 0.05 level (2-tailed).

Thematic Analysis: Thematic analysis was done to analyze the qualitative data (profession wise) obtained from the open ended questionnaire. The questions as well as the themes are as below:
Table 5: What is Happiness?

<table>
<thead>
<tr>
<th>Profession</th>
<th>State of Mind</th>
<th>Success</th>
<th>Social Aspect</th>
<th>Way of Live</th>
</tr>
</thead>
<tbody>
<tr>
<td>Army</td>
<td>Less tension</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Creative</td>
<td>Energetic, Happiness and gratitude is more than complaints, Love and freedom, Positive attitude.</td>
<td>Accomplishment</td>
<td>Acceptance</td>
<td>-</td>
</tr>
<tr>
<td>Teacher</td>
<td>Calm, Without worries, Active, Pleasure</td>
<td>Fulfillment of aspirations</td>
<td>-</td>
<td>Spreading happiness</td>
</tr>
<tr>
<td>Student</td>
<td>Proud, Confident, High morale, Joy, Satisfaction, Bliss, Feeling complete, Aligned to natural energy, Love</td>
<td>A good career</td>
<td>Meeting new people, Seeing others happy, Making parents proud</td>
<td>Togetherness, Socialize, living in the moment.</td>
</tr>
</tbody>
</table>

Table 6: Importance of Understanding and Managing Emotions

<table>
<thead>
<tr>
<th>Profession</th>
<th>Practical Aspect</th>
<th>Hidden Emotions</th>
<th>Personal Qualities</th>
<th>Way of Life</th>
</tr>
</thead>
<tbody>
<tr>
<td>Army</td>
<td>Less tension</td>
<td>-</td>
<td>-</td>
<td>Family love and support, Improves social relationships</td>
</tr>
<tr>
<td>Creative</td>
<td>As important as breathing</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Teacher</td>
<td>-</td>
<td>Leads to adverse personality</td>
<td>-</td>
<td>Magnifies positivity</td>
</tr>
<tr>
<td>Student</td>
<td>Affects decision making, helps deal with various phases, increase productivity</td>
<td>Sympathy, Negative emotions have damaging consequences</td>
<td>Healthy relationship with others, resolve inner conflicts, love and understand oneself, helps during hard times</td>
<td>Way to know someone better emotions drive life.</td>
</tr>
</tbody>
</table>

Discussion

The aim of the study was to study the relationship between happiness and emotional intelligence among army officers, teachers, college students and creative artists. Another aim was to find whether there are differences in happiness and emotional intelligence among these professions. For this purpose the data were collected using questionnaires on emotional intelligence and happiness. A structured open ended questionnaire was also used. The sample size was 88 including both males and females of different professions.

The mean score for emotional intelligence is 132.51. The mean score for happiness is 12.65.

Results show that there exists a significant positive correlation between emotional intelligence and happiness. This result is consistent with the results obtained by Furnham and Petrides (2003) which stated that positive relationship between trait emotional intelligence and happiness persisted if the big five personality factors were present. Army professionals obtained a mean score of 127.10 for emotional intelligence and 4.96 for happiness. For teachers, the mean score for emotional intelligence was 131.77 and for happiness, it was 7.62. Creative artists obtained a mean score of 132.81 on emotional intelligence and a score of 12.03 on happiness. Student’s sample achieved a mean score of 135.94 for emotional intelligence and 20.14 for happiness.

One-way AN OVA was carried out to study the profession-wise difference in both the variables and it was found out that there is no profession-wise significant difference in emotional intelligence but in terms of happiness there exist significant profession-wise differences.

Further, Post-hoc analysis for happiness was carried out to study the difference between the professions. Army personnel significantly differed with individuals in creative profession and with students. Teachers show significant difference on happiness with artists and with students. Creative professionals show significant difference with all the other three professions. Students also show significant difference with all three professions.

Thematic analysis was used for the qualitative analysis of the data obtained from responses to the structured open-ended questionnaire. The responses to the structured open ended questions were read over and over again which led to the finding of various prominent codes. Then, when the codes were categorized, various themes emerged.
Through this, various meanings of happiness developed from individuals ranging in different professional fields, which clearly reflects their personality aspects and the components which actually make them happy. Artists, teachers, as well as students correlated happiness to achievements in life. Artists gave holistic meanings to happiness by attaching notions of gratitude, love and freedom to it. For students happiness was confined to their day-to-day world of family members, friends and career.

For most of the subjects, understanding and managing emotions was clearly important so as to develop personal qualities that are socially desirable and also to maintain a balanced thinking pattern when faced with a challenge. Teachers and army professionals also related hiding of emotions to personality disorders. Participants believe that through understanding and managing one’s emotions we are able to understand and love ourselves better.

When the subjects were asked as to whether managing of emotions led to happiness, all the participants from the various professional categories positively correlated management of emotions to the expansion of happiness: positivity, and peace.

The subjects showed mixed responses when asked whether their profession has an influence on their emotions or not. Creative professionals linked emotion with their professions and stated that “emotion is in itself an art”. The answers to this question yielded four different views wherein career and emotions both influence each other in both positive and negative ways.

The qualitative analysis helped to get a wider picture of the profession wise difference in the emotional understanding and management and its further role, in happiness. Through the results a profession wise difference was observed in the subjects.

Hence, this study found a positive relationship between emotional intelligence and happiness. Also thematic analysis led to in-depth understanding of the variables under study. The study has implications in terms of understanding the positive relationship between emotional intelligence and happiness. It has also led to an increased understanding of the important role of one’s profession in one’s emotional intelligence and happiness.

**Conflict of Interest:** Author declare no conflict of interest.

**Source of Funding:** Self

**Ethical Clearance:** I testify that my research paper submitted has not published elsewhere and I actively involved in substantive completion of Paper.

**References**

The Role of Psychological Well-being in Positive Human Health

Nitin Girdharwal
Associate Professor-Research, Krishna Institute of Engineering & Technology, Ghaziabad-NCR, India

Abstract
Employment not only means financial stability but it also defines an individual’s identity. Well-being refers to a positive measure and global assessment of all aspects of an individual’s life whereas Job Satisfaction involves specific beliefs about one’s job, behavior intentions and feelings about it. Both the above constructs have an important role in predicting organizational commitment and therefore greater success at work. The objective of the present study was to understand the role of Wellbeing and job satisfaction in predicting an individual’s commitment to his/her work in Indian Organization. It was hypothesized that employees would become more committed to their organizations if they are satisfied with their current job and have positive evaluations of themselves. For this, a convenience sample of employees was taken from various organizations and was administered Organizational Commitment Questionnaire (Mowday, Steers & Porter, 1979), Minnesota Satisfaction Questionnaire (Hirschfeld, 2000) and Psychological Wellbeing Scale (Ryff, 1989). Pearson’s product moment method of correlation coefficient and multiple regression analyses were used to analyze the data. Correlation and regression analyses revealed a number of significant relationships between the above constructs. The research was concluded by briefly foregrounding some of the study’s implications and future directions.

Keywords: Job Satisfaction, Organizational Commitment, Wellbeing.

Introduction
A foremost part of a character’s lifestyles is spent at work. Employment not most effective means monetary balance but it also defines an individual’s identification. Employees are one of the most critical determinants that decide the success of a corporation in competitive surroundings. A character who has an effective psychological functioning and is happy with process would perform his/her responsibilities well and might be dedicated to his/her enterprise.

World Health Organization (WHO) described fitness as “a nation of whole physical, mental and social Wellbeing and now not simply the absence of ailment or disease” (Ryff & Singer, 1998)\(^1\). Psychological Wellbeing is described in terms of a common effectiveness of a character’s psychological functioning (Berkman, 1971)\(^2\). Recently, psychologists have focused on important components of psychological Wellbeing: hedonic and Eudaimonic (Ryan & Deci, 2001)\(^3\). The hedonic approach centered on happiness and described mental Wellbeing in phrases of pleasure attainment and pain avoidance. The eudaimonic approach centered as recognition & achievement of human capacity. The cause of the existing studies is at the eudaimonic approach.

Both job satisfaction and organizational commitment have a positive effect on each other. (Yucel & Bektas, 2012)\(^4\). Some researches recognized job satisfaction to be a component of organizational commitment whereas others stated job satisfaction to be a predictor of organizational commitment (Kovach, 1977; Porter, Steers, Mowday, & Boulian, 1974)\(^5\).

Psychological Wellbeing was found to be positively related to job satisfaction and organizational commitment (Wright & Bonnet, 2007)\(^6\). Previous researches stated that organizational commitment developed the need of belongingness in an individual for the organization which was attained through positive psychological Wellbeing.

Employees are the most vital aid for an employer. One of the biggest challenges that Information Technology (IT) industries are facing today is the potential to draw and keep high-quality human assets. Industry attrition quotes are maximum amongst
employees having among 1 and 5 years of experience with the very best turnover charges said in India (14%), China and Switzerland (14%), The United States and Canada (10%) (Pastore, 2000). Employee turnover is affected largely through employee’s organizational dedication. If an agency wants to carry out higher, it’s far very critical to understand the extent of dedication of its employees. In the existing situation of the work way of life, psychologists are employed in organizations to understand what factors play a position in permitting employees to gain a tremendous mental kingdom and what can a business enterprise do to make employees happy with their jobs.

The choice of taking Indian IT companies as the sample for data -collection for the purpose of the present research is motivated by a variety of reasons. First, there are limited researches on human resource management issues in India. Second, in today’s time, the IT sector in India is seen to have a lot of significance.

Objective of the Study: The present study helps in understanding that enhancing the optimal functioning and making the employees satisfied with their jobs would increase their commitment towards the organization. This would lead to betterment of the employees and the organization to achieve the goals at both levels. So, the objective of the research was to understand the role of psychological Wellbeing and job satisfaction in predicting organizational commitment. To fulfill the above objectives, the following hypotheses were formulated:

Hypothesis of the Study:

1. There might be a statistically sizeable relation among Psychological Wellbeing and Job Satisfaction facets with organizational commitment.

2. Psychological Wellbeing and Job Satisfaction are giant predictors of Organizational Commitment.

Method

Instruments: The following instruments were employed for data collection in the study:

Biographic Information Schedule: Biographic information schedule was used to record gender, age, marital status, educational qualifications and work experience for respondents working at various organizations.

Psychological Wellbeing Scale (PWB): It is developed by Ryff in1989 reflecting the six areas of psychological Wellbeing: autonomy, environmental mastery, personal growth, positive relations with others, purpose in life and self-acceptance. Respondents rate statements on a scale of 1 to 6, with 1 indicating strong disagreement and 6 indicating strong agreement. Internal consistency values (coefficient alpha) for each dimension varied between 0.86 and 0.91 indicating high reliability of the scale.

Organizational Commitment Questionnaire (OCQ): It is developed by Mowday, Steers and. Porter in 1979. It was used to measure the how committed an employee is towards his/her organization. Respondents rate statements using a seven point Likert scale ranging from (strongly agree) to 7 (strongly disagree). Reliability for the OCQ has been recorded as satisfactory with alpha levels of 80 and above.

Minnesota Satisfaction Questionnaire (MSQ): It is developed by Hirshfeld in 2000. This brief version of the questionnaire was used to measure the activity pleasure of employees. It measures satisfaction with specific components of the activity. Respondents rate statements on a scale of 1 to 6, with 1 indicating strong disagreement and 6 indicating robust agreement. Reliability for the MSQ has been recorded as first-class with alpha ranges of 77 and above.

Participants: The study population consisted of males and females working in IT sector at Delhi/ NCR. The data was collected using a purposive cum convenience sampling technique. The size of the total sample was 50 aged 20-50 years. The details of the demographic characteristics are presented in table 1

Table 1: Biographic Details of Employees

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>22</td>
<td>44</td>
</tr>
<tr>
<td>Female</td>
<td>28</td>
<td>56</td>
</tr>
<tr>
<td>Age (in years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-25</td>
<td>7</td>
<td>14</td>
</tr>
<tr>
<td>26-30</td>
<td>16</td>
<td>32</td>
</tr>
<tr>
<td>31-35</td>
<td>12</td>
<td>24</td>
</tr>
<tr>
<td>36-40</td>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td>41-45</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>46-50</td>
<td>2</td>
<td>04</td>
</tr>
</tbody>
</table>
**Characteristics** | **Number** | **%**
---|---|---
Marital Status |  |  
Unmarried | 14 | 28  
Married | 36 | 42  
Divorced | 0 | 0  
Educational Qualifications |  |  
Bachelor’s Degree | 30 | 60  
Master’s Degree | 20 | 40  
Work Experience (in years) |  |  
Less than 3 | 5 | 10  
4-7 | 14 | 28  
8-10 | 16 | 32  
11 and above | 15 | 30  

**Procedure:** The goal of the present research was to think about the job of mental Wellbeing and occupation fulfillment in foreseeing hierarchical duty. A purposive cum convenience sampling technique was utilized to gather a sample of 50 males and females working in an IT segment at Delhi/NCR. Members were educated about the nature and motivation behind the investigation and consent was acquired from interested members expressing that the inquiries addressed would be kept private. Likewise, they were informed that interest was totally intentional and could be ended whenever. The Organizational Commitment Questionnaire (Mowday, Steers and Porter, 1979)\(^8\), Minnesota Satisfaction Questionnaire (Hirschfeld, 2000)\(^9\) and Psychological Wellbeing Scale (Ryff, 1989) were regulated and it took roughly 15 minutes for the respondents to finish these surveys. Descriptive statistics (means and standard deviations) were utilized to investigate the information. Pearson product-moment correlation coefficients were utilized to determine the connection between the factors. A different relapse examination was directed to decide the extent of difference in the reliant variable (Organizational duty) that is anticipated by the autonomous factors (Psychological Wellbeing and Job Satisfaction).

**Result**

The present study was designed to understand the role of psychological Wellbeing and job satisfaction in predicting organizational commitment. For this descriptive and inferential statistics was used. The data was analyzed using SPSS (version 19). In Table 2, main and standard deviation of psychological Wellbeing, Job Satisfaction with their dimensions and Organizational Commitment were reported.

**Table 2: Showing Mean and SD of Psychological Wellbeing, Job Satisfaction with their Dimensions and Organizational Commitment (n = 50)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychological Wellbeing</td>
<td>76.88</td>
<td>14.28</td>
</tr>
<tr>
<td>Freedom</td>
<td>11.68</td>
<td>2.86</td>
</tr>
<tr>
<td>Environmental Expert</td>
<td>12.44</td>
<td>2.97</td>
</tr>
<tr>
<td>Personal Development</td>
<td>13.68</td>
<td>2.80</td>
</tr>
<tr>
<td>Positive Relations with Others</td>
<td>12.88</td>
<td>3.06</td>
</tr>
<tr>
<td>Purpose of Life</td>
<td>13.16</td>
<td>2.88</td>
</tr>
<tr>
<td>Self-Acceptance</td>
<td>13.08</td>
<td>3.23</td>
</tr>
<tr>
<td>Job Satisfaction</td>
<td>71.02</td>
<td>16.77</td>
</tr>
<tr>
<td>External Satisfaction</td>
<td>26.22</td>
<td>6.53</td>
</tr>
<tr>
<td>Intrinsic Satisfaction</td>
<td>44.80</td>
<td>13.38</td>
</tr>
<tr>
<td>Organizational Commitment</td>
<td>76.28</td>
<td>12.86</td>
</tr>
</tbody>
</table>

**Table 3: Showing Correlation between Psychological Wellbeing and Job Satisfaction Facets with Organizational Commitment**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Organizational Commitment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychological Wellbeing</td>
<td>0.65</td>
</tr>
<tr>
<td>Freedom</td>
<td>0.36</td>
</tr>
<tr>
<td>Environmental Expert</td>
<td>0.75</td>
</tr>
<tr>
<td>Personal Development</td>
<td>0.46</td>
</tr>
<tr>
<td>Positive Relations with Others</td>
<td>0.58</td>
</tr>
<tr>
<td>Purpose of Life</td>
<td>0.39</td>
</tr>
<tr>
<td>Self-Acceptance</td>
<td>0.57</td>
</tr>
<tr>
<td>Job Satisfaction</td>
<td>0.83</td>
</tr>
<tr>
<td>External Satisfaction</td>
<td>0.50</td>
</tr>
<tr>
<td>Intrinsic Satisfaction</td>
<td>0.80</td>
</tr>
</tbody>
</table>

**Person product moment method correlation was employed to see the relation between Psychological Wellbeing and Job Satisfaction facets with Organizational Commitment. These correlations are presented in Table 3. Results from Table 3 revealed significant positive relations between Psychological Wellbeing and Job Satisfaction facets with Organizational Commitment.**

A multiple regression analysis was conducted to determine the proportion of variance in the dependent variable (Organizational commitment) that is predicted...
by the independent variables (Psychological Wellbeing and Job Satisfaction). The findings are presented in Table 4. Results from the Table 4 indicated that the adjusted R2 was calculated as 0.70. This means that 70% of the total variability in Organizational Commitment is explained by the Psychological Wellbeing and Job Satisfaction (R2 = 0.70; F = 60.65; p < 0.05)

Table 4: Showing Regression Analysis of Psychological Wellbeing and Job Satisfaction with Organizational Commitment

<table>
<thead>
<tr>
<th>Variables</th>
<th>R</th>
<th>R²</th>
<th>Adjusted R</th>
<th>F</th>
<th>B</th>
<th>df</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychological Wellbeing</td>
<td>0.84</td>
<td>0.72</td>
<td>0.70</td>
<td>60.65*</td>
<td>0.15</td>
<td>(2,47)</td>
<td>1.65</td>
</tr>
<tr>
<td>Job Satisfaction</td>
<td>0.55</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7.05*</td>
<td></td>
</tr>
</tbody>
</table>

*p < 0.05

**Discussion**

The objective of the present research was to study the role of psychological Wellbeing and job satisfaction in predicting organizational commitment. The data was collected using purposive cum convenience sampling. The sample was administered questionnaires on psychological Wellbeing, job satisfaction and organizational commitment. Descriptive statistics (means and standard deviations) were used to analyze the data. Pearson product-moment correlation coefficients were used to specify the relationship between the variables. A multiple regression analysis was conducted to determine the proportion of variance in the dependent variable (Organizational Commitment) that is predicted by the independent variables (Psychological Wellbeing and Job Satisfaction).

The first hypothesis stated statistically significant relation between Psychological Wellbeing and Job Satisfaction facets with Organizational Commitment. Significant and positive relations were found on the above constructs. Similar findings were reported by previous studies.

The present research found moderate to high positive relation of psychological Wellbeing and its dimensions with organizational commitment. Having strong and trusting relationships with the colleagues is an important factor for an individual to be committed to the organization. When an individual has satisfying relationships, he/she becomes concerned with the welfare of others and this helps in reaching the organizational goals. An individual who is autonomous, able to resist social pressures and has a positive attitude towards self (self-acceptance) is more able to make independent decisions at work. He/she is clearer and more directed towards the individual and organizational goals which further helps to remain in the organization.

Job satisfaction was also located to have an excessive advantageous correlation with organizational commitment. The findings of the present research is in line with the study performed through Cheng and Stockdale (2003), Tella, Ayeni and Popoola (2007) mentioning that task pride and organizational dedication are two very relevant operating mindset, because of this that robust courting existed among the constructs and there is a few overlap of the two working mind-set while there may be an effect on other variables. Extrinsic delight had a moderate relation and intrinsic delight had a high fantastic relation with organizational dedication stating the truth that intrinsic elements have a better source of affiliation as compared to extrinsic elements. Intrinsic assets of pride rely on the person traits of the man or woman, along with the ability to use initiative, relations with supervisors, or the work that the person certainly plays; those are symbolic or qualitative sides of the process while extrinsic resources of delight are situational and depend on the surroundings (SousaPoza & Sousa-Poza, 2000; Armstrong, 2003).

The second hypothesis stated that psychological Wellbeing and job satisfaction are significant predictors of organizational commitment. The results of regression analysis revealed 70% of the total variability in organizational commitment is explained by the psychological Wellbeing and job satisfaction (R² = 0.70; F = 60.65; p < 0.05). This means that both psychological Wellbeing and job satisfaction play an important role in organizational commitment. There is only 30% contribution is of other factors in organizational commitment which is not the focus of
the present research. The finding of the present research is supported by previous review of literature that stated job satisfaction to be a predictor of organizational commitment (Kovach, 1977; Porter, Steers, Mowday, & Boulian, 1974).

Managerial Implication: The present investigation has direct ramifications for the present modern world. Whittling down rates soaring and representatives are moving starting with one association then onto the next in fast progression. This study has contributed to the existing theory of organizational behavior and is useful for research purpose. The examination expressed positive mental state and occupation fulfillment are significant benefactors in making the workers focused on their associations. Organizations can improve organizational commitment of their employees by initiating employee development programs to improve their attitude in the workplace. Furthermore, the findings of this study can be of great help in designing policies for improving organizational commitment.

Limitation of the Study: There exist constraints originating from the size just as the idea of the example. Since the example of respondents is moderately little and the example was gathered from couple of IT organizations in Delhi/NCR, this investigation should be reproduced over a bigger database of respondents to affirm the discoveries. Likewise, the example was gathered utilizing non likelihood inspecting techniques so it didn’t give a sheltered premise of speculation. In addition, self-report information could be one-sided and may not give the most substantial or exact records of a person’s conduct.

Conflict of Interest: Author declare no conflict of interest.

Source of Funding: Self

Ethical Clearance: I testify that my research paper submitted has not published elsewhere and I actively involved in substantive completion of Paper

References
Online News Media Coverage of Women’s Health in India: 
A Content Analysis

Olive Nerurkar

Associate Prof, Symbiosis International (Deemed University)

Abstract

Women’s health is of particular concern in India as numbers involving Non-Communicable Diseases (NCD) are rising alongside Reproductive and Sexual health disorders. Women’s health must, therefore, encompass women’s sexual and reproductive health, as well as NCDs. Media coverage of issues related to women’s health plays a vital role in increasing awareness, influencing public opinion, and motivating change in health policies. Hence, this study was designed to assess news coverage of women’s health in India.

Method: Online daily news media exclusively covering health in India from June 2018- May 2019 were systematically analyzed, and articles concerning women’s health were identified. The articles were taken from two national online daily news media reporting in English language about women’s Reproductive and Sexual health and Noncommunicable diseases, and the pieces were coded and analyzed.

Results: Out of a total of 240 articles, 108 relevant to the study were identified from two online news media which enjoyed high readership. The articles were a mix of news, features, and commentary/interview. The articles covered various disease types (Reproductive and Sexual Health, CVD, Cancer, Respiratory Diseases, Diabetes, Mental Health, General Wellbeing, and Other). The article coverage included research study findings from India, international agencies / countries, or global. Prevention, diagnostics and therapy, location or context of the news, and the stakeholders were also covered. The analyses show reportage mostly covering diseases affecting women’s Reproductive and Sexual Health and Cancer. Limited information was provided on most of the significant Non-communicable Diseases like Cardiovascular Diseases (CVD), Diabetes, Chronic respiratory diseases. The rate of NCDs affecting women in India is galloping. The skew in the article coverage of conditions may create a gap in awareness about more pressing NCDs and hence may fail to influence policy actions at the governmental or industry level.

Further the articles mentioned stakeholders like the government, global/international agencies or countries, and individual. There was a lesser mention of industry. Some lost opportunities in the media coverage have been identified as lack of a balance in the articles published on diseases, lack of comprehensiveness in terms of disease burden, stakeholder role or lack of suggestions for policy changes.

Conclusion: Gaps exist in the current online news media coverage on women’s health in India, suggesting the need for more comprehensive coverage of diseases and influencing policy action of the government and industry. Through better coverage of the major NCDs, quantification of the health burden and suggestion for policy actions, the media can play a critical role in galvanizing India’s movement on women’s health. These data suggest opportunities for government and industry.

Keywords: Online news media, content analysis, women’s health in India, Non Communicable diseases and Reproductive and Sexual Health, stakeholders.

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Introduction

Health is an essential factor that contributes to wellbeing and economic growth of a nation. With a total life expectancy at birth of 68.8 years (67.4 years for men and 70.3 for women), India has made significant
progress on various health parameters, yet the sector faces many challenges and barriers. While the country is still struggling with communicable diseases, NCDs have been reported to have become more threatening, causing 60 percent of the deaths in the country. [1] NCDs are estimated to create the country a loss of USD 4.8 trillion between 2012 and 2030 and is expected to be the primary cause of mortality overtaking communicable diseases. Its insufficient health infrastructure will mar the future of India as a world economic power. [2]

In this context, the health of Indian women assumes prominence because of their contribution to society in their productive and reproductive roles. According to WHO 2008, Reproductive and sexual ill-health accounts for 20% of the global burden of ill-health for women as compared to 14% for men. [3] Apart from Reproductive Health issues, women have to contend with NCDs, which are the world’s number one killer and account for 18 million deaths among women. [4] NCDs is a significant threat to women’s health worldwide, and in developing countries affect them in their most productive years. So sustained and comprehensive action is required to tackle women’s health on both fronts sexual and reproductive health and NCDs. Media coverage on those above will help create awareness, inform about the possible policy changes and actions required by all stakeholders.

Women in poor health are more likely to give birth to low weight infants, provide inadequate care for their children, and if they are employed will be less productive. Further, in India, families depend primarily on women to provide family care. Thus poor health of women seriously affects themselves as well as their families. [5]

Media coverage of women’s health issues plays an essential role in creating awareness, influencing individual actions that they can be taken to prevent, diagnose, and seek treatment. Policy decisions by industry, government, international agencies may also be informed by media coverage. Hence, this study was designed to assess online news media coverage of women’s health in India.

The rationale for this study: Given the role of online news media in spreading awareness about issues and problems, influencing public opinion and shaping government policy, a systematic content analysis of news stories published online in the period 2018–2019 was undertaken, to assess the news media’s prioritization of women’s health in India. Women’s health related to reproductive health and NCD formed the backdrop of the study. In light of the above, it was considered worthwhile to examine online news media relating to women’s health.

Method

Articles published by online news media in India with exclusive coverage of health from June 2018-May 2019 formed a part of the data for the study. The articles that discussed women’s health were systematically content analyzed. Total of 108 articles from two online news media covering health in India was analyzed. These online news media were reported to have good readership on health and specifically target decision makers, policymakers, and other stakeholders. The articles were downloaded from two online papers devoted to the Health sector in India, namely: ET Healthworld and E Health.

Keyword search on “women health” resulted in 240 articles. These were checked for relevance and reduced to 108. Articles were filtered out because they were covering communicable diseases, diseases affecting the general population or news about aspects not relating to the scope of study like news about awards received by individuals. All the 108 identified articles were covered by the analysis because of their relevance. Because women’s health in developing and lesser developed countries are showing the presence of high amount of non-communicable diseases (NCD) specifically the study covers NCD and Reproductive and sexual health of women in India.

Coding frame for content analysis: A coding frame for content analysis was developed, and the following topics were included:

- Type of story: news, feature, commentary/interview.

A news story is short less than 300 words and written in a pyramid form. A news feature is a longer news article. Commentary is an opinion.

- Type of Diseases covered: Reproductive and Sexual health, Coronary and vascular diseases (CVD), Diabetes, Cancer, Depression, Chronic Respiratory. Other (includes specific mention of women’s condition in the context of overall health coverage of article), General wellbeing.
Non-communicable diseases (NCDs) tend to be of long duration involving a combination of genetic, physiological, environmental, and behavioral factors. The main types of NCDs are cardiovascular diseases (like heart attacks and stroke), cancers, chronic respiratory diseases (such as chronic obstructive pulmonary disease and asthma) and diabetes. For the study, the following NCDs were covered: Coronary and vascular diseases (CVD), Diabetes, Cancer, Depression, Respiratory, Other.

- **Visuals:** photos, illustrations
  Visuals consisted of photos of people, illustrations, symbols, and logos. All were clubbed under Visuals.

- **Health Status and coverage:** Research, Disease, diagnostic, prevention, therapy, and treatment.
  News is primarily aimed at informing, creating awareness, interpreting, and sometimes persuading or mobilizing opinions. Hence the following Issues in the news story were studied: Research information about the disease, Disease explanation including symptoms, diagnostic, prevention, therapy, and treatment.

- **Location:** International/global country or agency, India, and the Indian States
  News covering areas was also captured. Location: international/global country or agency, India, and the Indian States.

- **Stakeholder:** Global /International country or agency, Government (Indian or State), Industry, individual.

Since most of the coding categories were multiple responses the percent respondents add up to more than 100%.

### Results and Analysis

The result of the content analyses is presented

#### Type of Story (Table 1): The news articles covering the year May 2018 - June 2019 were 108 in all. These articles included news (32.41%), features (43.52%) or commentary and interviews (24.07%).

<table>
<thead>
<tr>
<th>Type of Story</th>
<th>News</th>
<th>Feature</th>
<th>Commentary/Interview</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number or Articles</td>
<td>35</td>
<td>47</td>
<td>26</td>
<td>108</td>
</tr>
<tr>
<td>%</td>
<td>32.41</td>
<td>43.52</td>
<td>24.07</td>
<td>100</td>
</tr>
</tbody>
</table>

#### Type of Disease (Table 2): The articles for the study relate to women’s health in India, covering non-communicable diseases and Reproductive and sexual health. Majority of the articles covered: Reproductive and sexual health, Cancer and Other. Reproductive health and sexual diseases consisted of 50.93%. Other included news about both sexes with mention of diseases affecting women (33.33%) and Cancer covered 26.85%.

<table>
<thead>
<tr>
<th>Type of Disease</th>
<th>Reproductive and Sexual Health</th>
<th>Coronary and Vascular Diseases</th>
<th>Cancer</th>
<th>Depression</th>
<th>Chronic Respiratory</th>
<th>General Well Being</th>
<th>Diabetes</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Number</td>
<td>55</td>
<td>5</td>
<td>29</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>36</td>
</tr>
<tr>
<td>Percentage</td>
<td>50.93</td>
<td>4.63</td>
<td>26.85</td>
<td>0.93</td>
<td>0.93</td>
<td>0</td>
<td>0.93</td>
<td>33.33</td>
</tr>
</tbody>
</table>

Percentage exceeds 100 due to multiple responses

#### Health status and coverage (Table 3): The coverage of these articles spans research, the disease, prevention, diagnostics, and therapy. The top categories include Research 46.30%, Prevention 40.74 %, Therapy and treatment 41.67 %. Most articles had visuals, either photos, illustrations, or logos (71.30%).

<table>
<thead>
<tr>
<th>Type</th>
<th>Research</th>
<th>Disease</th>
<th>Prevention</th>
<th>Diagnostic</th>
<th>Therapy and Treatment</th>
<th>Visual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>50</td>
<td>40</td>
<td>44</td>
<td>43</td>
<td>45</td>
<td>77</td>
</tr>
<tr>
<td>Percentage</td>
<td>46.30</td>
<td>37.04</td>
<td>40.74</td>
<td>39.81</td>
<td>41.67</td>
<td>71.30</td>
</tr>
</tbody>
</table>

% exceeds 100 as there are multiple responses
**Location and Stakeholder (Table 4):** The coverage of news articles include references to global agencies / international countries 37.03%, India 79.63%, and specific States 22.22% of articles. Stakeholders mentioned included global agency or international countries 24.07%, Government of India 53.70%, Individual 37.037%, industry 28.70%, and not specified 10.18%.

<table>
<thead>
<tr>
<th>Location</th>
<th>Stakeholder</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global/ International Agency or</td>
<td>India</td>
<td>40</td>
<td>37.03</td>
</tr>
<tr>
<td>country</td>
<td>Indian State</td>
<td>86</td>
<td>79.63</td>
</tr>
<tr>
<td></td>
<td>Global/ International Agency or country</td>
<td>24</td>
<td>22.22</td>
</tr>
<tr>
<td></td>
<td>India</td>
<td>26</td>
<td>24.07</td>
</tr>
<tr>
<td></td>
<td>Industry</td>
<td>58</td>
<td>53.70</td>
</tr>
<tr>
<td></td>
<td>Not Specified</td>
<td>40</td>
<td>37.04</td>
</tr>
<tr>
<td></td>
<td>Industry</td>
<td>31</td>
<td>28.70</td>
</tr>
<tr>
<td></td>
<td>Not Specified</td>
<td>11</td>
<td>10.18</td>
</tr>
</tbody>
</table>

% exceeds 100 as there are multiple responses

**Discussion**

This study found a significant volume of reporting on issues related to women’s health in India about NCDs and Reproductive and sexual health. But also there are significant gaps and missed opportunities that may guide future action by the media in terms of awareness creation.

Online news media reports as per the content analysis emphasize reproductive and sexual health and Cancer and appeared to have given CVD, Respiratory diseases, diabetes, mental health far lesser coverage. Is the reporting, therefore, unbalanced? Lack of reportage of major NCDs is a missed opportunity for creating awareness, influencing the informed choice, and demanding policy change when the nation’s burden from NCDs is growing. Many of the NCDs are caused by a poor selection of food, physical inactivity, and poor lifestyle choices and can be reduced by emphasizing individual action and government intervention. Consequently, the media reportage and prioritization might have the effect of misleading public attention and policy priorities for work. India’s burden of non-communicable diseases (NCDs) is escalating, the issues of multiple chronic conditions prevail, and many a time NCDs remain undiagnosed due to lack of awareness and insufficient health-care access. [6]

Media should be able to play its constructive role in creating awareness, educating people of the risks and complications that can arise out of neglect.

The study found that these two publications reported news which covered global/international, national, and news related to the Indian states. Domestic health news articles were predominantly available.

The women’s health status covered issues related to the disease, research, prevention, diagnostics, and treatment with a fair amount reported under each reflecting a reasonable balance. Most articles had photos or illustrations depicting the problem.

Most reported the government as the stakeholder, with roles of global agencies, individual and industry being reported as well. The bulk of the reports mentioned the government but a lesser amount reported industry as a stakeholder. There were, likewise, missed media opportunities for highlighting solutions to addressing women’s health by the sector.

There were, likewise, missed media opportunities for highlighting solutions to addressing women health, particularly in calling for a comprehensive health management system aimed at preventions and control and affordability. Media missed opportunities to advocate for taxes on unhealthy processed foods and call for policy changes for affordable health.

Media reporting must consider women’s health as crucial to the health of a society and should receive due importance. Media needs to emphasize the role of deliberate policy and action and recognize its role in facilitating the same. [7]

The growing non-communicable diseases affect a large portion of the population in countries like India. An affordable healthcare policy intervention has the potential to improve the status of health significantly.
and will have a significant impact on economic growth. Media needs to emphasize the importance of prevention as NCDs to a large extent, are caused by improper lifestyle choices.

Concerns have been raised by researchers about not enough research being carried out on women’s health and NCDs and are calling for a sex-disaggregated approach to health studies. They also advocate a life course approach to women’s health, deliberate policies aimed at nurturing women’s health and well-being across the life cycle for realizing the full potential of women and girls. [8]

Very few articles called for the industry to show leadership in addressing women’s health. The strengths of this study lie in the large volume of articles analyzed and the comprehensiveness and depth of the content analysis.

Nonetheless, there were some limitations to the study. The search terms were restricted to “women health” and confined to Indian online news media with a health focus. It did not cover dailies covering the general news which also might have an occasional weekly section on health. Further, the articles were restricted to only the English language. Future studies might so contemplate analysis of Indian regional media for the study of comparable problems.

**Conclusion**

The study identified substantial media reporting on women’s health in India covering diseases, the status of development, symptoms, diagnostics, and therapy, the contexts like location in India and international alongside stakeholders. However, news reportage appears skewed towards some diseases over others.

This study has identified the media reporting on the diseases reported to be reasonably balanced about symptoms, research, prevention, and diagnostic and therapy thus making these issues salient in the national media. The media had also identified stakeholders, but the emphasis was on government, global/international agencies, and individual.

However, there were many gaps in reporting observed. While Reproductive and sexual health and a few NCDs were generally reported, many important ones were not reported. Discussion of policy options tended not to be covered. Preventive measures were not mentioned in the context of addressing women’s health. Not only does this represent a lost opportunity to address health issues and policies to be implemented. Accountable government and industry needs to be at the forefront of health and must play an active part in advancing the health perspective in women.

Media must seek to redress many of the gaps identified in this study. Increased specificity about the burden of women’s health, including advice for the groups most vulnerable to the impacts of poor health would serve a mainly educational purpose. Greater elaboration in the media, particularly by key influencers, on the real sources of and solutions to women’s health, can help trigger policy action. Calls on the government and industry and individuals to play a more active role in the country would prove beneficial.

**Ethical Clearance:** Not required

**Source of Funding:** Self

**Conflict of Interest:** Nil

**References**


Migration and Displacement: The Case of Tuberculosis

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Abstract

The recent years have witnessed an enormous rise in population displacements both beyond country borders as well as within. Limited access to health services and unfavourable living and working conditions make migrants vulnerable to an array of health risks and hazards including tuberculosis (TB) infection, progression to TB disease and poor treatment outcomes. Underlying social determinants of health are the most crucial risk factors that multiply the chances of contracting TB. Also, around 40 per cent of the total number of incident TB cases globally are missed by the public health systems which have serious public health implications and are most likely to occur among populations susceptible to TB, like migrants and refugees. With respect to ‘crowd infections’ and public health emergencies like TB, the health of migrants therefore assumes a critical position. This study makes an important contribution by providing a comprehensive survey of existing evidence on how migration and displacement can increase the risk of TB infections across countries and empirically validating the same in the Indian context.

Keywords: Tuberculosis, epidemiology, risk factors, migration, displacement.

Introduction

Tuberculosis (TB) remains a public health emergency, substantially contributing to the global burden of disease. In 2017, there were an estimated 10 million incident cases of TB globally and 1.3 million TB deaths among HIV-negative people. Moreover, only 64 per cent of incident TB cases were notified to national authorities and eventually to the WHO. Treatment default has been one of the prime reasons for the rampant emergence of drug-resistant TB. TB is an opportunistic infection. Several medical conditions like HIV, diabetes, silicosis, tobacco and alcohol abuse present risk factors for the disease and are responsible for detrimental TB treatment outcomes.

Although TB is not exclusively a disease of the poor, deprivations and vulnerabilities typically associated with poverty increase the risks of infection and disease manifold. The burden of disease is in general disproportionately more among the poor with less access to healthcare whether measured by geographical and financial accessibility, availability, acceptability or quality of care.

The recent years have witnessed a rising trend in population movements, forced or voluntary, both across international borders and across country states. Globally, there are 244 million international migrants and 740 million within national territories. Migrants constitute a heterogeneous group comprising overlapping sections of migrant workers and their families moving from one location to another in search of work or better living conditions, immigrants, refugees, internally displaced persons, asylum seekers and victims of human trafficking. Exposure to new environments generally render migrants more vulnerable to an array of health risks and hazards with limited access to some of the basic social services including health.

In this era of globalisation, population mobility across countries is an underlying factor behind the emergence of public health threats that are often related to transmissible pathogens. Migrants and the displaced present a key population for a communicable disease and social affliction like TB. This paper makes an
attempt to explore the body of literature that throws light on the dynamics of migration and displacement on the epidemiology of TB. Besides providing a comprehensive survey of existing evidence on how displacement can aggravate the risk of TB infection and disease it tries to validate the association between migration and risk of TB with the help of secondary data in the Indian context.

**Tuberculosis and migration at crossroads:** The migrant status itself constitutes a social determinant of health (Fig.1) interacting with other determinants to adversely affect access to health care and health outcomes\(^8\)\(^,\)\(^10\).

![Fig 1: Migration cuts across social determinants of health](image)

**Source:** International Organisation for Migration: The TB epidemic serves as testimony to substandard living and working conditions, nutritional deficiency, low education and disease awareness and low access to health care serving as some of the critical determinants of morbidity and mortality associated with TB\(^11\). Although national TB control programmes worldwide have steadily brought down prevalence and mortality rates, not much has been achieved on the incidence front despite availability of effective diagnostic tools and a treatment regime. ‘Missed cases’ comprising a mix of under-diagnosed and under-reported incident cases are responsible for perpetuation of infection in the community and are most likely to occur among population subsections more susceptible to TB, like migrants and refugees. Migration as a social determinant of health increases TB related disability and deaths among migrants along all migration pathways\(^12\)\(^,\)\(^13\).

**Vulnerability of migrants to TB:** Certain conditions associated with the migrated population make them more vulnerable to TB infection and disease. Migrants in detention centres like prisons and in asylums or victims of trafficking are often forced to live in inhuman and filthy conditions lacking ventilation and proper sanitary arrangements for long periods of time. Such conditions present hotbeds for TB infection to spread and thrive. Forced displacement of people following an armed conflict or natural calamity is often associated with food scarcity and undernourishment, overcrowding in temporary shelters like camps and disruption in treatment. Occupational hazards like silicosis expose migrant workers engaged in the mining industry to a high risk of TB\(^14\). In case of migrants with a legal status, access to diagnostic and treatment services for TB are conditional on terms of contract, work permits and entitlement to insurance and other health allowances provided by the state or the employer concerned. However, if falling sick leads to loss of work permits, individuals may be tempted to withhold positive TB status till late to avoid the risk of being sent back. Delay in seeking care causes infection to spread. Irregular migrants fear deportation which limits their access to health services. Deportation during the course of treatment leads to treatment default and consequently drug-resistance, poor health outcomes and continued transmission of infection. Again, the typically long tenure of TB treatment with daily administration of drugs becomes a challenge when people are on the move causing breaks in the treatment continuum. The outcome may be death or development of more complicated drug-resistant TB\(^15\).

Risk factors for exposure to TB infection, its transmission and adverse health outcomes present themselves all along the migratory process. These may be categorised into **individual factors** like poor living and working conditions, low socio-economic status, low nutrition status, smoking and alcoholism, **sociocultural factors** like linguistic barriers, cultural differences, legal rights, fear of stigma and discrimination and low awareness regarding disease and health service entitlements and **economic burden of TB** at the level of the household involving direct costs like costs of care and opportunity costs like income loss for migrants and their families, governments and loss of remittances for home countries\(^16\). Thus the interplay of determinants of health and TB at multiple levels sustains the migrant population’s vulnerability to TB.

**Migration pathways:** Modern migration processes constitute junctures like origin, transit, destination and sometimes, return (Fig 2). While migrants may be otherwise fit to travel, they may be at a higher risk of getting TB infection
or developing the disease depending on the incidence of TB in their home country, conditions experienced during travel and during stay in the destination country.

![Fig 2: Migration pathways](image)

**Source:** International Organisation for Migration: Factors that determine the health profile of the migrant and TB risks at country of origin include the individual’s own health status, access to and availability of quality health services, prevailing socioeconomic conditions and experience of any epidemic, conflict or emergency. Journey of migrants or the transit phase plays a role in determining the TB risk of migrants especially when they undertake travel under perilous situations. For example, unlike legal migrants who would travel with requisite documents and approval as well as pre-migration health screening, irregular ones may travel on foot or by unsafe and crowded conveyance. Undocumented migrants may be held up in jail where they are forced to stay in crowded and ill-ventilated conditions with poor nutrition together with other inmates already infected. Asylum seekers and human trafficking victims who suffer physical abuse often undergo mental trauma causing them to refrain from seeking health care from both private providers and public services due to mistrust. Upon reaching destination, conditions under which migrants work and live, their socioeconomic condition, availability of health services in the host country, access to such services, affordability and acceptability, all these factors play out to influence migrants’ risk of contracting TB and eventually its treatment and outcome. Coping with a new environment may be both physically and emotionally demanding for migrants and lack of identity and obligation to abide by social norms may instigate them to take recourse to drugs or prostitution as a means to escape loneliness, frustration and social isolation. These pave way for the marginalised populations to acquire immunosuppressive conditions like HIV and eventually TB infection and disease.

**Effects of migration on TB epidemiology:** Migration influences the epidemiology of TB by serving as a connecting link across countries or regions within a country with varying degrees of disease prevalence and socioeconomic settings. People moving across country borders or within have different health profiles that impact access to health care, health seeking behaviour and disease burden. The burden of morbidity and mortality from TB in the low TB burden high income countries is mostly borne by foreign-born individuals who have migrated into these countries, the probable reason being reactivation of previously acquired latent TB infection in their countries of origin – low and middle income, high TB burden settings or along the migration pathway. It may be interesting to note that some of the top countries of origin for international migrants – like China, India, Bangladesh, Pakistan, Afghanistan, Indonesia, the Philippines and the Russian Federation also find place among the 30 high TB burden countries identified by the WHO. More than half of TB incidence in Europe and North America is accounted for by foreign born individuals with active case finding strategies revealing higher rates of multi drug resistant TB higher among immigrants, refugees and asylum seekers.

**Migration and risk of TB: an empirical exercise in the Indian context:** India accounts for more than a quarter of global TB incidence and almost a third of global mortality from TB annually. According to the estimates of the Economic Survey of India 2017, inter-state migration in India was as high as 9 million annually between 2011 and 2016, and there are around 139 million internal migrants in the country. The 2001 Census of India identifies few important states with respect to inter-state migration, each of which had more than a million migrants by place of birth from both other states in India and other countries. NFHS 3 (2005-06) reports TB prevalence at household level across states in India. Table 1 shows the percentage shares of the preferred destination states in all-India in-migrant population and their percentage shares in all-India reported TB prevalence.

**Table 1:** Percentage shares of preferred destination states for migration in India, in all-India in-migrant population and all-India reported TB prevalence

<table>
<thead>
<tr>
<th>States</th>
<th>Percentage share of total in-migrants</th>
<th>Percentage share of reported TB prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maharashtra</td>
<td>16.4</td>
<td>6.29</td>
</tr>
<tr>
<td>Delhi</td>
<td>11.6</td>
<td>1.85</td>
</tr>
<tr>
<td>States</td>
<td>Percentage share of total in-migrants</td>
<td>Percentage share of reported TB prevalence</td>
</tr>
<tr>
<td>-------------------</td>
<td>---------------------------------------</td>
<td>---------------------------------------------</td>
</tr>
<tr>
<td>West Bengal</td>
<td>11.5</td>
<td>6.34</td>
</tr>
<tr>
<td>Uttar Pradesh</td>
<td>6.1</td>
<td>11.8</td>
</tr>
<tr>
<td>Haryana</td>
<td>6.1</td>
<td>2.05</td>
</tr>
<tr>
<td>Gujarat</td>
<td>5.4</td>
<td>3.71</td>
</tr>
<tr>
<td>Madhya Pradesh</td>
<td>4.8</td>
<td>3.66</td>
</tr>
<tr>
<td>Karnataka</td>
<td>4.4</td>
<td>1.71</td>
</tr>
<tr>
<td>Punjab</td>
<td>4.4</td>
<td>1.51</td>
</tr>
<tr>
<td>Rajasthan</td>
<td>3.8</td>
<td>2.83</td>
</tr>
<tr>
<td>Jharkhand</td>
<td>3.7</td>
<td>4</td>
</tr>
<tr>
<td>Bihar</td>
<td>3.7</td>
<td>5.12</td>
</tr>
<tr>
<td>Andhra Pradesh</td>
<td>2.2</td>
<td>3.95</td>
</tr>
<tr>
<td>Chhattisgarh</td>
<td>2.1</td>
<td>2</td>
</tr>
<tr>
<td>Rest</td>
<td>13.8</td>
<td>43.17</td>
</tr>
</tbody>
</table>

Source: Census 2001 migration data highlights and NFHS 3 household level data

Correlation between the share of total in-migrants and the share of reported prevalence of TB for the selected states comes out to be 0.49 (approx.) and a test of significance for the correlation yields \( p = 0.06 \) implying significance of the test at 10 per cent level.

This small analytical exercise as a case study of India establishes a positive and significant association between migration and the risk of TB infection and disease.

**Discussion**

Health of migrants is a crucial global public health issue, especially in view of public health emergencies like TB and other infectious diseases. TB is a ‘crowd’ infection that shares its underlying drivers with the social determinants of health. Various factors at play along migration pathways may be regarded as social determinants of health that make migrants a critical population for TB. One concern with TB in migrants is the public health implication of delayed diagnosis and care seeking, if any, due to financial constraints, poor health literacy and fear of termination of employment contract and deportation. Besides worsened health outcomes for the affected population, delay in care seeking leads to uninterrupted spread of infection in the community. Development of drug-resistant TB among illegal migrants without any social protection, refugees and displaced persons due to poor treatment adherence and high default rates is another area of concern given their mobile lifestyle and possibilities of deportation while on treatment. Thus, immigration laws need to be framed exclusive of health care needs for migrants, irrespective of their legal status. Migrant workers are most often engaged in hazardous occupations that facilitate contraction of TB. Policies of the health sector need to be framed in coherence with non-health sectors like labour and immigration to support TB-related interventions across and within countries. There are health implications of migration in the host country. Recently, the rising burden of TB in Lebanon for example has been associated with a rise in the number of migrants and influx of refugees displaced in the aftermath of the conflict in Syria. It has been shown that despite their origins in a low TB setting, Syrian refugees in Jordan have higher rates of disease. While some migrants may exhibit the ‘healthy migrant’ effect, others may have pre-existing health conditions in the form of remotely acquired latent TB infection that eventually impacts the local disease epidemiology. As part of preventive measures, some destination countries make pre-migration screening and other health assessments mandatory particularly for infectious diseases like TB, for prospective legal migrants or lay down certain health conditions as entry-prohibiting. However, this poses a certain ethical dilemma with respect to the trade-off between ensuring preventive health measures for the native population and preservation of human rights. In case of irregular migrants and forced migration however, screening mechanisms prior to migration are difficult to implement.

**Conclusion**

TB management and control for migrants need to adhere to the basic public health principles of removal of disparities in health status and access to TB-related services between migrants and the host population thereby preserving health rights of migrants, reduction of TB burden in migrant population and minimization of the adverse effects of various phases of the migration process on their TB-related health outcomes. Also, pulmonary TB being a communicable disease, strategies to control it in the migrant populations need to balance the human rights of afflicted individuals with prerogatives to safeguard population health in host communities. National TB control programmes should come up with migrant-inclusive strategies like measurement and analysis of TB burden among migrants along with sensitization of health personnel towards their particular TB-related needs. Active screening for TB among refugees and immigrants and contact tracing assume
critical importance in responding to issues of under-diagnosis of TB cases, treatment non-compliance and increase in drug-resistant cases. The WHO for example recommends systematic screening for detection of active cases of TB among immigrants from settings with high TB prevalence and people in refugee camps, identifying them as ‘possible risk groups’ for TB. Also, the continuum of care must be ensured at all levels through facilitation of appropriate cross-border communication and follow-up. For the first time, the contribution of migration to sustainable development has been recognised as part of the development vision for 2030. Management strategies focusing on migration as a facilitator of TB and political commitment at national and international levels are critical for achieving the ambitious goals of the End TB Strategy and health equity including TB related targets in the era of the Sustainable Development Goals.

Conflict of Interest: Nil

Source of Funding: Nil

Ethical Clearance: Not applicable

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1. WHO. Global Tuberculosis Report. 2018
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6. IOM. World Migration Report. 2015
To Study the Knowledge Regarding Immunization among Caregivers of Under Five Children in Amritsar, Punjab

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¹Associate Professor, ²Professor, Department of Community Medicine, Sri Guru Ram Das Institute of Medical Sciences and Research, Sri Amritsar

Abstract

Introduction: Childhood immunization almost guarantees protection from several diseases. Since parents are the important health decision makers of their children, their knowledge regarding immunization and their educational status have a great impact in the immunization status of their children. This study evaluates the knowledge among parents/caregivers about vaccines, to understand their perception towards immunization and to identify solutions to address the knowledge gap.

Objectives: The objectives of this study were to assess the knowledge of parents or caregivers regarding immunization and to establish a correlation between socio-demographic variables and knowledge about immunization.

Methodology: The study was conducted in Sri Guru Ram Das Institute of Medical Sciences and Research, Vallah, Amritsar. Parents or care givers who came to the immunization clinic of the hospital to vaccinate their children were interviewed by a self-designed questionnaire. Each parent or caregiver’s knowledge, was assessed by giving specific scoring to selected questions in the questionnaire. Significance of difference in parameters was calculated using Chi-square test at 95% confidence interval.

Results: Out of 130 parents/caregivers studied, 6.9% of the parents/caregivers had good knowledge, 63.9% had average knowledge and 29.2% had poor knowledge about immunization. The association between knowledge and educational status (p = 0.002), type of family (p = 0.006), birth order (p = 0.030) and relation of the child with the caregiver (p = 0.020) were found to be statistically significant.

Conclusion: Majority of the subjects did not have adequate knowledge on vaccination. Socio-demographic factors had a significant influence on the knowledge of the caregiver. There is an urgent need to increase the coverage of vaccines under Universal Immunization Programme and a dire need to arrange for health education programme for all the parents regarding the importance of complete adherence of vaccination among children.

Keywords: Parents, Caregiver, Knowledge, Socio-demographic factors.

Introduction

Immunization is one of the most successful and cost-effective interventions.¹ Worldwide, vaccines have saved countless lives and improved health and well-being of children. In May 1974, the WHO launched the global programme known as Expanded Programme on immunization (EPI) to protect all the children of the world against six vaccine preventable diseases (VPDs) by the year 2000.² An estimated 19.4 million children under the age of one year did not receive basic vaccines. Globally, 1 in 10 infants did not receive any vaccinations in 2016.³ The Government of India launched Universal Immunization Programme on 19th November 1985, with the main objective of covering at least 85% of all infants against the six vaccine preventable diseases by 1990. As per the national family health survey– IV
(2015–16) only 62.0% of eligible children were fully vaccinated. Though India had implemented the universal immunization schedule, under which immunization services are offered free in public health facilities, the magnitude of its coverage remains poor. The main reason for non-immunization is lack of knowledge and awareness among the caregivers.

Adequate knowledge regarding immunization among parents or caregivers is important for prevention of diseases in the future. On the other hand, inadequate knowledge is dangerous and may perpetrate poor vaccine uptake and underutilization of the vaccination programs.

Several studies on immunization status of children conducted in various countries have revealed that increasing parents’ knowledge regarding vaccination improves immunization status and affects success of immunization programme. Education status and other socioeconomic status of parents have a great impact on their decision regarding vaccination. Therefore, our aim of this study was to assess parent’s knowledge towards vaccination and to correlate these factors with socio demographic variables so as to improve the vaccination coverage.

Objectives
1. To assess the knowledge of parents or care givers regarding immunization.
2. To assess the effect of demographic determinants on the knowledge of the respondents.

Materials and Method

A hospital based cross sectional study was carried out in the immunization clinic of Sri Guru Ram Das Institute of Medical Sciences and Research, district Amritsar, Punjab. Study population included parents or caregivers of children from 0 to 5 years of age, who visited the immunization clinic.

The study was conducted for a period of one month starting from 15 June 2019 to 15 July 2019. A pre tested and predesigned questionnaire was administered to the study subjects after taking an informed consent from them. Parents or care givers who did not cooperate for the interview were excluded from the study. Questionnaire consisted of two parts; Section A consisted of the socio-demographic profile of the study subjects, which included age, sex, qualification of the parent, income of the family, type of family, area of residence, number of siblings, birth order and age of the child coming for vaccination.

Section B included questionnaire to assess the awareness and knowledge of immunization, as per National Immunization Schedule as followed in India, knowledge about importance of vaccination, knowledge was assessed based on the number of vaccine preventable diseases known to the respondents, age at which first vaccine is administered, side effects of vaccines, awareness regarding special vaccines.

Knowledge regarding vaccination of each study subject was assessed by giving scores to their response to eight questions. Each correct answer was given a score of ‘1’ and wrong answer was given ‘zero’ score. The maximum score was 8 & minimum score was ‘0’. Using likert’s scale the knowledge was categorized as poor (score 0 to ≤ 3), average (score 4 to ≤ 6) and good (score 7 to ≥ 8). Role of following parameters were assessed to understand the knowledge of parents/care givers regarding immunization such as age, sex, qualification of the parent, income of the family, type of family, area of residence, number of siblings, birth order and age of the child coming for vaccination.

Approval of college ethical committee was granted at the time of submission of the plan of the study. Data was tabulated on Microsoft Excel Sheet. The master chart was prepared and data analysis was carried out by using SPSS 22.0 version. The demographic variables were analysed by frequency and percentage. Association between knowledge with other demographic variables was found using chi-square test. Value of p < 0.05 was considered as statistically significant.

Results

Table 1: Distribution of parents/caregivers according to socio demographic variables

<table>
<thead>
<tr>
<th>Socio-demographic factor</th>
<th>Total (N = 130)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age Group (years)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-24</td>
<td>23</td>
<td>17.7</td>
</tr>
<tr>
<td>25-34</td>
<td>71</td>
<td>54.6</td>
</tr>
<tr>
<td>&gt;35</td>
<td>36</td>
<td>27.7</td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>38</td>
<td>29.2</td>
</tr>
<tr>
<td>Female</td>
<td>92</td>
<td>70.8</td>
</tr>
<tr>
<td><strong>Educational status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>9</td>
<td>6.9</td>
</tr>
<tr>
<td>Below Matric</td>
<td>17</td>
<td>13.1</td>
</tr>
<tr>
<td>Matric and above</td>
<td>68</td>
<td>52.3</td>
</tr>
<tr>
<td>Graduate and above</td>
<td>36</td>
<td>27.7</td>
</tr>
</tbody>
</table>
Table 1 depicts the socio-demographic profile of the parents/caregivers. More than half i.e. 54.6% belonged to 25-34 years of the age group, 27.7% were more than 35 years and 17.7% were in the age group of 15-24 years. Females predominated as 70.8%. Regarding educational and occupational status of the study subjects, 52.3% of them were matric and above and 62.3% were unemployed respectively. Per capita income of 74.6% was less than 10000 and 83.1% belonged to joint family. As far as birth order of the child is concerned, in 59.2% cases it was second or above and in 40.8% it was first child. Among the study subjects mother predominated i.e 55.3%. More subjects i.e. 65.4% were from rural areas.

Table 2: Distribution of knowledge about immunization among parents /caregivers

<table>
<thead>
<tr>
<th>Level of knowledge</th>
<th>Number</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor (score 0-3)</td>
<td>38</td>
<td>29.2</td>
</tr>
<tr>
<td>Average (score 4-6)</td>
<td>83</td>
<td>63.9</td>
</tr>
<tr>
<td>Good (score 7-8)</td>
<td>9</td>
<td>6.9</td>
</tr>
</tbody>
</table>

Table 2 describes that out of 130 respondents, 29.2% of parents/caregivers had poor knowledge, 63.9% had average knowledge and 6.9% had good knowledge about immunization.

Table 3: Association between socio-demographics and knowledge of parents / caregivers

<table>
<thead>
<tr>
<th>Socio demographic variables</th>
<th>Poor N (%)</th>
<th>Average N (%)</th>
<th>Good N (%)</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-35years (n = 94)</td>
<td>24 (25.5)</td>
<td>62 (66.0)</td>
<td>8 (8.5)</td>
<td>Chi sq = 3.062, p = 0.216, Df = 2</td>
</tr>
<tr>
<td>&gt;35years ((n = 36)</td>
<td>14 (38.9)</td>
<td>21 (58.3%)</td>
<td>1 (2.8%)</td>
<td></td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male (n = 38)</td>
<td>13 (34.2)</td>
<td>22 (57.9%)</td>
<td>3 (7.9%)</td>
<td>Chi sq = 0.0827, p = 0.661, Df = 2</td>
</tr>
<tr>
<td>Female (n = 92)</td>
<td>25 (27.2)</td>
<td>61 (66.3%)</td>
<td>6 (6.5%)</td>
<td></td>
</tr>
<tr>
<td><strong>Literacy status</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than Matric (n = 24)</td>
<td>14 (58.3)</td>
<td>10 (41.7%)</td>
<td>0 (0.0%)</td>
<td>Chi sq = 12.834, p = 0.002, Df = 2</td>
</tr>
<tr>
<td>Matric and above (n = 106)</td>
<td>24 (22.6)</td>
<td>73 (68.9%)</td>
<td>9 (8.5%)</td>
<td></td>
</tr>
<tr>
<td><strong>Occupation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employed (n = 49)</td>
<td>13 (26.5%)</td>
<td>33 (67.3%)</td>
<td>3 (6.1%)</td>
<td>Chi sq = 0.420, p = 0.811, Df = 2</td>
</tr>
<tr>
<td>Un employed (n = 81)</td>
<td>25 (30.9%)</td>
<td>50 (61.7%)</td>
<td>6 (7.4%)</td>
<td></td>
</tr>
<tr>
<td><strong>Per capita Income</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 10000 (n = 97)</td>
<td>28 (28.9%)</td>
<td>61 (62.9%)</td>
<td>8 (8.2%)</td>
<td>Chi sq = 1.041, p = 0.594, Df = 2</td>
</tr>
<tr>
<td>More than 10000 (n = 33)</td>
<td>10 (30.3%)</td>
<td>22 (66.7%)</td>
<td>1 (3.0%)</td>
<td></td>
</tr>
</tbody>
</table>
Table 3 Association between socio demographics and knowledge of parents / caregivers

<table>
<thead>
<tr>
<th>Type of family</th>
<th>Joint (n = 108)</th>
<th>Nuclear (n = 22)</th>
<th>Area of residence</th>
<th>Urban (n = 45)</th>
<th>Rural (n = 85)</th>
<th>Birth order</th>
<th>First order (n = 53)</th>
<th>Second or more (n = 77)</th>
<th>Relation</th>
<th>Mother (n = 72)</th>
<th>Father (n = 35)</th>
<th>Grandparents and others (n = 23)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>33(30.6%)</td>
<td>71(65.7%)</td>
<td></td>
<td>12(26.7%)</td>
<td>53(62.4%)</td>
<td></td>
<td>21(39.6%)</td>
<td>17(22.1%)</td>
<td></td>
<td>15(20.8%)</td>
<td>11(31.4%)</td>
<td>12(52.2%)</td>
</tr>
<tr>
<td></td>
<td>71(65.7%)</td>
<td>12(54.5%)</td>
<td></td>
<td>30(66.7%)</td>
<td>53(62.4%)</td>
<td></td>
<td>31(58.5%)</td>
<td>52(67.5%)</td>
<td></td>
<td>54(75.0%)</td>
<td>20(57.1%)</td>
<td>9(39.1%)</td>
</tr>
<tr>
<td></td>
<td>4(3.7%)</td>
<td>5(22.7%)</td>
<td></td>
<td>3(6.7%)</td>
<td>6(7.0%)</td>
<td></td>
<td>1(1.9%)</td>
<td>8(10.4%)</td>
<td></td>
<td>3(4.2%)</td>
<td>4(11.4%)</td>
<td>2(8.7%)</td>
</tr>
</tbody>
</table>

Chi sq = 10.296  
P = 0.006  
Df = 2  
Chi sq = 2.47  
P = 0.884  
Df = 2  
Chi sq = 6.986  
P = 0.030  
Df = 2  
Chi sq = 11.70  
P = 0.020  
Df = 4

*Significant for p < .05; ** Highly significant for p < .01

Perusal of Table 3 depicts that age, sex, occupation, per capita income and area of residence and had no effect on the knowledge of the parent/caregiver where as educational status (p = 0.002), type of family (p = 0.006), birth order of the child (p = 0.030) and relation with the caregiver (p = 0.020) were significantly associated with the knowledge of the parent/caregiver.

Discussion

Analysis of the demographic characteristics (Table 1) of the 130 participants shows that, majority (54.40%) were in the age group 25- 34 years. A study done by Mereena et al showed that a higher percentage (50.3%) of mothers belong to age group 26-30. In another study done by Patil R at Bhopal, majority of parents were between the age group of 25-35 years. Present study also shows that 62.3% of the respondents were unemployed. Similar finding was seen in the study conducted by Mugada et al in 2017.

In our study 83.1% respondents were from the joint family, a study conducted by Panari H and Anuchithra in 2015 and Sinha S et al (2018) to assess the knowledge on immunization among the mothers of under five children also showed that most of them belonged to joint family. Present study revealed that 59.2% children were of birth order second or more, similar birth order is seen by Patil R in their study. In the present study 55.3% of the children were brought to the immunization clinic by their mother, whereas 30.0% were brought by their father, almost 17.7% were being brought by their grandparents/ uncles or aunts. This is in accordance with the study done by Sinha S et al (2018).

As far as knowledge about immunization is concerned (Table 2), present study showed that 29.2% of parents/caregivers had poor knowledge, 63.9% had average knowledge and 6.9% had good knowledge. Similar findings were reported by Jose et al (2013), Vaithilingan S (2017) and Dharmalingam et al (2017) in their studies.

In the present study (Table 3), educational status (p = 0.002), type of family (p = 0.006), birth order (p = 0.030) and relation with the caregiver (p = 0.020) were significantly associated with the knowledge of the parent/caregiver.

In our study, other demographic variables like age, sex, occupation, per capita income and area of residence were not found to be associated with knowledge about immunization. Similar findings were observed by Saraswathi and Lissa et al (2010) in their study showing no association of age, occupation and family income with the knowledge about immunization.
Conclusion

The present study highlighted the knowledge of parents or caregivers on immunization. A better understanding of health issues associated with the immunization constituted a challenge for clinician and researchers. So there is a great lot scope for exploring this area. Research should be conducted to identify the attitude and practice of mothers on immunization. Low literacy level of mothers is a matter of worry. Some of them don’t know about the diseases for which their child is being immunized, so there is a dire need to arrange for health education program sessions for mothers of under five children with main emphasis on importance of vaccination & Vaccine Preventable Diseases (VPDs). Socio-demographic factors had a significant influence on the immunization status. Hence, efforts should be focused on improving them also besides educating them about vaccines to improve their knowledge. TV, newspaper and other Medias can be also promoted as most important sources which can be used for spreading educational messages regarding vaccination. There is need to upgrade knowledge among parents so as to ensure that immunization schedule is followed properly.

Source of Funding: Nil

Conflict of Interest: Nil

References

15. Saraswathi K N and Lissa J. A study to assess the knowledge on selected optional vaccine among mothers of under five children in selected immunization centers at Mysore with view to develop information booklet. A and V Publications 2010; 54:(12-5).
Health is an important issue for nations, who are engaged in economic development. All development activities, whether economic as well as social depend upon the sound mind, health and environment. The economic pressure in the country is the most striking factor that leads to the development of women weavers. Women weavers are endowed with invaluable talent of weaving masterpieces on textiles. Women in rural areas basically take up entrepreneurship to improve their standard of living. Weavers are a person whose job is to weave cloth. Weaving involves using a loom to interlace two sets of threads at right angles to each other. Weaving is a method of textile production in which two distinct sets of Yarns or thread are interlaced at right angles to form a Fabric or cloth. Other method are knitting, crocheting, felting, and braiding. The longitudinal threads are called the warp and the lateral threads are the Weft or filling. The method in which these threads are inter-woven affects the characteristics of the cloth. Weaving can be summarized as a repetition of these three actions, shedding, Picking, Beating Up or battening which are primary motion of the loom, let of motion and take up motion is a secondary motion of the loom and lastly warp and weft is the tertiary motion of loom. The health issue can be one of the barriers to women weavers. The paper is based on primary data were it tries to focus on the health condition of the people and their impact on weaving. The primary data has been collected on the basis of simple random sampling from the district of Lakhimpur in Assam.

Keywords: Health, weavers, shedding, picking, Motion.

Introduction

Health is an important issue for nations, who are engaged in economic development. All development activities, whether economic as well as social depend upon the sound mind, health and environment. The economic pressure in the country is the most striking factor that leads to the development of women weavers. Women weavers are endowed with invaluable talent of weaving masterpieces on textiles. Women in rural areas basically take up entrepreneurship to improve their standard of living. Weavers are a person whose job is to weave cloth. Weaving involves using a loom to interlace two sets of threads at right angles to each other. One of the encouraging steps is the development of women handloom weavers and the artisans. Weaving is a method of textile production in which two distinct sets of Yarns or thread are interlaced at right angles to form a Fabric or cloth. Other method are knitting, crocheting, felting, and braiding. The longitudinal threads are called the warp and the lateral threads are the Weft or filling. The method in which these threads are inter-woven affects the characteristics of the cloth. Weaving can be summarized as a repetition of these three actions, shedding, Picking, Beating Up or battening which are primary motion of the loom, let of motion and take up motion is a secondary motion of the loom and lastly warp and weft is the tertiary motion of loom. The women in Assam have also been gifted with artistry of weaving intricate and mesmerizing design on their looms. As during Mahatma Gandhi Visit in Assam he remarks that, “the women in Assam can weave dreams on their looms.” The preamble of the charter of world health organization defines health as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity”.

With the existence of creativity skill, the women in Assam spends their available time to build the beautiful garments basically for their family and sometime for the business purpose too which help in the creation of a position for herself in the textile market with her artistic skills. Since there is very less research regarding the health condition and artistic skill of the women weavers, the present study tries to focus on the condition of weavers and their health condition in Assam. The paper tries to look on the women in villages of Assam who have desire to weave cloth as their spare time activity and as a income source and to focus on their hindrances.

Objective: Women weavers are blessed with the skill of weaving masterpieces on textiles, this papers...
tries to look on the health as a hindrance that obstruct women weaver’s entry into entrepreneurial activity in villages of Assam.

**Research methodology:** The paper utilizes empirical investigation and interview method with rural women engaged in domestic weaving in addition to bibliographical retrospect. Thus interpretive and empirical approaches form the basis of this study. Merbil, Baligaon, Panigaon, Harmutty(Bagicha), and Bahbari villages that exhibit typical rural characteristics in Lakhimpur district of Assam have been chosen for undertaking the research. These villages are specifically selected as these villages represent a good combination of Bodo, Kachari, Deori and Assamese populations. These women folk are very well known for their textile artistry in Assam. Assamese women in rural settings also practice textile weaving. Thus woman weavers who are engaged in the production of textiles while making the study are taken as the sample for the study.

**Sample Design:** Since health is an important factor for the development of the society as a whole let us take into account the domestic women weavers and their health condition, fifty respondents from fifty households were purposively chosen through convenience sampling technique out of a total of 100 households. The most of the sample were into weaving textiles which is used for domestic purpose as well as accomplish a part for occasional sale but not considering it as a full time occupation. The same respondents belong to the lower age category of 18-35 years, middle age category of 36-45 years and upper age category of above 45 yrs but less than 60 years. From literature studies it has been observed that women especially in rural areas engage in entrepreneurial activities at later age once they are free from domestic responsibilities like taking care of their children, their health and the activities in their home. But, the presence of artistic skills is rooted among women at a very young age. Hence, the lower age limit is set at eighteen years, as this becomes a legal age in India and thereby legal to start an individual enterprise.

**Analysis:** Health is one of the significant factors for up gradation of the economic activities or skill. Women entrepreneurship faces a series of problems especially when they belong to village settings. Women in India are faced with many problems to get ahead their life in business. With respect to women weavers in the selected villages it is astonishing to observe that only 43.3% of the women weavers in surveyed villages weave for occasional sale and 6.7% respectively weave for gifting purposes. But every woman who knows to weave dedicatedly weaves for her family.

According to statistics given below, 77.1% women believe that lack of access to start up finance is a major hurdle in their endeavor. It is seen from the table one that no access to property, difficulty to secure loan due to collateral security and dependence on family members for finance are major obstacles with respect to access to finance.

**Table 1: Hindrances to take up Weaving as an entrepreneurial activity**

<table>
<thead>
<tr>
<th>Hindrances</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of access to finance</td>
<td>Yes 77.1</td>
</tr>
<tr>
<td>Lack of access to raw materials</td>
<td>Yes 81.2</td>
</tr>
<tr>
<td>Lack of access to mechanized tools</td>
<td>Yes 16.5</td>
</tr>
<tr>
<td>Lack of access to Market</td>
<td>Yes 83.6</td>
</tr>
<tr>
<td>Lack of time to be in full-fledged business</td>
<td>Yes 51.3</td>
</tr>
<tr>
<td>Domestic problems</td>
<td>Yes 55.4</td>
</tr>
<tr>
<td>Socio-cultural attitude of the society</td>
<td>Yes 11.6</td>
</tr>
<tr>
<td>Legal formalities in starting up new business</td>
<td>Yes 45.6</td>
</tr>
<tr>
<td>Lack of government assistance</td>
<td>Yes 52.6</td>
</tr>
<tr>
<td>Health related issues like poor eyesight etc.</td>
<td>Yes 51.1</td>
</tr>
</tbody>
</table>

Source: Field Survey

Let us look on the hindrances more elaborately below, with the help of table.

**Table 2: Access to finance as hindrance**

<table>
<thead>
<tr>
<th>Access to Finance</th>
<th>Yes (%)</th>
<th>No (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No access to property</td>
<td>67.1</td>
<td>32.9</td>
</tr>
<tr>
<td>Dependence on husband or other family member</td>
<td>6.1</td>
<td>31.3</td>
</tr>
<tr>
<td>Lack of knowledge about securing loan</td>
<td>59.1</td>
<td>40.9</td>
</tr>
<tr>
<td>Difficulty to secure loan due to collateral security</td>
<td>78.4</td>
<td>21.6</td>
</tr>
<tr>
<td>Bank officials apathy</td>
<td>36.3</td>
<td>63.7</td>
</tr>
<tr>
<td>Tardious process of securing loan</td>
<td>51.9</td>
<td>49.1</td>
</tr>
<tr>
<td>Insufficiency of loan amount</td>
<td>28.9</td>
<td>71.1</td>
</tr>
<tr>
<td>No necessary documents</td>
<td>79.1</td>
<td>20.9</td>
</tr>
<tr>
<td>Loan refunding issue</td>
<td>68.8</td>
<td>31.2</td>
</tr>
</tbody>
</table>

Source: Field Survey

The two major factor concerns for the low assessment of loan facility is loan refunding and lack of documents to avail loan. For few women, loan is something which they never prefer over financial support from family. A respondent retort that:
there is a continual miserable condition for me. Once I have taken money to buy two pigs. [...] they did not survive due to flood. Now I am in debt and still paying for it.

But there are some who are quite ok with the idea of approaching banks for loans and do not mind the process as tedious.

For one respondent, as she exclaimed that: There are certain things have to be compromised if one truly requires loan. I do not mind waiting in queue and beg to officials for loan or for the work to be done.

**Table 3: Availability of raw material as obstacles**

<table>
<thead>
<tr>
<th>Raw material and Infrastructure</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of raw materials limits purchase quantity</td>
<td>81.7</td>
<td>19.3</td>
</tr>
<tr>
<td>Good quality raw material is not available nearby</td>
<td>72.4</td>
<td>27.6</td>
</tr>
<tr>
<td>Dependence on other family members for raw materials purchase</td>
<td>45.8</td>
<td>54.2</td>
</tr>
<tr>
<td>Difficulty to access work shed</td>
<td>39.9</td>
<td>60.1</td>
</tr>
<tr>
<td>Lack of necessary tools for weaving</td>
<td>33.6</td>
<td>66.4</td>
</tr>
<tr>
<td>Old and outdated tools</td>
<td>35.5</td>
<td>64.5</td>
</tr>
</tbody>
</table>

Source: Field Survey

In case of accessibility to raw materials like thread and dyes and infrastructural issues, we can see from the table 1 that 81.2% of respondents believe that lack of access to raw materials is one of the major obstacles in their decision to take weaving as an entrepreneurial activity. The implicit problems with respect to raw material and infrastructural accessibility are presented in Table 3 where we can see that cost and the good quality raw material are the major obstacles.

In the above table we can see that women weavers find difficulty in purchasing raw materials due to high costs. A majority (72.4%) believes that lack of availability of good quality raw materials like variety of yarns and dyes in the nearby market is a problem factor in their pursuit.

**Table 4: Market as obstacles**

<table>
<thead>
<tr>
<th>Market issues</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market is very far</td>
<td>78.6</td>
<td>21.4</td>
</tr>
<tr>
<td>Dependence on others to sell products in nearest market</td>
<td>48.5</td>
<td>51.5</td>
</tr>
<tr>
<td>Lack of knowledge about where to sell</td>
<td>51.6</td>
<td>48.4</td>
</tr>
<tr>
<td>Lack of knowledge about whom to sell</td>
<td>55.1</td>
<td>44.9</td>
</tr>
</tbody>
</table>

Source: Field Survey

As we can see from table 1 that regarding domestic problems only 55.4% women in villages believes that it can be a major issue for them. As compared to literature review that shows lack of support from family as a primary obstacle for women to enter into business, the picture in villages of Assam tells a different story. Table 5 shows that only 40.4% of women agreed that their family will not support them if they desire to start their own weaving business. At the same time, it is also true that women in villages cannot take business decisions on their own as is evident from responses of 58.8% respondents.

**One lower age group respondent said that:** My family always recommends me to have my own business since I am skilled in this work well. Not everyone is gifted with such talent and I must utilize when I know how to weave the cloth. However, I cannot decide what is good or bad on my own and I take guidance of my husband and the family member in every matter.

77.3% women believe that family responsibilities hold first place for them but at the same time they believe that it is not impossible to balance family and work life as stated by 48.5% respondents.

**Table 5: Domestic problem as hindrances**

<table>
<thead>
<tr>
<th>Domestic Problem</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of support from family</td>
<td>40.4</td>
<td>59.6</td>
</tr>
<tr>
<td>Cannot take business decision on own</td>
<td>58.8</td>
<td>41.2</td>
</tr>
<tr>
<td>Family responsibilities come first</td>
<td>77.3</td>
<td>22.7</td>
</tr>
<tr>
<td>Difficulty to balance between family and work life</td>
<td>48.5</td>
<td>51.5</td>
</tr>
<tr>
<td>Taking care of agricultural responsibilities and other menial jobs</td>
<td>69.1</td>
<td>30.9</td>
</tr>
</tbody>
</table>

Source: Field Survey

As we can see from the table 5 that there is some domestic problem in the society, since they have to do some domestic work as well. 77.3 % of respondent consider family responsibility to be their first preference then the weaving or any other activities. A respondent retorts that;
I woke early morning do all my household works [...] and works in night after all sleep.

Many women in the villages face major difficulty to take up weaving as business activity as there are many other responsibilities. Most of the women in villages rear pigs, poultry, etc. alongside agriculture which take away most of their time.

Table 6: Health Related issues as hindrance

<table>
<thead>
<tr>
<th>Health Issues</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eyesight</td>
<td>72.1</td>
<td>27.9</td>
</tr>
<tr>
<td>Lack of accessibility to hospitals</td>
<td>36.1</td>
<td>63.9</td>
</tr>
<tr>
<td>Distance</td>
<td>65.1</td>
<td>34.9</td>
</tr>
<tr>
<td>Lack of Manpower in Hospitals</td>
<td>46.6</td>
<td>53.4</td>
</tr>
</tbody>
</table>

Source: Field Survey

Some of the respondent’s retort that: After working for a longer period there is a problem with the eyesight, there is headache and sometime due to excessive time in weaving there is laziness […] creates some domestic issues.

As we can see from the table 6 that the eyesight problem is one of the important issues among the weavers, it is seen that 72.1 % of women are facing eyesight problem. Similarly, the distance among the people and the health sector were too high as one of the respondent’s retorts that;

I was suffering from fracture in hand and when I went to the hospital after a long distance there was no doctors present in the hospital […]

Conclusion

Weaving is one of the artistic skill presences among the people with increase in hindrances in weaving the weaving sectors are lagging behind. If the health condition of the people is up to mark they are motivated to their work or weaving cloths. A prior importance should be given for the development of the health sector of the people for the development of the economy as a whole.

Women weavers are not averse to the idea of taking up weaving as a full time occupation or enterprising. They have the inner urge or creativity and they want to prove themselves. For the up gradation of women weavers these are few significant factors that should be upgraded i.e. Health issues, finances, raw materials, training, access to markets, etc. to help such women utilize their skills productively. Various studies from time to time has focused on these persisting issues it is imperative to see that their requirements are fulfilled so that these obstacles do not hinder their entrepreneurial pursuit. If such provisions are given to our village women, we could expect more number of talented women weavers joining the commercial activity, and thereby, making the village society prosperous and self-sustainable.

Ethical Clearance: It is a review article.

Source of Fund: Self.

Conflict of Interest: Nil

References
7. Rao V, Venkatachalm A, Joshi HG. Challenges faced by women entrepreneurs running micro, small and medium scale fashion and apparel business: a study on fashion and apparel enterprises in Coastal Karnataka.
Temporal Processing Ability in Normal Hearing Participants with Type-II Diabetes

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Abstract

Introduction: The literature provides a clear evidence of involvement of auditory system from peripheral auditory system to auditory cortex in individuals with Type-II diabetes. Speech perception in noise, along with auditory brain stem responses (ABR) and otoacoustic emissions have been found to be affected in these individuals. The speech perception ability is affected in these individuals which can be associated with central auditory processing ability. There is a need to understand central processing ability involvement. Hence aim of the present study was to explore the effect of Type-II diabetes on temporal processing abilities like modulation detection and gap detection thresholds.

Method: The research was carried out on 40 participants, between the age ranges of 28 – 60 years, who were diagnosed as having Type-II diabetes since 5 years and compared to control age and gender matched participants without diabetes.

Results: Independent t-test was applied to assess the statistical significance between both the groups. The results reveal that the group of participants without diabetes performed better than the group of participants with type-II diabetes.

Conclusions: There is an involvement of central auditory processing ability on task of modulation detection and gap detection in participants with type-II diabetes.

Keywords: Temporal modulation transfer function, Gap detection, Diabetes.

Introduction

India is one among those nations which has the maximum proportion of individuals having diabetes, being designated the “Diabetes capital of the world”(1). American Diabetes Association (2011) has broadly identified Type I and Type II varieties of Diabetes Mellitus. In Type I diabetes, little or no insulin is produced owing to the destruction of the cells that produce insulin in the pancreas, which is not preventable(2). Type-II diabetes is the most common type, with more than 90% of all diabetes in the world and is generally due to excessive body weight and lack of physical activity. People with this type of diabetes produce too little insulin or the insulin they produce is of no use because their body has become resistant to insulin. These hormones regulate blood sugar in body and irregularity in production of these hormones can lead to uncontrolled diabetes, over time causing serious damage to nerves and blood vessels. Our entire auditory system is highly dependent on blood supply specially the cochlear portion. The type-II diabetes has an impact on auditory system also, both at peripheral as well as central auditory pathway. The auditory evoked brainstem response is reported to be affected in individuals with Type-II diabetes(3-6). It has been reported that individuals with Type-II diabetes
possess difficulty in perceiving speech during adverse listening conditions(7). Individuals with Type-II diabetes have also been found to exhibit reduced temporal processing abilities along with the high frequency hearing loss(8).

**Need for the study:** The literature provides a clear evidence regarding involvement of auditory system from peripheral auditory system to auditory cortex in individuals with Type-II diabetes. Speech perception in noise, along with auditory brain stem responses (ABR) and otoacoustic emissions have been found to be affected in these individuals. The central processing issue needs to be explored more as speech perception ability depends on central processing ability. Sometimes in the absence of peripheral hearing loss, there may be impact on central hearing in individuals with Type-II diabetes, owing to the damage of the nerve cells. The central auditory processing ability through temporal modulation transfer function and gap detection can shed light on better understanding about involvement of central auditory processing ability. The speech perception is important for communication, especially in adverse listening conditions and it determines the quality of life. Hence, this study intends to study central auditory processing abilities among those individuals with Type-II diabetes who have normal peripheral hearing. The auditory processing abilities in present context include performance of the participants on two tasks i.e. gap detection threshold (GDT) and modulation detection threshold (TMTF) respectively.

**Aim and objectives of the study:** The aim of the present study was to explore the effect of Type-II diabetes on temporal processing abilities like modulation detection and gap detection thresholds. The primary objective of the research was to estimate the difference in the performance of individuals with and without Type-II diabetes on the given two tasks of temporal processing. Furthermore, the research also explored the correlation between the task performances on the two given tasks with the duration of the diabetes among the individuals with Type-II diabetes.

**Method**

**Participants:** The research was carried out on 40 individuals, between the age ranges of 28 – 60 years (Mean- 44 years, SD- 5.3 years), who were diagnosed as having Type-II diabetes (Group 1) since Sticky Note. Their performance was compared to control group (Group 2) which consisted of 40 age and gender matched participants without diabetes as screened by Canadian Diabetes screening checklist (CAN RISK)(9). The hearing sensitivity of all the participants was found to be within 25 dB HL for air conduction and bone conduction at octave frequencies ranging from 250Hz – 8 kHz and 250Hz – 4 kHz respectively, with an air bone gap of 10 dB or less. Further, participants with normal middle ear function and minimum score of 25 on Mini Mental Status Examination were considered for the study(10).

**Procedure:** The procedure of the entire study was carried out across two steps. The first step involved assessment of the eligibility criteria of the participants followed by their evaluation of temporal processing abilities. All the participants underwent TMTF and GDT for the assessment of temporal processing skills.

**TMTF:** In this task, a participant is expected to detect the sinusoidal amplitude modulation in a broadband noise depending upon the depth and rate of stimulus modulation. In the present study, sinusoidal amplitude modulated stimulus was presented at the modulation rate of 8Hz, 20Hz, 60Hz and 200Hz with two alternative force choice, by using staircase procedures to track threshold. Presentation of the stimuli was binaural. In Simple Up-Down or Staircase Method, the stimulus intensity is increased every time a participant fails to respond to the stimulus and is decreased when the participant responds(11). Temporal discrimination or resolution is the shortest time needed to discriminate between two auditory signals. TMTF is the ability to detect amplitude modulation in a sound, generally measured by having the participants indicate whenever a silent interval embedded is heard in a noise burst. In present research, the carrier was given in two consecutive intervals with silent intervals of 200ms, sinusoidally amplitude modulated in randomly chosen interval. As the threshold run was in progress, the modulation depth in dB (20 log m), was attuned by a 1 down 1-up rule. Step size was 31.5 with 48 reversals. Participants were given 3-4 practice trails before the commencement of each test.

**GDT:** White band noise was used to find out the auditory acuity of the participants. The Noise consisted of 0.5 msec cosine ramps at the beginning and end of the gap which was presented for a duration of 500 msec. Rephrase this sentence to “Inter stimulus duration was 500 ms and duration of gap was changed at step size of 2ms in the beginning, while step size was reduced...
to 1.41421 ms near threshold. Two interval alternative forced choice task was used for estimating threshold. Inter stimulus duration was 1500 msec with varied gap changes of 2 1.41421 msec step size in two interval alternative forced choice task in simple staircase method.

**Statistical Analysis:** The scores of the participants of both the groups across the two tasks were tabulated and subjected to statistical analysis using the SPSS 15.0 version. Independent t-test was administered to evaluate the existence of difference between the performance of both the groups across TMTF and GDT. The relation of duration of diabetes with the performance on both the tasks, among the Group 1 was evaluated by using the Pearson’s correlation.

**Results**

**Modulation Detection Threshold:** The TMTF was performed across four modulation frequencies i.e. 8Hz, 20Hz, 60Hz, and 200Hz for both the groups. The results revealed that the group of participants without diabetes performed better than the group of participants with type-II diabetes for all four modulation frequencies which means that the participants with type-II diabetes had poor ability on modulation detection ability. Independent t-test revealed statistically significant difference between the two groups across all the four modulation frequencies [8Hz-\(t(78)=3.20, p=0.002\); 20Hz, \(t(78)=3.87, p<0.001\); 60 Hz, \(t(78)=4.49, p<0.001\); 200Hz, \(t(78)=5.87, p<0.001\)]. The Figure 1 describes the mean and one standard deviation values obtained by participants of both the groups for TMTF tasks in dB.

![Fig 1: Mean and standard deviation of TMTF values of participants with and without diabetes](image)

The participants without type-II diabetes surpassed the participants with type-II diabetes i.e., participants with type-II diabetes had poor ability on gap detection and took longer time than the non-diabetes participants. Independent t-test revealed a statistically significant difference between the two groups [\(t(78)=3.08, p=0.003\)]. The Figure 2 describes the mean along with standard deviation values obtained by participants of both the groups for GDT tasks in msec.
Fig 2: Mean with standard deviation of GDT values for participants with and without diabetes

Effect of age of diabetes on TMTF and GDT scores: To understand, if there exist any significant correlation of the duration of diabetes with TMTF and GDT scores for participants with diabetes, the Pearson’s correlation coefficient was performed. In Table 1, the correlation of the duration of diabetes with TMTF and GDT have been depicted.

Table 1: Showing the Correlation between the duration of diabetes and test variables

<table>
<thead>
<tr>
<th>Parameter</th>
<th>R value</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>TMTF8Hz- Duration of diabetes</td>
<td>0.091</td>
<td>0.571</td>
</tr>
<tr>
<td>TMTF20Hz- Duration of diabetes</td>
<td>0.176</td>
<td>0.272</td>
</tr>
<tr>
<td>TMTF60Hz- Duration of diabetes</td>
<td>0.220</td>
<td>0.166</td>
</tr>
<tr>
<td>TMTF200Hz- Duration of diabetes</td>
<td>0.113</td>
<td>0.480</td>
</tr>
<tr>
<td>GDT-Duration of diabetes</td>
<td>0.392</td>
<td>0.011</td>
</tr>
</tbody>
</table>

The correlation coefficient correlation value disclosed that the duration of diabetes positively correlated with both the tasks. However, it reached a level of statistical significance for the GDT task only, than the performance on TMTF task.

Discussion

The presence of significant differences between the performance of participants from group 1 and the group 2 on both TMTF and GDT tasks suggests that the type-II diabetes group had a substantial influence on the temporal processing abilities compared to the group without diabetes who demonstrated greater ability. This finding indicates that though the peripheral hearing ability is within normal limits, the central auditory processing ability was affected. Hence, it can be inferred that individuals with Type-II diabetes may have auditory processing difficulty in spite of peripheral hearing being within normal limits. The auditory processing difficulty in present study, we attribute to Type-II diabetes as it is known to cause serious damage to nerves and blood vessels. These results are in line with the earlier observation where TMTF was affected among individuals having Type-II diabetes, who possess high frequency hearing loss\(^8\). The evidence from other study have also noted that there is presence of subclinical hearing loss along with deviant auditory brainstem responses among individuals with Type-II diabetes\(^3\)\(^-\)\(^6\). Speech perception abilities being significantly affected in individuals with Type-II diabetes with normal hearing is reported in previous research as well\(^7\).

Though all the participants had type-II diabetes for more than 5 years in this study, a significant correlation was witnessed between their duration of diabetes and performance on various tasks. With the increase in the years of having diabetes, affected individuals exhibited lower performance on both the TMTF and GDT tasks, respectively. This could be attributed to the age linked increase in impact of Type-II diabetes on structural aspects of the central nervous system, the auditory processing and cognitive influences.

Conclusion

The present study’s results conclude that participants with type-II diabetes exhibit significant deficits in the
temporal processing abilities and gap detection abilities in spite of peripheral hearing abilities being normal. Further, there is an association amongst the duration of diabetes and the deterioration in performance on the temporal processing tasks. Hence it can be concluded that there is an involvement of central auditory processing ability on task of modulation detection and gap detection in participants with diabetes.

**Conflict of Interest:** The authors of the present research disclose no conflict of interest.

**Funding:** The present research received no funding.

**Ethical Clearance:** The present research was cleared by the Institutional ethics committee of KMC, Mangalore.

**References**


Impact of Dividend Announcement on Stock Returns and Market Efficiency in India

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Abstract

The announcement of dividend can be seen in two perspectives: if the dividend that is announced is up to expectations of shareholders, the market price of the shares will be positively affected. Whereas, if the dividend that is announced is not up to expectations of the equity investors, the market price of the shares will be negatively affected. Market efficiency is defined as the amount of time it takes for the stock market to react to announced public information. Finally, when a market is strong-form efficient, investors are unable to earn above normal returns by relying on both public and private information. This research is an attempt to find out the relationship between dividend announcement and the market efficiency. This paper explores the market reaction to dividend announcements of BSE SENSEX stocks for the period 2014-2017 using Event study methodology.

Keywords: Dividend announcement, Market Efficiency, Abnormal Return, Event study.

Introduction

Investment means commitment of funds or money to gain a return. However, this commitment of capital also has a price in terms of blocking of money and that too with a risk of losing it. The concept is applied while investing in common stock in a more precise manner. Stocks are more volatile and risky than debt securities. Before investing into common stock, an investor should keep three factors in mind nature of business, quality of management and price to be paid. These three factors will help together to decide the proportion and time of investment. In addition to these factors there are so many points to be considered before an investor finally takes a decision to invest in a particular security. These factors can be knowledge of share market, trading at stock exchanges, risk and return analysis, dividend expectations, news announcements especially dividend announcements. When a corporation earns a profit or surplus that can be put to two uses: it can either be re-invested in the business or it can be paid to the shareholders as a dividend. Many corporations retain a portion of their earnings and pay the remainder as dividend. The variation in the stock prices would be more if dividend policy is frequently changed. It happens due to the frequent reactions of investors in lieu of announcements at stock exchanges by the companies.

Market efficiency depends on the ability of traders to devote time and resources to gathering and disseminating information. Markets that are more efficient attract more investors, which translate into increased market liquidity (Osei, 1998)6. Investors care about market efficiency because stock price movements affect their wealth. More generally, stock market efficiency may affect consumption and investment spending and therefore influence the overall performance of the economy. This study is an attempt to examine the stock price reaction to dividend announcements by 30 companies listed on BSE SENSEX during the period 2014-2017.

Review of Literature: Balachandran Balasingham (2001)3 examined the share price reaction to announcement of bonus share issues of Australian companies. They found that the magnitude of price
reaction to bonus issue announcements is statistically related to the size of bonus issues and pre-announcement effect.

Vandana Gupta (2003)\textsuperscript{[14]} in a study involving a sample of 145 bonus issues examined the announcement effects of bonus issues on equity share prices in India and concluded that the Indian Stock market was efficient in its semi-strong form.

Budhraja et al. (2004)\textsuperscript{[4]} in their study on BSE suggested that abnormal returns in stock prices around the bonus issue announcement data, over three day trading period starting one day before the announcement is significant at 95 per cent confidence level.

Mishra (2005)\textsuperscript{[10]} examined the reaction of the stock price to the information content of bonus issues and found that the stock starts showing positive abnormal returns eight to nine days before the announcement date. This could be due to the leakage of the informational content. This paper lends support to the hypothesis that Indian stock market is efficient in its semi-strong form.

Madhuri Malhotra et al. (2007)\textsuperscript{[8]} in their study has examined the share price reaction to the announcement of bonus issue for a sample of Indian companies. Bonus issue announcement yielded negative abnormal returns around the announcement date. There is a negative reaction after the bonus issue announcement conveying that the market underreacts after the announcement. It was also observed that there is no information leakage prior to the announcement.

Olatundun Janet Adelegan (2009)\textsuperscript{[2]} assessed the speed with which share prices adjust to the information contained in dividend announcements in the Nigerian stock market and to investigate market reactions to announced changes in dividend policies by Nigerian companies and determine whether there is no overreaction or a drift. The study revealed that the mean excess returns are generally negative for all the dividend omission subsamples both before and after the date of announcement, but positive after the announcement date.

Muhammad Aamir and Syed Zulfiqar Ali Shah (2011)\textsuperscript{[1]} study dividend announcement and the abnormal returns for the event firm and its rivals. The study found that there were some firms whose abnormal return were negative on the dividend announcement date but became positive immediately after the dividend announcement date. There were some other companies, whose abnormal returns were positive on the dividend announcement date and some days before and after the announcement date. There are instances of dividend announcement day return was negative but it was positive before and after the dividend announcement date. Overall results indicate that impact of dividend on dividend announcement date and few days after were positive. These results confirm the theoretical background regarding the impact of dividend on the stock prices.

Suwanna and Thanwarat (2012)\textsuperscript{[13]} study result indicates that the stock prices move upward significantly after dividend announcements. Abnormal return (AR) and cumulative abnormal return (CAR) from the market model are statistically significantly revealed. The results confirm dividend signaling theory as the dividend announcements have significant impact on share prices.

Pradhan and Subhendu (2014)\textsuperscript{[11]} examined that there is a rise price after result but that rise in price is mainly due to market conditions rather than dividend. The increase or decrease in share price is not reflecting the amount of dividend. The CAR is positive in the long run after dividend announcement.

Rosario et al. (2016)\textsuperscript{[12]} findings show that there is an increase in the share price and has resulted in positive average abnormal return especially in the post dividend declaration period in Oman context.

**Objectives of the Study:**

1. To investigate the stock market reaction to dividend announcements.
2. To test the market efficiency with the announcement of dividend by a company.
3. To examine the excess or abnormal return that the shareholders expect at the time of dividend announcements.

**Hypotheses of the Study:**

\(H_1:\) There is no statistically significant difference in the response of stock price to dividend announcements.

\(H_2:\) Indian stock market is inefficient.

**Methodology:** This paper focuses on the relationship between the stock prices reactions to dividend announcement by selected companies. For this purpose, secondary data were collected from BSE SENSEX which has increased dividends during 2014-2017. The data has been taken from the website of www.bseindia.
com and the Economic Times. As per the methodology a common event with different dates has been applied. The common event is the firm’s announcement of dividend. The event period is created taking the public announcement day as benchmark or day “0” 15 days prior to the public announcement date and 15 days after the date are taken into consideration. So the event period is of 31 days starts with -15th day and end with +15th days. These 31 days are referred as event period.

Daily abnormal returns for the security ‘i’ from 15 days before to 15 days after the dividend announcement has been computed as follows:

\[ AR_{i,t} = R_{i,t} - E(R_{i,t}) \] (1)

where,

\[ t = \text{day measured relative to dividend increase announcement day} \]

\[ AR_{i,t} = \text{abnormal return on security ‘i’ for day ‘t’} \]

\[ R_{i,t} = \text{raw return on security ‘i’ for day ‘t’ which was calculated as:} \]

\[ R_{i,t} = \frac{MP_{i,t} - MP_{i(t-1)}}{MP_{i,t}} \]

where,

\[ MP_{i,t} = \text{market price on security ‘i’ for day ‘t’} \]

\[ MP_{i(t-1)} = \text{market price on security ‘i’ for day ‘t-1’} \]

\[ E(R_{i,t}) = \text{expected return on security ‘i’ during day ‘t’ which has been estimated through market model using BSE SENSEX as follows} \]

\[ E(R_{i,t}) = \alpha_i + \beta_i * R_m - \varepsilon_i \] (2)

Where \( \alpha_i \) and \( \beta_i \) are the parameters of market model,

\( R_m = \text{Return to the market (BSE SENSEX)} \]

\( \varepsilon_i = \text{abnormal return} \)

Average abnormal return has been calculated as:

\[ AR_{t} = \sum \frac{r_{it}}{N} \] (3)

where

\( AR_{t} = \text{Average abnormal returns} \)

\( N = \text{Number of securities with abnormal returns during day ‘t’} \)

The cumulative average abnormal returns (CAR) of dividend announcement by summation of the average abnormal returns (\( AR_t \)) in the respective window.

\[ CAR = \sum_{t=-15}^{15} AR_t \] (4)

For the purpose of study, the stock prices of 30 companies are taken. The list of sample companies is displayed in Table 1.

### Table 1: List of Sample Companies

<table>
<thead>
<tr>
<th>S.No</th>
<th>Name of the Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Adani Ports &amp; SEZ</td>
</tr>
<tr>
<td>2</td>
<td>Asian Paints</td>
</tr>
<tr>
<td>3</td>
<td>Axis Bank</td>
</tr>
<tr>
<td>4</td>
<td>Bajaj Auto</td>
</tr>
<tr>
<td>5</td>
<td>Bharathi Airtel</td>
</tr>
<tr>
<td>6</td>
<td>Coal India</td>
</tr>
<tr>
<td>7</td>
<td>Dr. Reddy’s Laboratories</td>
</tr>
<tr>
<td>8</td>
<td>HDFC Bank</td>
</tr>
<tr>
<td>9</td>
<td>Hero Motor Corporation</td>
</tr>
<tr>
<td>10</td>
<td>HUL</td>
</tr>
<tr>
<td>11</td>
<td>Housing Development Finance Corporation</td>
</tr>
<tr>
<td>12</td>
<td>ICICI Bank</td>
</tr>
<tr>
<td>13</td>
<td>IndusInd Bank</td>
</tr>
<tr>
<td>14</td>
<td>Infosys</td>
</tr>
<tr>
<td>15</td>
<td>ITC</td>
</tr>
<tr>
<td>16</td>
<td>Kotak Mahindra Bank</td>
</tr>
<tr>
<td>17</td>
<td>L &amp; T</td>
</tr>
<tr>
<td>18</td>
<td>Mahindra and Mahindra</td>
</tr>
<tr>
<td>19</td>
<td>Maruti Suzuki</td>
</tr>
<tr>
<td>20</td>
<td>NTPC</td>
</tr>
<tr>
<td>21</td>
<td>ONGC</td>
</tr>
<tr>
<td>22</td>
<td>Power Grid Corporation of India</td>
</tr>
<tr>
<td>23</td>
<td>Reliance Industries</td>
</tr>
<tr>
<td>24</td>
<td>SBI</td>
</tr>
<tr>
<td>25</td>
<td>Sun Pharmaceuticals</td>
</tr>
<tr>
<td>26</td>
<td>TCS</td>
</tr>
<tr>
<td>27</td>
<td>TATA Motors</td>
</tr>
<tr>
<td>28</td>
<td>TATA Steel</td>
</tr>
<tr>
<td>29</td>
<td>WIPRO</td>
</tr>
<tr>
<td>30</td>
<td>YES Bank</td>
</tr>
</tbody>
</table>

Source: BSE SENSEX

### Results and Discussions

For testing the market efficiency, in this study cumulative annual return (CAR) of all the thirty companies are computed. For computation of CAR, we need to first compute the average abnormal return (AR).
Table 2: AR and CAR of Sample Companies

<table>
<thead>
<tr>
<th>Days</th>
<th>AR</th>
<th>CAR</th>
<th>t(AR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-15</td>
<td>-0.0104</td>
<td>-0.0104</td>
<td>-0.142</td>
</tr>
<tr>
<td>-14</td>
<td>-0.0331</td>
<td>-0.0435</td>
<td>-0.36</td>
</tr>
<tr>
<td>-13</td>
<td>0.0034</td>
<td>-0.0297</td>
<td>0.026</td>
</tr>
<tr>
<td>-12</td>
<td>0.0026</td>
<td>0.006</td>
<td>0.112</td>
</tr>
<tr>
<td>-11</td>
<td>-0.0002</td>
<td>0.0024</td>
<td>-0.021</td>
</tr>
<tr>
<td>-10</td>
<td>0.0011</td>
<td>0.0009</td>
<td>0.022</td>
</tr>
<tr>
<td>-9</td>
<td>0.0009</td>
<td>0.002</td>
<td>0.008</td>
</tr>
<tr>
<td>-8</td>
<td>-0.0015</td>
<td>-0.0006</td>
<td>-0.078</td>
</tr>
<tr>
<td>-7</td>
<td>-0.0049</td>
<td>-0.0064</td>
<td>-0.393</td>
</tr>
<tr>
<td>-6</td>
<td>-0.0028</td>
<td>-0.0077</td>
<td>-0.087</td>
</tr>
<tr>
<td>-5</td>
<td>0.0021</td>
<td>-0.0007</td>
<td>0.3</td>
</tr>
<tr>
<td>-4</td>
<td>-0.0051</td>
<td>-0.003</td>
<td>-0.067</td>
</tr>
<tr>
<td>-3</td>
<td>0.1048</td>
<td>2.387</td>
<td>1.072</td>
</tr>
<tr>
<td>-2</td>
<td>0.0006</td>
<td>-0.0003</td>
<td>0.653</td>
</tr>
<tr>
<td>-1</td>
<td>0.5742</td>
<td>3.7636</td>
<td>2.085</td>
</tr>
<tr>
<td>0</td>
<td>0.1837</td>
<td>2.6402</td>
<td>1.673</td>
</tr>
<tr>
<td>1</td>
<td>0.0064</td>
<td>0.0141</td>
<td>0.026</td>
</tr>
<tr>
<td>2</td>
<td>-0.0051</td>
<td>0.0013</td>
<td>-0.054</td>
</tr>
<tr>
<td>3</td>
<td>0.008</td>
<td>0.0029</td>
<td>0.76</td>
</tr>
<tr>
<td>4</td>
<td>-0.0055</td>
<td>0.0025</td>
<td>-0.052</td>
</tr>
<tr>
<td>5</td>
<td>-0.0419</td>
<td>-0.0474</td>
<td>-0.393</td>
</tr>
<tr>
<td>6</td>
<td>0.0079</td>
<td>3.055</td>
<td>1.093</td>
</tr>
<tr>
<td>7</td>
<td>-0.0003</td>
<td>0.0076</td>
<td>-0.563</td>
</tr>
<tr>
<td>8</td>
<td>0.0022</td>
<td>0.0019</td>
<td>0.294</td>
</tr>
<tr>
<td>9</td>
<td>-0.0012</td>
<td>0.001</td>
<td>-0.321</td>
</tr>
<tr>
<td>10</td>
<td>0.0009</td>
<td>-0.0003</td>
<td>0.43</td>
</tr>
<tr>
<td>11</td>
<td>-0.0005</td>
<td>0.0004</td>
<td>-0.112</td>
</tr>
<tr>
<td>12</td>
<td>0.0035</td>
<td>0.003</td>
<td>1.093</td>
</tr>
<tr>
<td>13</td>
<td>0.5875</td>
<td>7.041</td>
<td>3.422</td>
</tr>
<tr>
<td>14</td>
<td>-0.0025</td>
<td>-0.0019</td>
<td>-0.087</td>
</tr>
<tr>
<td>15</td>
<td>0.0027</td>
<td>0.0002</td>
<td>0.367</td>
</tr>
</tbody>
</table>

Source: Estimated values, *Significant at 10% level, ** Significant at 5% level, ***Significant at 1% level

The results of the table 2 shows that the market reacts positively to the increasing dividend as the investors considered the increasing dividend as positive signal of future optimum earning. Meanwhile, the signaling cannot be applied to the decreasing period where there is significant positive AR reflected by market during the days -1 and +1 in parallel with Yip (2010)\textsuperscript{[15]}. The positive significant changes for AR in the day -1 might reveals a leakage of information in a short period before the official announcement and it can be considered as a short-term reaction linked to the event after the announcement (Kothari, et al., 2006\textsuperscript{[7]}). The market reaction in Indian stock market is complete within a day. This result suggest that the Indian stock market responds quickly and efficiently to the corporate news about dividend announcement. The null hypotheses H_1 there is no statistically significant difference in the response of stock price to dividend announcements has been rejected. The results are in line with the developed markets Gurgul et al, 2003\textsuperscript{[5]}; McClusky et al, 2006\textsuperscript{[9]}.

Table 3 shows that CAR values are significant for event windows (-15, 0), (-10, 0), (-5, 0), (-2, 0) at 1% level of significance and at 5% level of significance for (-15, +15) event window. It can be confirmed that the market addressed positive abnormal returns on days -1, 0 and +1. CAR value is 1.009 on the 15\textsuperscript{th} day of trading, which means that stock market was inefficient over that time period. This results in the acceptance of null hypotheses H_2 that the Indian stock market is inefficient.

Figure 1: Average Abnormal Returns of Sample Companies
Figure 2: Cumulative Abnormal Returns of Sample Companies

The figure 1 indicates that AR does not vary significantly. It is very clear that the AR curve follows almost a linear pattern with very negligible deviation. This means, that dividend declaration does not have much impact on average abnormal return.

In figure 2, the CAR presented 15 days before the declaration of dividend was quite lower and it got much impact day on day basis after declaration of dividend. CAR has been decreasing in the pre-announcement and post-announcement period.

Conclusion

Dividends are payments made by a corporation to its shareholder members. It is the portion of corporate profits paid out to stockholders. When a corporation earns a profit or surplus, that money can be put to two uses: it can either be re-invested in the business or it can be paid to the shareholders as a dividend. It increases wealth maximization of shareholders. This study indicates that investors do benefit from dividend announcement over the 31 period of days. After declaration of dividend the market shows inefficiency and that does not affect the stockholders.

The positive impact of dividend increase has been reflected in the Indian stock market. Findings also reveal that dividend signals good news to cause large price movements than those involving bad news. This suggests that bad news may be discounted long before the dividend announcement.

Ethical Clearance: Not Applicable

Source of Funding: Self

Conflict of Interest: Nil

References


A New Ensemble Approach to Predict Breast Cancer

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Abstract

The primary objective of using a variety of Data mining techniques in health care domain is to construct a useful model that can effectively interpret the data from a cluster of medical datasets. To reveal the hidden pattern in data, Data Mining techniques and algorithms rely on a wide variety of machine learning techniques. Classification along with prediction techniques play an essential role in medical decision making. This type of knowledge-based system can aid doctors in predicting the disease accurately. The main objective of this paper is to create an ensemble of classification algorithms to classify the cancer data set with higher classification accuracy when compared with the existing classification algorithms available in the literature.

Keywords: Data mining, Classification, Ensemble Learning, Bagging, Boosting.

Introduction

Data mining is the cognitive process of divulging exciting patterns and knowledge from a huge quantity of data. All the tools and techniques used for retrieving the interesting relationships in large amounts of data come under the umbrella of data mining.¹

Classification and Prediction are the two prominent data mining techniques that play a vital role in the health care domain. Classification also is known as categorization and used to classify or place the known data in one of the preexisting classes with the help of various learning rules. If the classification model is used to prognosticate the class for new data, it would be a prediction. For effective disease prediction, physicians make use of a variety of expert systems trained by machine learning techniques.

These techniques can be broadly classified into three different categories namely supervised learning, unsupervised learning, and semi-supervised learning. Supervised learning techniques build models for relegating succeeding events according to the historical information. A wide variety of models developed using supervised machine learning techniques are available in the literature. One of the challenging tasks to the researchers is to identify an appropriate technique for constructing and implementing an efficient expert system for disease diagnosis.

Breast cancer is considered to be the second common non-skin cancer. In India, breast cancer ranks as the number one cancer among Indian females. Cancer affects nearly 1% of the female population. The medical community faces deterrence in developing guide-lines for cancer prediction due to the absence of even a single identifiable cause for this disease. Findings of the recent research, reports that 90% of patients with cancer had related symptoms long before they were diagnosed. The proposed ensemble model acts as an efficient classifier than the existing system. Boosting ensemble approach gives an accuracy of 94.13% with Naive Bayes, 95.07% with K-Nearest Neighbor (KNN) and 99.06% with Multi-Layered Perceptron (MLP).

Literature Review: A hybrid knowledge-based system that employs various machine learning techniques for diseases prediction was proposed. Disease prediction is done in this system with the use of fuzzy rules.² Fuzzy rules were generated using the regression tree algorithm. EM algorithm was used for data clustering and for dimensionality reduction PCA was used. Several
experiments were conducted to evaluate the efficiency of the proposed system on various data sets like Wisconsin Diagnostic Breast Cancer and Pima Indian Diabetes. Parkinson’s telemonitoring dataset was used for validation purpose. Experimental results indicate that this integrated approach results in higher accuracy in disease prediction. The data sets used in the experiments are with known input and output parameters.

Humans with excessive glucose are said to be diabetic. According to a survey, about 415 million people in the world are said to be diabetic. The number is expected to rise to 642 million people by 2040. Still 46% of the people with diabetic are unrecognized. Most of the classification algorithms used for diabetic prediction relies on the traditional approaches namely linear discriminant analysis (LDA), quadratic discriminant analysis (QDA), and Naive Bayes (NB). Gaussian process (GP)-based classification technique was used for diabetic prediction. This process uses three different kernels namely radial basis, linear and polynomial. [3] Accuracy, sensitivity, specificity, negative predictive value, positive predictive value, and receiver-operating characteristic were the parameters used to evaluate the accuracy of the Gaussian process. Pima Indian Diabetic data set was used as input to the proposed system. From the experimental results, it is evident that the proposed system results in higher accuracy than the traditional approaches.

A new expert system for efficient classification of breast cancer disease was proposed. Clustering plays a vital role in increasing the accuracy of any disease prediction system. Expectation Maximization (EM) is used to group data in the experimental data set. Regression Trees were used to generate fuzzy rules from the data set. [4] To defeat the multi-collinearity issue in the data, the dimensionality reduction technique was utilized using Principal Component Analysis (PCA).

An online tool named HPBCR (a hybrid predictor of breast cancer recurrence) was proposed to predict breast cancer in an efficient manner. Authors have analyzed the characteristics of 579 breast cancer patients and identified the essential features using statistical feature selection method. [5] These features were further refined using Particle Swarm Optimization algorithm. 4-fold cross-validation technique was used to measure the accuracy of the proposed system. From the experimental results, it is evident that the performance of HPBCR was higher than the other tested classifiers.

The objective of this work is to find the best combination of classifiers which is suitable for a heterogeneous collection of data sets related to heart disease. Subsequently, six classifiers namely Bayesian Net, Naive Bayes, Support Vector Machine, Neural Network, C4.5, and FDT are used to predict heart diseases. [6]

A framework is created for Heart disease prediction by utilizing a Naive Bayesian Order strategy. The framework extricates concealed information from an authentic coronary illness database. From the experimental results, it is found that this model is the best one to anticipate patients with coronary illness. This model is capable of answering complex inquiries, each with its very own requirements without any difficulty of model elucidation. [7]

A novel neuro fuzzy strategy is built to analyze the reality of the illness from the patient report. A summed up database is built for basic decision making from the diminished traits set, which is a yield of genetic algorithm. A four layered fuzzy neural system for proficient demonstrating and dissuading fleeting conditions under vulnerability is utilized. [8]

**Proposed System:** The objective of our proposed work is to construct an ensemble with Multi-Layered Perceptron, Naïve-Bayes, and K-nearest neighbour algorithms. Here we have given Wisconsin dataset as an input to all the three classification algorithms. Then ensemble method like Bagging and Boosting are applied to these algorithms.

**Results and Discussion**

For experimental purpose, we have used Wisconsin dataset. It has 683 instances and 9 attributes namely sample code number, clump Thickness, Uniformity of cell shape, Uniformity of cell size, Marginal adhesion, Singe epithelial cell size, Bare nuclei, Bland chromatin, normal nucleoli, Mitosis. From the Table 1, it can be inferred that boosting ensemble with Multi-Layered Perceptron method results in higher accuracy.

<table>
<thead>
<tr>
<th>S.No</th>
<th>Algorithm</th>
<th>Without Ensemble</th>
<th>Ensemble with Bagging</th>
<th>Ensemble with Boosting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>KNN</td>
<td>92.98</td>
<td>94.60</td>
<td>95.07</td>
</tr>
<tr>
<td>2</td>
<td>MLP</td>
<td>96.72</td>
<td>98.83</td>
<td>99.06</td>
</tr>
<tr>
<td>3</td>
<td>NAIVE BAYES</td>
<td>91.67</td>
<td>93.66</td>
<td>94.13</td>
</tr>
</tbody>
</table>
**Conclusion**

Cancer is a disease in which cells separate in an uncontrolled manner and ruin body tissue. Breast cancer is one type of cancer that forms in the cells of the breasts. Breast cancer is considered to be the most common type of cancer in women. 2 million new cases were reported in the year 2018. The suggested ensemble can render promising results in breast cancer prediction. Our approach has used Boosting and Bagging ensemble techniques with Multi-Layered Perceptron, Naïve-Bayes and K nearest neighbour algorithms which result in the precise prediction of breast cancer. We can understand from the experimental results that Multi-Layered Perceptron with boosting is the best ensemble technique for cancer prediction.

**Ethical Clearance:** Not required.

**Source of Funding:** Self

**Conflict of Interest:** Nil

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Effectiveness of a Parent Education Programme on Knowledge Regarding Home Care Management of Children with Epilepsy

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Abstract

Purpose: To assess the effectiveness of a parent education programme on knowledge regarding home care management of children with epilepsy and compare the pre-test knowledge scores of mothers with the selected demographic variables.

Method: The research approach was quantitative and the design of the study was one group pre- test post- test. The sampling technique was convenience sampling. The sample size of the study was 30 mothers of children with epilepsy. Data was collected with the help of a structured knowledge questionnaire to assess the knowledge of mothers and the demographic details. The analysis was done by using frequency, percentage and t-test.

Results: The mean post-test knowledge score (23.26 ± 3.71) is significantly higher than the mean pre-test knowledge score (14.50 ± 3.62) which indicates that the mothers gained more knowledge after the administration of parent education programme on home care management of children with epilepsy. The comparison of pre-test knowledge scores of mothers with selected demographic variables (p value-0.000) shows that there is significant association between the pre-test knowledge score only in the area of education and occupation of the parents.

Conclusion: The study depicts the importance of implementing education programme for parents of children with epilepsy as it would help to improve knowledge on home care management and follow healthy practices, through which the children can build up a good quality of life.

Keywords: Epilepsy, Home care management, Children, Parents, Knowledge.

Introduction

Childhood is a unique phase of human development. Children are the important feature of every society and also the future of a nation. Epilepsy is the common neurological condition in children. Epilepsy can begin at any time of life. Although it varies from person to person, children with epilepsy generally have seizures.1

According to the World Health Organization definition, “a diagnosis of epilepsy is made in the presence of recurring seizures, at least two unprovoked ones.” Approximately 45,000 children under the age of 15 develop epilepsy each year. Population based studies have reported the prevalence rate of 3.6-4.2/1000 children in developed countries and approximately double these rates in developing countries. Beliefs, attitudes, and misconceptions toward the disease still exist, and families do not easily accept the disease and its treatment regimen. These “stigma” and misconceptions are due to lack of information and knowledge toward the disease.2

According to the International League Against Epilepsy (ILAE) 2005, Epilepsy is a disorder of the brain characterized by an enduring, predisposition
to generate epileptic seizures and by the neurologic, cognitive, psychological and social consequences of this condition.\(^3\)

In India the overall “incidence” of epilepsy lies between 20-50 cases per year per 100,000 persons in a general population. The “prevalence” rate is 500-1000 cases per 100,000 persons in the population. Going by these statistics, there will be about 2,600-6,500 new cases of epilepsy every year in Delhi alone (estimated population of 1.3 crores) and 200,000 to 500,000 new cases in the whole of India (estimated population about 100 crores) Kruskal Values test.\(^4\)

Many epilepsies have direct impact on a child’s brain and, therefore, on their cognitive development, language and social skills. Children with epilepsy have higher rates of Attention Deficit Hyperactivity Disorder (ADHD), Learning disorders and Behavioural problems, Disruptive behaviour and Aggression.\(^5\)

A cross sectional study conducted by Ettinger et al. among 100 epileptic, aged 6-11 years old children who visited Neurological Clinic at Queen Sirikit National Institute of Child Health depicts that prevalence of behavioural problems was 57% in epileptic children. The study results also reveals that behaviors that indicate Attention Deficit Hyperactivity Disorder (ADHD) was 58%, social problems are 32% and conduct disorders was 24% respectively. Depression is a common but frequently overlooked problem in children with epilepsy. Also found that 26% of children with epilepsy had symptoms of depression, but none had been identified or treated.\(^6\)

Epilepsy leads to sleep problems and tiredness are reported frequently by parents of children with epilepsy, particularly in non idiopathic epilepsy. Seizures can delay sleep, lead to awakenings during the night; disrupt quality of sleep and decrease total sleep time, affects memory. Parents of children with epilepsy suffer from sleep deprivation as they regularly wake to check on their children during the night.\(^7\)

In addition to the ‘normal’ influences of demographics, cultural, cognitive and behavioural factors in development of children with epilepsy they can also experience social incompetence at school, with their peers and in other relationships, and in group activities. The reduced social competence in girls could be due to several factors, the severity of the epilepsy, subtle cognitive defects, subclinical behavioural disorders, over protection from their family and fear of seizures which can be transmitted to children by parental anxiety and negative attitude.\(^8\)

After headache, epilepsy is the second most common neurological condition seen by neurologists among all age group worldwide. Epilepsy is a common illness occurring approximately in one percent of the general population in South India. The knowledge about epilepsy are often clouded in mysticism, superstition and despair not only among the rural folk who constitute nearly 76.7% of the country’s population, but also among the urban people including the intellectual.\(^9\)

The family can act as a buffer or stressor for all children with epilepsy, the stress the parent feels can affect their behaviour towards their child and the psychological impact upon the child’s adaptation to their condition. Parents may be anxious about their child’s diagnosis seeing them as different to other children. Parents can encourage dependence on them so that children do not develop their own competencies as parents can overprotect children at times being overly intrusive.\(^10\)

A descriptive study was conducted by Manju et al. to evaluate the knowledge and attitude of parents of children with epilepsy toward the disease. Parents of 60 children from pediatric neurology clinic of All India Institute of Medical Sciences, Delhi were enrolled. Data on epilepsy were collected using pre-tested and validated self-developed questionnaire (α=0.85, 0.89). The mean knowledge and attitude scores of parents of the children with epilepsy were 9.82±3.9 (2-22) and 31.25±9.27 (0-40), respectively. Parents of the children with epilepsy had poor 50(83.3%, scores <60%) to fair knowledge scores (60-70%). Correlation between knowledge and attitude was found to be very weak and negative (r=−0.039, p=0.77) with few misconception related to disease and clear idea about the activities to be performed with/without caution. The study suggested that there is a need for developing information booklet and conducting educational sessions on epilepsy for the parents.\(^11\)

A study conducted by Radhakrishnan K, Pandian JD, Santhoshkumar T, Thomas SV, Deetha TD, Sarma PS, et al. on Prevalence, knowledge, attitude, and practice of epilepsy in Kerala. The study reveals that people with epilepsy face stigma in many communities. Stigma is referred to as a severe social disapproval of personal characteristics or beliefs that are against
cultural norms. The study was conducted among total of 1,175 mothers. Among these, 31% thought epilepsy to be a hereditary disorder, 27% a form of insanity, 40% were denied employment due to their condition, 11% of the parents did not allow their child to play with children with epilepsy and 55% of the women concealed their epilepsy during marriage negotiations. Out of those who concealed, 18% were legally divorced and 20% were separated from their spouses because of the disease. These studies reflect different aspects of stigma associated with epilepsy.12

A survey conducted at Institute of Medical Education and Research, Chandigarh in 1995 on Public awareness, understanding and attitude towards epilepsy. The report shows that 92% of persons were not read or heard about epilepsy. Most (55%) of them knew someone with epilepsy. Less percentage (18%) of them thought that epilepsy to be a hereditary disorder. 40% of them had an opinion that children with epilepsy should not be sent to school. Half (50%) of the parents did not know the first aid during seizures.13

Lack of knowledge and misconceptions about epilepsy have been associated with parental anxiety. Children take their cues from their parents and develop worries and concerns about their epilepsy. Education about epilepsy is effective in reducing parental anxiety.14

A key element in managing these patients and their families is adequate education. Parents of children with epilepsy are at high risk of having anxiety, which correlates significantly with their quality of life. Parents’ knowledge of epilepsy is associated with lowered parental anxiety. Also, family activities are less restricted if they are more knowledgeable, and they reported less worries regarding their children. Knowledge of epilepsy also leads to less stigmatization, social isolation, and depressive symptoms. Overall, parents’ attitudes are significantly influenced by the depth of their knowledge of the disease. Therefore, misconceptions and misinformation should be identified and corrected for optimal care and management.15

The purpose of the study was to assess the effectiveness of a parent education programme on knowledge regarding the home care management of children with epilepsy among mothers as well as to find the comparison between the knowledge of mothers and the selected demographic variables.

Materials and Method

The study was conducted among 30 mothers of children with epilepsy attending Pediatric Neurology unit at AIMS, Kochi. The data collection was started after obtaining Ethical Clearance certificate from the Ethics Committee and Scientific committee of Amrita Institute of Medical Sciences and Research Centre (AIMS), Kochi. The sample was selected by convenience sampling technique based on inclusion criteria. After building rapport with the mothers, written informed consent was obtained from each subject. Data had been collected by a structured self administered knowledge questionnaire includes two sections; section A and section B. Section A consists of 12 items on sociodemographic variables and section B includes 40 items on knowledge of mothers regarding the home care management of children with epilepsy. Pre-test was done on the first day using tools and the intervention also administered on the same day. The parent education programme was a systematically developed, individual teaching session of 45 minutes duration. The session includes the areas of: meaning of epilepsy, triggering factors, signs and symptoms, investigations, medications–side effects and home care management of the child.

Statistical analysis: Statistical Analysis has done using IBM SPSS statistics 20 windows (SPSS Inc., Chicago, USA). For all the continuous variables the results are either given in mean ± standard deviation and for categorical variables as percentage. To compare the mean difference of numerical variable between two groups, two sample t-test was applied for parametric test or mannwhitney u test was applied for non parametric test. For more than two groups Kruskal Values test was applied for non parametric test. To compare between pre-test and post-test intervention of mothers knowledge paired t-test was applied. Probability value (p value) less than 0.05 is considered for statistical significance.

Results

Section I: Description of Sample Characteristics: The data shows that all the subjects 30(100%) were mothers and most of them 20(66.7%) were in the age group of 34-41 years. With regard to the educational status of mothers 9(30%) of them were in each group of high school and graduation level of education. Regarding the source of health information 26(86.7%) of them were getting health information from the health workers. Among total subjects 17(56.7%) of the subjects expressed that they do not have history of epilepsy in
their family but 13(43.3%) of them had the history of epilepsy in their family.

Section II: Effectiveness of the Parent Education programme on Knowledge of mothers.

Table 1: Comparison of Pre-test and Post-test Knowledge Scores of the mothers.

<table>
<thead>
<tr>
<th>Knowledge of mothers</th>
<th>N</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test</td>
<td>30</td>
<td>14.50</td>
<td>3.62</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Post-test</td>
<td>30</td>
<td>23.26</td>
<td>3.71</td>
<td></td>
</tr>
</tbody>
</table>

Table 1 show that the mean post-test knowledge score (23.26 + 3.71) is significantly higher than the mean pre-test knowledge score (14.50 + 3.62) which indicates that the mothers gained more knowledge after the administration of parent education programme on home care management of children with epilepsy.

Section III: Analysis of Area wise Knowledge scores of mothers of children with Epilepsy.

Table 2- Analysis of area wise Pre-test and Post-test Knowledge scores of Mothers on Home care management of Children with Epilepsy.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Area of Knowledge</th>
<th>N</th>
<th>Pre-test Mean+ SD</th>
<th>Post-test Mean+ SD</th>
<th>Mean difference in Knowledge Score</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>General Information and Misconceptions</td>
<td>30</td>
<td>4.70±0.91</td>
<td>11.53±2.64</td>
<td>6.83</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>2.</td>
<td>Triggering Factors</td>
<td>30</td>
<td>0.80±0.76</td>
<td>2.46±1.00</td>
<td>1.66</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>3.</td>
<td>Signs and Symptoms</td>
<td>30</td>
<td>3.16±1.55</td>
<td>5.66±1.39</td>
<td>2.5</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>4.</td>
<td>Medications</td>
<td>30</td>
<td>0.83±0.37</td>
<td>1.70±0.83</td>
<td>0.87</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>5.</td>
<td>Home care and Follow up</td>
<td>30</td>
<td>5.33±2.44</td>
<td>6.70±1.60</td>
<td>1.37</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Table 2 show that the mothers have shown significant improvement in knowledge in all the areas. Further it shows that the area which shows maximum improvement in General Information and Misconceptions (mean difference is 6.83) followed by signs and symptoms of epilepsy with the mean difference of 2.5.

Section IV: Analysis of Comparison Pre-test Knowledge scores of Mothers with Demographic variables.

Analysis done on comparison of pre-test knowledge scores of mothers with selected demographic variables. The demographic variables included were age, education, occupation, type of family, area of residence and history of epilepsy in the family. The p-value (0.000) shows that there is significant association between the pre-test knowledge score only in the area of education and occupation of parent.

Discussion

Objective-1: Assess the effectiveness of a parent education programme on knowledge regarding the home care management of children with epilepsy.

The mean post-test knowledge score (23.26) is significantly higher than the mean pre-test knowledge score (14.50) which indicates that the mothers gained more knowledge after the administration of parent education programme on home care management of children with epilepsy.

The study is supported by a study conducted by Najimi A, Dolatabadi NK, Esmaeili AA, on the effect of educational programme on knowledge, attitude and practice of mothers regarding prevention of seizures at Iran. The study was conducted among 88 mothers attending a children’s hospital and the intervention consisted of educational sessions. The results showed that...
a significant increase in knowledge (p<0.001), attitude (p<0.04) and practice (p<0.001) in the intervention group one month after the intervention compared with that of before intervention.16

Objective 2: Compare the pre-test knowledge scores of mothers of children with epilepsy and the selected demographic variables.

The comparison of pre-test knowledge scores of mothers with selected demographic variables shows that there is significant association between the pre-test knowledge score only in the area of education and occupation of the parents.

Conclusion

An epilepsy diagnosis can be a frightening, an unwelcome interruption in any family’s life. But with education, support and perseverance, parents can ensure that their child has a happy and meaningful life.

Conflict of Interest: None

Source of Funding: None

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4. Indian epilepsy centre, new Delhi, india, http://www.indianepilepsycentre.com/


Indian Health Care Sector: A Case for Bringing Competition Framework Beyond Price Interventions

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Abstract
Health care for all” has been receiving attention of multilateral forums to strategize the same as a fundamental right and duty of all sovereigns. The Health care sector comprises of composite health care functions and services by health and is a USD 250 billion market globally; as far as pharmaceutical industry alone is concerned. The pharmaceutical industry is highly regulated and is subject to tangential sectoral regulations, interfaces of Price Control Measures, Intellectual Property Law and Public Welfare element and is a sector which is largely concentrated and is prone to anticompetitive practices in manufacture, supply, distribution and sale of generic branded and generic generic drugs. Evidence globally has shown abuse of market power through dominance in the relevant market, cartelization in fixing prices and territories in generic drug segments as also prescription medicines to the detriment of general masses globally with price escalation of over 1000%. The paper examines the efficacy of Price Regulations in keeping the drug prices unabated and their appropriate calibration with incentivizing R & D to bring new innovation and the anti-competitive practices endemic to sector. It explores the relevance of enforcing Competition Law interventions to extant ecosystem of pharmaceutical industry to ensure removal of Competition bottlenecks.

Keywords: Price Regulation, Intellectual Property, Anticompetitive practices, Public Interest.

Introduction

Health Care Sector in India

The WHO Declaration on Primary Health Care at Alma Ata in 1978 advocated action to ‘protect and promote health for all’ and recognized it as a fundamental right¹ and re-endorsed in October, 2018 at Primary Health Care Global Conference, Astana. United Nations has set up 17 Sustainable Development Goals (UNSDG) with mission of ‘leaving no one behind’ for 2030 and Goal 3 relates to objective of ensuring ‘healthy lives and promote well being for all ages’. Under Article 21 of the Constitution of India, this is not an explicit fundamental right but rather a derived right; and in ND Jayal versus Union of India; it was specifically recognized to be right to life.² Government of India has set up National Health Mission to benchmark its initiatives in compliance to UNSDG. Through Directive Principles of State Policy; improvement of public health is foremost duty of Government and National Health Policy addresses the preventive health matters³.

The National Health Accounts India monitors the health care expenditure across government and private-sector ⁴. The 2018 report illustrates the Total Health Expenditure (THE) as 3.84 % of GDP at INR 5.28 trillion with per capita expenditure being INR 4116 and the Current Health Expenditure (CHE) was at INR 4.95 trillion being 93.7% of the THE (National Health Accounts Estimates for India, 2018)⁴. The total pharmaceutical expenditure (including prescribed medicines, over the counter drugs and those provided to inpatient/OPD by the healthcare providers) contributed nearly 35% of the CHE with expenditure on traditional, complementary and alternative medicines being 12% of CHE ⁴.

As a nation which is trying to follow a model of inclusive growth targeted for those at the bottom of the pyramid of the Indian population; bulk of which do not have or have least access to the healthcare providing affordable healthcare to all becomes a daunting challenge as a public policy prescription measure ³. The Indian healthcare customers face perilous situation...
Despite price controls under Drug Price Control Orders due to presence of structural deformities arising out of lack of adequate competition culture within the country which results in instances of manipulation of prices to the detriment of masses at large for innovated, branded generic and generic-generic drugs to which the current article addresses.

**The ecosystem of Indian healthcare market:** India occupies a unique space in the world pharmaceutical market and is estimated amongst first three in terms of volume/value created.\(^5\) There is competition amongst the generics as well branded generics, a phenomenon not seen in developed countries and more so the combination drugs which allow the companies to keep their prices artificially high notwithstanding that therapeutic properties in terms of health outcomes are far from satisfactory.\(^6\) The generics contribute 72% of the revenue, OTC drugs 19% and patented drugs 9% respectively of the revenue in country.\(^7\)

The Indian pharmaceutical industry today primarily thrives on manufacturing generic drugs and exports thereof with 20% of the worldwide exports being contributed by India subject to their meeting local regulatory compliances; for drugs which have come off patent list overseas.\(^7\) This calls for a calibrated approach to encourage companies to invest for R & D and ensuring cheaper prices to achieve the public welfare objectives.

When the High Court of Delhi takes cognizance of the public interest litigation filed in the matter of Birender Sangwan versus Union of India\(^8\) for intervention of the Court for inclusion of coronary stents in the NLEM List which incidentally fall under the definition of drugs under section 3 (b) (iv) of the Drugs and Cosmetics Act but ceiling prices for which were not monitored by NPPA; it being a non-scheduled drug; or when the Apex court in the matter of Union of India versus K Gopinath\(^9,10\) directs for inclusion of non-essential medicines in the list of NLEM; they need to be seen in context of the public interest involved.

Section 3 of the Essential Commodities Act empowers the Government to issue Drug Price Control Orders through notification in the Gazette of India, declaring a ceiling price for essential and life-saving medicines as indicated in the National List of Essential Medicines (NLEM) to ensure that life-saving and essential drugs are available under price control mechanism for safeguarding public interest. Section 31 of the DPCO provides for non-application of the DPCO in respect of new drugs patented under the Indian Patents Act for a period of five years from the date of commencement of the commercial production in the country.\(^11\) The NLEM lists 376 medicines which are scheduled drugs/formulations and nearly 30% of the domestic market in India is under price regulation through DPCO rather than effective competition.\(^9,10\) A press release points out saving of INR 12,447 crores due to price fixation of essential medicines.\(^12\)

The National Pharmaceutical Pricing Policy\(^13\), while regulating the prices under DPCO takes into regard only the medicines listed in NLEM\(^9\) a market-based pricing to ensure affordability and availability and the price control to be made applicable only on drug formulations; and in respect of non-scheduled drugs the DPCO prescribes for the price not to exceed the price of said nonscheduled medicine during the last 12 months. During 2014, National Pharmaceutical Pricing Authority (NPPA), brought in conception of public interest for covering 108 drugs outside the NLEM list under price control regulation invoking extraordinary circumstances.\(^14\)

Despite such framework of price regulation and control, there have been persistent instances of overcharging of cases for period up till March 2019.\(^15\) NPPA has issued internal guidelines for dealing with ‘overcharging’ and ‘Without Price Approval (WPA)’ cases which inter alia provide for appropriate action against the drug manufacturers for selling the formulation at higher than the notified price under DPCO for which action can be initiated for overcharged amount.\(^15\)

It is equally pertinent to examine the emerging directions of the Indian pharmaceutical industry which on line of what has been happening globally is going in the direction of strategic alliances to remain competitive as there are compelling reasons for their being sustainable. A drug before it gets finally launched in the market takes few years for completion of ‘conception’ to ‘prescription’ phase and in process on an average USD 300 million getting spent on its trials.\(^16\) As patent in India last only for 20 years before products becomes generic; compels the pharmaceutical sector to foray in horizontal or vertical integration.\(^17\)

**Anti-trust and Healthcare globally:** It is not that developing countries like India alone are at the receiving end of market infringements affecting the consumer interests. An anti-trust lawsuit in the United States...
States highlights the menace of excessive drug pricing in generic drug segments such as tablets, capsules, ointments and prescription medicines including antibiotics, antidepressants and anti-inflammatory drugs primarily used for the treatment of opportunistic infections, diabetes, cancer and antiretroviral treatment amongst. Prices were escalated to extent of 1000% thus affecting the patients, taxpayers funded healthcare programs and the insurers and evidenced conspiracy in fixing prices and territories and thus cause restraints in trade through competition retardation in over hundred generic drugs which have billion-dollar strong foothold in US market by established brands. 

With such trends continuing; huge scale anti-trust violations are not ruled out given the current trends for strategic alliances as also increasing tendency for a coordinated approach and market for pricing and territorial strategies to cause least turbulence arising out of competition. Vitamin Cartel; referred as the mother of all cartels, involving many countries around globe and as per a study, caused cartel damages of USD 4000 million.

**Market Infringements in India:** Under the Competition Act 2002; section 4 focuses on regulating the conduct of the market players in restricting competition exploitative conditions and inflicting supra high prices and cannibalizing the competition through predatory pricing. The competition regulator has to take into account the dominance of undertaking to charge unfair price regardless of the competitive forces and the state of competition in the relevant market and setting up such terms of trade which affect competitors, consumers and the relevant market. The Competition Commission of India (CCI), the anti-trust regulator in India, in the case of *HT media Ltd versus Super Cassette Industries* has laid down what constitutes excessive pricing and related it to higher than the price charged by the competitor.

Going opposite this conception of laissez faire (allowing market to connect on own in the case of *Shamsher Kataria versus Honda*, the CCI ruling came in favour of remedial interventions for structurally modifying the market for corrections in prices as the practices infringed the provisions of section 4 (2).

In the case of *Biocon versus Hoffmann Roche*, CCI, held the initial higher prices being charged by Roche not as anticompetitive conduct but rather corollary of rewarding innovation and being the originator of anti-cancer drug Trastuzumab and allegation by Biocon for excessive pricing in comparison to its biosimilar was quashed; albeit Roche did introduce the cheaper versions namely Biceltis in the market later. In the case of *Vivek Sharma versus Max Super Specialty*, CCI while recognising the dominance of Max Super Specialty in the relevant market; held its practice of requiring its in-house patients to buy syringes at higher prices than the same available outside hospital; had directed the Director-General to cause investigation not only in respect of syringes but surgical tools as well as medicines by the other specialty hospitals as well in regard to their impugned practice of charging higher prices and forestalling the competition by not allowing buying of similar/same product from outside market.

**Conclusion**

The country followed a socialistic government controlled pattern and with liberalization of economy during 1990’s; a need was felt to have relook into the extant provisions of the Monopolies and the Restrictive Trade Practices Act; which was found to be wanting in enforcement of a competition culture. The Competition Act 2002 has come a long way from the yesteryears MRTP Act; in its 10 years of active enforcement; yet it is to find steam in detecting and deterring the business practices which cause adverse appreciable effect on competition. Such restraints through the collusive conduct of pharma companies who while are meant to compete with each other in the market; but rather enter into gentlemen agreement of collaborative approach resulting in distortions to free play of markets through manipulated market share, volume allocation, price distortions affecting the consumer sovereignty.

Indian pharmaceutical market faces host of issues beyond price regulation; namely role of trade associations, marketing practices and trends towards strategic alliances and competition violations which are not permitting the market to grow. Barring the OTC drugs, the end user segment is dependent upon the particular drug which may have been prescribed by the physician and choices are curtailed by nature of industry due to asymmetric information affecting the competition.

Due to inherent preference for Original Innovations and branded generics, with a concentrated market of few dominant players; they tend to usurp market power to dictate terms to adversity of Competition and Customers alike despite price control under DPCO thus warranting Competition Regulatory interventions.
Pharma Market is completely intertwined and overregulated already. Interface of Intellectual Property Law, price intervention through DPCO crisscross each other. Patents allow companies to amass market power and affect fair play of markets and competition. Anti Trust Laws and Intellectual Property Law, though complimentary, bring about divergent perspectives for consumers.

Multiplicity of supply chains and their unfair practices also raises a competition concern as also the definition of relevant market in view of original, branded generic and generic generic drugs. SSNIP test may not be helpful due to substitutability.

There are challenges with regard to what constitutes a benchmarked fair price when seen in context of the initial investments which go into research and development and any attempts on price regulation may disincentivise the motivation for future research. Whether or not the stance taken by CCI to make excessive pricing cognizable only once undertaken by a dominant form in the relevant market can be said to be a cogent approach to anti-trust regulation when the instances of higher prices are at galore. The current tendency of enforcing remedial action beyond price regulation is something which needs to be examined for a benchmarked perspective for future.

What would warrant inclusion of a drug in the NLEM; should it be guided by ‘essentiality’ and should include the ‘analogues’ and ‘close substitutes’ needs attention. An era of transparency and predictability needs to be built in achieving the outcome of National Pharmaceuticals Pricing Policy namely better healthcare by making available the essential medicines at reasonable prices based on premise of ‘essentiality’, ‘control of formulations prices only’ and ‘market-based pricing’.

The public interest element therefore in addition to price regulation; in order for overall comprehensive promotion of freedom of trade, choice to consumers, manufacturers, supply chain participants and other stakeholders; warrants a move towards integration of Competition Laws for a regulatory framework beyond administered prices to control the anticompetitive practices of abuse of dominance, cartel practices and exclusionary/exploitative conduct.

**Conflict of Interest:** Nil

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**Ethical Clearance:** Not applicable for this article. I undertake that it complies with the various ethical requirements as stated at your website. The article acknowledges the secondary sources of data based for research.

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An Analytical Study of Sleep Duration, BMI and Blood Pressure Reactivity among Medical College Students

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Abstract

Introduction: Short sleep duration is a major risk factor for higher BMI and has been supported by much evidence from the past studies. Hypertension is an important risk factor for cardiovascular disease in children as well as in adults. So in this study we aim to evaluate the effect of insufficient sleep duration on BMI as well as blood pressure in medical college students of MMIMSR, Ambala.

Method: A cross-sectional study of 200 young medical college students of age 18–24 years were recruited randomly for this study. All the participants were assessed under similar laboratory conditions in the departmental research laboratory. Sleep pattern and duration were determined by using a validated Pittsburg sleep quality index (PSQI) questionnaire. Body weight and height were measured and BMI was calculated by using Quetelet index as BMI = kg/m² where kg is a participant’s weight in kilograms and m² is their height in meters squared. Blood pressure was measured by using mercury sphygmomanometer.

Results: Shorter sleep duration was highly significantly (p<0.01) associated with higher BMI and with higher SBP. Sleep duration was also significantly (p<0.05) associated with DBP in both male and female student participants.

Conclusion: Participants with relatively shorter sleep durations (<7hrs) had higher blood pressure reactivity and were either overweight or obese. Preliminary findings are consistent with the hypothesis that sleep duration may be one mechanism through which daily social stress influences BMI and long-term cardiovascular health.

Keywords: Sleep duration, BMI, Blood pressure.

Introduction

In India, for the last few years decline in sleep duration has grown to be a hallmark of modern-day society among the children as well as in adults. Both are having shorter bedtimes with average sleep duration of 7 hours per night and one-third sleeping less than 7 hours per night⁴,⁵. Televisions and smartphones which came into households as remarkable source of information and entertainment has robbed sleep time and voluntary sleep restriction. Using cell phones at night is common among children and in adults as reported by them. It has become a serious barrier to health development⁶. Sleep is a critical modulator of neuroendocrine function and glucose metabolism in children and in adults. Short sleep alters metabolic as well as endocrine functions which leads to reduced glucose tolerance, decreased insulin sensitivity, increase in night time concentrations of cortisol, increased ghrelin level and decreased leptin levels⁷,⁸. All of these results in more hunger and appetite.

ACKNOWLEDGMENT

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years\textsuperscript{[9-11]}. High blood pressure (BP) during childhood acts as an indicator for the prevalence of coronary artery disease during adulthood. In adults both hypertension and coronary artery disease have been associated with short sleep duration\textsuperscript{[12,13]}. However, the cause of this relationship is not completely understood and very little is known about the interrelationship between usual sleep and hypertension. In India, Hypertension exerts a significant burden on cardiovascular health status and healthcare systems\textsuperscript{[14,15]}. Hypertension is responsible for 57\% of all stroke deaths and 24\% of all coronary heart disease deaths\textsuperscript{[16]}. According to WHO, hypertension is one of the main cause of premature death worldwide\textsuperscript{[17]}. According to a worldwide data, in India 20.6\% of men and 20.9\% of women are suffering from hypertension in 2005 and at these rates for hypertension is expected to go up to 22.9\% for men and 23.6\% women, respectively by 2025\textsuperscript{[18]}. So, in view of significantly increasing BMI and prevalence of hypertension in relation to short sleep duration among medical college students this study was planned.

**Material and Method**

This cross-sectional study was conducted in the Department of Physiology of Maharishi Markandeshwar Institute of Medical Sciences and Research, Ambala. The study comprised of 200 healthy subjects of which 100 male student participants and 100 female student participants were taken randomly and a written informed consent was taken at the beginning of the study. The study was approved by Institutional ethical committee.

**Inclusion criteria:** For this study we have taken apparently healthy, non-alcoholic and non-smoker male and female medical students of age group 18-24 years.

**Excluding criteria:** Medical students on a long term medication or with any acute or chronic illness & any history of hypertension in parents were excluded from this study.

**Anthropometric Indices:** All the anthropometric indices were measured.

Weight was measured in minimal clothing i.e. bare feet and with light clothing. Daily calibration was made to the weighing scale.

Height was measured with the subject barefoot, the heels, hip and shoulder and head in neutral position with eye gazing forward.

Body mass index (BMI) was calculated by dividing weight in kilograms by square root of body height in meters (kg/m\(^2\)). According to body type classification for Health ministry and Diabetes Foundation of India in 2008 normal weight considered as BMI 18.5 to \(\leq 22.9\), overweight as BMI 23 to \(\leq 24.9\) and obesity as BMI \(\geq 25\) kg/m\(^2\)\textsuperscript{[19]}.

**Sleep duration determination:** Sleep duration was determined by using standardized and validated Pittsburgh sleep quality index questionnaire which was given to each student participant\textsuperscript{[20]}.

**Blood Pressure:** Blood pressure (BP) is characterized by large spontaneous variations, therefore the diagnosis of hypertension was based on taking multiple BP measurements. Standard mercury sphygmomanometer was used. Appropriate-size BP cuff was used to measure BP. The BP cuff encircle and cover two-thirds of the length of the arm. Proper maintenance and calibration of the sphygmomanometer was ensured. Student participants were asked not to drink tea/coffee or take heavy meals and exercise for at least 30 minutes before the measurement the BP. Student participants were allowed to sit for at least five minutes in a quiet room before measuring their blood pressure. Measurement was taken preferably in a sitting position. Student’s arm was fully bared and supported at the level of heart. According to the recommendation of the 4\textsuperscript{th} report of national high blood pressure in children and Adolescents blood pressure was measured\textsuperscript{[21,22]}.

**Statistical Analysis:** By using Microsoft Excel and SPSS software Statistical analysis was done. Anthropometric indices were compared with sleep duration and blood pressure. Pearson correlation was used where P value <0.05 was considered as significant and <0.01 was considered as highly significant.

**Results and Analysis:** The study included 200 medical students of MMIMSR, Ambala of which 100 were male and 100 were female student participants. Among 100 male participants, a usual sleep duration of 8 or more hours per night was reported by 23\% of the male and 21\% female participants including 23\% male participants and 21\% female participants sleeping 9 hours or more per night respectively. A usual sleep duration of less than 7 to <8 hours per night was reported by 13\% male and 18\% female participants. Sleep duration of 6 to <7 hours were reported by 24\% male and 32\% female participants while sleep duration of < 6 hours were
reported by 17% male and 14% female participants. Hypertension was identified on the basis of measured blood pressure. We found that decreased sleep duration was highly significantly associated (p<0.01) with higher Body mass index (BMI) in both male (Table no.1) and female participants (Table no.2). Our results showed that with the decrease in sleep duration there was significant increase in weight gain among both the male [Figure 1] as well as female student participants [Figure 2]. However, when compared 8-9 hours of sleeping to sleeping less than 7 hours it was found to be significantly associated with the increased Blood pressure and risk factors for pre-hypertension and hypertension. Sleep duration was highly significantly (p<0.01) associated with increased Systolic Blood Pressure (SBP) and significantly (p<0.05) associated with Diastolic Blood Pressure (DBP) in both male (Table no.1) and female participants (Table no.1).

In our study we found that longer usual sleep duration is significantly associated with decrease in Body mass index (BMI) and also serve as an indicator of normal BP in both the participants i.e. increased sleep duration was significantly related with decreased chances of prehypertension and hypertension in both the genders (Figure 1 and Figure 2).

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Data are expressed as the male participants (Standard deviation)

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Data are expressed as the female participants (Standard deviation)
Prevalence is increasing at the epidemic rate. This study showed that there is a considerable overall irregularity in sleep among both male and female medical student participants. Our results support a positive relationship between higher BMI and short sleep duration. Studies conducted by Deen. W. Beebe et al found that the subjects having short sleep duration and disturbed sleep were having more BMI as compared to the control participants\[23\]. Our results also correlates with the study done by Patel SR et al,\[24\] Gangwisch JE et al\[25\] in which a direct association was found between short sleep duration and weight gain. According to Kripke et al\[26\] and Cummings et al\[27\] a direct relationship between disturbed sleep duration and weight gain in adults was found.

**Discussion**

In India, the ongoing prevalence of obesity in doctors and medical students, has emerged as a huge challenge. Sleep deficiency and irregularity in sleep patterns is common among doctors as well as medical students. Some risks which are documented for the prevalence of obesity are food eating patterns, consumption of sweet beverages and fried food snacks. However, sociocultural aspects like societal pressure on academic performance seriously affects their health. Moreover, the criticality of recreation, play and physical activity in almost nil in medical students and they are unable to find a way to neutralize this pressure. Obesity has become a sedentary lifestyle disease and has become a topic of concern.
Stressful lifestyle and busy work schedule along with altered food choices has led high blood pressure to be a major health issue among medical students as well as in public health which is growing exponentially every year in India. Our study correlates with the studies done by Meininger et al\cite28\, which in their study found the direct association between long sleep duration with a decrease in both the SBP as well as DBP. Archbold et al\cite29\ in their study found direct relationship between lack of sleep duration and an increase in BMI with increased BP. According to a study done by Kuciene R and Dulskiene\cite30\ <8 hours of sleep was directly associated with Prehypertension and Hypertension among both children as well as in adolescents. In a recent research, one in three adults are suffering from this hazardous lifestyle disease and the prevalence of hypertension in urban areas of India is 20%-40% and 12%-17% in rural areas\cite31\.

**Conclusion**

High blood pressure (BP) has turned into the most predominant chronic disease in India. What’s even horrifying is that hypertension is no longer an old age disease. Adults and even children who sleep much less are at the risk of having higher BMI and high blood pressure. Major contributing factors to this silent but deadly disease are sedentary way of living with no exercise, night time snacking, consuming more salty and fatty ingredients in diet. Since, hypertension takes time to develop, around 90% of the patients are not even aware from it until the threshold of their blood pressure increases and the symptoms start appearing. In summary, in today’s world students and even general population are too busy in achieving their goals that they don’t have time even for selfcare. Small but necessary lifestyle modification such as daily exercising, proper sleeping and healthy eating should be at the top of the priority list. Exercising regularly makes us more positive, energetic, productive and creative. It makes us more effective entrepreneur so that we can generate more revenue and create a bigger impact in the world and can go a long way in reducing the risk of hypertension and other associated health complications.

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Abstract

Gingival recession is defined as apical migration of gingival margins resulting in exposure of the root surface. It can be either localized or generalized, involving one or more than 1 surfaces and there by leading to functional & esthetic problems like hypersensitivity, cervical abrasions & root caries. Various techniques have been developed to achieve root coverage. The current case report describes treatment of multiple class I gingival recession using vestibular incision sub periosteal tunnel access (VISTA) technique and platelet rich fibrin (PRF) membrane. Position of gingiva was maintained using coronally anchored sutures during initial healing period. The use of PRF membrane along with the VISTA allows clinicians to successfully treat multiple gingival recession defects.

Keywords: VISTA, Platelet rich fibrin, gingival recession, tunnel technique, sutures, wound healing.

Introduction:

Gingival recession is defined as migration of gingival margin apical to the cementoenamel junction (CEJ).¹ Key indications for root coverage procedures are aesthetic needs, cervical dentinal hypersensitivity, prevention of root caries, cervical abrasion & to improve plaque control by the patient.² Treatment of gingival recession associated with multiple teeth poses greater challenge as avascular root surface is more extensive. In addition to that a thin biotype, root prominence, root proximity and reduced keratinized tissue width make surgical treatment of multiple gingival recession difficult as compared to localized recession defects.³

The management of multiple gingival recessions with various tunnel techniques have been attempted previously which maintain better blood supply & critical papillary integrity. However, these techniques are sensitive and resulted in unfavorable healing outcomes due to trauma to sulcular epithelium. In 2011, Zadeh H H⁴ modified the tunnel technique offering the so-called VISTA technique for the treatment of multiple adjacent gingival recessions in anterior esthetic area. Connective tissue graft (CTG) is considered as a gold standard for root coverage procedure, however it has its own limitations like creation of second surgical site, technique sensitive procedure and patient morbidity. In order to accelerate healing and to improve the clinical outcomes, various root coverage procedures have been combined with agents like rh-PDGF, platelet concentrates and collagen membrane.⁶ PRF has been used as a membrane for root coverage and in combination with graft for periodontal regeneration, ridge augmentation, sinus lift procedures.⁵ The aim of this case report is to clinically assess the outcome by using the minimally invasive VISTA technique along with PRF in the management of multiple gingival recession defects.

Case report: A 39 year old female reported to Department of Periodontology with a chief complaint of sensitivity to cold water in upper right tooth region.
Nothing significant was recorded in the medical and dental history. The patient presented with Miller Class I recession i.r.t 12,13 (Figure 1). Recession Width (RW), Recession depth (RD), Clinical Attachment Level (CAL), Probing Depth (PD), Gingival Thickness (GT), Keratinized tissue height (KTH) were the clinical parameters. Scaling and root planning were performed. Once the patient was able to maintain her oral hygiene an informed consent was obtained and the surgical procedure was carried out.

**Procedure:** After administration of LA, root planning was done. Using a 15 C blade, a vestibular access incision of 3mm was given in the vestibule between 12 and 13(Figure 2). Sub-periosteal tunnel was created using microsurgical tunneling instruments. The tunnel was extended to one teeth beyond the teeth that required root coverage in order to allow mobilization of the flap and to facilitate its coronal advancement. Additionally, the tunnel was extended inter-proximally under each papilla as far as the embrasure space permitted without penetrating the papilla (Figure 3). Once the gingival margin was coronally advanced, 10ml of venous blood was drawn from the patient and placed into a sterilized glass test tube of 10 ml and centrifuged at 3000 rpm for 10 min using a tabletop centrifuge (REMI R-8C Laboratory Centrifuge). Due to differential densities, centrifugation will result in the separation of three basic layers: RBC layer at the bottom, PRF clot at the center and Acellular platelet poor plasma at the top. The middle PRF layer was removed and placed in between two sterile gauze pieces to obtain a membrane of uniform thickness. 4-0 resorbable sutures were used to give support sutures on both the ends of the PRF membrane which was guided through the access incision (Figure 4). In order to position the PRF membrane into the desired site, the support sutures were pulled through the sulcus of 12 and 13. Once in position, the support sutures were used to stabilize and suture the PRF membrane with the subperiosteal tunnel (Figure 5). The membrane and mucogingival complex were then advanced coronally using a 5-0 silk suture and adapted to the new position with coronally anchored sutures which were approximately 2 to 3 mm apical to the gingival margin. A knot was tied at the mid coronal portion of the facial aspect of each tooth, and secured with composite resin (Figure 5). Periodontal pack was placed and post-operative instructions were given. Patient was prescribed analgesics to be taken as and when required and 0.2 % chlorhexidine gluconate mouthwash for plaque control. The sutures were removed after 21 days and the patient kept on maintenance therapy.

**Results:** The result demonstrated 100% root coverage at 6 months. Healing was satisfactory and results were stable at 6 months. (Figure 6).

**Discussion:** Over the past years, a number of different techniques have been used with various degree of success for the treatment of gingival recession which may be classified as: epithelialized grafts or connective tissue grafts and pedicle soft tissue grafts such as the laterally sliding flap the double papilla flap the coronally repositioned flap and its modification the semilunar coronally repositioned flap. This search for predictable esthetic outcomes has led to the development of several new and modified surgical techniques in this past decade.

Different tunnel techniques have been attempted for management of recession defects which maintain better blood supply and critical papillary integrity. However, these procedures are technique sensitive and cause tissue trauma to sulcular epithelium leading to unfavorable healing outcome. To avoid these complications, the vestibular incision sub-periosteal tunnel access (VISTA) approach was introduced. The most differentiating feature between VISTA and other tunneling approaches/other classical gingival augmentation procedures is the degree of coronal advancement obtained during the procedure (to adjacent interdental papilla rather than CEJ). The advantage of placing the access incision in the vestibule has various advantages like: i) little/no visible scarring resulting in better esthetic outcome. ii) provides access to the entire area including the underlying alveolar bone and root dehiscence iii) less likely to disrupt the blood supply iv) decreases the likelihood of traumatizing the gingiva of the teeth being treated. Advantage of using coronally anchored suturing includes: i) prevention of apical relapse of the gingiva during initial stages of healing. ii) Minimize the micro-motion of the gingiva thereby preventing scar tissue formation, whereas in conventional techniques the gingiva is subjected to displacement during facial movements. In addition to careful preparation of the sub-periosteal tunnel, addition of PRF membrane contributes to the final success of this technique.

In 1970’s platelet rich plasma was first applied as a glue. Presently, fibrin glue is prepared from platelet poor plasma and is seen to have a positive impact on repair and regeneration. However it has limited use.
due to complicated and time consuming preparation. According to studies in 1900s & 2000s PRP was observed to be a promising reservoir for growth factors that could make wound healing and bone regeneration easier. However, addition of bovine thrombin posed a risk of transmission of diseases, also the key role of fibrin was neglected at this time. Anitua and coworkers in 1999 developed Platelet Rich in Growth Factors which was characterized by elimination of leukocytes to suppress their pro-inflammatory properties. With the aim to eliminate xenofactors and to simplify the PRP preparation, Choukroun et al developed platelet rich fibrin (PRF) which is derived from patient’s own blood and comprises of platelets, monocytes, B- and T-lymphocytes, neutrophilic granulocytes, growth factors & stem cells. It was stated that PRF could be an important source of hematopoietic stem cells (HSCs), which can potentially play a major role in tissue regenerative dentistry. Choukroun further modified PRF by reducing the centrifuge speed to produce Advanced PRF (A-PRF) and Injectable PRF (I-PRF) which are characterized by platelets, leukocytes, stem cells & endothelial cells in fibrin clot. In 2006, Sacci et al developed concentrated growth factor (CGF) using a centrifuge device that has a special programmed spin cycle to obtain a fibrin matrix that is larger, denser and richer in GF as compared to PRF. PRF technology draws on the following three fundamental principles and biological processes of haemostasis and wound healing:

i) Presence of fibrin matrix at the site of surgery can act to provide a scaffold for recruiting and migration of cells (like fibroblasts, epithelial & endothelial cells) throughout wound healing and reparation process.

ii) Within the fibrin matrix, platelets, neutrophils, leukocytes and monocytes release growth factors & chemotactic proteins that recruit fibroblasts, epithelial & endothelial cells in order to facilitate wound healing and reparation.

iii) Angiogenesis depends on fibrin matrix and stimulation of endothelial cells recruitment through vascular endothelial growth factors. New blood vessels in the wound bed are essential for carrying oxygen and nutrients to sustain cell metabolism and regeneration.

Various case reports have been published wherein VISTA technique was used along with Platelet Rich Fibrin and CTG and they have concluded that VISTA technique together with platelet-rich fibrin (PRF) and CTG membrane can be successfully used as a treatment method for multiple Miller’s Class I and Class II defects.

Recent studies have confirmed that PRF has a sustained release of key growth factors for a period of at least 1 week and up to 28 days. It was seen that PRF could stimulate its environment for a notable period during the wound healing process. PRF contains large amount of platelets and cytokines, which have an important role in the self-regulation of inflammatory and infectious processes. PRF membrane has mechanical adhesive properties, biologic functions, maintains the flap in position and increases angiogenesis. Hence PRF membrane can be used as an alternative to other bioactive agents. Use of PRF has an added benefit of preventing additional surgical site which is associated with harvesting of CTG, thereby reducing patient morbidity. Various studies have compared PRF with CTG and have concluded that PRF is a valid alternative to CTG in the treatment of gingival recession. In the present case report access incision was given in the vestibule between 12 and 13. To the best of the author’s knowledge this is the first case report where in contrary to the usual position of the access incision (i.e. labial frenum) for VISTA procedure, the access incision was given in the vestibule between 12 and 13.

Photographs

Figure 1: Preoperative view

Figure 2: Access Incision between 12 & 13
Various treatment options exist for the treatment of gingival recession. However, treatment of multiple gingival recession is always a greater challenge compared to single recession defects. Hence, VISTA technique with PRF membrane used in this case report is aimed at overcoming the shortcoming of other treatment options and gives better results in multiple class I & II Millers gingival recessions. Clearly, long-term follow-up with clinical and histological studies will be required to obtain more information about this technique as a root coverage for multiple adjacent gingival recession.

**Conflict of Interest:** None

**Source of Funding:** None

**Ethical Clearance:** Ethical clearance was obtained from Institutional Ethical Committee.

**References**


Impact of Working Status of Mothers on Nutritional Status of their Preschool Children from Selected Rural Areas and Urban Slums of Pune: A Preliminary Study

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Abstract

Background: Women augment family income by working; however, this reduces the time for childcare and may adversely influence the nutritional status of children. Objectives: A preliminary study was conducted to assess the impact of mothers’ working status on the nutritional status of their preschool children (2-5 years). Method: A cross-sectional study was conducted on 80 mother-child dyads (40 each from rural areas, and urban slum of Pune). Information on mothers’ working status, socio-demographics, socioeconomics and food consumption pattern of children were collected. The children’s anthropometric indices, namely, Z-scores of weight-for-height (WHZ), weight-for-age (WAZ), height-for-age (HAZ) were estimated. Results: The study did not find any significant difference in the nutritional status of children with respect to the working status of their mothers. It was found that children of formally educated mothers had significantly higher mean Z-scores for WAZ (p=0.050) and WHZ (p=0.035); children who received family-based childcare practice had higher mean WAZ (p=0.039) and WHZ (p=0.005), and children whose fathers were in skilled occupation had higher mean HAZ (p=0.040) scores. Children who frequently consumed chocolates and candies had lower mean HAZ (p=0.039) and WAZ (p=0.005), and used savories had significantly lower mean WAZ (p=0.045), and HAZ (p=0.019) scores. Conclusion: The present study indicates the importance of sociodemographic factors and the necessity for appropriate nutritional care for young children of working mothers.

Keywords: Working status, Preschool children, Nutrition status, India, urban slums, and rural area.

Introduction

Globally more than 200 million children suffer from undernutrition (165 million stunted, 52 million wasted).¹ According to Global Hunger Index 2017 report, more than 21% of Indian children below age of 5 years suffer from wasting.² As per National Family Health Survey report, in Maharashtra state, 29.3% children in urban areas are stunted and 30.7% are underweight.³ The contributing factors for undernutrition include prolonged period of poor diet, repeated illness, poor sanitation, lack of formal education of mothers, poor child feeding practices and inappropriate care during childhood.⁴ ⁵ Children are dependent on their parents and caretakers for their nutritional and health care needs.

With the changing times and higher monetary demands, mothers play the role of breadwinners for their families that compels them to engage in income generating activities. The dual responsibility increases her workload and demands her on her time.⁶ Working mothers need to find alternate arrangements for childcare while she is at work. The kind of care provided to the child may vary according to the geographic location, sociodemographic characteristics such as family size, support from family members, and economic status of the family. The kind of alternate arrangements for childcare influence the dietary habits, nutritional and health status of children. The present study was aimed to assess the impact of working status of mothers on the nutritional status of their preschool children from selected rural areas and urban slums of Pune.

Materials & Method

A preliminary study was conducted during year 2015-2016 in preschool children of age 2-5 years from selected rural areas and urban slums of Pune, Maharashtra, India. One urban slum and rural village was selected purposively for the present study. The
village Marunji, under Man division was selected for the study. Aganwadi centers located in the urban slums and rural areas were approached for the recruitment of the study participants. In total 80 apparently healthy preschool children aged between 2-5 years (urban slum=40 and rural area=40) were included in the study. Children suffering from any chronic illnesses, sick at the time of recruitment, children with mental illnesses were excluded from the study. Permission for the study were obtained from Women and Child Development Department of Pune. Ethical approval was obtained from the Institutional Ethics Committee, Symbiosis International University, Pune. The study purpose and protocols were explained to mothers and caretakers in local language (i.e. Marathi). Participants who met the inclusion criteria were recruited for the study after obtaining a written consent from mothers as the children were minors.

The data were collected through household surveys and personal interview of the mother were conducted. Working mothers (i.e. mothers involved in self-employment at home or outside the home to generate income) and nonworking mothers (i.e. mothers were not involved in any type of income generating activities) were recruited for the present study. The type of child care arrangement mothers sought to while they were at work were categorized as family-based care (i.e. child care performed by grandparents or closed relative or father or taking the child to their workplace) and non-family care (i.e. leaving child with neighbour or with young sibling). The mother’s occupational status was classified into two categories as skilled (i.e. nonmanual work secretarial or clerical, teaching, nursing etc.) and unskilled (i.e. domestic work or agricultural labourers).

Anthropometric data followed WHO standard7 protocol using Tanita digital weighing scale (Model HD 380) with accuracy of 0.1 kg and portable SECA Stadiometer (Model 213) with accuracy of 0.1 cm was used to measure the weight and height respectively. TriPLICATE measurements were taken and mean of three readings were taken. The measuring devices were calibrated using standard measures.7 WHO Anthro software version 1.0.3. was used to determine the nutrition status. Height-for-age, weight-for-age and weight-for-height were compared to the growth standards (WHO).8

A qualitative food frequency questionnaire (FFQ) was used to assess the dietary patterns of children by interviewing their mothers. The food items in FFQ were grouped as cereals, pulses & legumes, poultry & meat, milk & milk products, vegetables, fruit, beverages, confectioneries & bakery products, and savory. The FFQ was designed with five food frequency categories such as daily, weekly, fortnightly, monthly, and never. For analysis of the food frequency questionnaire the above categories were grouped into dichotomous variables as frequently consumed (i.e. daily and weekly consumption of food items) and less frequently consumed (i.e. fortnightly and monthly consumption of food items).

The data were analyzed using SPSS software version 20.0. Descriptive statistics were used to summarize the characteristics the study participants and their family parameters. The Kuppuswamy’s scale was used to classify socioeconomic status of study population.9 Chi Square test was used to compare the significant difference of sociodemographic characteristics among rural and urban population and compare the nutritional status of preschool children of working and non-working mothers from selected rural areas and urban slums. Student t test were used to find the significant association of different factors with nutritional status of preschool children. P values of ≤ 0.05 is considered statistically significant.

Findings
A total of 88 children were approached for recruitment in the study, and 80 preschool children (40 Urban slums;40 Rural areas) agreed to participate giving the response rate of 90%. The mean ± SD age of preschool children were 43.8 ± 9.8 months (n=40) and 46.5 ± 7.8 months (n=40) in urban and rural areas, respectively [Table 1]. The study showed that 65%(n=52) of children belonged to lower socioeconomic status with a higher proportion of these children from urban slums than in rural areas (82.5% vs 47.5%; p=0.001). The proportion of working mothers were significantly higher in urban slums (i.e.62%(n=26) vs 40%(n=16); p=0.025) than rural areas and were primarily engaged in unskilled occupation (n=90%). The majority of fathers in the study were engaged in unskilled occupations i.e. 88.7%(n=71) and 27.5%(n=22) of mothers had no formal education [Table 1]. About 75% of children of working mothers had family-based care regardless of being located in urban slum or rural area. Among children, 77.5% were non-vegetarians and 22.5% were vegetarians [Table 1]. The proportion of non-vegetarian children were significantly higher in the urban slums than in rural areas (p=0.007).
Evaluation of the nutrition status of children of working and non-working mothers from rural areas and urban slums showed that 69.2% children were stunted, 23.1% were wasted and 50% were underweight [Table 2]. Similarly, in rural areas, 43.8% children of working mothers were stunted, 18.8% were wasted and 43.8% were underweight. The study did not find significant difference between the nutritional status of preschool children regardless of their location (i.e. urban slum vs rural areas) [Table 2].
Table 3: Factors associated with the nutritional status of pre-school children

<table>
<thead>
<tr>
<th>Variables</th>
<th>N(%)</th>
<th>Height for Age</th>
<th>Weight for Age</th>
<th>Weight for Height</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>t-Stat</td>
<td>P-value</td>
<td>t-Stat</td>
</tr>
<tr>
<td>Geographical Area</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>40(50.0)</td>
<td>-1.140</td>
<td>0.258</td>
<td>-1.061</td>
</tr>
<tr>
<td>Rural</td>
<td>40(50.0)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>46(57.5)</td>
<td>-0.712</td>
<td>0.479</td>
<td>-1.105</td>
</tr>
<tr>
<td>Female</td>
<td>34(42.5)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Economic Status</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lower</td>
<td>52(65)</td>
<td>-1.296</td>
<td>0.199</td>
<td>-1.398</td>
</tr>
<tr>
<td>Middle</td>
<td>28(35)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occupation of Father</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skilled</td>
<td>9(11.3)</td>
<td>2.075</td>
<td>0.041*</td>
<td>1.906</td>
</tr>
<tr>
<td>Unskilled</td>
<td>71(88.7)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educational Status of Mother</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No formal Education</td>
<td>22(27.5)</td>
<td>-1.239</td>
<td>0.219</td>
<td>-1.989</td>
</tr>
<tr>
<td>Educated</td>
<td>58(72.5)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Working Status of Mother</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Working</td>
<td>42(52.5)</td>
<td>-0.555</td>
<td>0.580</td>
<td>-1.112</td>
</tr>
<tr>
<td>Nonworking</td>
<td>38(90.4)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occupation of Mother</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skilled</td>
<td>4(9.6)</td>
<td>-1.968</td>
<td>0.056</td>
<td>-1.270</td>
</tr>
<tr>
<td>Unskilled</td>
<td>38(90.4)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child Care</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family Care</td>
<td>30(71.4)</td>
<td>0.390</td>
<td>0.699</td>
<td>2.130</td>
</tr>
<tr>
<td>Non Family Care</td>
<td>12(28.6)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dietary Habits</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vegetarian</td>
<td>18(22.5)</td>
<td>-0.310</td>
<td>0.757</td>
<td>-0.031</td>
</tr>
<tr>
<td>Nonvegetarian</td>
<td>62(77.5)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Statistical test used: Student t-test. * Significance at *P ≤ 0.05

The associations of nutritional status of children with the frequency of consumption of different food groups such as vegetables, fruits, milk and products, unhealthy foods (i.e. chocolate and candies, savories and bakery items) were analyzed [Table 4] Results showed that mean z-scores of height-for-age, weight-for-age and weight-for-height were significantly lower in children who consumed chocolates and candies frequently than those who consumed these less frequently (p=0.039, p=0.005 and p=0.034, respectively) The mean Z-score of height-for-age and weight-for-age was significantly lower among children who consumed savories frequently than who consumed these less frequently (p=0.019 and p=0.045, respectively) [Table 4].

Table 4: Association of frequency of consumption of vegetable, fruits, milk and unhealthy foods (i.e. Chocolate, Candies, Savories, and bakery items) with nutritional status of children.

<table>
<thead>
<tr>
<th>Food Group</th>
<th>Frequency</th>
<th>N(%)</th>
<th>Height for Age</th>
<th>Weight for Age</th>
<th>Weight for Height</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>t-stat</td>
<td>P- Value</td>
<td>t-stat</td>
</tr>
<tr>
<td>Vegetable</td>
<td>Frequently</td>
<td>8(10.0)</td>
<td>0.437</td>
<td>0.663</td>
<td>0.522</td>
</tr>
<tr>
<td></td>
<td>Less Frequently</td>
<td>72(90.0)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fruit</td>
<td>Frequently</td>
<td>9(11.2)</td>
<td>1.440</td>
<td>0.154</td>
<td>1.339</td>
</tr>
<tr>
<td></td>
<td>Less Frequently</td>
<td>71(88.8)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Milk</td>
<td>Frequently</td>
<td>39(48.8)</td>
<td>0.222</td>
<td>0.825</td>
<td>0.005</td>
</tr>
<tr>
<td></td>
<td>Less Frequently</td>
<td>41(51.2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chocolate/Candy</td>
<td>Frequently</td>
<td>62(77.5)</td>
<td>-2.097</td>
<td>0.039*</td>
<td>-2.872</td>
</tr>
<tr>
<td></td>
<td>Less Frequently</td>
<td>18(22.5)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Savories</td>
<td>Frequently</td>
<td>55(68.8)</td>
<td>-2.402</td>
<td>0.019*</td>
<td>-2.037</td>
</tr>
<tr>
<td></td>
<td>Less Frequently</td>
<td>25(31.3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bakery</td>
<td>Frequently</td>
<td>24(30.0)</td>
<td>0.923</td>
<td>0.359</td>
<td>0.585</td>
</tr>
<tr>
<td></td>
<td>Less Frequently</td>
<td>56(70.0)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Statistical test used: t-test. Significance at *P ≤ 0.05

The associations of nutritional status of children with the frequency of consumption of different food groups such as vegetables, fruits, milk and products, unhealthy foods (i.e. chocolate and candies, savories and bakery items) were analyzed [Table 4] Results showed that mean z-scores of height-for-age, weight-for-age and weight-for-height were significantly lower in children who consumed chocolates and candies frequently than those who consumed these less frequently (p=0.039, p=0.005 and p=0.034, respectively) The mean Z-score of height-for-age and weight-for-age was significantly lower among children who consumed savories frequently than who consumed these less frequently (p=0.019 and p=0.045, respectively) [Table 4].
Additionally, it was observed that the children of working mothers had significantly higher frequency of use of bakery products than children of non-working mothers (p=0.033) [Table 5]. The intake of the other food groups such as vegetables, milk, savories and sweets remained the same between both the groups.

<table>
<thead>
<tr>
<th>Food Group</th>
<th>Frequency</th>
<th>Working Mother n(%)</th>
<th>Non-working Mother n(%)</th>
<th>P- Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vegetable</td>
<td>Frequently</td>
<td>3(7.1)</td>
<td>5(13.2)</td>
<td>0.374</td>
</tr>
<tr>
<td></td>
<td>Less Frequently</td>
<td>39(92.9)</td>
<td>33(86.8)</td>
<td></td>
</tr>
<tr>
<td>Fruit</td>
<td>Frequently</td>
<td>4(9.5)</td>
<td>5(13.2)</td>
<td>0.609</td>
</tr>
<tr>
<td></td>
<td>Less Frequently</td>
<td>38(90.5)</td>
<td>33(86.8)</td>
<td></td>
</tr>
<tr>
<td>Milk</td>
<td>Frequently</td>
<td>19(45.2)</td>
<td>20(52.6)</td>
<td>0.511</td>
</tr>
<tr>
<td></td>
<td>Less Frequently</td>
<td>23(54.8)</td>
<td>18(47.4)</td>
<td></td>
</tr>
<tr>
<td>Chocolate/Candy</td>
<td>Frequently</td>
<td>30(71.4)</td>
<td>32(84.2)</td>
<td>0.174</td>
</tr>
<tr>
<td></td>
<td>Less Frequently</td>
<td>12(28.6)</td>
<td>6(15.8)</td>
<td></td>
</tr>
<tr>
<td>Savories</td>
<td>Frequently</td>
<td>31(73.8)</td>
<td>24(63.2)</td>
<td>0.308</td>
</tr>
<tr>
<td></td>
<td>Less Frequently</td>
<td>11(26.2)</td>
<td>14(36.8)</td>
<td></td>
</tr>
<tr>
<td>Bakery</td>
<td>Frequently</td>
<td>17(40.5)</td>
<td>7(18.4)</td>
<td>0.033*</td>
</tr>
<tr>
<td></td>
<td>Less Frequently</td>
<td>25(59.5)</td>
<td>31(81.6)</td>
<td></td>
</tr>
</tbody>
</table>

Statistical test used: Chi Square Test. Significance at *P ≤ 0.05

**Discussion**

The present study was aimed to assess the impact of mothers’ working status on the nutritional status of their preschool children. The results showed that working status of mothers did not affect the nutritional status of their pre-school children. Additionally, sociodemographic factors such as mother’s educational status, father’s occupational status, family-based care of children and the dietary factors (i.e. the higher frequency of consumption of chocolates, savories and bakery products by the children) influenced the nutritional status of preschool children. The children of working mothers had a higher frequency of use of bakery products than that of non-working mothers.

The earlier studies from Madhya Pradesh and Nepal indicated that mothers’ working status influenced the nutritional status of their children due to the lesser time for childcare.\(^{10,11}\) A few previous studies from States other than Maharashtra have reported that mothers’ socioeconomic, education, and working status, and a rural family background determined the nutritional status of preschool children.\(^{12,13}\) However, the present study found that mothers’ working status and socioeconomic status of families did not influence the nutritional status of their children. The above contrasting results could be attributed to a smaller sample size of the present study or due to chance. Also, children in the present study received family-based care while mother was away at work which would have supported a good nutritional status of these children.\(^{14,15}\) In the study area it was observed that grandparents, elder siblings or neighbours provided caregiving while mother was at work. Also, we report the absence of any supportive childcare facilities such as creches or any other facility for childcare in this study area.

Additionally, the present study indicates that occupational status of father had significant impact on the nutritional status of the children. Our findings are similar to the study results of Sharma et. al. who found that fathers of underweight and thin children were employed in unskilled occupations. Further, this could have contributed to irregular income flow to the family, and thus, poverty.\(^{16,17}\) In addition to the other factors, some studies reported that mothers’ education status impact the nutritional status of their children.\(^{18,19}\) The present study showed a significant association between mothers’ education and nutritional status of their children.

Another important finding from this study was the frequent consumption of bakery products (i.e. Khari and
Biscuits) among children of working mothers compared to non-working mothers. This could be because working women in urban areas were unable to spend enough time on cooking for children and family members, which leads to an increased demand for convenience and processed foods. The study had a significantly higher number of working mothers from urban slums than in rural areas, and these working women plausibly replaced some of the meals of children with processed foods. Similar results reported by Japanese study that children of employed mothers very often skipped their meals and snacked more.

The results from the present study should be considered with caution. The results are from a preliminary study with a smaller sample size that may not be enough to establish a causal relationship between working status of the mothers and nutritional status of their children. Despite this limitation, the study provides an understanding on the existing prevalence of undernutrition among preschool children from rural areas and urban slum in selected areas of Pune with reference to working status of mothers. Additionally, the study report insights to the food pattern of preschool children, and the impact of working status of mothers on their food consumption pattern. In order to assess the causal relationship a study with larger sample size would be required.

**Conclusion**

In summary, the present study showed that mothers’ education status, father’s occupational status family based childcare support while mothers are at work and the frequent use of bakery products determined the nutritional status of their preschool children. In the context of unavailability of mothers’ care, children may develop poor dietary habits that adversely influence their health, nutritional status and development.

**Acknowledgments:** The authors wish to thank all the parents and children for their selfless contribution to the study.

**Conflict of Interest:** The authors declare no conflicts of interest.

**Financial Support and Sponsorship:** Nil

**References**

8.


Weekly Iron and Folic Acid Therapy in the Treatment of Anemia in Adolescents

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Abstract

Objectives: To study the effectiveness of weekly iron and folic acid therapy in the treatment of nutritional anemia in adolescents as an alternative to daily therapy.

Method: A comparative study was done in 123 anemic adolescents aged 12-15 years, in Chennai, Tamil Nadu. The study was done with the approval of our Institutional Ethics Committee and permission from the school authorities. The study population was divided into two groups, one receiving weekly and the other daily iron and folic acid therapy. Hemoglobin (Hb) estimation was done at baseline, 8 weeks and 16 weeks after initiating the treatment.

Results: Overall 105 children, 56 in the weekly therapy group and 49 in daily group completed the study. Within the groups analysis was done by repeated measurements of ANOVA at 3 different points of time. The increase in Hb level from baseline at 8 and 16 weeks was found to be significant within both the groups (p value <0.001). The improvement in Hb levels in the two groups was compared by independent student t test. There was no significant difference between the groups (p value > 0.05).

Conclusions: Weekly iron and folic acid therapy is as effective as daily therapy in the treatment of nutritional anemia.

Keywords: Anemia, weekly treatment, iron and folic acid, adolescents.

Introduction

Iron deficiency anemia (IDA) is a major public health problem affecting billions worldwide. In India, the prevalence among the women in the reproductive ages and children is almost 50%.¹ IDA in adolescents can affect the growth, immunity, development, scholastic abilities and educational achievements.² The diagnosis of anemia and its treatment in adolescent girls is important because they reach the reproductive phase sooner.³ Prevention and control of anemia is one of the major components of health programs for improving adolescent health.⁴

The National Anemia Prevention and Control Program in India developed by Ministry of health and Family Welfare (MoHFW) recommends weekly supplementation of iron and folic acid (IFA) to children between 5 -19 years for the prevention of anemia.⁴, ⁵ Its beneficial effect in anemia prevention is well known. However, there is no recommendation for pretreatment screening of these children for anemia. For established anemia, daily therapy is still recommended. When any medication has to be taken daily, compliance is a challenge, particularly in adolescence. Adherence to a weekly regime, especially when implemented through the school is easier and if proved effective it will be a good alternative to daily iron.

Since the prevalence of anemia in this age group is almost 50%, we studied the effect of weekly iron and
folic acid therapy through the school on improving the Hemoglobin (Hb) level in anemic adolescents.

Material and Method

This comparative study was done in school children in Chennai, South India, between August 2018 and January 2019. The study was done with the approval of our Institutional Ethics Committee and with the permission from the school authorities. The trial was registered with Clinical Trial Registry of India (CTRI/2018/01/011181). After obtaining informed consent from the parents and assent from the adolescents, students in classes 7 to 10 (aged 12 to 15 years), in two schools A and B were screened for anemia. After history and physical examination, Hb estimation using the Haemocue method was done by a trained lab technician. This Haemocue method is generally recommended for use in surveys. \[6\] This Portable Photometer with disposable microcuvettes having reagent in a dry form, stored in a dry place at room temperature was used for analysis. The modified azidemethemoglobin reaction happens in the microcuvettes. \[7\] This finger prick method was done under strict aseptic precautions with adequate tissue puncture to get accuracy in blood sampling. At population level Hb estimation is the reliable method to diagnose anemia. \[8\] Diagnosis of anemia and its severity was based on WHO classification. Mild - Hb : 11-11.9gm/dl, moderate – Hb : 8-10.9 gm/dl and severe (<8 gm/dl). In males at 15 years of age and above 11-12.9 gm/dl was considered mild anemia.

Inclusion Criteria:

2. Written consent from parents and assent from the adolescents.

The children with severe anemia (Hb<8gm/dl), suspected non nutritional anemia (palpable spleen / goiter), chronic systemic diseases and those who had been hospitalized or used any medication for two weeks in the previous 3 months were excluded from the study.

Sample Size Calculation: Based on the previous studies, \[9\] with the observed value of 0.15, difference in Hb between baseline and after 3 weeks of weekly therapy with standard deviation of 0.08, effect size 0.63, power 90 and alpha error 5, a sample size of 44 in each group was derived. Considering 20 % attrition a sample size 60 in each group was calculated. A non inferiority margin of 0.2 was taken for sample size calculation.

Overall, out of 550 children in two schools (A &B) screened for anemia, 152 children (27.6%) were found to be anemic. This 27.6% prevalence of anemia is of moderate public health significance. \[6\] Those willing to participate were enrolled after obtaining written consent from the parents and assent from the adolescent. Those fulfilling the inclusion criteria from school A (N = 60) were allotted to the weekly therapy group while those from school B (N= 63) were assigned to the daily therapy group. The two groups were comparable in terms of, age, sex, BMI and baseline Hb (Table 1). The children, parents and class teachers were educated regarding the possible side effects by the Principle Investigator (PI) and they were asked to report to the class teacher in the event of any side effects. If any child in the weekly therapy group had a drop in the hemoglobin by 8 weeks, change to daily therapy was planned.

Ferrous sulphate sustained release capsule 150mg (46 mg of elemental iron) and 500 mcg of folic acid was used in both the groups. For daily treatment one capsule per day was prescribed. As per the national guidelines by the MoHFW, 60 mg elemental is given daily to anemic children in the age group of 10-19 years for 3 months. Since the capsule we used was 46mg of elemental iron, we gave it for 16 weeks. The capsules were provided to the respective class teachers in both the groups. The weekly therapy group (Group A) received two capsules once a week under the direct supervision of the school teacher for 16 weeks. In the daily therapy group (Group B) the parents were called and given 14 capsules every two weeks by class teacher and asked to give one capsule daily at home and record the administration in a calendar. This was continued for 16 weeks. A self reported adherence to treatment on six out of seven days in a week was taken as adequate. Children in both the groups received Tablet Albendazole 400mg (2 doses, 2 weeks apart) before starting therapy. In both groups, first hemoglobin estimation was done at the end of 8 weeks (+ 4 days) and the second, at the end of 16 weeks (+ 4 days).

Data was analyzed using SPSS version 16. Independent t test was used to analyze the differences between the groups. Within the groups analysis was done by repeated measurements of ANOVA at 3 different points of time and by Friedman test. Chi square test was used for the baseline demographic characteristics. P values less than 0.05 was considered significant.
Findings

The total number of children enrolled initially was 123 (60 in group A and 63 in Group B). There were 14 dropouts in daily treatment group due to gastrointestinal side effects (4 children) and poor adherence (10 children) and four in the weekly therapy group, one after the first dose due to gastrointestinal side effect and other three after two doses due to withdrawal of consent for personal reasons unrelated to side effects. Hence 49 in daily treatment group and 56 in the weekly therapy group completed the study. Details of the study population are given in Table1.

The mean Hb concentration showed significant increase from the baseline at 8 weeks and 16 weeks in both the groups (p value <0.001). (Table.2). There was no significant difference between the two groups at either 8 or 16 weeks. At the end of 16 weeks 69.6% (39/56) in weekly group and 61.2% (30/49) in daily group had normal Hb level. (Table 3).

Table.1 Details of study population at baseline

<table>
<thead>
<tr>
<th>Age group 12-15 yrs</th>
<th>Group A (Weekly) N= 60 n (%)</th>
<th>Group B (Daily iron) N= 63 n %</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Age (years)</td>
<td>13.3±0.962</td>
<td>13.95±1.084</td>
<td>0.001</td>
</tr>
<tr>
<td>Boys</td>
<td>22</td>
<td>24</td>
<td>0.870</td>
</tr>
<tr>
<td>Girls</td>
<td>38</td>
<td>39</td>
<td></td>
</tr>
<tr>
<td>Thinness</td>
<td>4</td>
<td>8</td>
<td>0.294</td>
</tr>
<tr>
<td>Normal</td>
<td>41</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>Overweight/Obese</td>
<td>15</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Baseline Mean Hb (g/dl)</td>
<td>11.39±0.569 SD</td>
<td>11.15±0.843 SD</td>
<td>0.065</td>
</tr>
</tbody>
</table>

Table.2 The mean Hb concentration between baseline, 8 weeks and 16 weeks in weekly and daily group

<table>
<thead>
<tr>
<th>Hb (g/dl)</th>
<th>Group A (Weekly Iron) n=56</th>
<th>Group B (Daily Iron) n=49</th>
<th>P value Between the two groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Hb</td>
<td>95% CI</td>
<td>Mean Hb</td>
<td>95% CI</td>
</tr>
<tr>
<td>Baseline</td>
<td>11.4±0.57 SD</td>
<td>11.27 to 11.5</td>
<td>11.17±0.93 SD</td>
</tr>
<tr>
<td>8 weeks</td>
<td>12.07±0.72 SD</td>
<td>11.88 to 12.27</td>
<td>11.93±0.90 SD</td>
</tr>
<tr>
<td>16 weeks</td>
<td>12.4±0.67 SD</td>
<td>12.22 to 12.58</td>
<td>12.4±0.87 SD</td>
</tr>
<tr>
<td>Mean Hb increase at 16 weeks</td>
<td>0.98±0.845</td>
<td></td>
<td>1.23±0.846</td>
</tr>
</tbody>
</table>

Table.3 Impact of therapy on prevalence of anemia at baseline and the end of 8 and 16 weeks in the two groups

<table>
<thead>
<tr>
<th>Hb (g/dl)</th>
<th>Group A (Weekly Iron) N =56 n (%)</th>
<th>Group B (Daily Iron) N = 49 n (%)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>56</td>
<td>49</td>
<td></td>
</tr>
<tr>
<td>Anemic</td>
<td>0</td>
<td>49</td>
<td>0.833</td>
</tr>
<tr>
<td>Normal</td>
<td>49</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>8 weeks</td>
<td>32 (57.1)</td>
<td>24 (42.9)</td>
<td>27 (55.1)</td>
</tr>
<tr>
<td>Anemic</td>
<td>24 (42.9)</td>
<td>55.1</td>
<td>49</td>
</tr>
<tr>
<td>Normal</td>
<td>32 (57.1)</td>
<td>24</td>
<td>27</td>
</tr>
<tr>
<td>16 weeks</td>
<td>17 (30.4)</td>
<td>39 (69.6)</td>
<td>19 (38.8)</td>
</tr>
<tr>
<td>Anemic</td>
<td>17 (30.4)</td>
<td>39</td>
<td>19</td>
</tr>
<tr>
<td>Normal</td>
<td>17 (30.4)</td>
<td>39</td>
<td>19</td>
</tr>
</tbody>
</table>

Discussion

Overall, with weekly IFA therapy, of the 56 anemic children, 42.9% became non anemic in 8 weeks and 69.6% in 16 weeks while in the daily therapy group this was seen in 44.9% and 61.2% respectively. The mean increase in Hb from the base line was similar in the two groups. The overall incidence of significant gastrointestinal side effects was very low in both groups (weekly group 1/60 and daily group 4/63).

A lower response rate to weekly therapy (50% vs 56.7%) was observed in one previous study in adolescent girls. [10] However they had used 350 mg of ferrous sulphate (70mg elemental iron) and 1.5 mg of folic acid per dose in both the daily and weekly regimes for 100 days. Our response rate to weekly therapy was higher probably due to the higher dose (92 mg) of elemental iron.
In our study the mean increase in hemoglobin from the baseline in both the groups was only around 1 gm over 8 weeks. This is lower than that reported in other studies where in children aged 5 – 10 years received 200mg ferrous sulphate given daily or weekly for 56 days, the mean Hb increase was 2.5 gm/dL in daily group and 2 gm/dL in weekly group. [11]

In our study the incidence of reported Gastro intestinal side effects was very small in both groups and seen only in the first week. This could be because of the pre intervention counseling and small sample size of 123. Other studies, with larger sample size, have reported a higher incidence of side effects (25% in first week, 7% in week two and 5 % in weeks three) following weekly iron and folic acid supplementation.[12]

The weekly supplementation strategy is based on the intestinal turnover time which is 5-6 days in human beings. This is because saturation of the iron binding protein (apoferitin) in the mucosal cells blocks further iron absorption till these cells are shed. [13, 14] Animal studies have shown better iron absorption when given every 3rd day than when given daily.[15] Weekly iron and folic acid administration is as effective as daily therapy in the treatment of nutritional anemia in adolescents.

The major limitation of our study is we enrolled only children with mild to moderate anemia. Also, we have not confirmed iron / folic acid deficiency as the cause of anemia or studied the iron status. Further studies without these limitations are needed before making guidelines.

**Conclusions**

Our study suggests that weekly iron and folic acid therapy is an effective alternative to daily iron therapy in the treatment of anemia in adolescents. Since the iron and folic acid therapy can be given under the direct supervision of school teacher compliance is also better.

**Acknowledgements:** The authors are grateful to all the participants in the study, to the school authorities for giving us permission and to SRIHER for the financial support.

**Contributions SP:** Data collection, data analysis, study design, literature search, and manuscript writing. PV : Study design, literature search, manuscript writing, critical revision and interpretation. GT: Data analysis, critical revision and interpretation. All authors approved the final draft.

**Compliance with Ethical Standards:** All procedures performed in this study is in accordance with the ethical standards of Institutional Ethics Committee with approval.

**Conflict of Interest:** None.

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Envisaging the Model of a Yoga Based Physical Activity Promotion in India

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Abstract

Background: There are numerous yoga centers around India promoting yoga for health and spirituality. Their model of propagation of yoga addresses both community engagement and individual level treatment through yoga. On other hand, India needs a National Physical Activity Plan based on a sound model encompassing both community & individual level to combat NCDs which is economically less taxing. As promulgation of yoga sounds promising in fulfilling above said two criteria, we analyzed the model of yoga propagation of a non-governmental organization in India named Patanjali yogpeeth.

Method: Google scholar, pubmed, Cochrane data base are searched for literature on yoga by Patanjali yogpeeth. The official web site of Patanjali yogpeeth i.e. www.divyayoga.com, Video clippings from You tube are searched for yoga camps by Swami Ramdev. Swami Ramdev’s TV programs on “Aastha” channel was searched for more information.

Result: The search yielded 193 items. All of them are available for analysis. We found there is a definitive model of yoga based physical activity promotion by Patanjali yogpeeth. Further, there is a similarity between the two most recommended models of physical activity promotion and yogic yogic physical activity promotion model.

Conclusion: Government of India must take a closer look at this model and prepare a system of induction of the YPA model in to the public health care system to prevent NCDs.

Keywords: Physical activity, Exercise, yoga, Energy expenditure, Health promotion, Non-communicable disease, National physical activity plan, Patanjali yogpeeth, Swami Ramdev.

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Background

As per the 2015 statistics health care costs for non communicable diseases has surpassed that of the communicable diseases¹. Although Indian government is gradually focusing more on NCDs, healthcare costs in India are very high and it’s expected to rise in near future²⁴. For this proactive and cost effective measures are required to respond to the NCD threat. According to WHO, well designed national prevention & management response can avert nearly 50% of premature annual NCD deaths⁵. Preventive steps of NCDs are distinctly different from communicable diseases. And physical activity promotion takes a lead role in NCD prevention.

To prevent NCDs at individual level, WHO recommends a stipulated amount of physical activity (PA) per day⁶. India has formulated a PAG obliging to WHO recommendation⁷. But at present there is no national physical activity policy (NPAP) in India. However, to combat NCDs at population level physical activity should be promoted through a “Whole society approach”⁸. For this to happen, first there should be
a national level program to engage the community to physical activity and second there should be a comprehensive system for PA interventions at individual level. The later should aim to make PA an inclusive element of medical paradigm for prevention and treatment of NCD healthcare system.\(^9\).

India is a country of lifestyle recommendations to the world since time immemorial. India is known to boast spiritual lifestyle recommendations by ancient philosophers\(^10-11\). Earliest Indian health directives are embedded in it’s philosophical systems which dates back to 1500 to 500 BC\(^10-11\). These primeval philosophical systems gave many lifestyle recommendations for then existing population\(^12,13\). There is a renewed interest of those lifestyle recommendations in current Indian society especially of yoga. According to the definition of physical activity by caspersen et al yoga can safely be assumed to be a type of physical activity.\(^14\) Further recent studies on yoga indicates, for example a specific yoga style called vinyasa yoga can lead to significant energy expenditure similar to that of any other physical activity of moderate intensity.\(^15,16\).

At present, there are numerous yoga centers around India promoting yoga for health and spirituality. And yoga have found it’s way through television and similar such mass media to reach common household. The model of propagation of yoga addresses both community engagement and individual level treatment. On other hand, India needs a National Physical Activity Plan based on a cost effective yet sound PA model encompassing both community & individual level to combat NCDs. As promulgation of yoga sounds promising in fulfilling above said two criteria, we analyzed the yoga propagation of a non-governmental organization in India named Patanjali yogpeeth which is one of the most popular yoga organization in India. Though, aims of yoga and Ayurveda in this organization are similar and complimentary to each other, they are kept separate. Among the multifarious yoga activities following are note worthy:\(^20\):

(a) yoga classes by trained yoga teachers held as camps outside and in the institution
(b) television broadcasts of the classes
(c) printing of yoga literature through books & magazines
(d) university based yoga course

It is noteworthy that “Agita Sao Polo” started as a regional PA promotion plan in Sao Polo, Brazil in 1996 is now recommended by WHO as a PA promotion model for developing countries.\(^17\). Most important aim in “Agita Sao Polo” model is community engagement for physical activity. Whereas established in the year 2007 by American Medical Association and American College of Sports Medicine, the “Exercise is medicine” solution model is said to be a global model for PA promotion.\(^18\). “Exercise is medicine” solution model focuses on a physical activity intervention. It provides a comprehensive system for PA interventions at individual level aiming to make PA as an inclusive element of medical paradigm for prevention and treatment of NCD healthcare system.\(^9\).

**Material and Method**

Google scholar, pubmed, Cochrane data base are searched for literature on yoga by Patanjali yogpeeth. The official web site of Patanjali yogpeeth i.e. www.divyayoga.com, video clippings from You tube are searched for yoga camps by Swami Ramdev. Swami Ramdev’s TV programs on “Aastha” channel was searched for more information. The search yielded 193 items excluding the duplicates and similar content and TV commercials of Ayurvedic & home care products by Patanjali yogpeeth.

**Findings**

**About Patanjali yogpeeth:** Patanjali yogpeeth (www.divyayoga.com) is associated with a phenomenal yoga based PA promotion in India. It’s founded by two well known social activists cum yogis, including Swami Ramdev who has an astounding reach as a health advisor to one sixth of Indian population.\(^19,21,22,23,24\)

Though, aims of yoga and Ayurveda in this organization are similar and complimentary to each other, they are kept separate. Among the multifarious yoga activities following are note worthy:\(^20\):

(a) yoga classes by trained yoga teachers held as camps outside and in the institution  
(b) television broadcasts of the classes  
(c) printing of yoga literature through books & magazines  
(d) university based yoga course

In the following section we will refer yoga by Patanjali yogpeeth as yogic physical activity or the YPA. Summary of our analysis on YPA promotion by Patanjali yogpeeth is as follows:

1. **The community engagement module:**

   a. **Platform for community engagement:** Media exposure & public messaging

   Popularity of Swami Ramdev as a yoga teacher both in India and across the globe attracts
print and electronic media coverage of all of his activities including his yoga camps. Hence there is no paid media approach for spreading the message of yoga. In addition, perception of public message is “Call for physical activity is from a spiritual master of ancient yogic system on holistic health” further helps in community engagement. For those who cannot attend yoga camps most of his yoga demonstrations comes live or in recorded format in different TV channels. Similarly, to engage more participants eminent personalities such as politicians & movie stars are invited to attend the camps. Public message is also spread through yoga teachers trained by Patanjali yogpeeth conducting small group sessions in the community.

b. “One to many” intervention format at camps: Format of the yoga sessions in the camp remains the same for all the places wherever it’s held. Camps are informative, interactive and interventional in nature. Swami Ramdev teaches yoga both to healthy and suffering participants by demonstrating it himself and asking the audience to follow while trained volunteers supervise each of the participants. Following can be observed in a typical yoga camp:

a. These camps address mostly NCDs. Yoga or YPA is projected both as an independent solution and as a complimentary treatment. A typical session lasting up to 30-60 min is a good mix of sequence of different yogic and non yogic exercises, yogic postures, breath control exercises (pranayama), relaxation & cool down exercises and meditation.

b. Participants are given the knowledge of applications & benefits incurred by regularly performing particular yoga or pranayama technique. In few of the instances quantum of change expected due to regular performance of yoga over a certain parameter or a disease is shared with the participant. Regular yoga is emphasized to all participants to have control and amelioration of their ailments. Post-camp, group sessions organized by trained volunteers is a factor for adherence to YPA.

c. Pre-camp screening, focusing mostly on NCD related ailments by trained Ayurvedic doctors are carried out. Participants are also given detailed knowhow of precautions & contraindications for using yoga in different ailments. For example certain violent expiratory pranayama techniques are asked to be avoided by participants suffering from cardiovascular diseases.

d. Branches and franchise of Ayurvedic pharmaceutical division of Patanjali yogpeeth ensure endorsement of YPA along with Ayurvedic medications by qualified Ayurvedic physicians who are trained on yogic exercises in their professional training course. This makes YPA available at individual level.

2. Sustainable community links created by Inspirational talks: Swami Ramdev is known for his inspirational talks that include general & health economics and Indian welfare. He restarted a Swadesi (means your “own country’s”) movement. This term “Swadesi” was profusely used in pre independence era India. Freedom fighters used this term to influence Indian people to use Indian goods. Swami Ramdev’s Swadesi movement is to call all Indians to use goods produced in India and adopting an oriental lifestyle as recommended in Ayurvedic system of health care. Thus YPA being an important part of Ayurveda has become the epicenter of his camps & campaigns. Addition of “Swadesi” movement attracts sustainable community changes.

3. The education module:

a. Education & skill training: Professional and university certified Yoga teachers & Patanjali yogpeeth certified yoga trainers (of different levels) are involved in YPA specific skill development. Many non professionals among lay public are prepared as YPA volunteers by short term training on YPA.

b. Service delivery mechanism of YPA: There is system for employing & engaging YPA-skilled persons for community and individual service. Many medically lay volunteers but trained in YPA extend the community service on suo moto basis.
4. Clinical module: Individual based, self driven & based on a focused practice system: YPA has a distinct edge in preventive health care in addressing wellness as it comes from the oriental system of spiritual practice. (See the following flowchart).

   Disease control through YPA
   ↓
   Physical wellness
   & Mental wellness through YPA
   ↓
   Social wellness (YPA is firm pillar of Swadesi movement which is an example of spreading commitment towards community)
   ↓
   Spiritual wellness

5. Research Module
   a. activities: A quality research center Patanjali yogpeeth (at Haridwar) conduct research activities in Ayurvedic system and yoga. Research team at Patanjali yogpeeth is comprised of medical researchers from both Ayurvedic and modern medicine. Research output is shared with the scientific community through publications in different journals. In addition Patanjali yogpeeth has its own publishing house for periodicals, books on yoga, Ayurveda.
   b. Evidence base: While conducting camps, research evidences regarding efficacy of certain YPA technique(s) over a disease or on health is disseminated. However, Many of Swami Ramdev’s references are generally anecdotal references and case studies from his primary data sources of the research center.

6. Expenditures: YPA is self driven and cost effective. YPA consolidates the Indian health care system for NCD prevention and care without banking on government resources.

Conclusion

Physical activity promotion by Patanjali yogpeeth demonstrates a definite model. Similar to the “Agita Sao Polo” model YPA has a good public messaging mechanism and it engages the community into physical activity. On other hand, similar to “Exercise is medicine” solution model YPA has a sound physical activity intervention format. Hence YPA combines the essence of both of the models i.e. “Agita Sao Polo” Model & “Exercise is medicine” solution model. Though not scientifically tested, YPA model seems to be a replicable model for PA promotion in public health.

YPA not only cost effective but also it seems to have an edge over above discussed two models as it promotes all the components of health i.e. physical, mental, social, spiritual. Hence it can potentially be a complete PA promotional model for economies like India.

A clarion call to public health practitioners & policy makers: A precarious scenario looms over Indian public health arena. On one hand there is a rise in the NCD occurrences with parallel increase in physical inactivity where as on the other hand there is an absence of an exclusive NPAP to promote PA at population level. As reflected in the recent National Health Policy released in year 2017 there is no planning for formulation of exclusive NPAP.

Creating a sustainable system for PA promotion & delivering the service at community and individual level for prevention and treatment of NCD is a herculean ask for a population of 132 crore. Nonetheless, YPA is a genuinely functional and well publicized platform for government of India to consider regarding PA promotion. Government of India must take a closer look at it and prepare a system for induction of the YPA model in to the public health care system. The economic feasibility for the same is assuring as YPA is already serving from individual to community level in all parts of India. Hence YPA model has the potential to help Indian NCDs scenario. However YPA needs a close scrutiny by experienced public health practitioners and researchers for suitable modification to fit all socio-religio-demographic spans. And a lot of clinical and public health research on YPA is needed to show a newer way to health in this NCD age.

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Ethical Clearance: This article is a review article hence no ethical clearance is required

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Dental Indices: An Appraisal at its Numerical Value

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Abstract

Dental index or indices are devices to find out the incidence, prevalence and severity of the disease, based on which preventive programs can be adopted. This current review article emphasizes and lists out the different indices that are used regularly in screening and treatment of various oral conditions. Few of the recent advances on dental indices have also been enumerated in the current article.

Keywords: Dental indices, oral hygiene, caries, Periodontitis, Tooth wear, Mobility.

Introduction

Oral diseases can be quantified more precisely than any other chronic conditions. The quantitative measures of these oral conditions most commonly relay on Indices or Indexes. Such differences can only be determined by indices¹.

According to Russel AL, an Index is defined as a numerical value describing the relative status of a population on a graduated scale with definite upper and lower limits, which is designed to permit and facilitate comparison with other populations classified by the same criteria and method². The ideal requisites of an indices are clarity, simplicity, objectivity, validity, reliability, Quantifiability, sensitivity, acceptability. The main uses of indices can be divided into three:

1. For individuals – for providing individual assessment.
2. For research – to determine baseline data.
3. For community health – to show the prevalence and incidence of a particular condition³.

Various indices are put forwarded for assessing the oral health status.

Few of the indices are described below:

Indices Used for Assessing Oral Hygiene:

There are number of indices which are used to assess the oral hygiene status. The indices those are used are: Oral hygiene index(OHI), Oral hygiene index simplified(OHI-S), Glass index for debris, Patient hygiene performance index (PHP), Modified patient hygiene performance index (PHP-M), Plaque free score, Clinical system for scoring Patient’s Oral Hygiene Performance, The university of Mississippi oral hygiene Index (UM-OHI)⁴. Out of all these we are discussing some of the indices in detail:

1. Oral Hygiene Index (OHI): It was developed by John C. Greene and Jack R. Vermillion (1960) to classify and assess oral hygiene status. This index is composed of Debris and Calculus Index. Rules for scoring are: 1) Only permanent teeth are scored, 2) Third molars or incompletely erupted teeth are not scored, 3) The buccal and lingual debris scores are both taken on the tooth in a segment having the greatest surface area covered by debris. 4) Interpretation: The minimum number of points for all segments in either debris or calculus score is 0. The maximum number of points for all segments in either debris or calculus score is 36. The higher
the score, the poorer the oral hygiene. Limitations are even though the oral hygiene index was to determined to be simple and sensitive, it was time consuming and required more decision making. So, an effort was made to develop a more simplified criterion.

2. Simplified Oral Hygiene Index (OHI-S): It was developed by John C. Greene and Jack R. Vermillion (1964) to reduce both the number of decisions required on the part of examiner and time required for the inspection. It differs from the original OHI in number of tooth surfaces (6 rather than 12). Substitution of missing teeth is possible in OHI-S when compared to OHI. The criteria used for assessing scores to the tooth surfaces are same as those used for the OHI.

Rules for scoring OHI-S are at least two of the six possible tooth surfaces must have been examined. Third molars are included only included if they are functional. Natural teeth with full crown restorations and surfaces reduced in height by caries or trauma are not scored. Instruments used are no.23 explorer and mouth mirror.

Indices Used for Assessing Plaque: There are number of indices used for assessing the plaque inside the oral cavity. Those are: plaque index and its modifications, Quigley –Hein Index and its modifications, Turskey-Gilmore-Glickman modification of the Quigley Hein plaque index, Shick and Ash Modification of plaque criteria, Global plaque index, Navy plaque index, Gingival marginal plaque index or Harpp index (GMPI), Distal mesial plaque index (DMPI), Proximal Marginal plaque index (PMPI), New method of plaque scoring (NMPS), Plaque assessment scoring system (PASS), Topographic plaque index. Some of the commonly used plaque indices will be discussing in detail:

1. Plaque Index: It was described by Sillness jand Loe H in 1964 and more fully described by Loe.H in 1967. It is unique among indices because it ignores coronal extent of plaque and assesses only the thickness of plaque at the gingival area of the tooth. It can be used as full mouth or as simplified index. The only limitation is the subjectivity in estimating plaque and if any single index tooth is missing, there is no substitution and a full mouth examination has to be done. Instruments used are mouth mirror and a dental explorer.

2. Turskey-Gilmore-Glickman Modification of The Quigley–Hein Plaque Index: Quigley G. and Hein J in 1962 reported a plaque measurement that focused on the gingival third of the tooth surface. They examined only the facial surfaces of anterior teeth. A numerical scoring system of 0 to 5 was used. The Quigley – Hein plaque index was modified by Turskey S, Gilmore N. D and Glickman I in 1970. Instrumrnts used are mouth mirror and disclosing agent (Quigley and Tursuskey used basic fuschin). Calculation will be index score =Total score/ number of surfaces examined. Interpretation is like a score of 0 to 1 is considered low and a score of 2 or more is considered high.

Indices Used for Assessing Gingival Disease: Indices that are used to assess the gingival diseases have been widely used through out the dentistry. Some of them are: Papillary Marginal Attached (PMA) index, Papillary Marginal (PM) index. Gingival index, Glass index, Gingival Bleeding Index (GBI), Gingival Assessment index, Dental health care index, Gingival tissue index. We are going to discuss some of the commonly used gingival indices:

1. Papillary Marginal Attached (PMA) Index: This index was developed by Maury Massler and Schour in 1944. The basic philosophy used is very similar to DMF (Decayed Missing and Filled Tooth Index) i.e number of gingival units affected were counted rather than the severity of the inflammation. A gingival unit was divided into three component parts: papillary gingiva, Marginal gingiva, Attached gingiva. The number of affected papillary, Marginal and attached gingival units are counted and then totaled separately, then added together and expressed numerically as the PMA index score per person.

2. Gingival Index (GI): This index was developed by Loe H and Sillness J in 1963, only for the purpose of assessing the severity of gingivitis and location in the four possible areas by examining only the qualitative changes of the gingival soft tissue. Instruments used are Mouth mirror and periodontal probe. All the four surfaces are examined and divide by number of tooth examined. The interpretation will be on mild, moderate and severe gingivitis.

Indices Used for Assessing Periodontitis: Indices that are used for assessing periodontitis are: Periodontal index (PI), Periodontal Disease Index (PDI), Community Periodontal Index for treatment Needs (CPITN),
Gingival Periodontal Index, Gingival-Bone Count Index, Community Periodontal Index (CPI), Dutch Periodontal Screening Index, Periodontitis Severity Index etc. Here will be discussing some of the commonly used index in detail:

1. Russel’s Periodontal Index (PI): This was developed by Russel A. L. in 1956, over a trial period of 10 years. The PI was intended to find deeper periodontal disease by measuring the presence or absence of gingival inflammation and its severity, pocket formation and masticatory function. The PI is a composite index. Instruments used are Mouth mirror and Plain probe. All the teeth are examined and Russel ‘s Rule states that “When in a doubt assign lesser score”. It is calculated by sum of the individual score divided by Number of teeth present. One of the limitation is since calibrated probe is not used there might be under estimation of true level of periodontal disease.

2. Community Periodontal Index for Treatment Needs (CPITN): This index was developed by the “joint working committee” of the “World Health Organization” and “Federation Dentaire Internationale” by Jukka Ainamo, David Barmes, George Beagrie, Terry Cutress, Jean Martin, and Jeniffer sardo-Infirri in 1982. This survey was developed primarily to survey and evaluate periodontal treatment needs rather than determining past and present periodontal status. The limitations of CPITN that it doesn’t record the position of the gingival margin and doesn’t provide assessment of past periodontal breakdown. It can be calculated in two ways by: Index teeth and Sextants. Instruments used are mouth mirror and CPITN Probe. Classification of diseases are coded from Code 0 to Code X. Classification of treatment needs are coded from TN 0 to TN 3.

3. Community Periodontal Index (CPI): It is just a modification of CPITN. The modification is done by the inclusion of measurement of “Loss of attachment” and elimination of the “Treatment need” category. Instruments used are mouth mirror and CPITN-C Probe. The codes and criteria are same as that of CPITN. The scoring criteria is from 0 to 9.

Indices Used for Assessing Dental Caries: Dental caries is the most common problem faced in our community. So to assess the dental caries in a wide population we have to relay upon these indices. The indices used for assessing dental caries are:

1. Decayed Missing Filled Teeth Index (DMFT): This index was developed by Henrt T. Klien, Carrole E. Palmer and Knutson J.W. in 1938 to determine the prevalence of coronal caries. The main advantages of this indices are Simple, Rapid, Versatile and Universally accepted. Instruments used are Mouth mirror and Explorer. All the 28 permanent teeth are included. The maximum score for an individual DMFT Score is 28 or 32. Total each component, i.e. D + M and F Separately, then, total DMF. There are several limitations like DMFT Values doesn’t show number of teeth at risk. DMFT index can overestimate caries experience in teeth in which preventive fillings are made. It gives only little study about root caries. DMFT equates a disease state with a healthy state by assigning the same score for a decayed tooth as well as for a filled healthy tooth. It was then modified in 1987 and 1997, in that all third molars were included and temporary restorations are considered as decay. only missing due to caries is missing component. In 1997 modification WHO Probe was made to assess the DMFT score and also for the individuals 30 years and older, M component should comprise teeth missing due to caries for any other reason.

2. International Caries Detection and Assessment System (ICDAS): Codes for coronal caries range from 0 to 6 depending upon the severity of the lesion. Criteria for the coding is described like:

0=Sound teeth
1=First visual change.
2=Distinct visual change.
3=Localized enamel break down.
4=Underlying dark shadow of dentin.
5=Distinct cavity with visible dentin.
6=Extensive distinct cavity with visible dentin.
3. **Specific Caries Index:** This was proposed by Sashidhar Acharya in 2006. These criteria for this index is based on GV BLACK, classification of cavity preparation. The main advantages are providing information on caries prevalence, criteria are simple and easy to use. Reproducibility is fair to good. Some of the limitations are in cases of large lesions covering more than one surfaces can’t be assessed. Lack of provision of root caries and inability of this index if used alone to capture information on treatment planning.

Indices Used for Assessing Root Caries: Root surface caries are generally confined to exposed root surfaces and is therefore an unusual condition, because it is dependent on previous disease, resulting in loss of attachment and cementum exposure. Some of the indices used are Root caries index, Root surface caries severity index, Root caries criteria as given by Banting DE, Ellen RP and Fillery ED.

1. **Root Caries Index (RCI):** It was developed by Ralph V Katz in 1979. Only teeth with gingival recession are examined. Method- Mesial, distal, buccal lingual are examined.

   RCI Score= RD+RF 100/ RD +RF+RN
   RD= Recession present, surface decayed
   RF= Recession present, surface filled
   RN= Recession present, Surface Normal or Sound

2. **Root Surface Severity Index:** It was developed by Billings RJ in 1986. According to these index criteria was graded. Grade I (incipient), Grade II (shallow), Grade III (cavitation), Grade IV (pulpal).

Indices Used for Assessing Tooth Wear and Mobility: Many tooth wear indices have been developed for clinical and laboratory use. Some of the common tooth wear indices are Tooth wear index, simplified tooth wear index, System for Assessing Occlusal tooth wear, Individual tooth wear index, UK Adult Health Survey Criteria, The Exact tooth wear Index. We will be explaining some of them in detail:

1. **Tooth Wear Index (TWI):** This was introduced by B.G.N.Smith and J.K. Knightin 1984 to assess the extent severity of dental erosion, attrition, and abrasion as well as any combination of these conditions. Scores are given in four criteria from no loss of enamel to defect more than 2mm deep–pulpal exposure. Some of the limitations are the thresholds proposed were high, erring towards understatement rather than exaggerations of pathological wear. Full use of index as a research tool is not feasible without computer assistance.

2. **Simplified Tooth Wear Index:** Barsdely et al pioneered a new, simplified version of TWI. Tooth wear scoring was essentially dichotomized into the presence or absence of dentine, with even cupping of dentine scoring one. Scores vary from 0 to 4 varying from No wear into dentine and exposure of pulp or secondary dentine.

Indices to Assess Tooth Mobility: Certain indices were developed to evaluate the tooth mobility to overcome the problems with devices. Some of them are Tooth Mobility Index, Mobility Index by Ramfjord, Mobility Index by Laster et al, Tooth Mobility Index by Lindhe.

1. **Tooth Mobility Index:** It was described by Miller SC in 1950. Tooth is held firmly between two instruments and moved back and forth. Mobility is scored from 0-3.

2. **Mobility Index by Ramfjord:** It was described by RAMFJORD in 1967. Code ranges from M0 to M3. From physiologic mobility to Extreme mobility.

3. **Mobility Index by Laster et al:** It was assessed by the application of Lateral horizontal forces based on the score from 0 to 3 i.e. from Normal to Mobility greater than 1mm.

**Conclusion**

Indices are the essential tool for conducting research projects, diagnosis, making treatment plans and evaluation of prognosis and treatment outcome. It is really difficult to find all related indices at one place, so in this current article we have tried to compile the different indices regularly used in dentistry for research and clinical evaluation of various oral disease & conditions. Future studies should be conducted on all indices that the future dentists will know the importance of indices in research as well as in clinical evaluation level.

**Ethical Clearance:** Not Applicable

**Source of Funding:** Nil

**Conflict of Interest:** Nil
References

15. International caries detection and Assessment system coordinating committee. Workshop held in Baltimore. Maryland, March 12th-14th 2005.
22. Ramfjord SP. The periodontal Disease Index. J Periodontol 1967; 38:602-10,
India is a land of spirituality with rich heritage of spiritual literature. Researchers proved that spirituality and mental health are inter related. Spirituality has a positive effect on physical as well as on mental health. Recent research reports strongly suggest that to many patients, religion and spirituality are resources that help them to cope with the stresses in life, including those of their illness. Many psychiatrists now believe that religion and spirituality are important in the life of their patients.

Align to the above present research emphasized on the importance of Spirituality and mental health. In the present paper the researchers have attempted in depth analysis of followers of four different discourses. The sample of the study consists of 311 followers of Divergent Discourses. Sample was collected in two of the States i.e Delhi and Rajasthan. The results revealed that there is relationship between mental health and spirituality of followers of four divergent discourses. Mental health was determined with the help of Mental Health Inventory developed by Dr Jagdish and Dr Srivastav. Spirituality was determined with the help of spirituality assessment scale developed by Judy. W. Howden. Research indicates that experiencing various kind of stress, anxiety increases the risk of suffering from various mental illnesses. From the perspective of positive psychology or holism, mental health may include an individual’s ability to enjoy life, and create a balance between life activities and efforts to achieve psychological resilience.

Keywords: Mental Health, Spirituality, Psychological Resilience, Discourses, Positivity.
termed “spiritual but not religious”. In modern times the emphasis is on subjective experience.

Dorte Toudal Viftrup (2013) used Inclusion and exclusion criteria, and checklists from standardized assessment tools. However, clear and delimited conceptualization of spiritual and religious factors is crucial in order to be able to conclude the direct influences of spiritual or religious factors on outcomes.

In (2010) P. S. Fry described the psychosocial model of mental health postulates that wellbeing in late life is significantly influenced by several externally generated factors such as social resources, income and negative life events.

Robert C. Atchley (2009) described spiritual life, one focused on personal growth and deep human experience, is a major focus and motivator for people over the age of forty. Ellen Idler (2008) highlighted through a discussion of current research and related observations that many of the positive benefits that religious and spiritual practice can have on one’s health and well-being.

Researcher has chosen the followers of four divergent discourses mentioned below:

Radha Soami Satsang Beas (RSSB)

Nirankari

The Art of Living

Anandpur Kuttiya

**Review of literature:** In modern society keeping mental health intact is important in day to day life. In this study we are talking about that how spirituality has a positive or negative impact on the mental health of followers of religious discourses. Some of the related reviews are:

Océane Agli et al in 2014 talked about that how religious and spiritual issues are clearly important to the older adult population and may play a positive role in maintaining health and recovering from illness. This study systematically reviewed the literature examining the effects of religion and spirituality on health outcomes such as cognitive functioning, coping strategies, and quality of life in people with dementia.

Dorte Toudal Viftrup, et al 2013 used Inclusion and exclusion criteria, and checklists from standardized assessment tools were applied to the research literature. Qualitative and quantitative papers were included. In total, 8 articles were considered eligible for the review. Findings from the evaluation suggested that the concepts of spirituality and religiosity were poorly conceptualized and the way in which spiritual and religious factors were integrated into such group psychotherapies, which distinguished it from other types of group psychotherapies, was not fully conceptualized or understood either. However, clear and delimited conceptualization of spiritual and religious factors is crucial in order to be able to conclude the direct influences of spiritual or religious factors on outcomes.

Patricia Higgins in 2011 found that in England and Wales there are over 700,000 people living with dementia, a third of who live in care homes. Notably two thirds of residents in care homes have dementia (Department of Health 2009). A study by Cohen–Mansfield et al 2006 found that the well-being of people with dementia living in care homes can be enhanced by the provision of person-centered care based on knowledge of their unique life story and the creation of positive relationships. For people with dementia, helping to maintain a link or reconnect with their religion as part of their provision of care has the potential to increase their sense of well-being. This has been recognized in the National Service Framework for Older People (DOH 2001) and by NICE/SCIE (2006). Both documents stress the necessity of providing person-centered care that responds to the individual’s needs including those relating to spirituality and religion.

P.S. Fry in 2010 described the psychosocial model of mental health postulates that wellbeing in late life is significantly influenced by several externally generated factors such as social resources, income and negative life events. More recently, the gerontological literature is drawing attention to the increasingly influential role of existential factors such as religiosity, spirituality and personal meaning in the psychological wellbeing of older adults. This study examined the unique and combined contribution of specific dimensions of religiosity, spirituality and personal meaning in life as predictors of wellbeing in samples of community-residing and institutionalized older adults. Using hierarchical regression analyses, the results showed that personal meaning, involvement in formal religion, participation in spiritual practices, importance of religion, degree of comfort derived from religion, sense of inner peace with self, and accessibility to religious resources were significant predictors of wellbeing for
the combined sample. The findings confirmed that existential measures of personal meaning, religiosity and spirituality contributed more significantly to the variance in wellbeing than did demographic variables or other traditional measures such as social resources, physical health or negative life events. The importance of existential constructs of religiosity, spirituality and personal meaning in helping older adults to transcend old age stresses and sustain wellbeing are discussed.

Similarly in 2009 Robert C. Atchley described spiritual life, one focused on personal growth and deep human experience, is a major focus and motivator for people over the age of forty. Yet there is a marked lack of rigorous academic study of spirituality’s importance in the lives of aging people. Noted gerontologist Robert C. Atchley remedies this problem by developing complex concepts and language about spirituality. Spirituality and Aging incorporates material from two decades of interviews, observations, study, and reflection to illustrate ways of thinking about and discussing spirituality—what it is why it is important, and how it influences the experience of aging. This book provides a nuanced view of spirituality and the richness it brings to the lives of older people. Atchley next focuses on two dimensions of spirituality that is likely to manifest later in life: becoming a sage (developing the capacity to bring spiritual light to everyday issues) and serving from spirit (creating opportunities for service that are rooted in spirituality). The last section illustrates how spirituality informs other aspects of late life, such as psychological coping and the experience of dying and death.

In 2008 Ellen Idler highlighted through a discussion of current research and related observations that many of the positive benefits that religious and spiritual practice can have on one’s health and well-being. Starting at an early age, the choices one makes based on spiritual beliefs and values directly relate to the creation of certain lifestyle habits, such as diet, alcohol use, and sexual practices. The overall effect of such practices on one’s health and well-being is found to be positive throughout one’s lifetime.

Methodology

Aim of the study: The main aim of the present research work is to study the psychology of spirituality: Mental health perspectives.

Hypotheses: There will be a significant relationship between mental health and spirituality of followers of divergent discourses of metropolitan city and non metropolitan city.

There will be significant difference in mental health and spirituality of followers of divergent discourses of metropolitan and non metropolitan cities.

Divergent discourses will have significant positive effect on mental health of followers of metropolitan and non metropolitan cities.

Spirituality will be significant predictor of mental health of followers in both metropolitan and non metropolitan cities.

There will be significant gender differences in mental health and spirituality of followers of divergent discourses of metropolitan and non metropolitan cities.

Sample: The present research focuses on “psychology of spirituality: Mental health perspectives.” For this, a sample of 311 followers of Divergent Discourses was taken. The sample of the research was taken from Delhi and Rajasthan. Total sample was of 311 followers of Divergent Discourses was taken for this research.

Instruments

Mental Health Inventory: The Mental health Inventory consists of 56 questions was developed by Dr Jagdish and Dr Srivastav in the year 1983. The Mental Health Inventory has a reliability of .73 and validity of .54. It consists of a series of statements reflecting the six areas: Positive Self Evaluation, Perception of reality, Integration of personality, Autonomy, Group oriented attitudes, Environmental mastery. There are positive and negative statements. Respondents rate positive statements on a scale of 4 to 1, with 4 indicating always and 1 indicating never. And respondents rate negative statements on a scale of 1 to 4, with 1 indicating always and 4 indicating never.

Spirituality Assessment scale: The Spirituality Assessment scale consists of 28 questions was developed by Judy.W.Howden in the year 1992. There are four dimensions in this scale: Personal and meaning in life, Innerness, Unifying interconnectedness, Transcendence. Respondents rate statements on a scale of 1 to 6, with 1 indicating strong disagreement and 6 indicating strong agreement.
Procedure for Data Collection: The researcher personally went to collect the sample. Sample was selected and were asked if would volunteer to participate in a study on “psychology of spirituality: Mental health perspectives.” Each of the Followers met personally and clarified their doubts if any on the questionnaire. The instructions for filling the questionnaires were given. Respondents were assured of confidentiality. Convenient time was given.

Results and Discussion: In the initial step, mean and S.D., for every variable was put under measurable examination, at that point, higher statistical processes were begun in which, Correlation was taken. Results are presented in the mentioned below tables. In comparison, significant difference was found.

Table no. 1 Correlation among Variables

<table>
<thead>
<tr>
<th></th>
<th>PMLQ</th>
<th>Inner-ness</th>
<th>Interconnectedness</th>
<th>Transcendence</th>
<th>SAS</th>
<th>PSE</th>
<th>POR</th>
<th>IOP</th>
<th>Autonomy</th>
<th>GOA</th>
<th>EM</th>
<th>MHI</th>
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<tr>
<td>Innerness</td>
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<tr>
<td>Interconnectedness</td>
<td>.52**</td>
<td>.63**</td>
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<tr>
<td>Transcendence</td>
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<td>.72**</td>
<td>.68**</td>
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<td>.85**</td>
<td>.87**</td>
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<td>-.092</td>
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<td>-.050</td>
<td>-.075</td>
<td>-.029</td>
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<td>Integration of personality</td>
<td>.13*</td>
<td>.17**</td>
<td>.19**</td>
<td>.18**</td>
<td>.20**</td>
<td>-.20**</td>
<td>.05</td>
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<tr>
<td>Autonomy</td>
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<td>.01</td>
<td>.02</td>
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<td>.05</td>
<td>.01</td>
<td>-.06</td>
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<td>-.02</td>
<td>.09</td>
<td>.01</td>
<td>.11*</td>
<td>.09</td>
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<td>-.04</td>
<td>.00</td>
<td>.31**</td>
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<td>-.21**</td>
<td>-.07</td>
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<td>.08</td>
<td>.01</td>
<td>.50**</td>
<td>.32**</td>
<td>.42**</td>
<td>.42</td>
<td>.51**</td>
<td>.34**</td>
<td>1</td>
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</tbody>
</table>

*The result is significant at the 0.05 level
**The result is significant at the 0.01 level

The above table is showing the Correlation between spirituality and mental health where correlation between different dimensions and their significant level that indicating a significant difference between different dimensions lying at 0.01 levels and 0.005 levels.

Table shows Correlation between innerness and personal and meaning in life is .68**, Correlation between interconnectedness and personal and meaning in life comes to .52**. Correlation between Transcendence and personal and meaning in life is .60**. Correlation between innerness and interconnectedness is .63**. Correlation between innerness and transcendence is .72**. Interconnectedness and transcendence comes to .68**. Correlation between SAS and Transcendence is .87**.

Correlation between integration of personality and personal and meaning in life comes to .13*, whereas correlation between integration of personality and innerness is .17**, correlation between integration of personality and interconnectedness is .19**, correlation between integration of personality and transcendence is .18**. Correlation between integration of personality and SAS is .20**.

Correlation between autonomy and integrity of personality is .12*, correlation between group oriented attitudes and positive self evaluation is .11*, Correlation between environmental mastery and positive self evaluation is .31**, Correlation between Mental health inventory and personal and meaning in life is .13*, Correlation between mental health inventory and positive self evaluation is .50**, Correlation between mental health inventory and perception of reality is .32**, Correlation between mental health inventory and integration of personality is .42**, correlation...
between mental health inventory and autonomy is .42**, correlation between mental health inventory and group oriented attitude is .51**, correlation between mental health inventory and environmental mastery is .34**.

The obtained results show that there is relationship between Spirituality and mental health of believers of divergent discourses. From the present research we come to know that how spirituality helps us in attaining good mental health. It does not eliminate stress or erase life’s difficulties, instead, it gives people strength to tackle problems head on, overcome adversity and move on their lives. Dealing with change or loss is an inevitable part of life. At some point, everyone experiences varying degrees of setbacks, rejections of all types such as social rejection, rejection from loved ones, rejection in marriage etc. All these rejections can have negative effect on person’s well being. Some of these challenges might be relatively minor (not getting into a class you really wanted to take), while others are disastrous on a much larger scale (hurricanes, tornadoes, terrorist attacks). How we deal with these problems can play a major role in not only the outcome, but also the long-term psychological consequences. Psychologists have identified some of the factors that make someone more mentally strong, among them a positive attitude, optimism, the ability to regulate emotions, and the ability to see failure as a form of helpful feedback.

**Conclusion**

This study examines the relation between psychology of spirituality: Mental health perspectives. This study was conducted so that results would yield a better picture that how spirituality has a positive or negative relation on mental health of believers. The findings suggested that spirituality may protect person’s well being on the other hand high level of stress, worries, rejection can harm person’s mental, physical and spiritual well being. However, more research and intervention plans are needed to understand the importance of spirituality in one’s lives.

**Conflict of Interest:** Nil

**Source of Funding:** This is not a funding research as this is an original research paper by the research scholar.

**Ethical Clearance:** This is a part of supporting PhD research work and ethical committee wing is not applicable for this research.

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Serodiagnosis and Molecular Characterization of Scrub Typhus in and around Vijayapura, North Karnataka Region

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Abstract

Background: Scrub typhus or tsutsugamushi disease, transmitted by the bites of infected immature mites (chiggers) is a most covert re-emerging febrile infection currently. The disease is unnoticed or misdiagnosed due to low manifestation and lack of specific diagnostic tests at all levels. Failure of timely diagnosis leads to significant morbidity and mortality. Geographically this disease is widely endemic in a confined area of the Asia-Pacific region. In India, Scrub typhus infection is increasing and reported from various geographical parts during the past 10-15 yrs. Serological test is widely used for the diagnosis of the disease.

Aim & Objectives: To investigate the presence of Scrub typhus infection in and around Vijayapura of North Karnataka region using serological tests and nested PCR.

Materials and Method: During the period of 2015-17, a total of 209 patients presenting with acute febrile illness with rashes, body ache were examined for Scrub typhus infections by Weil Felix agglutination test and IgM ELISA. Further all the ELISA positive samples were tested by nested PCR using the specific primers of the gene encoding the immunodominant 56 kDa protein and PCR products were sequenced.

Results: Out of 209 cases, 39 (18.5%) samples showed agglutination in Weil Felix antigen OXK test with titre 1:160 and above. In Scrub typhus IgM ELISA 13 (6.3%) samples were positive with the OD value more than 0.5. In nested PCR, two samples were amplified a 483 base pairs diagnostic segment of the gene encoding the 56 kDa antigen of O. tsutsugamushi using specific primers. PCR product was sequenced bidirectionally, and nucleotide sequences queried against NCBI BLAST programme to identify the sequenced sample.

Conclusion: Findings of our study demonstrated that, though more seropositivity of Spotted Fever Group Rickettsial infection is observed by WF test, scrub typhus infection is also circulating and causing acute febrile illness in and around Vijayapura, North Karnataka region. As the routinely used Weil felix test is less sensitive, inclusion of more specific tests like ELISA and nested PCR is very useful in proper diagnosis and patient management.

Keywords: Weil Felix test, Rickettsia, Scrub typhus, ELISA, Nested PCR.

Introduction

Rickettsial diseases are the most covert re-emerging febrile infections of the current era and mostly go unnoticed or misdiagnosed due to low manifestation and lack of specific diagnostic tests at all levels. Biogroups of Rickettsiaceae includes Spotted fever group, Typhus group and Scrub typhus¹. Scrub typhus or tsutsugamushi disease is caused by the bacterium Orientia tsutsugamushi, which is transmitted by the
bites of infected, immature mites (chiggers) belonging to the family Trombiculidae. Illness typically begins after the bite of an infected chigger and lasts for 7-10 days. The most common symptoms of infected persons are consistent fever of more than 7 days, headache, myalgia, rashes, eschar and lymphadenopathy. Delay in diagnosis and treatment leads to severe complications like central nervous system problems or circulatory collapse caused by disseminated intravascular coagulation and even death of the individual\(^2\)\(^3\). Geographically this disease is widely endemic in a confined area of the Asia-Pacific region, distributed in tsutsugamushi-triangle i.e. India and Nepal in the west; China, Japan, South Korea, and Taiwan in the north, and Australia and Indonesia in the south\(^2\)\(^3\)\(^4\). In India, the presence of Rickettsiosis has been reported from Jammu and Kashmir, Himachal Pradesh, Delhi, Rajasthan, Uttarakhand, West Bengal, Assam, Meghalaya, Karnataka, Andra Pradesh, Maharashtra, Tamil Nadu, Puducherry and Kerala\(^3\)\(^4\).

During the last 10 - 15 years, several researchers from different geographical parts of India have reported seropositivity of scrub typhus infections using single or combination of serology based tests like, ELISA, Weil felix and Microimmunofluorescence assay etc\(^3\)\(^4\)\(^8\)\(^10\)\(^11\). Further, a few researchers have also demonstrated the PCR, a molecular test for the diagnosis of scrub typhus by detecting different genes, namely 56kDa\(^15\)\(^-\)\(^20\), Groel, and 16SrRNA\(^16\) from blood samples\(^15\)\(^-\)\(^19\) and rodents\(^20\).

When we reviewed the hospital medical records of last two years, we observed significantly high number of acute febrile illness cases diagnosed as Rickettsial infection on the basis of single serological test i.e. Weil felix. Though Scrub typhus infection has been increasing and reported from various geographical parts of India, no confirmatory data is available from north Karnataka region. Hence, we undertook this study during the period 2015– 2017 to investigate the existence of Scrub typhus infection in and around Vijayapur, Karnataka using both serological tests and molecular test- nested PCR.

**Materials and Method**

During the period of 2015-17, a total of 209 patients presenting with acute febrile illness, rashes and body ache were screened for the presence of Scrub typhus infection. It was a prospective study and the study group comprised of patients of all age-groups and both sexes who attended and admitted to OP/IP departments Shri B.M. Patil Medical College, Hospital and Research centre, Vijayapur and District hospital, Vijayapur. The patients with acute febrile illness, and already diagnosed as other infections like malaria, enteric fever, dengue during the sample collection were excluded from the study.

After obtaining the informed consent, 5 ml of Venus blood samples were collected from patients in plain tube and serum was separated and blood clots of all the samples were stored at -20°C.

**Serological Tests**

**Weil Felix test:** Serum samples were screened for the presence of antibodies against Scrub typhus infection by Weil felix tube agglutination test (Tulip diagnostics, Goa), in which the antibodies present in the serum reacts with antigens derived from various proteus species and exhibit agglutination. Samples with titres of 1:160 and above for OXK were considered as positive for Scrub typhus infection.

**IgM ELISA:** All the samples were screened for the serological confirmation of the presence of specific antibodies against Scrub typhus infection by IgM ELISA (Inbios International, USA), a method which is reported to be more sensitive and specific by several researchers\(^3\)\(^4\)\(^8\)\(^10\)\(^11\). Both positive and negative controls provided with the kit were also included in the assay. Both the serological tests were performed strictly according to the manufacturer’s instructions.

**Nested PCR:** Blood clot was homogenized and the DNA was extracted from 200 μl of homogenized blood using the QIAmp blood mini kit (Qiagen) as per manufacturer’s instructions. The eluted DNA was aliquoted and stored at -30°C. Nested PCR was performed using two sets of primers to amplify a 483 base pairs segment of the gene encoding the 56 kDa antigen of *O. tsutsugamushi* as described by Furuya et al. (1993). The primers were procured from Integrated DNA Technologies (IDT).

**Details of primers used are:**

First set (Outer primer); P34: 5’-TCA AGC TTA TTG CTA GTG CAA TGT CTGC- 3’ and P55: 5’-AGG GAT CCC TGC TGC TGT GCG-3’

Second set (Inner primer); P10: 5’-GAT CAA GCT TCC TCA GCC TAC TAT AAT GCC-3’ and P11: 5’-CTA GGG ATC CCG ACA GAT GCA TTA TGA GGC-3’
Premixed ready to use green master mix (Promega, USA) was used for amplification, which consists of Taq Polymerase, dNTPs, MgCl$_2$ and reaction buffers at optimal concentrations for efficient amplification of DNA templates by PCR. Total volume of reaction mixture including templates was 50 µl. First PCR was performed with the template DNA using first set of primers (p34 & p55). The first PCR product was used as template for the second PCR with second set of primers (p10 & p11). Amplification protocol for both PCR was: initial denaturation of template at 95°C for 10 min, denaturation at 95°C for 30 sec, annealing at 55°C for 1 min, extension at 70°C for 1 min for 35 cycles followed by final elongation at 70°C for 10 min in a thermal cycler (Aeris, ESCO). The amplicons were electrophoresed in a 1% agarose gel containing ethidium bromide (0.5μg/ml) and visualized in Gel documentation system system (Syngene, USA). PCR products were sequenced by Sanger sequencing method to identify the species.

Results

Out of 209 samples, 39 samples showed agglutination with OXK antigen with titre of 1:160 and above, and 13 samples were positive by IgM ELISA. Interpretation was done as per the manufacturer instructions (Table 1).

<table>
<thead>
<tr>
<th>Serological Tests</th>
<th>Total positive</th>
<th>IgM ELISA Positive</th>
<th>IgM ELISA Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weil felix OXK positive</td>
<td>39</td>
<td>11</td>
<td>28</td>
</tr>
<tr>
<td>Weil felix OXK negative</td>
<td>170</td>
<td>02</td>
<td>168</td>
</tr>
</tbody>
</table>

Negatives include samples with titre 1:80 and below for OXK, and samples positive for other WF antigens except OXK. Samples non reactive with WF antigens were not evaluated.

In nested PCR, out of 13 ELISA positives, two samples amplified the gene encoding the 56 kDa antigen of *O. tsutsugamushi*. (Fig 1). One positive control received from Dept of Microbiology, BMCRI, Bangalore and one negative control was also tested along with the samples.

![Fig 1. Agarose gel electrophoresis picture of amplified DNA by nested PCR. Lane 1- sample 1, lane 2- sample 2, lane 3 sample 3, lane 4 sample 4, lane -C positive control and lane - N negative control.](image-url)

Discussion

Rickettsial infections are re-emerging in India and will lead to significant morbidity and mortality if failed to diagnose timely and take appropriate treatment. The diagnosis of scrub typhus is generally made by the history and clinical presentation. The vast variability and common clinical manifestations of the disease which is similar to other febrile illnesses makes the clinical diagnosis challenging. During the last decade, several researchers have reported the existence of rickettsial infection in different part of India using single or a combination of serological tests like Weil felix, ELISA and Microimmunofluorescence assay and using both Serological test and molecular test- PCR.

When we reviewed the last two years medical records of tertiary care facility Shri B.M. Patil medical college Hospital and research centre Vijayapura, we found that significant numbers of cases have been diagnosed using Weil felix test alone, and in which seropositivity for
SFG Rickettsiae or Indian Tick typhus was commonly reported than Scrub typhus. We also have observed and reported similar results in our previous serological study on R. conorii. In that study, out of 231 cases screened, 105 cases were positive for OX2 antigen by Weil felix test suggestive of R. conorii and 27 cases were confirmed serologically by IgM ELISA.

Though scrub typhus infection have been increasing and reported from various parts of India, Scrub typhus was not evaluated and no confirmatory data is available from north Karnataka region. Hence, we undertook this study to investigate the existence of Scrub typhus in Vijayapura area of Karnataka using both serological and molecular tests. All the cases included in the study were clinically suspected with fever of more than one week (100%), body ache (23%) and rashes (19%). We could not find eschar in any cases.

Out of 209 symptomatic cases screened, 39 (18.5%) were positive by Weil felix with titre of OXK >1:160 and 13 were positive by IgM ELISA suggestive of Scrub typhus infection. It is highly significant in this region even though the results obtained in our study shows considerable difference in percentage of positive cases reported by several researchers from different geographical parts of India like Karnataka, Andrapradesh, Pondicherry, Tamil Nadu, Himachal Pradesh and Delhi. We have observed more seropositivity during cooler months between August to January, and same was reported by few of the investigators.

Since both the serological tests exhibit significantly varied sensitivity and specificity according to the geographical area, the detection of causative organism directly from the patients sample would be highly important. Different PCR techniques have been reported during the last decade for detection of different genes of scrub typhus namely 56kDa, Groel and 16SrRNA from blood samples and rodents. To substantiate the seropositivity observed in the study area, we performed the nested PCR on blood clots of ELISA positive samples for the confirmation of organism using the primers encoding the 56kDa gene of O. tsutsugamushi as described by Furuya et.al. While ELISA positive samples had high OD value, we succeeded to amplify a 483 bp segment of the gene encoding the 56 kDa antigen of O. tsutsugamushi in only two samples which were positive by both the serological tests Weil Felix and IgM ELISA. Results of Nucleotide sequences queried against NCBI BLAST programme showed 97 to 99% homology with the strains reported from KMC Manipal (MG283201.1), Andaman and Nicobar (MF457892.1), Pondicherry (KT970967.1), Himalayan region (DQ286233.1) and Uttar Pradesh (KR706188.1).

**Conclusion**

Findings of our study demonstrated that though more seropositivity of SFG Rickettsial infection is observed by Weil Felix test, scrub typhus infection is also circulating and causing acute febrile illness in and around Vijayapura, North Karnataka region. As the routinely used Weil felix test is less sensitive, inclusion of specific tests like ELISA and nested PCR is very useful in proper diagnosis and patient management.

**Acknowledgement:** The authors are thankful to Dr. Sneha Chunchanur, Assistant Professor, Dept. of Microbiology, BMCRI Bangalore for providing the positive control and the guidance.

The authors acknowledge the support of Non-teaching staff of Dept. Microbiology, BLDEUs Shri B.M Patil Medical College, Vijayapur for their support during the sample collection and performing the tests, and staff of NITM Belgaum for the support during molecular testing process.

**Conflict of Interest:** None

**Source of Funding:** Self

**Ethical Clearance:** Ethical clearance was obtained from ethical committee, BLDE University Vijayapur.

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Management of Type I Talon’s Cusp Using Cone Beamed Computed Tomography as a Diagnostic Aid: A Case Report

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Abstract

Talon’s cusp is an uncommon developmental anomaly that frequently creates an occlusal interference resulting in occlusal trauma, premature contact or reversible apical periodontitis of the opposing tooth. Such occlusal interference is commonly encountered during orthodontic treatment while retraction of maxillary anterior teeth. Advanced diagnostic tools like CBCT is useful for exploring the details of endodontic architecture. The present case revealed bilateral existence of talon’s cusp on the palatal aspect of maxillary lateral incisors interfering with the bite during orthodontic treatment. With the use of CBCT as a diagnostic aid, this case was managed using a minimally invasive approach with greater patient comfort.

Keywords: Dental anomaly, Talon’s cusp, CBCT, accessory cusp.

Introduction

Talon’s cusps are unusual dental anomalies with an accessory cusp like projection on the cingulum area of the anterior teeth. It was first reported by Mitchell in 1892 and was termed as “Talon cusp” by Mellor and Ripa in 1970 as its shape resembles an eagle’s talon. The etiopathogenesis of talon’s cusp is multifactorial and polygenetic with influence of some environmental factors. It occurs during the morphodifferentiation stage of odontogenesis, as a consequence of outward folding of the inner enamel epithelial cells and a transient focal hyperplasia of dental papilla.¹

Maxilla shows a greater predilection for talon’s cusps, commonly affecting the maxillary lateral incisors followed by central incisors, with male to female ratio of 16:9.² It has also been seen in patients with Sturge-Weber syndrome, Mohr syndrome, Rubinstein-Taybi syndrome and incontinentia pigmenti achromians. It may also be associated with other dental anomalies like microdontia, peg lateral incisors, dens invaginatus, odontoma, impacted mesiodens, supernumerary teeth, accessory cusps of premolars, bifid cingulum, cingulum hypertrophy and prominent cusps of carabelli.¹

The talon cusp might result in clinical problems like occlusal interference, caries, attrition, displacement of the affected tooth and irritation of local soft tissues.³ As talon’s cusp frequently interferes with the orthodontic tooth movement of incisors during retraction, it demands an early and preventive intervention. In the present case report, we successfully managed a case of talon’s cusp on the palatal aspect of bilateral maxillary lateral incisors interfering with the orthodontic tooth alignment, using a minimally invasive approach.

Case report: A 19 years old female patient undergoing orthodontic treatment was referred to the department of conservative dentistry and endodontics as bilateral cuspal projections on the palatal surfaces of maxillary lateral incisors were interfering with the correction of overjet. Medical and dental history was non-contributory. On intraoral examination, talon’s cusps were seen on both the maxillary lateral incisors, extending from the cingulum to incisal edge and were
almost in contact with the mandibular anterior teeth on occlusion (Fig: 1A, 1B). Both the lateral incisors were non caries and the teeth responded normally to pulp sensibility testing.

As intraoral periapical radiograph (IOPA) shows superimposition of talon’s cusp over the tooth crown, a CBCT (i-CAT, Hatfield, Pennsylvania, USA) with limited field of view (FOV) was advised, that confirmed the extension of pulp horn into the talon’s cusp. In sagittal and coronal sections, CBCT also revealed that the pulp has extended around 2.4 mm to 3.4 mm into the talon’s cusp (Fig: 1C, 1D). So, to prevent the exposure of the pulp, a conservative treatment plan of gradual reduction of the cusp at consecutive appointments with an interval of 4-6 weeks was planned.

The patient was prescribed desensitizing toothpaste (Sensodyne, GSK Ltd, India) at the start of the treatment to prevent sensitivity. Before starting grinding of the cusp, a putty index (Aquasil soft putty, Dentsply IH Ltd, UK) was made and cut sagittally at the maximum height of talon’s cusp. In every appointment, the talon’s cusp was reduced 1mm along the side of the cusp using a flame-shaped diamond bur (Mani, Japan) using putty index as a reference. A desensitizing agent (Colgate Duraphat Varnish, UK) was applied on the reduced tooth surface after each session (Fig: 1E, 1F). The pulpal health was assessed using a cold test before each grinding session and the entire cusp was completely reduced in four appointments (Fig: 2). There was no pulpal exposure during reduction and after final reduction, a thin layer of flowable composite (Filtex Supreme Ultra, 3M ESPE, US) was placed to cover the exposed dentinal tubules.

Discussion

Maxillary lateral incisors are susceptible to develop a talon’s cusp because of the compression of its tooth germ from the adjacent central incisor and canine in the morphodifferentiation stage, which develops 7 months prior to lateral incisor.4 Though a talon’s cusp associates with other developmental abnormalities, the patient did not have any other documented developmental anomalies in the present case.

Based on the degree of cusp formation and extension, talon’s cusp is categorized into three types.5 Type I (Talon) contains a supplementary cusp that encompasses at least half of the distance from Cemento Enamel Junction (CEJ) to the incisal edge, Type II (Semitalon) covers over less than half the distance from CEJ to incisal edge and Type III (Trace talon) exhibits a prominent cingulate with variations like conical, bifid, and tuber types. The present case comes under the category of Type I as the cusp extends from from CEJ to incisal edge.

Treatment of talon’s cusp is usually not required, when the caries or advanced attrition is absent, esthetic appearance is satisfactory and the function is within normal limits.6 But in the present case, management became necessary as the cusp was interfering with occlusion for the orthodontic correction of excessive overjet.

Talon’s cusp contains enamel and dentin with variable extents of the pulp tissue.7 Treatment planning mainly depends on whether the cusp comprises or lacks a pulp horn.1 In intraoral periapical radiographs, it becomes very difficult to detect the pulpal configuration inside the talon’s cusp. This is because of the result of superimposition of the cusp over the tooth crown as these radiographs provide only two dimensional imaging.8 Hence, a CBCT with limited FOV was advised in the present case to reduce the radiation exposure to the patient and to accurately interpret the complex three dimensional anatomy of pulp.9

Type I Talon’s cusp can be managed by total reduction of the cusp in single appointment or periodic gradual reduction of the cusp at consecutive appointments.1 The total reduction of the cusp is usually accompanied by pulp therapy like root canal treatment, pulpotomy or partial pulpotomy, which is normally indicated in cases of severe occlusal interference. The gradual reduction of the cusp with an interval of 4-6 weeks stimulates reparative dentin deposition for protecting the pulp.5

The gradual reduction of the cusp was chosen because it is a minimally invasive approach with reduced risk of pulp exposure that preserves the pulp vitality. It also reduces patient’s discomfort without hindering the progress of orthodontic treatment.10 Thus, CBCT helped in understanding the pulpal configuration before opting for invasive treatment approaches that might result in pulpal exposure.
Putty index acted as a reference guide which facilitated predictable way of tracking the amount of cuspal reduction in every appointment. As most of the odontoblasts lie along the length of the cusp, the grinding was performed mainly on the side of the cusp rather than at its tip to promote reparative dentin formation.\textsuperscript{11} Cold test was performed in every appointment to assess the pulpal health as the electric pulp test findings are not reliable in teeth undergoing orthodontic tooth movement.\textsuperscript{12}

The management of talon’s cusp in the present case was performed in a stepwise calculated manner entirely based on the principles of minimal intervention dentistry. This allowed a very precise and limited removal of dental tissues for preserving the tooth vitality.\textsuperscript{13}

Figure 1A: Bilateral talon’s cusps on maxillary lateral incisors, Figure 1B: Talon’s cusps causing occlusal interference by touching the lower incisors, Figure 1C: In sagittal sections of CBCT, 12 revealed 3.22 mm and 22 showed 2.44 mm of pulpal extension into talon’s cusp, Figure 1D: In coronal sections of CBCT, 12 revealed 3.4 mm and 22 showed 2.6 mm extension of pulp into talon’s cusp, Figure 1E: Correction of overjet orthodontically after grinding of talon’s cusps, Figure 1F: Completed grinding of talon’s cusps in four appointments

Figure 2: Grinding of talon’s cusp in consecutive appointments, Figure 2A: First appointment, Figure 2B: Second appointment, Figure 2C: Third appointment, Figure 2D: Fourth appointment
Conclusion

A correct diagnosis with a prompt treatment is necessary for improving the oral health and quality of life of the patient. CBCT is a superior diagnostic aid for management of teeth with uncommon anatomy that may pose substantial challenge to clinicians during treatment planning. The management of talon cusp should always aim at maintaining the pulpal vitality along with re-establishing the occlusal and esthetic requirements.

Ethical Clearance: Patient’s consent taken.

References

Perception and Attitude Regarding Measles Rubella (MR) Vaccination

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Abstract

Objectives: Objectives of the study are to assess the perception and attitude regarding Measles Rubella vaccination and find out the association between demographic variables with perception and attitude regarding Measles Rubella vaccination.

Methodology: Descriptive survey design was adopted for the study. Convenience sampling technique used to select 300 people from 1st, 14th and 16th ward of Nayarambalam Panchayath. The tool used for the study consists of structured questionnaire to identify perception regarding Measles Rubella vaccination and demographic data and five point Likert scale to assess Measles Rubella vaccination. Data was analyzed using descriptive and inferential statistics.

Results: Most of the subjects (95%) had good perception and in the case of attitude most of them (91%) had favourable attitude towards Measles Rubella vaccination. The age of the subjects had significant association with perception and attitude regarding Measles Rubella vaccination.

Conclusion: In conclusion of the study people had favourable approach to Measles Rubella vaccination

Keywords: Perception, attitude, Measles Rubella vaccination.
disease status. MR vaccination introduced in routine immunization and replaced measles vaccine given at 9-12 months and 16-24 months of age of child. After the success of first phase of MR campaign second phase of MR campaign launched in eight states and union territories. The second phase completed in Andrapradesh, Chandigarh, Himachel Pradesh, Kerala, Telangana, Uttrakhand, Dadra and Nagar Haveli and Daman and Diu from August 2017. In Kerala Measles Rubella campaign started on October 3rd 2017. There was resistance from a group of people against measles rubella vaccination in the initial phase and lead to less coverage. A qualitative study conducted by V K Krishnendu and Lyana Susan George about drivers and barriers for Measles Rubella Campaign and the study identified that the main barriers for the MR campaign was anti vaccination propaganda in social media. A case control study conducted in Kancheepuram about trust in health information and acceptance of Measles-Rubella campaign in Tamil Nadu. The study result shows teachers have good role in Measles rubella campaign and Perception of parents regarding the benefits of measles rubella vaccination was not good. Majority of people have the confusion regarding the Measles Rubella Vaccination. Perceptions regarding Measles Rubella vaccination affect coverage of measles and rubella vaccination. The researcher interested to check the perceptions and attitudes regarding MR vaccination in people residing in selected south Indian rural village.

Statement of the problem: Study to assess the perception and attitude regarding Measles rubella Vaccination among the people residing in selected south Indian rural village.

Objective of the Study

Primary objective:
1. To assess the perceptions and attitude regarding Measles Rubella (MR) Vaccination among people in selected community

Secondary objective: To find out the association of demographic variables with perceptions and attitudes regarding Measles Rubella (MR) vaccination among people in selected community

Research Methodology: The present study used a descriptive survey design to collect the data. The study conducted at 1st, 14th and 16th ward of Nayararambalam Panchayath in Ernakulam district of Kerala and data collection period from 11/12/2017 to 23/12/2017. Sample was taken by convenience sampling technique and the sample size was 300. The subjects included that study was people having the age group of 20 to 60 years and are able to read Malayalam and English. The tool used for the study included structured questionnaire and five point Likert scale. Structured questionnaire used to collect demographic data and perceptions regarding Measles Rubella vaccination. Demographic data included age, educational status, occupational status and monthly income. Five point Likert scale used to assess the attitude regarding Measles Rubella Vaccination. Data collected after approval obtained from the research committee of Amrita College of Nursing Scientific committee and ethical committee of AIMS. Permission to conduct the study collected from Nayarambalam Panchayath. Informed written consent taken from the participants before commencement of the study. Data analysed with descriptive and inferential taitistics. Percentage and frequency used as descriptive statistics and chi square test used as inferential statistics. Ethical permission took from the ethical committee, AIMS before the data collection

Results

Socio demographic factors such as age, sex, marital status, educational status and occupation of subjects were studied. The study finding show that nearly half of the subjects, 147 (49%) were in the age group of 31-40 years followed by 89 subjects (29.7%) in the age group of 18-30. Out of 300 majority of the subjects, 237 (79%) were females. About the marital status, most of the subjects, 289 (96.3%) were married. Regarding the educational status 119 subjects (39.7%) were having education status of higher secondary followed by 118 subjects (39.3%) in secondary. About the occupation majority of the subjects, 185 (61.7%) were unemployed.

Figure 1: Perception regarding measles rubella vaccination.
Figure 1 depicts the perception regarding measles rubella vaccination. Most of the subjects (95%) had good perception regarding measles rubella vaccination and demographic variables reveals that only age of the subjects has association with perception ($\chi^2 = 6.865$, $p=0.032$).

### Discussion

In our study most of the subjects (95%) had good perception regarding Measles Rubella vaccination and most of the subjects (91%) had favourable attitude towards Measles Rubella vaccination. In demographic variables only age of the subjects had significant association with perception and attitude regarding Measles Rubella vaccination. No other demographic variables had significant association with perception and attitude regarding Measles Rubella vaccination. A descriptive study conducted about the level of knowledge regarding Measles Rubella Vaccine Among mothers of under 15 years Children In Rural Area, Bhucho Mandi, Bathinda, Punjab\(^{13}\). The result was contradictory to the present study Sample method used for the study was purposive sampling and sampling size was 150. Study result was nearly half of the subjects (53.33%) had moderately adequate knowledge, 45.33% had inadequate knowledge and 1.33% had adequate knowledge. There was association between occupation, family income, religion with the knowledge of Measles-Rubella vaccine among mothers of under 15 years of children. In our study only association present between perception and age of the subjects. Another study conducted among students of Egyptian University after the measles rubella campaign\(^{14}\). The descriptive study conducted to assess uptake of MR vaccine and reasons for declining the vaccine among medical and non-medical students in the campaign and to assess the knowledge about the vaccine and the diseases. The finding was students were not informed all the aspects of vaccination especially about adverse effects and contraindication and medical students informed more than other students. Overall 64.8% medical students accepted the vaccine and among the non vaccinated subjects around half of subjects (43.3) were given reason that little information about the vaccine leads to their non vaccination. In our study people had good perception regarding all aspects of Measles rubella vaccination.

### Conclusion

In conclusion of the study people had favourable approach to Measles Rubella vaccination. The health awareness programme may helps to improve good perception and promote favourable attitude towards Measles Rubella vaccination.
Financial support: Self

Conflict of Interest: There are no conflicts of Interest.

Ethical consideration: Ethical permission took from the ethical committee, AIMS before the data collection.

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Laryngospasm: Prevention Better than Cure

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Abstract

Laryngospasm is one of the most commonly occurring perioperative complication seen in the practice of every Anaesthesiologist. It can present with varying degrees of severity and presentation may not be the same in all individuals. There are several risk factors that can cause laryngospasm, knowledge of which can help in its prevention. Over the years, several researchers have published data on the prevention and management of the laryngospasm. This article highlights the types, mechanism of action, risk factors, prevention and treatment by reviewing literature on this long studied and frequently encountered anesthetic emergency.

Keywords: Anesthetic emergency, laryngeal muscles, glottic spasm, Larsons manoeuvre, no touch technique.

Introduction

For an anaesthesiologist, laryngospasm is one of the most common difficulties seen in the perioperative period¹ especially during induction and extubation. It is a superior laryngeal nerve mediated reflex resulting in prolonged glottic closure²-⁴. In 1937, Guedel added laryngospasm in the description of anesthetic planes, as seen as excitement, in Phase II⁵,⁶. An incidence study that was computer aided including 1,36,929 reported that laryngospasm is said to be less than 1%⁷. The incidence in children was twice that of adults and increases by three times in the first three months of life⁸. In patients undergoing adenoidectomy and tonsillectomy, incidence in the literature is as high as 25%⁹. In adults, 40% of the airway obstructions have been reported to be a consequence of laryngospasm.

We performed an electronic search in Google Scholar, PubMed and Cochrane databases for original and review articles on laryngospasm from 1950 to 2019. The current preventive and management techniques around Laryngospasm are summarized.

Risk Factors

A lighter plane of anaesthesia especially during intubation and extubation can trigger laryngospasm especially in patients who are prone to it due to other related factors¹³,¹⁴. The incidence during the induction and maintenance phase was increased when a face mask or laryngeal mask airway (LMA) was used.
Volatile anaesthetics may cause laryngospasms especially in children (2.3%)\(^1\). Desflurane has the highest incidence (50%) of triggering a laryngospasm than any other volatile anaesthetic while there are no changes in incidence with respect to sevoflurane and halothane\(^2\). Isoflurane can also cause laryngospasms while compared to sevoflurane and halothane\(^3\). Intubation per say can trigger a laryngospasm due to manipulation of the airway especially when neuromuscular blockers are not used. Repeated attempts as well as trauma to the glottic aperture can stimulate the same\(^4\). Laryngospasms were also common after tracheal extubation\(^5\).

Intravenous induction agent like thiopentone is said to cause higher incidence of laryngospasm in patients than with propofol because its lack of suppression of airway reflexes\(^6,7\). The incidence of ketamine causing laryngospasm is 0.4%\(^8\), as it may irritate the vocal cords due to its tendency to increase salivary secretions\(^9\).

Paediatric population are more prone to laryngospasms especially the ones who had a respiratory tract infection in the past 4-6 weeks\(^10\). Several studies have reported the higher incidence in desaturation, laryngospasm and bronchospasm in children with active or recent (< 6 weeks) upper respiratory tract infections\(^11,12\).

Airway reactivity: Approximately a 10 times increase in risk, if patients had active asthma and 10-fold risk continued for up to 6 weeks\(^13\). Even in adults who are chronic smokers the incidence is said to be higher than non-smokers\(^14\). Passive smoking and tobacco use can trigger laryngospasms especially in children\(^15,16\).

Patient related factors: Smoking\(^17,18,19\), obesity, obstructive sleep apnoea, difficult airway\(^20\), gastroesophageal reflux disease\(^21\), ASA IV patients are conditions where incidence of laryngospasm has been shown to be higher.

Type of surgery: Among incidence in upper airway surgery, which is 21-26%, tonsil and adenoids surgery have the highest incidence of laryngospasms\(^22,23\). Other surgeries that can trigger laryngospasms include appendectomy, Lords dilatation and dilation of the cervix, skin transplants, bronchoscopy and mediastinoscopy and hypospadias surgery. Reports have shown that iatrogenic removal of the parathyroid glands or damage to the superior laryngeal nerve during surgery of the thyroid causes hypocalcemia that has predisposed to laryngospasm\(^24,25\).

Prevention

The best way to treat laryngospasm is the awareness of precipitating factors and avoiding them. As Anaesthesiologists we may witness laryngospasms during three phases, induction\(^26\), during the time of extubation and postoperatively\(^27,28\).

A study done in 2015 found that an adequate depth with limiting the number of attempts at intubation decreased the morbidity and hence the incidence of cardiac arrest and death\(^29-31\). The main factors responsible were repeated airway manipulations and inadequate anesthetic depth accounting about 43.4% and 22.6% respectively\(^32\).

In children with history of asthma and those with hyper reactive airways, propofol has been shown to be the best drug used for induction due to its property of depressing the laryngeal reflexes. Pre-treatment with opioids also seems to decrease hyper stimulatory reflexes by 10%\(^33\).

Blood and secretions are irritants and reflex closure of the muscles of the larynx can prevent foreign material from entering the tracheobronchial tree.

In 2016, Qi X et al demonstrated that using intravenous (1 to 2 mg/ kg) or topical lignocaine during general anesthesia, especially in children was efficacious in preventing laryngospasm\(^34\). Nebulised lidocaine reduces sensitivity of upper airway and may be used before tracheal intubation\(^35\).

Magnesium sulphate at a dose of 15mg/ kg has a protective effect due to its effect on muscle relaxation and increasing depth of anaesthesia, although more studies are required. It is used to prevent laryngospasm especially after tonsillectomy and adenoidectomy\(^36\).

During extubation, the no touch technique decreased the incidence of laryngospasm and this was shown by Tsui and colleagues\(^37\). The patients’ secretions are aspirated, at an adequate plane of anaesthesia, and placed in left lateral position. This is followed by tracheal extubation when the patient is awake and is then ventilated with 100% oxygen through a face mask\(^38\). The basis of this technique is that extubation is done while the lungs are in positive pressure, which reduces the laryngeal response to adduction and thereby laryngospasm.
A survey done in the United states found that 64% anaesthesiologists performed deep extubation and it was shown in two studies by Koga et al. and Patel et al. there was no difference in airway obstruction when patients were extubated awake or in deep plane.

Treatment

The first step is to identify and treat the precipitating cause especially if it is an obvious one like stimulation due to surgery or pain.

Applying gentle pressure at the angle of the mouth like in jaw thrust manoeuvre has shown to overcome moderate laryngospasm. The placement of an oral airway may also be sufficient depending on the grade of laryngospasm. In cases where mouth opening can be a hindrance a nasal cannula can be carefully placed through the nose without causing trauma to the nasal cavity.

Application of continuous positive airway pressure (CPAP) with 100% oxygen via face mask, in extreme cases can be used with two hands. It should be borne in mind that air should not be insufflated into the stomach during this technique as it can cause regurgitation or vomiting which makes the situation worse especially if the patient aspirates.

Larson's manoeuvre: Guadagni and Larson advocated that a firm press at the 'laryngospasm notch' helps relieve spasm because anterior displacement of the mandible can prevent the tongue from falling backwards. This is justified with the explanation that the periosteal pain caused by pressing on the styloid process triggers the autonomic nervous system to relax the vocal cords.

If gentle jaw thrust is unable to relieve laryngospasm immediately, the depth of anaesthesia can be increased by administration of propofol. It has been shown that propofol breaks the laryngospasm in 77% of cases with just a small dose of 0.25 to 0.8 mg/kg. Occasionally cardiovascular depression, bradycardia, cyanosis and apnoea can occur when propofol is injected. Volatile agents such as sevoflurane has decreased airway complications compared to other agents.

Administration of muscle relaxant: Succinylcholine at an intravenous dose of 0.1 mg.kg\(^{-1}\) should be used especially when above described procedures fail. If the intravenous route is unavailable, intramuscular (i.m.), sublingual or intraosseous routes are alternatives at doses of 3-4 mg.kg\(^{-1}\). If succinylcholine is unavailable, rocuronium which is a non-depolarizing muscle relaxant can be used at an average dose of 1.2 mg/kg intravenously.

Superior laryngeal nerve block: Monso et al. reported that laryngospasm can be successfully treated with superior laryngeal nerve blocks. Mevorach described the mechanism of superior laryngeal nerve block stating that it interrupts the reflex arc and thus helps in dissipating the stimulus that causes laryngospasm.

Conclusion

Laryngospasm can be a detrimental situation if not detected and treated immediately. Knowing the risk factors and taking appropriate measures to prevent it is crucial especially in patients who are known to be susceptible. Since it's a common occurrence, it is prudent to be vigilant and aggressive in treating this condition.

Source(s) of Support: Nil

Conflict of Interest: Nil

Ethical Clearance: Not applicable

References


60. Wisely NA, Mayall R - Intralingual succinylcholine injection provides a rapid onset of muscle relaxation in an emergency. Anaesthesia 2001; 56:1213.


A Study on Knowledge, Attitude and Practice Regarding Sanitation and Personal Hygiene among Sanitation Workers of an Urban Local Body in Odisha, India

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Abstract

A study on knowledge, attitude and practice was conducted on 140 nos. of sanitation workers employed in the city of Cuttack in Odisha. Out of 140 participants, 76(54.3%) were female with mean age of 37.8 yrs ± 7.39 and 64(45.7%) were male mean age of 37.2 yrs ± 7.39.

Out of 140 participants, 107(76%) had adequate knowledge regarding sanitation and personal hygiene and 122(86%) reported good practices. This study shows adequate level of knowledge, attitude and practices among the sanitation workers.

Keywords: Sanitation, Personal hygiene, Sanitation workers, KAP.

Introduction

Maintenance of clean environment has become a challenge and many sanitation workers are working under urban local bodies to maintain sanitation in their respective towns and cities. They do variety of work like collection and transportation of garbage to cleaning of roads and toilets.¹ These workers are exposed to a number of pathogens (bacteria, viruses, parasites and cysts), toxic substances and extremes of temperature.² In low-income countries, these sanitation workers’ medical problem is often compounded by socio-economic factors such as poverty, lack of education, poor housing conditions and poor diet.³

A worker should be aware of sanitation and personal hygiene to work in sound health and mind for which the worker must know the work hazards which may affect his/her health during working hours. If the worker remains healthy, the exposure to health hazards during work decreases and the productivity increases.

A study done in Thailand showed that most sanitation workers have low level of knowledge and alertness on occupational health risks.⁴ Despite the severity of occupational health hazards encounter by these sanitation workers, many studies have shown that the provision and usage of personal protective equipment (PPE) is low.⁵⁶⁷ During their work they are prone to carry dreadful pathogens through their dresses, hands, skin and hair to their houses and can be major sources to contaminate the food and water of their families for which they should be aware of sanitation and personal hygiene.

This study was done to assess the knowledge, attitude and practice among sanitation workers of Cuttack Municipal Corporation on sanitation and personal hygiene.

Objectives of the study:

1. To determine Knowledge, Attitude and Practice of the Street Cleaners regarding sanitation and personal hygiene.
2. To determine association of Knowledge, Attitude and Practice with different socio-economic factors.

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e-mail: drsatyajitpattnaik@gmail.com
Mobile: 9444189003
Materials and Method

This cross-sectional study was conducted between January 2019 and June 2019 among the sanitation workers engaged in street cleaning of Cuttack city, Odisha. A sample of 140 nos. of street cleaners was taken out of which males were 76(54.3%) and females were 64(45.7%) in number chosen from four sweeper’s colonies of Cuttack city. A well structured and a pretested questionnaire was used which was printed in the local Odiya language to be filled up by the sanitation workers. The study population used to work from early morning 6 A.M. to 2 P.M. daily for which they were contacted only in the afternoon hours i.e. from 4 P.M. to 6.30 P.M. and they were explained lucidly regarding filling up the questionnaires.

Inclusion and Exclusion criteria: The sanitation workers who gave their consents to participate in this study irrespective of sex within the age group of 21 years to 60 years were included. If both husband and wife were having the same job, only one of them was included in the study. Part time workers were excluded from the study.

Sample size and sampling technique: A pilot study was conducted on 50 nos. of street cleaners and it was found out that 90% of such workers were having good knowledge of sanitation and hygiene basing on which a sample of 140 sanitation workers were selected from four sweeper colonies of Cuttack city with the following formula to calculate the sample size. Further samples were drawn at the rate of 35 from each sweeper colony through stratified systematic random sampling method.

\[ n = \frac{Z^2pq}{d^2} \]

where \( n \) = required sample size, \( Z = 1.96 \) (standard normal variate), \( p = \) proportion, \( q = (1 - p) \) and \( d = \) desired level of precision at 95% CI = 5% = 0.05

\[ n = \frac{(1.96)^2 \times 0.9 \times 0.1}{0.5 \times 0.5} = 138.24 \text{ or say 140, Hence } n = 140 \]

Data Analysis: Data was entered in Microsoft Excel sheet. Qualitative data were presented as frequency distribution with its percentage; and for quantitative data descriptive statistics were done. Chi-square test had been calculated to relate the three KAP scores with different socio-demographic variables. A p-value of less than 0.05 was taken as the statistical level of significance.

Results

The participants (n=140) comprised of 76(54%) females and 64(46%) males. The mean age of female participant was 37.2 years while the mean age of male participants was 37.8 years. Their age profile showed majority, 59(42.2%) in the age group of 35-45 years as shown in Table No.1. Most, 56(40%) of the participants belongs to upper lower socio-economic class as per modified Kuppuswamy socio-economic classification scale. (J) of them, ninety (64.3%) possessed education up to primary level as shown in Table no.1.

Out of 140 participants, 110(76.4%) have adequate knowledge and attitude. There was no significant difference in knowledge and attitude in respect to gender, age or socio-economic status as shown in Table No. 2. But there is a significant association between educational status of the participants and knowledge and attitude. (Table No.2)

One hundred twenty-one (86%) participants reported good practice related to sanitation and hygiene. There was a significant association between educational status of the participants and good practices. However, no significant association was found between good practices and gender, age or socio-economic status as shown in Table No.3

Table No. 1: Participant’s socio demographic profile 
(N=140)

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<thead>
<tr>
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<th>n (%)</th>
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<tr>
<td>Female</td>
<td>76 (54)</td>
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<tr>
<td>25 - 35</td>
<td>58 (41.4)</td>
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<tr>
<td>36 – 45</td>
<td>59 (42.2)</td>
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<tr>
<td>46 - 55</td>
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<tr>
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Table No. 2: Association of socio-demographic variables with knowledge and attitude on sanitation and hygiene

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<tr>
<th>Variables</th>
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<th>P - value</th>
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Table No.3: Association of socio-demographic variables with sanitation and hygiene practices

<table>
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<th>χ²</th>
<th>D.F.</th>
<th>P – value</th>
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<td>19</td>
<td>140</td>
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</table>
Discussions

Out of 140 participants, 107 (76.4%) were found to have adequate knowledge about sanitation and hygiene. In a similar study done in Indore city, 85% sanitation workers were found to have adequate knowledge. In another study done in Nigeria, only 15% of sanitation workers reported adequate knowledge.

One twenty-one (86%) respondents in this study reported good practices relating to sanitation and hygiene. This result is discordant with the results from a similar study in Indore city where only 18% reported good practices and another study done in Addis Ababa, which reported only 27% good practice.

The present study shows a gap between knowledge and practice among the sanitation workers regarding sanitation and hygiene measures. All these findings suggest the absence of a proper health and safety mechanism at the place of work.

There is a need for necessary programme interventions in the colonies and community of the street cleaners to educate them on environmental sanitation, personal hygiene, hand washing and solid waste disposal as their work is responsible for a clean look of the city. At the same time proper personal protective equipment (PPE) should be provided to the sanitation workers.

Conflict of Interest: None

Source of Funding: Self-funded

Ethical Clearance: The study was cleared by the institutional ethical committee.

References


Comparison of Ultrasound and Low Level Laser Therapy in the Management of Diabetic Foot Ulcer

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Abstract

Introduction: Diabetic foot ulcer (DFU) is one of the complications of diabetes mellitus. It is caused due to destruction of deep tissue which is associated with neurological abnormalities and various degree of peripheral vascular disease of lower limbs. DFU and its infections cause major medical, economic and social problems and leads to morbidity and mortality in developing countries like India. Mixed bacterial infections are the major predisposing factors for foot ulceration

Method and methodology: 30 male and female patients were selected based on the inclusion criteria (according to wagner grading system). They were divided into two groups randomly and named group A as control group and group B as experimental group. Group A received ultrasound where as group B has received low level laser therapy (LLLT) Helium – Neon (He – Ne) of 660nm wavelength with a dosage of 4J/cm² for five days a week for four weeks.

Results: Both the groups were compared with pre intervention and post intervention scores by using T test. Group A results were not significant where as group B results showed significant values at p <05.

Keywords: Diabetic foot ulcer (DFU), Ultrasound (USD), Low level laser therapy (LLLT), Helium Neon laser (He – Ne).

Introduction

Diabetic foot ulcer (DFU) is one of the complications of diabetes mellitus. It is caused due to destruction of deep tissue which is associated with neurological abnormalities and various degree of peripheral vascular disease of lower limbs. DFU and its infections cause major medical, economic and social problems and leads to morbidity and mortality in developing countries like India. Mixed bacterial infections are the major predisposing factors for foot ulceration.

Based on the recent epidemiological data from world health organization, India has the largest number of diabetic patients with about 20 million and the number is predicted to reach about 57 million by the year of 2025. Foot is a complex part of the human body. Approximately 40–72% of all lower extremity amputations are related to diabetes. DFU is a common cause for hospital admission among diabetics in India. This could be attributed to several socio cultural practices such as barefoot walking, inadequate facilities for diabetes care and education and poor socio-economic conditions. Diabetes foot is thus a serious issue of great economic and social importance. Many drugs like Augmentin, Amoxycillin with potassium clavulanate were tried to reduce infections like streptococci and staphylococci at the wound site but they were not successful.

Many Physiotherapy modalities like infra red rays, Ultra-violet rays and electrical stimulations was used, but the recovery was very slow with these modalities. Ultrasound (USD) and low level laser therapy (LLLT) is gaining much more importance to reduce foot ulcers. It is administered safely and has no side effects. Laser is...
broadly used as an analgesic, anti-inflammatory and for tissue healing \(^{(3, 4)}\).

USD is a high frequency modality which delivers mechanical vibration and promotes healing at cellular level. It reduces pain and increases circulation and mobility of soft tissues. It helps in reducing inflammation and promotes healing process \(^{(5)}\).

LLLT is a non invasive modality and it does not involve thermal interaction. Due its photon energy it causes photochemical, photo physical and photo biological effects in cells and tissues which is useful in nerve regeneration. One of the possible mechanisms behind the therapeutic effects of LLLT is the interaction of photons from laser irradiation at optimal doses (therapeutic window) with specific receptors in the mitochondria through induction of epithelial cells and modification of capillary density, stimulation of local microcirculation at the periphery which helps in tissue healing \(^{(6, 7, 8)}\).

**Materials and methodology**

**Subjects:** thirty patients both males and females were selected for the study from MGM hospital and Vaagdevi physiotherapy centre.

**Type of study:** Simple randomized experimental study

**Duration of study:** four weeks

**Inclusion Criteria:** Patients diagnosed with diabetes mellitus and suffering with diabetic foot ulcer, according to Wagner grading score 3.

**Exclusion criteria:** Patients who are suffering with diabetic foot ulcer above Wagner grade 3, other neurological complications, orthopaedic complication, circulatory complications, renal complications and cardiac complications were excluded from the study.

**Outcome measure:** Wagner grading system is used as an outcome measure. It consists of five grades, these grades are used in the calculation of ulcer depth, presence of osteomyelitis and gangrene.

- grade 0: pre-or postulcerative lesion,
- grade 1: partial/full thickness ulcer,
- grade 2: probing to tendon or capsule,
- grade 3: deep with osteitis,
- grade 4: partial foot gangrene, and
- grade 5: whole foot gangrene \(^{(9)}\).

**Methodology:** thirty male and female patients were alienated into two groups by means of simple random sampling technique. Each group has 15 patients. They were named as group A and group B. Group A was treated with Ultrasound and group B was treated with LLLT. Group A received Ultrasound with a dosage of 1MHz with an intensity of 1W/cm\(^2\) \(^{(10)}\) for 10 mins. Ultrasound was applied around the periphery of the wound in a circular manner. This was continued for five days a week for four weeks.

Whereas group B received Helium – Neon (He – Ne) laser with a dosage of 4J/cm\(^2\) for 10 mins. Laser was applied directly onto the wound (Centre of the wound). This was continued for five days a week for four weeks. Both the groups were positioned comfortably before treatment and their pre and post treatment values were recorded according to Wagner grading system.

**Results**

Both the groups pre and post treatment values were extracted. Group A received ultrasound for four weeks, group B received laser for four weeks. The pre and post test values were calculated by using Kruskal – Wallis test \(^{(11)}\)

The test statistic is given by

\[
H = \left[ -\frac{12}{n(n+1)} \sum_{j=1}^{g} \frac{T_j^2}{n_j} \right] - 3(n+1)
\]

The calculated value for group A (Pre & Post treatment values) is \(H = 22.86\), here \(n =15\ (>10)\) so the Kruskal – Wallis test is converted into chi-square test.

Whereas the calculated value for group B (Pre & Post treatment values) is \(H = 40.99\), with their mean and standard deviation.
Table 1: Mean and Standard deviation of Group A and B (Pre and Post Values)

<table>
<thead>
<tr>
<th></th>
<th>Group A</th>
<th></th>
<th>Group B</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre–Values</td>
<td>Post–Values</td>
<td>Pre–Values</td>
<td>Post–Values</td>
</tr>
<tr>
<td>Mean</td>
<td>2.4</td>
<td>1.3</td>
<td>2.6</td>
<td>0.6</td>
</tr>
<tr>
<td>S.D.</td>
<td>0.7</td>
<td>0.6</td>
<td>0.6</td>
<td>0.5</td>
</tr>
</tbody>
</table>

Table Value: $\chi^2_{(4)}$, d.f = 23.685

In group A the calculated H value is lesser than table value. So null hypothesis is accepted. Where as in group B the calculated H values is greater than table value, so null hypothesis is rejected.

This shows that group B has improved more when compared with group A.

**Discussion**

This study was performed to identify the effect of USD Vs LLLT in the management of diabetic foot ulcer. Patients were assessed by using Wagner grading system. The pre and post treatment values were extracted for every week for four weeks. Later on they were calculated by using Kruskal – Wallis test. When compared with group A, Group B has improved a lot in reduction of wound size. Healing has been accelerated more in group B patients who received LLLT for four weeks than USD group.

The reduction of wound size in group B could be due to increased circulation to the wound site, release of cytokines and growth factors. These are responsible for vasodilatation and form new capillaries.

**Conclusion**

The study concludes that, there is marked amount of reduction of wound size and acceleration of wound by applying laser when compared with USD group. So LLLT can be incorporated in the management of DFU, which will reduce the burden and is cost-effective. For better results this study has to be performed on large group.

**Conflict of Interest:** Nil

**Source of Funding:** Self

**Ethical Clearance:** IHEC/VCOP/VCOPH/2016/1/1 dated 04/01/2016

**References**

The Level of Stress among the Parents of Children Having CAH 21 Hydroxylase Deficiency between 6 Years and above in a Selected Tertiary Care Hospital, Bangalore

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Abstract

Background: CAH Congenital adrenal hyperplasia (CAH) is a genetic disorder, when confronted with the unexpected diagnosis of CAH, the parents experience severe stress. This study assess the stress among parents of children having CAH 21 hydroxylase deficiency and find the association between stress and selected baseline variables.

Method: The research design selected for this study was descriptive design. The setting selected was the OPD at Indira Gandhi Institute of Child Health Hospital, Bangalore. Parents of children affected with CAH 21 hydroxylase deficiency were selected for interview schedule to assess the level of stress by them. The collected data were analysed using descriptive and inferential statistics.

Results: The findings of the study showed that the parents had severe financial stress. The parents having low income, low educational level had significantly high stress (P<0.001). Parents having more than one child affected and birth order of child ≥ 2 showed more stress and significant at p<0.01 level of significance. The Parents who had not received counselling also elicited more stress at p<0.01 level of significance.

Conclusion: These findings of the study clearly point out that CAH 21 hydroxylase deficiency is a stressful event faced by the parents. Positive attitude towards stress is present but needs to be better handled.

Keyword: CAH 21 hydroxylase deficiency, stress, OPD.

Introduction

Congenital adrenal hyperplasia (CAH) is an autosomal recessive inherited disorder of 21 hydroxylase gene (CYP 21) defect. If left untreated, low serum cortisol and aldosterone levels result in shock in both sexes. Early diagnosis and prompt initiation of replacement therapy with glucocorticoid and mineralocorticoid is life-saving¹.

When confronted with the unexpected diagnosis of CAH, the parents experience severe stress. Parenting a child with a chronic illness increases the likelihood of mental health problems in parents. Parents with chronically ill children are more likely to experience depression and marital discord as compared to parents without a chronically ill child². ³. Generally, mothers are responsible for more day to day care of children and families, and as such, the majority of research studies have examined the effects on mothers rather than on fathers or parents in general³. While it is difficult for parents in general, fathers more than mothers responded to a change by mourning the loss of the son they thought they were going to have⁴. Parents often go through a period of grief and bereavement such as might be expected when one loses a child⁵. These parents also

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feel “bewilderment about the medical implications of the child’s condition”, and they may feel confused, threatened, or angry about the implication of a genetic origin to the disorder. Another study of parental response found that parents of girls with CAH and over masculinized genitalia were less likely to feel symptoms of depression than parents of male children with under masculinized genitalia. Psychological support for the care givers is therefore particularly important and is a vital part of comprehensive medical treatment. Health personnel need to inform patients and care givers on therapeutic developments, future directions, and encourage psychological support.

Since CAH 21 hydroxylase deficiency causes more stress among the parents, the researchers felt it is a strong need to study the stress of parents of children with CAH 21 hydroxylase deficiency attending OPD to plan for interventional study among them to assess the level of stress among the parents of children having CAH 21 hydroxylase deficiency between 6 years and above in a selected tertiary care hospital, Bangalore. Study also find the association between stress and selected baseline variables.

Materials and Method

A descriptive cross-sectional study was conducted from October to November 2017, comprises 100 parents of children having CAH 21 hydroxylase deficiency after obtaining the permission and approval from the Institutional committee of ethics (ICE). The study was conducted in the OPD and wards of Indira Gandhi Institute of Child Health, Bangalore which is equipped with major subspecialty departments in paediatrics, including a full-fledged neonatal and paediatric intensive care unit. The sample size for the study was determined based for a previous study using the following formula.

\[ N = \frac{z^2 s^2}{d^2}; \]

\[ Z = Z \text{ Value corresponding to a 95% level of significance (1.96), } S = \text{Estimated sample size, } d = \text{Absolute precision (10%)}. \]

Samples were selected using purposive sampling technique guided by inclusion criteria of the study. The data was collected using stress scale by a structured interview schedule method. The time take for each interview was about 15 minutes, 5-8 parents were interviewed per day. Variables were stress among the parents of children and extraneous variables were age, sex, educational status of the parent, occupation and income of parent, duration of illness of child, birth order of child, number of siblings affected, frequency of visit, family type, and place of residence, religion and previous counselling received.

Chronicity Impact Parent Questionnaire developed by Debra P. Hymorich (1984) to measure the stress. In this Section A contained the baseline variables of the parent and the child and Section B had consists of 27 items. These items are rated on a 5-point rating scale where 1-Never, 2-rarely, 3-sometimes, 4-often and 5 represents always. The lowest score is 27 and the highest score is 135. Content validity and Reliability of tool was sent for validation to 13 experts. Reliability of the tool was established by split-half method and calculated using spearman’s brown prophecy formula. The reliability of the stress scale, \( r=0.71 \) Data were analysed with with the student’s t-test, x test and F-max test as test of significance to determine the association between the baseline variables and stress.

Results

Parents belonged to the age group 20-50 years in majority and the mean age was 34.1±6.8. Children belonged to the age group 6-15 years and the mean age group was 7.7±6.6. All the children were first hospitalized between the age group of 0.08 to 5 years of age and the mean being 1.01± 1.01. Majority (46%) of the parents had completed high school education, 22% of them were graduates, 14% of them had completed higher secondary education and 9%, 6% and 3% were illiterate, primary and post graduates respectively. That 63% of the parents were semiskilled workers, 19% of them were skilled and 18% of them were unskilled workers. The income status shows that 65% of them had a monthly income between Rs.1,001-5,000; 18% of them had between Rs.5,001-10,000; 7% between Rs.10,001-15,000 and Rs.15,001-20,000 each and 3% of them had income above Rs.20,000. 35% of the children had the illness duration of 6-10 years, 34% of them were between 1-5 years and 24% between 11-15 years whereas 7% of them were below 1 year of age. The ranges of illness are 0.4-14.0 and mean duration being 6.5 (SD-4.1). The majority of the children having CAH 21 Hydroxylase deficiency (57%) were males and 43% of them were females. 94% of the children affected did not have any other sibling with the same problem where as 6% of them had one sibling affected in the family.
The majority of the children (56%) were first born in the family, 34% of them were second born, and 8% third born and only 2% of them were of the fourth birth order. Distribution of parents according to the frequency of visit of the children to the hospital shows that majority (65%) of them had to visit the hospital once a month, 21% of them visited once in less than a month and 14% of them visited once in more than a month. In the data finding, 53% of the parents belonged to extended family and 47% of them belonged to the nuclear family. 55% of the population belonged to urban area and 45% of them were from rural area. Majority (75%) of the samples was from Hindu background, 21% of them were Muslims and 4% of them were Christians. The table also shows that 71% of the parents had not received any counselling and only 29% of them had received previous counselling. The data shows that 94% of the samples did not have similar illness in the family background and only 6% had similar problems within the family relations. The data presented in table 1 shows that 82% elicited financial stress, 59.60% had emotional stress, 48.60% experienced social stress and 43.75% had physical stress. Majority (77.30%) of the samples expressed moderate stress and 21% of them had mild stress. The most of the samples elicited severe financial stress (74%) and majority had moderate emotional stress (70%).

There was association between the educational status and the stress at p< 0.01 level of significance. The obtained value of ‘r’ was -0.28, which indicates that the lower the educational status, the greater the stress experienced by them. Association was also found between the income and stress of the sample. The obtained ‘r’ value was -0.40 and is highly significant at p<0.001 level. This shows that the parents having less income experienced more stress (Table 2). There was a significant relationship between the stress scores and the birth order of the child at p<0.01. This shows that higher the birth order, greater is the stress of parents. There was also a significant relationship found between the stress and the number of siblings affected at p<0.01. Parents having more than one child affected with CAH 21 Hydroxylase deficiency experienced more stress as evident in the table 3. Association was found between the stress and previous counselling received at p<0.01. The data shows that parents who did not receive previous counselling had more stress.

Table 1: Mean, mean percentage and standard deviation of the various aspects of stress among parents having children with CAH 21 hydroxylase deficiency.

<table>
<thead>
<tr>
<th>Various aspects of stress</th>
<th>No of items</th>
<th>Max Score</th>
<th>Range</th>
<th>Mean</th>
<th>SD</th>
<th>Mean %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical stress</td>
<td>5</td>
<td>25</td>
<td>5 to 19</td>
<td>10.94</td>
<td>3.74</td>
<td>43.75</td>
</tr>
<tr>
<td>Emotional stress</td>
<td>10</td>
<td>50</td>
<td>12 to 46</td>
<td>29.8</td>
<td>6.52</td>
<td>59.6</td>
</tr>
<tr>
<td>Social stress</td>
<td>7</td>
<td>35</td>
<td>7 to 29</td>
<td>17.01</td>
<td>5.33</td>
<td>48.6</td>
</tr>
<tr>
<td>Financial stress</td>
<td>5</td>
<td>25</td>
<td>5 to 25</td>
<td>20.5</td>
<td>4.77</td>
<td>82</td>
</tr>
<tr>
<td>Total</td>
<td>27</td>
<td>135</td>
<td>35-115</td>
<td>78.25</td>
<td>15.5</td>
<td>57.96</td>
</tr>
</tbody>
</table>

Table 2: Association between stress and selected baseline variables.

<table>
<thead>
<tr>
<th>Baseline Variables</th>
<th>Mean</th>
<th>SD</th>
<th>Stress Mean (SD)</th>
<th>‘r’</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age of parent</td>
<td>34.1</td>
<td>6.8</td>
<td>78.25 (15.5)</td>
<td>0.03 NS</td>
</tr>
<tr>
<td>Educational status</td>
<td>10.3</td>
<td>4.3</td>
<td>-0.28*</td>
<td></td>
</tr>
<tr>
<td>Income/month</td>
<td>7564</td>
<td>9564</td>
<td>78.25 (15.5)</td>
<td>-0.40**</td>
</tr>
<tr>
<td>Duration of illness</td>
<td>6.5</td>
<td>4.1</td>
<td>0.07 NS</td>
<td></td>
</tr>
<tr>
<td>Age of child</td>
<td>7.7</td>
<td>4.1</td>
<td>0.01 NS</td>
<td></td>
</tr>
<tr>
<td>Age during first Hospitalization</td>
<td>1.01</td>
<td>1.01</td>
<td>-0.21 NS</td>
<td></td>
</tr>
</tbody>
</table>
Table 3: Association between stress and selected baseline variables like occupation and frequency of visit

<table>
<thead>
<tr>
<th>Baseline variables</th>
<th>Mean</th>
<th>SD</th>
<th>‘t’</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>78.5</td>
<td>15</td>
<td>0.1</td>
<td>0.91 NS</td>
</tr>
<tr>
<td>Sex of child</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>78</td>
<td>16</td>
<td>0.2</td>
<td>0.84 NS</td>
</tr>
<tr>
<td>Female</td>
<td>78.6</td>
<td>16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Birth order of child</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st</td>
<td>75.3</td>
<td>16</td>
<td>2.2</td>
<td>0.029*</td>
</tr>
<tr>
<td>≥2</td>
<td>82</td>
<td>14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of siblings affected</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>77.3</td>
<td>15</td>
<td>2.4</td>
<td>0.018*</td>
</tr>
<tr>
<td>1</td>
<td>92.7</td>
<td>14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family type</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nuclear</td>
<td>77.2</td>
<td>16</td>
<td>0.6</td>
<td>0.54 NS</td>
</tr>
<tr>
<td>Extended</td>
<td>79.2</td>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Place of residence</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>81.1</td>
<td>13</td>
<td>1.8</td>
<td>0.08 NS</td>
</tr>
<tr>
<td>Urban</td>
<td>17.9</td>
<td>17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Previous counselling received</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>80.9</td>
<td>14</td>
<td>2.8</td>
<td>0.006*</td>
</tr>
<tr>
<td>Yes</td>
<td>71.7</td>
<td>18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Similar problem in the family</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>78.4</td>
<td>16</td>
<td>0.5</td>
<td>0.64 NS</td>
</tr>
<tr>
<td>Yes</td>
<td>75.3</td>
<td>16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unskilled</td>
<td>83.6</td>
<td>9.9</td>
<td>2</td>
<td>0.13 NS</td>
</tr>
<tr>
<td>Semiskilled</td>
<td>78.2</td>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skilled</td>
<td>73.4</td>
<td>19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency of visit</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 1 month</td>
<td>79.1</td>
<td>17</td>
<td>0.4</td>
<td>0.69 NS</td>
</tr>
<tr>
<td>1 month</td>
<td>78.7</td>
<td>14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;1 month</td>
<td>74.9</td>
<td>21</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* p<0.01- significant NS- not significant, *p<0.01 – significant **p<0.001-highly significant NS- not significant; NS- not significant

**Discussion**

The major stressors affecting parents were categorized into physical, emotional, social and financial. The participants mainly elicited financial stress (82% mean), 59.6% mean had emotional stress, 48.6% mean had social stress. Similar findings have been found in the study conducted at NIMHANS were caregivers concerns were regarding the future (91%), illness (80%) and finances (73%). Another study cited by Melnyk et al. reported that finance is one of the factors which contributed to the stress of parents of young children admitted in hospitals. The similar findings were obtained in a study conducted at Athens where mothers were of mean age group of 43 years (range, 30-53 years) Nineteen females were interviewed and out of them 10(52.6%) were employed and 10(52.6%) were employed and 10(52.6%) had completed nine years of education. The parents of this study mainly were from...
urban (55%) background and 75% of them belonged to Hindu religion. Almost similar findings were found in a study conducted at NIMHANS were 52% of the participants were from urban background and 80% of them were Hindus.\(^\text{15}\)

The stress was found to be associated with various extraneous factors which were assessed in the study. The results showed that there was an association between stress and income at \(p<0.001\), stress and birth order of child, stress and number of siblings-affected, Previous counselling received and stress and educational status at \(p<0.01\) level. A study conducted to assess perception of stress among mothers found that mothers education was significantly associated with the sex of the caregiver \((\chi^2 =6.02, p=0.014)\). Twenty eight (76%) of women caregivers had poorer quality of life \(^{11, 15}\). This data contradicts to the present study findings as there was no association found between sex of parent and stress. This is supported by a study a study conducted in Israel were no significant differences was found between interaction and severity of illness by fathers and mothers, \(F (df-2.77) = 0.30; p>0.05\). The research hypothesis is partly accepted as there was an association found between stress and baseline variables like educational status, income per month, birth order of the child, number of siblings affected and previous counselling received.

**Conclusion**

CAH 21 hydroxylase deficiency is the most common autosomal recessive disorders. The impact of CAH on families is so intense and the burden is more than what most families can bear. These findings of the study clearly point out that CAH 21 hydroxylase deficiency is a stressful event faced by the parents, which also suggests that positive attitude towards stress is present but needs to be better handled.

**Ethical Clearance:** Taken from institutional review board, Indira Gandhi Institute of Child Health, Bangalore

**Source of Funding:** No funding for this word was received.

**Conflict of Interest:** None

**References**


Taste, Taste Receptors and Role of GLP-1 Signaling in Taste Perception

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Abstract

Balanced diet and proper healthy nutrition, avoidance of consuming high calorie or junk food or ingesting toxic substances that are harmful to the body and maintenance of physiological energy homeostasis are very crucial for all living organisms including human beings. After every food ingestion brain gets sensory signal from gustatory receptors and segregates and evaluates the stimuli based on the individual taste, leading to the personalized experience very commonly known as flavor. There are five very well-known taste qualities such as sweet, salty, bitter, sour, and umami. The production of physiologically important incretin hormone Glucagon like peptide-1 (GLP-1) in the taste perception cells and the presence of its known receptor GLP-1R on adjacent taste nerve fibers evidently suggest that GLP-1 signaling is associated with the function of taste. In this brief review, we will provide a bird eye view on the recent advance in taste, taste receptors and GLP-1 signaling and we will discuss their pivotal role in overall taste perception and signaling.

Keywords: Taste, Sweet, Sour, Umami, GLP-1.

Introduction

A healthy and balanced diet is essential for all organisms for their harmonious growth, good health and nutrition. It protects human beings against various chronic noncommunicable diseases, such as cardiovascular diseases (CVD), type 2 diabetes, Nonalcoholic fatty liver disease (NAFLD) and cancer. A good diet or food should taste good too for consumption. There are five taste qualities and they are sweet, salty, sour, umami (savory), and bitter. The sense of taste protects us from harmful food and helps to maintain a consistent chemical balance in the body. Therefore, taste perception is crucial for stirring food intake in order to obtain energy along with vital nutrients for maintaining normal body functions and plays major role in our health ¹. On consuming food or any other substances, sapid molecules that can stimulate the taste buds interact with saliva in the mouth and bind to taste receptors in the oral cavity. Functions of taste receptors include inducing appetite, identification of toxins, maintaining nutrition, regulating gastrointestinal motility and immune response. Here, in this short review we are trying to shed a torch light on recent advances in physiology and molecular mechanism of taste receptors and taste perception².

Mechanism of Taste Perception: The transient receptor potential (TRP) ion channels are evolutionarily conserved integral membrane protein superfamily of ion channels occurring in cell membranes that are involved in various types of sensory reception including taste. These proteins are encoded by 30 distinct genes in humans. These are cation channels that enhance the
intracellular \( \text{Ca}^{2+} \) levels and are stimulated by change in pH, temperature and osmolarity etc\(^3\).

The mechanism involves ligand binding at the taste receptors which further activates the second messenger cascades causing depolarization of the taste cells. Further, for perception of bitter taste a set of Ga subunit called Gustducin are associated having a major role in TAS2R (Taste receptor type 1 member 2). Additionally, taste receptors involve the use of TRM5 (Transient receptor potential cation channel subfamily M member 5) and phospholipase PLC\( \beta \)\(^2\). Activation of PLC\( \beta \)2 by Gustducin in response to external taste results in activation of IP3/ITP3 signaling. ITP3 channels in response to IP3 facilitate the movement of Calcium out of the endoplasmic reticulum. These calcium cations activate TRPM5 causing depolarization. (Figure 1).

**Sweet:** The taste of sugar and its broad ranges of substitutes are experienced when the molecules bind to the sweet receptors i.e., the TAS1R2+ TAS1R3 heterodimer receptors. The TAS1R3 homodimer also functions as sweet receptors in a similar manner to TAS1R2+3 but show reduced sensitivity to sweet substances. However, natural sugars are easily detected by TAS1R3 receptors compared to other sugar substituent thereby explaining the reason for different taste perception between natural sugars and artificial sweeteners\(^4\).

**Bitter:** The taste receptors for bitter taste are the TAS2R proteins. There are 43 existing human TAS2R genes each lacking introns and coding for GPCR proteins (excluding five pseudogenes). Compared to TAS1R proteins they possess shorter domains. Some of the common bitter ligands are cycloheximide, denatonium, PROP (6-n-propyl-2-thiouracil), PTC (phenylthiocarbamide) and \( \beta \)-glucopyranosides.\(^6\)

The \( \alpha \) subunit of Gustducin are also involved in the signal transduction of bitter stimuli by activating taste phosphodiesterases and decreasing levels of cyclic nucleotides. Its \( \beta\gamma \) subunits mediate taste by activating IP3 and DAG pathways by opening gated ion channels and releasing internal calcium. One such mechanism proposed for gustducin independent bitter tasting involves interaction with the ion channels by specific bitter ligands similar to that occurring for sour and salty stimuli\(^7\).

**Sour:** Earlier studies on sour taste perception anticipated that only when free hydrogen ions directly depolarized the taste receptors, sour taste could be produced. However, research indicates the involvement of certain specific receptors with other modes of action for sour taste. HCN1 and HCN4 are two such proposed HCN channels, both of which are cyclic nucleotide-gated channel receptors. The other two ion channels suggested to contribute to sour taste perception are ACCN1 and TASK-1\(^8\).

**Salt:** Salt plays major role in our diet and many times without salt and salty taste food seems tasteless. There are many numbers of salty receptors have also been proposed along with the possible taste detection of commonly known components of food such as lipids, carbohydrates and water. However, these receptors lack strong scientific evidences to prove their presence in mammals including human beings. However, they have shown the presence of ENaC receptor for the detection sodium in Drosophila. Therefore, this ENaC plays major role in salt taste (sodium) perception in Drosophila.

**Savoury or Umami:** The tastes for savory or umami are frequently associated with food additive monosodium glutamate (MSG) and are enhanced through the binding of inosine monophosphate (IMP) and guanosine monophosphate (GMP) molecules. The umami receptors are the TAS1R1+ TAS1R3 heterodimer receptors which respond to L-amino acid binding particularly L-glutamate. Alternative candidate umami taste receptors include splice variants of metabotropic glutamate receptors, mGluR1 and mGluR4 and NMDA type glutamate ion channel receptors\(^9\).

**Genetic Variation in Taste Receptors:** Individual food choices (vegan and non vegan) vary on a wide number of criteria like geological, sociocultural, theological, physiological, nutritional and environmental factors. However, the sensory quality of food is critical to dietary preferences and taste in particular might be a vital determinant in food choices\(^10\). Genetic polymorphism in taste receptors may contribute to the variability in taste perception between individuals, their food choices and dietary habits. This in turn affects the nutritional, physiological, physical and health status of the individual as well as their risk factors to various chronic diseases\(^11\). Recent researches have highlighted that bitter taste perception is mediated by T2Rs, a family of GPCRs which are encoded by about 25 functional TAS2R genes located on chromosome 5, 7 and 12 in humans\(^12\).

As evident from day to day observation, unlike bitters, sweet substances are perceived as pleasant and
are clustered separately from bitter taste in humans which reflect the evolutionary pressure to choose high energy food substances. Although T1R2/T1R3 heteromer have been associated with sweet taste detection, the number of sweet taste receptors unresolved. The human gene encoding for T1R3, Tas1r3 are located on chromosome 1 along with the first and second members of the taste receptor family 1 TAS1R1 and TAS1R2 respectively.

The primary substance eliciting umami taste in humans is the L-glutamate and L-aspartate, abundantly found in foods that occur as monosodium glutamate (MSG). The response was increased in presence of IMP or GMP and T1R1 and T1R3 do not respond to sweet stimuli, D-amino acids, or either IMP or GMP alone.

Over the past few years strong evidences regarding two transient receptor potential ion channels (TRP) baring relation to putative sour taste has been established. In humans, the amiloride sensitivity of NaCl perception is specific to minor sour component of the taste rather than to the salty stimuli itself. The salty taste perception is however inhibited on rinsing with oral antiseptic chlorhexidine which suggests that salt sensitive ion channels in the TRCs are not selectively sensitive to amiloride.

As discussed earlier the genetic and environmental factors play a major role in the nutritional and overall health status of an individual which is a growing public health concern. Therefore, understanding the concept behind food intake and its correlation with taste perception is of prime importance since taste perception lies at the interface between the food an individual consumes and the biological predisposition to prefer certain food depending on the individual’s environment. Polymorphism in taste receptors is useful as surrogate markers of dietary exposure in the gene-disease association studies where information on dietary habits are not available.

**GLP-1 And Taste Signalling**

**Glucagon Like Peptide-1:** The pro-glucagon gene undergoes transcription to give the product which is known as Glucagon-like peptide gene (GLP-1). GLPs are obtained from expression of prepro-glucagon gene which is present on the chromosome 17 and is a member of glucagon peptide family. The intestinal ileum contains L-cells which secretes GLP-1 after the absorption of nutrients in small intestine. The pro-peptide convertase acts upon the gene product that breaks the product into at C-terminal into proprotein and pro-peptide substrate in order to create the biologically active peptides.

**Functions of GLP-1:** The glucagon like peptide effects the glucose secretion of insulin mainly in the beta cells of Langerhans in the pancreas. It also increases the expression of insulin and blocks the apoptosis of beta cells. It also helps in the regeneration of the beta cells in pancreas and decrease the secretion of glucagon.

In stomach GLP-1 decreases gastric emptying and motility through the nonadrenergic and non cholinergic pathways. It decreases the food transit time in colon by changing the parasympathetic neuronal input thereby increases the cholinergic stimulation and alters the colonic transit time.

In adipose tissue the GLP-1 functions to increase the thermogenesis of brown adipose tissue via sympathetic nervous system. It also increases browning of white adipose tissue by reducing the sympathetic activity and further increases energy expenditure.

In brain GLP-1 decreases the food uptake and decrease body weight due to the reduction of the peripheral nervous GLP-1 receptor. The GPCR signaling cascade initiated by sweet, bitter and umami sensitive cells cause an activation of neural signals to the brain. T1R and T2R for sweet, umami and bitter respectively and the G protein subunit α-gustducin are also expressed in the cells of the lower GI tract and are involved in the nutrient-dependent regulation of metabolism. For instance, the GLP-1 present in enteroendocrine L cells are mediated by T1R3 taste receptor subunits and α-gustducin. On observing the molecular similarity between the enteroendocrine L cells of the gut and the taste receptor cells of the oral cavity it can be suggested that the GLP-1 signaling could also play a major role in the gustatory functions.
Figure 1: A schematic representation of taste signaling for bitter, sweet, and umami

Figure 2: A schematic representation of taste-induced signaling via T2Rs and T1Rs in enteroendocrine cell activates GLP-1 signaling
Conclusion

Diet and diet induced obesity, type 2 diabetes, NAFLD, cardiovascular diseases and cancer are major health problems of 21st century. Recently, artificial GLP-1 analogues also have shown promising effect not only on the patients suffering from type 2 diabetes but also on patients with type 1 diabetes. These analogues also have shown positive role in reducing blood glucose and significantly reduces the fasting and post-prandial blood glucose. They can be exploited in the treatment of diabetes, Nonalcoholic Fatty Liver, CVD and Cancer. Therefore, these artificial tastants and GLP-1 analogues have revolutionized the modern medicine and the way we look at metabolic syndrome and associated diseases by providing us with the first anti-hyperglycemic weight-losing oral or injectable drugs.35

Ethical Clearance: Obtained from Institution ethical committee.

Conflict of Interest: Nil

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Impact of Work Life Balance on Employee Performance

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Abstract

Work life balance plays a significant role in influencing the performance and behaviour of the employee. There goes a popular saying that “All work and no play makes Jack a dull boy”. An individual needs to have activities which will help him to overcome the stress caused by his mundane activities at his workplace. The aim of this paper is to understand the effects of work life balance on the performance and behaviour of the employee. Based on the literature reviews, it was found that work life balance had a positive influence on employee performance and behaviour. It increased the levels of job satisfaction, commitment and engagement. This ultimately increases the performance of the employees. It is also helpful in reducing the stress level of employees. A conceptual framework has been proposed based on the literature reviews. It focuses on the relationship between factors that cause work family life conflict and job performance and mediating effect of work life balance.

Keywords: Employee, Stress, Resilience, Work life Balance.

Introduction

The success of a nation be it developed or developing, lies on the hands of the human resources. The natural, physical, financial and technological resources can be utilized to the fullest potential only if the nation has a strong, competent and knowledgeable workforce. The quality of the human resources play a crucial role in the development process of the developed countries. Organizations are in need of energetic and motivated individuals to achieve the organizational goals. The organization, in turn, should strive to keep the enthusiasm and energy levels high. This job is undertaken by the Human Resources Department. Management of human resources has undergone an evolution. The human resources cannot be managed in the same way as it was done during the traditional times. The employees are ensuring that they meet all the needs and demands of their family members. This is done due to the peer pressure faced by the employee and their family members in the society. This causes the employees to travel that extra mile to achieve the best for himself and the people dependent on him. This extra mile comes as a package along with erratic work schedules, extended working hours, intense competition etc. This has unfortunately increased the stress levels.

Stress impacts the health and performance of the employees. There is a pressing need for the HR managers to understand these factors to deal with the human resources efficiently. The HR managers need to have the emotional intelligence for understanding and appreciating the emotions and feelings of the employees.

The term work life balance came into existence in 1986. This term came up as outburst of the feelings of the individuals who were overburdened and pressurized due to the ever-increasing demands at their workplace. They felt that they were being stressed to that level that they were not able to spend time with their families. There was a constant conflict between work and family life. This gave rise to terms like “Family-work conflict” or “Work-Family conflict”. Work life balance has been defined as contentment achieved at work and home in performing the duties and responsibilities without or minimum conflict in terms of roles[3]. This point could be like achieving equilibrium between work and home. A

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person who has achieved work life balance is able to meet the demands of family and work. Achieving work life balance is about deriving satisfaction in three domains. The employee is happy at work, home and personal front. Spending time with oneself is also considered as a part of work life balance. Work life balance does not mean that an individual has to spend the same amount of time at home and work. It is the amount of satisfaction a person derives fulfilling his responsibilities at home and work. He/she needs to feel that they have completed a particular task within the speculated time and need not carry it when they leave that particular place [4]. The pressure on personal and work front have created a huge amount of stress among individuals. This stress has led to health issues like depressions, anxiety attacks, heart attacks etc. It has also affected the organization’s productivity. The organization needs to devise policies which help the employees to achieve work life balance. They need to understand that the standard of living of the employees have increased due to increasing demands. The organizations have to organize trainings related to emotional intelligence and resilience. This will help in reducing the stress levels of the employees [5].

Objectives

- To understand the importance of work life balance
- To review the literatures which deal with the effect of work life balance on the employee performance

Research Methodology: The paper relies on the secondary data published in the journals for gaining an in-depth knowledge about work life balance and its effect on employee performance.

Literature review: Work-life balance acts as an interface between the work for which the individual is being paid by the organization and other activities which are unpaid and it is performed by the individual for the betterment of the individual, his family, society and his community. Work-life balance is about generating a constructive work culture which will help the employees to minimize the conflicts between family and work. This means that organization is supportive towards the employees. They have devised policies that benefit the employees. If the employees are benefitted by the policies, it would reflect in their behaviour. The job satisfaction, engagement levels, performance, efficiency and productivity will improve eventually. Work life balance also has a positive effect on the health of the employees [8].

Work life balance concept in organization should incorporate training programmes related to time management. Time management is extremely necessary to maintain a balance between professional and personal commitments. It will eventually help the employees to prioritize their work. The employees will be able to handle stressful situations in a proper manner [1].

Devising employee friendly work life balance policies benefit the organization as well as the employee. The work life balance policies could be providing work from home options to the employee, part time work options, child care provisions at workplace, flexible working hours etc [7].

The employee can resort to negative behaviours like disengagement from work, absenteeism, negligent behaviour if there is a constant conflict between his work and family. This can be rectified if the work life balance policies are in place. The policies should be framed in such a way that the productivity of the organization and individuals should get boosted. Taking initiatives with respect to work life balance can help the organization to increase the levels of job satisfaction, engagement, commitment and decrease the levels of absenteeism and negligent behaviour [10].

A study has been conducted on the work life balance of the public sector banking employees. They have also studied the relationship of work life balance on variables like job satisfaction, commitment, career development, target achievement, rate of absenteeism. They found that work life balance exhibited a positive relationship with job satisfaction, commitment, career development, target achievement and was negatively related with rate of absenteeism and stress. They have also proved that work life balance is negatively related with stress and rate of absenteeism [6].

The effect of work life balance has been studied on the engagement level of employees. They felt the employees need to be engaged with the company to perform better. The policies related to work life balance influences the behaviour of the employee towards the organization. An employee wishes to work in an organization that cares about its employees. The formulation of sound work life balance assures that the employee engagement level goes up. This increases the productivity and performance of the individual and organization [9].

The effect of work life balance of employees working in commercial banks of Nigeria has been
analysed. The effect of work life balance initiatives like flexible working hours, initiatives to take care of the dependents, policies related to paid leaves have been taken into account. They were found to have positive effect on work life balance. The researches have suggested that these initiatives will help the employee to support his family and reduce his intention to quit. It will also improve the levels of satisfaction and performance. They have suggested that the management should assess their work life balance policies from time to time. This will ensure that the employers understand the problems faced by the employees. The employees will also be committed towards the organization.\[11]\n
Proposed Conceptual Framework

![Proposed Conceptual Framework](image)

**Discussion and Conclusion**

The current paper highlights the importance of work life balance in the life of an employee. Work life balance helps the employee maintain equilibrium between work and life. It also benefits the organization as it increases the levels of job satisfaction, commitment, engagement and productivity. These are in accordance with the findings of the study which states that the organization should work and formulate policies to help the employees to achieve work life balance. The organization should render support to the employees, which will help them to establish healthy rapport with the employees [2].

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**References**


Physical Fitness among the Dental Physician, Dental Undergraduates and Postgraduates Students

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Abstract

Introduction: The aim of the survey is to check the physical fitness among the dental physician and Dental students.

Dentistry is a something that provides satisfaction, but it is a very demanding job with a high degree of concentration and exactness and accuracy in work. Dentists require depth perception, psychomotor skills, manual dexterity, and ability to maintain occupational postures over long periods.

Many of the dentists are much vulnerable to work-related musculoskeletal disorders (WMSDs) of the neck and upper extremities and low back. The widespread presence, of these in dentists and students are very high. Precise manner of long working hours, inability to select the appropriate size of dental instruments and high job demand are the most significant risk factors. Back and neck pain, has been found to be a major health problem for dental physicians with musculoskeletal disorders affect the physical, psychological and social aspects of dentists. This, in turn, has an great impact on their productivity and ultimately reduces their quality of life. Musculoskeletal disorders contribute significantly to sick leave, and reduced productivity and quitting the profession. The most common regions of pain in dentists are the neck, back and shoulders and back.

Materials and method: A Study was carried out among 102 professional people 15 questions were given to each of them. A validated, online self-administered questionnaire was used to gather the data to each of them to avoid discussion among them and also to avoid false results, thereby no bias is evidence in this study. Each of them were given one hour to complete the questionnaire. The results were statistically analysed descriptive statistics were used to analyse frequency, percentage.

Result: A questionnaire was prepared and circulated among the students of Saveetha dental college. It was also circulated among few staffs. The profession of dentistry itself is a hectic and long hours of working job. They keep on working for longer periods which developed stress and strain the back. Due to their inappropriate postures during dental procedures, they develop musculoskeletal pain.

Conclusion: Important that the education in and the application of ergonomic principles should begin early on, beginning with students of dentistry, and continue throughout the life-long postgraduate education of working dentists.

Keywords: Backache, Dentists, Musculoskeletal, Neck pain, Low back pain.

Introduction

Dentists are exposed to multiple types of health hazards while doing routine professional duties, for example, are exposed to occupational health hazards that predispose them to develop a multiple of health disorders. A wide variety of injurious work, like environmental factors are proved to affect the physical health of dentists or even aggravate their pre-existing disorders [1].
A dentist working for more than seven to eight hours a day without 15-20 min break between patients is found to increase the chance of Muscular skeletal disease. The dental physician and dental students are at very high risk of neck, back, and shoulder complains due to the limited work area and because they do not have access to impaired vision associated with the oral mouth cavity.

Dentistry is a highly rewarding profession, but it is a very demanding job with a high degree of concentration and precision in work. Dentists require good visual acuity, hearing, depth perception, psychomotor skills, manual dexterity, and ability to maintain occupational postures over long periods.

Moreover, dental procedures and planning are usually long and require much more concentration during work. Back pain is one of the most common and troublesome of complaints; its exact causes are unknown, and an correct diagnosis is often very difficult.

Even in optimal seated postures, more than one-half of the body's muscles are contracted statically, and there is little movement of the vertebral joints. The condition may result in damaging physiological micro changes will occur that can lead to back, neck or shoulder pain or musculoskeletal disorders leading to macro changes in the body because of the overstrained and awkward postures, repetitiveness of different joint movements, use of very high frequency vibration tools, both physiological and psychological stress have been identified as a high risk factors. Studies have shown that dental physicians reported more frequent musculoskeletal pain particularly low back and neck pain, including shoulder pain has been found to be a major health conditions for dental physicians and dental students its exact causes and diagnosis is often very difficult.

It has been stated that the most frequent sites of pain among dentists physicians and dental students are in the areas of the cervical and lumbar vertebrae involving low thoracic vertebrae. It has been pointed out that common postural faults among dentists are craning or sometimes excessive bending and twisting of neck, bending forward from the waist, elevation of shoulders, and general bending which leads to twisting of the back and the neck.

As preventive measure dentists should be taught relaxation techniques and resting between each patient taught them early in clinical training, and they should be taught correct working posture at chair side.

Recently, “Ergonomics” has become a popular term. The term has been used in most professions, but increasingly in the dental profession. It is a discipline that studies workers and their relationship to their occupational environment. This includes many different concepts such as how dentists position themselves and their patients, how they utilize equipment, how work areas are designed, and how all of these impact the health of dentists.

It is very important to maintain an adequate work postures and that the instruments and furnitures that the dental physicians and students is working with have adequate working. characteristics. Furthermore, they are exposed to biomechanical risk factors, which indicate that work forced postures, would imply more risk of soreness and presence of skeletal muscle lesions. These lesions could begin to appear at the beginning of their clinical practice as students, by acquiring inadequate postures and working habits that will harmful to them in future if they are corrected in early the postures of their professional life, acquiring an unhealthy lifestyle in their work environment.

Due to lack of understanding ergonomic principles may also play its role. Specially the students who is joining the dental professions in their first year curriculum, must be orientation on how to decrease musculoskeletal disorders, partially implemented even by the relatively motivated group of dental students and dental physicians. However, there is a lack of data regarding musculoskeletal pain among the Dental physicians and dental students in south Tamil Nadu.

Hence, this study was conducted with the aim to determine the prevalence of Musculoskeletal disorders among dental physicians and dental students in south Tamil Nadu and factors associated with its ubiquity.

The objectives of this study were to know the prevalence of pain in different anatomic location and to investigate the association between Musculoskeletal disorders and demographic and clinical details.

This questionnaire study was taken to assess the prevalence, severity, and extent of lower back and neck pain and propose some preventive measures. Hence the aim of the survey is to check the physical fitness among the dental physician and dental students.
Materials and method

A Study was carried out among 102 professional people 15 questions were given to each of them. A validated, online self-administered questionnaire was used to gather the data to each of them to avoid discussion among them and also to avoid false results, thereby no bias is evidence in this study. Each of them were given 1 hour to complete the questionnaire. The results were statistically analysed descriptive statistics were used to analyse frequency, percentage

Result and discussion

A questionnaire was prepared and circulated among the students of Saveetha dental college. It was also circulated among few staff. The profession of dentistry itself is a hectic job. Working for longer periods which developed stress and strain. Due to their inappropriate postures they develop musculoskeletal pain. Hundred and twenty dentists completed and returned the questionnaires through online survey for analyses, hence a response rate of 120 dentists, 40 (33%) were male and female 60(50%) and mean age 34yrs in both sex. Years of practising dentistry 5yrs 59% and more than 7yrs 28% table 1. The practice taking breaks in between 80% said yes and 20% said No table 2. Physical activity like swimming, jogging walking and running, most of the dentist said walking more than 30km 39% table 3. Hand dominance using right hand 90% and left hand 10% table 3. Reduction of work overload due to muscular skeletal pain low back pain 41%, neck pain21%, and shoulder pain 20% table 4. Preventing from practice dentistry occasionally 40%, taking sick leave from work for low back 42% and neck pain 20%. table 5.

From these results it shows many dental physicians and dental students are suffering from low back pain and ergonomic principles must be taught them in early carrier to prevent musculoskeletal disorders.
Conclusion

To prevent the occurrence of pain in future dentists, more emphasis must be placed on prevention strategies and proper work positioning in the undergraduate and postgraduate curriculum. Continuing dental education programs can be conducted for practicing dentists to update their knowledge.

Conflict of Interest: Nil

Source of Funding: Self

Ethical Clearance: Saveetha University IHEC Committee

Reference

Anti-Depressant and Anti-Anxiety Like Effects of Cydonia Oblonga in Mice Exposed to Mild Stress

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Abstract

Background: Cydonia oblonga is the scientific name of Quince and it has been claimed to have antioxidant, antidiabetic, antimicrobial, antihemolytic, aphrodisiac and anti-allergic properties in previous studies.

Objectives: Anxiety and depression are linked with oxidative injury so in the present study, Cydonia oblonga was explored for its antidepressant and antianxiety potential.

Material & Method: The experiments with Cydonia oblonga seed extract were carried out in animal models of depression and anxiety (Swiss albino). Five groups of six mice each (total of 30 mice) were trained initially to consume 2% sucrose solution for three weeks. The first group was normal control, the remaining four were exposed to stress and were fed with either: 10ml water per kg p.o, imipramine (antidepressant drug) 15 mg/kg body weight, diazepam (anti-anxiety drug) 25mg/kg body weight and Cydonia oblonga seed extract in dosages of (40 mg, 60 mg, 80mg per kg body weight) for the time period of 30 days.

Results: indicated that Cydonia oblonga seed extract of 80 mg/kg body weight and imipramine groups had significantly increased sucrose consumption, decreased duration of immobility during Forced Swim Test (FST) and tail suspension test (TST) thus indicating significant antidepressant like activity of the extract. Similar results were seen for anti-anxiety effect, this effect was evaluated using photoactometer and elevated plus maze method.

Conclusion: The findings of the study indicate that Cydonia oblonga seed extract is effective in depression and anxiety and the effects are dose dependent with comparable efficacy at higher dosage to the standard approved drugs

Keywords: Cydonia oblonga, Forced Swim test (FST), Tail Suspension Test (TST), antidepressive, anti-anxiety, photoactometer.

Introduction

Depression and anxiety are two extremely common neurotic disorders affecting different age groups and genders globally. WHO reported in 2015 that around the world an estimated 322 million populations were affected by depression¹. Several non-communicable diseases are linked to depression². Depression of moderate to severe nature becomes a disabling condition creating substantial health and socio-economic impact on people, families, the community and society at large³. Depression is generally caused by reduced secretion of monoamines, i.e neurotransmitters like serotonin, dopamine and nor-epinephrine which play an important role in pathogenesis of depression³.

Anxiety is a normal human emotion. Anxiety is considered pathological once it leads to psychological,
social, occupational, biological, and alternative impairment. Women of reproductive age are more susceptible to neurotic disorders like anxiety and depression.

In recent decades, despite the advancement in pharmacotherapy for the treatment of depression and anxiety, a significant proportion of patients are still treatment resistant. Antidepressant drugs generally have more side-effects or they are lacking in desired results for the patients. Their chronic therapy is also an economic burden for the patients. Thus, explorative studies for anti-depressive or anti-anxiety like effect of natural substances is justified by the need to find new compounds that have good clinical efficacy and fewer adverse effects.

Quince scientifically known as *Cydonia oblonga* is a shrub of Rosacea family and native west Asia region. Its fruits are edible and consumed in many forms. Quince seeds presented a good phenolic profile composed of quinic acids, lucenin-2, vicenin etc and have been shown to have anti-oxidant properties. Phenolic compounds represent a promising class of natural substances in neuropharmacology, taking into account its antioxidant and neuroprotective properties. Oxidative damage can lead to depression and anxiety; studies have shown that significant increase in serum levels of oxidative stress biomarkers in depressed patients in acute phase as compared to those of healthy subjects. Quince seeds possess antioxidant properties thus present study aimed to investigate the effects of repeated administration of *Cydonia oblonga* seed extract in modulating behavioural changes in stress induced mice.

**Material and Method**

**Plant Material:** *Cydonia oblonga* seeds were obtained from Srinagar, Jammu & Kashmir India. Seeds were washed several times with water and air dried. The dried seeds were packed under vacuum and stored at 18°C in dark till taken out for experiments.

**Preparation of extract:** The seeds as stored above were ground to fine powder and 100 g was taken in Soxhlet apparatus for solvent extraction by using ethanol as solvent at 60-80 °C for 9-10 hrs. The solvent of the extract was allowed to evaporate at room temperature and the material left was stored at 4°C for analysis.

**Standard drug:** Imipramine was referred to as the standard drug used for evaluating anti-depressive activity and Diazepam was referred to as the standard drug used for evaluating anti-anxiety activity in mice. Drugs were powdered and made into suspension in distilled water.

**Animals:** Proper care of animals was taken as per the guidelines of the Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA) for laboratory animal facilities, and permission from the Institutional Animal Ethics Committee (Regn No. 1173/ac/por/08/CPCSEA) was obtained. Thirty Swiss albino mice of either sex weighing between 25 and 30 g were housed in a group of 6 in a polypropylene cages, exposed to standard laboratory conditions i.e. 12 hr dark-light cycle at the temperature of 22°C ± 2°C with the access of free drinking water and were fed ad libitum with standard laboratory pellet diet.

**Protocol for the Experiment:** In the beginning of the experiments, animals were trained to consume 2% sucrose solution. Relation between consumption of sucrose and bodyweight was observed for 2 weeks and then grouping was done. Total of 30 mice of either sex were subjected to the study. Evaluation of anti-depressive activity was done in five different groups (n = 6/group) of mice. The control, standard drug and three test groups were orally administered distilled water (10 ml/kg), Imipramine (20 mg/kg), and incremental doses on 40, 60 and 80 mg of *Cydonia oblonga* seed extract respectively.

Evaluation of anti-anxiety activity was done in five different groups (n = 6/group) of mice. The control, standard drug and three test group were orally administered distilled water (10 ml/kg), diazepam (5 mg/kg), and incremental doses on 40, 60 and 80 mg of *Cydonia oblonga* seed extract respectively.

**Experimental groups:** The experimental test was performed one hour after oral (p.o) administration of vehicle/drug.

- Group 1 – Control:(Distilled water) (10ml/kg, p.o.) – [Control]
- Group 2 – Standard drug: Imipramine (20 mg/kg, p.o)
- Group 3 – Standard drug: Diazepam 5 mg/kg, p.o for anti-anxiety activity
- Group 4 – *Cydonia oblonga* seed extract (40 mg/kg, p.o.) -[QSE 40]
- Group 5 – *Cydonia oblonga* seed extract (60 mg/kg, p.o.) - [QSE 60]
Group 6 – *Cydonia oblonga* seed extract (80 mg/kg, p.o.) - [QSE 80].

**Chronic Mild Stress procedure:** The mice were subjected to the chronic stress protocol as described by P.Willner\textsuperscript{11} with slight modifications. Stress was given after 2 weeks of adaptation with 2% sucrose except for the control group (Group I), all the animals were subjected to chronic mild stress. The procedure was done as follows: 16hrs of water deprivation; 5h food deprivation prior to sucrose test (2days); 17h of overnight illumination and exposure to low temperature at 0\textdegree C for 5h. These stress procedures were run for 30 days.

**Experimental models for depression**

**Forced swim test:** The forced swim test was developed by Porssolt et.al. 1977 to verify the behavioural change in animals after giving them antidepressant substances\textsuperscript{12}. Each animal was placed inside a vertical plexi glass cylinder (40 cm in height and 18 cm in diameter), containing water up to a height of 15 cm maintained at 24 – 25\textdegree C. After the initial two to three minutes of vigorous struggling activity, an animal usually assumes a typical immobile posture. A mouse was considered to be immobile when it remained floating in the water without trying to struggle, making only minimum movements of its limbs, necessary to keep its head above water. During the test, each animal was placed in the water for 6 min. The duration of immobility was recorded during the last four minutes of the forced swim test. After removing the mice from water they were allowed to dry for 15 min. and then replaced back into the cage. An antidepressant effect was indicated when there was decrease in the duration of immobility.

**The tail suspension test:** Tail suspension test was used as an alternative to forced swim test for the assessment of anti-depressive potential of substances\textsuperscript{13}. In this test, each mouse was suspended from the edge of a 58 cm high table top with the help of an adhesive tape placed approximately 1 cm from the tip of the tail. The duration of immobility was recorded for a period of 5 minutes. Mouse was considered immobile when it hung passively and remained completely motionless, except for the respiratory movements, for at least 1 min. The duration of immobility in the different groups was compared. A decreased duration of immobility is indicative of antidepressant effect.

**Experimental models for Anxiety**

**Elevated plus maze method:** Elevated plus maze (EPM) is an apparatus to measure anxiety in mice providing laboratory conditions as suggested by Guyetal\textsuperscript{14}. The apparatus consists of two open arms, two enclosed arms giving a shape of plus (+) thus both the closed and open arms are facing each other. Each animal was placed at the centre of the apparatus facing towards the open arms. Digital recording was done to measure time spent and number of entries in open and closed arms within the duration of 5 min test period. Anxiety is expressed in term of time spend in closed chamber by the mice.

**Measurement of spontaneous locomotor activity:** Spontaneous locomotor activity was measured using photocactometer. Photocactometer is an apparatus in which continuous beams of light pass through the chamber. Mice was placed in between and by the criss-cross movement of mice light beam got interrupted and these interruptions were recorded for a period of 10 min. Spontaneous locomotor activity was expressed in terms of total photo beam interruptions.

**Statistical Analysis:** Results were analysed using one-way analysis of variance followed by Turkey post hoc tests.

Difference between groups were considered significant P<0.01.

**Results**

**Sucrose intake:** Sucrose intake was observed to decrease from 1.98 ml to 0.84ml per day in mice exposed to mild stress. Normal control group maintained the sucrose intake compared to imipramine fed animals. Higher sucrose intake was observed at higher dosage of *Cydonia oblonga* seed extract i.e 80mg/kg(P<0.05), which was similar to imipramine fed animals. Results are shown in Figure 1.
Effect of Quince seed on the duration of immobility in FST and TST: Cydonia Oblonga seed extract (40, 60 and 80 mg/kg, p.o) decreased the immobility time in FST \([F (4,29) = 47.23, P<0.01]\) and TST \([F(4,29)= 684.69, P<0.01]\) as compared to control group. Imipramine, (20mg/kg, p.o.) used as a positive control, showed effects similar to Cydonia oblonga seed extract 80 mg/kg, p.o. which was statistically significant thus dose of 80 mg/kg, p.o was the most effective dose in reducing mobility time in the forced swim test and this was chosen for subsequent experiments in the model of depression.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>FST (s)</th>
<th>TST (s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>QSE 40</td>
<td>89.88±0.76</td>
<td>173.72±2.16</td>
</tr>
<tr>
<td>QSE 60</td>
<td>107.05±0.93</td>
<td>153.44±1.56</td>
</tr>
<tr>
<td>QSE 80</td>
<td>129.55±0.55</td>
<td>131.77±1.43</td>
</tr>
<tr>
<td>Control</td>
<td>84.5±0.25</td>
<td>180.44±1.70</td>
</tr>
<tr>
<td>Imipramine</td>
<td>162±1.34</td>
<td>138.94±1.19</td>
</tr>
</tbody>
</table>

Effect of Cydonia oblonga seed extract on anxiety level of mice: Results of the impact of different dosages of Cydonia oblonga seed extract on anxiety level of mice are presented in Fig 2,3. Maximum reduction of SMA (Spontaneous locomotor activity) count was observed using the dosage of 80 μg/ml of the extract which is statistically significant in comparison to standard drug Diazepam 5mg/kg p.o. \([F (2,45) = 345.89]\). Results revealed that the effect of Cydonia oblonga seed extract on anxiety is dose dependent.

Similar results have been observed for elevated plus maze test, dosage of 80 μg/ml increases the time spent in closed arm which is statistically significant when compared to standard drug diazepam 5mg/kg p.o. \([F (2,45) = 345.89]\). Results revealed that the effect of Cydonia oblonga seed extract on anxiety is dose dependent.
Discussion

Depression and anxiety are the most prevalent mental disorders which widely effect world’s population. Diagnosis, treatment and recovery of these disorders become a great challenge due to the complexities of nervous system which deliberately affect the whole process. More of research is required to reduce the global impact of these disorders. For the treatment of depression and anxiety serotonin-specific reuptake inhibitors (SSRIs), antidepressants and benzodiazepines are routinely prescribed to patients. These classes of drugs are effective but have unwanted side effects and are costly. Hence, there is need to develop more effective and safer alternatives, thus this study focuses on effects of *Cydonia oblonga* seed extract on depression and anxiety.

Figure 1 suggests that higher dosage of the extract can be supplemented for improved cognitive functions.

Behavioral changes were reported in animals exposed to stress, animal models were used for evaluating the efficacy anti-depressive and anti-anxiety properties of different natural formulations. In the present study anti-depressive and anti-anxiety properties of quince seed extract were studied using behavioral changes in mice.

Forced Swim test and elevated plus maze method were used to produce the behavioral changes in mice. Results indicated that *Cydonia oblonga* seed extract of high dosage i.e 80 µg/kg p.o reduced the immobility time of mice when compared with imipramine. This effect may be due to the presence of polyphenols, as many studies have proved that natural polyphenols play important role in brain functions and modulate neurotransmitters. Silva, et. al has suggested that *Cydonia oblonga* seed extract has significant amount of polyphenols.

Spontaneous locomotor activity model was used to assess the anti-anxiety effect of *Cydonia oblonga* seed extract. Results indicate that the behavior change is dose
dependent and when compared with diazepam there is significant reduction in exploratory behavior of mice in photoactometer. Similar results were seen for elevated plus maze method, thus the extract of higher dosage, i.e 80 mg/kg body weight shows anti-depressive and anti-anxiety effect.

**Conclusion**

The findings of the study indicate that *Cydonia oblonga* seed extract is effective in depression and anxiety and the effects are dose dependent with comparable efficacy at higher dosage to the standard approved drugs. Further biochemical and molecular biological studies are needed to determine the exact mechanisms by which the *Cydonia oblonga* seed extract exhibits anti-depressant and anti-anxiety effects.

**Conflict of Interest:** No conflict of interest

**Source of funding:** Self-funding

**Ethical Clearance:** IAEC, School of Medical Sciences and Research, Sharda University.

**References**

Accessibility and Barriers to Oral Health Care among Gypsy Tribes in Chennai: A Cross Sectional Study

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¹Postgraduate, ²Professor & Head, ³Reader, ⁴Senior Lecturer, Department of Public Health Dentistry

Abstract:

Background: Narikuravars are nomadic population who do not tend to give importance to their oral health. Many people among them consume alcohol and tobacco products which might deteriorate their oral health.

AIM: The aim of this study was to evaluate the accessibility and barriers to oral health and to evaluate the oral health status of the narikuravar population.

Methodology: The present cross-sectional descriptive study was conducted among gypsy narikuravar population in Chennai. The sample size was 102. A pre-tested questionnaire containing 15 questions was used to collect data from all sample recruited for the study. Data was collected by face to face interview in tamil. Complete oral examination was done and recorded in WHO proforma 2013.

Results: Totally 68 (66.6%) females and 34 (33.4%) males participated in the study. Majority of them 60 (58.9%) individuals use tobacco products and only 42 (41.1%) do not use it. 72.6% get their dental treatments done in private dental clinics and 21.6% only get their treatments done in government hospitals. 72.5% participants have dental caries which is in majority among other oral diseases. Periodontal problems were present in 35.3% participants. 23.5% had missing teeth. 3.9% had oral lesions. 1.9% of participants only had dental fluorosis and dental erosion.

Conclusion: The narikuravar community tend to have a negligence towards oral health. Measures to improve their access and limits to their barriers to oral health care must be taken to improve their oral health status.

Keywords: Narikuravar, oral health, barriers, accessibility.

Introduction

The word “Narikurava” is a fusion of two Tamil words “Nari” and “Kurava” meaning “fox people”or the”jackal people”.[¹]They are an indigenous community from Indian states of Tamil Nadu. The main employment of this people who originally belong to the indigenous tribal group, is hunting. But since they were prohibited from entering into the forests to continue their main occupation, they were forced to sell beaded ornaments as an alternative to survive. Hence, they had to migrate from one place to another in search of a market for their beads. Children also accompany their parents wherever they go, which invariably means they dont get to attend schools or colleges.

The Narikuravars like the other tribes in other areas of Tamilnadu speak vagriboli language. There is no written form for this vagriboli language. They also sing folk songs in this language. The narikuravars are well-versed in Tamil too.[²]

There are about 36 types of tribal and local communities who reside in forests and nearby areas of Tamil Nadu.[³] Their entire families live together in small huts or tents, in both rural areas and cities of Tamil Nadu which are at times even made of elephant grass stems. There they continue their hunting of birds, rabbits etc. The women in their community indulge themselves in the making and selling of beaded necklaces. Men as well
as women wear jewellery made of shells, beads and coins. The women often wear ghoagro which are colorful pleated skirts that are not as long as saris.

The Narikuravar community people are evenly distributed all over the South Indian states. They are a nomadic people who are often known to other people for their passionate behaviour, independent nature and unwillingness to work under others. Unlike many caste of Hindus, most Narikuravars consume country liquor, especially during a pooja or festivals.

Majority among this community, have primary level education only. Due to this they might not have much knowledge about oral health too. They do not tend to give importance to their oral health. Many people among them consume alcohol and tobacco products which might deteriorate their oral health. Hence, an attempt was made in this study to evaluate their accessibility and barriers to oral health and to evaluate their oral health status.

Materials and Method

The present cross-sectional descriptive study was conducted among gypsy narikuravar population in Chennai.

The sample size was 102 based on convenience sampling among the narikuravar population living in Avadi and Thirumullaivoyal in Chennai. Ethical committee approval was obtained for conducting the study.

The inclusion criteria included all the participants who gave consent to participate in this study. All the participants were informed about the purpose of the study and confidentiality was assured. Verbal consent was obtained from all the participants. The study was conducted during the period of December 2018 to January 2019.

A pre-tested questionnaire containing 15 questions was used to collect data from all sample recruited for the study. Data was collected by face to face interview in Tamil. The questions were put forward on their demographic details (Name, age, and gender), their oral hygiene practices, dental issues, access to oral care and barriers.

Oral health of all the participants was accessed according to American Dental Association type 4 clinical examination with available illumination. Complete oral examination was done and recorded in WHO proforma 2013. Descriptive statistics was done and the association was assessed using Pearson’s Chi Square test. Statistics was done using SPSS version 23.0 and the p-value was set at 0.05.

Results

This study was a cross sectional study done among narikuravars in Chennai, Tamilnadu to assess their accessibility and barriers to oral health care. A total of 102 narikuravars in the age group of 12-70 years participated in the study.

Table 1: Distribution based on gender, user and non user of tobacco and alcohol

<table>
<thead>
<tr>
<th>Variables</th>
<th>Categories</th>
<th>N</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Female</td>
<td>68</td>
<td>66.6</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>34</td>
<td>33.4</td>
</tr>
<tr>
<td>Use of Tobacco</td>
<td>Yes</td>
<td>60</td>
<td>58.9</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>42</td>
<td>41.1</td>
</tr>
<tr>
<td>Use of Alcohol</td>
<td>Yes</td>
<td>68</td>
<td>66.6</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>34</td>
<td>33.4</td>
</tr>
</tbody>
</table>

Table 1 shows that totally 68 (66.6%) females and 34 (33.4%) males participated in the study. Majority of them 60 (58.9%) individuals use tobacco products and only 42 (41.1%) do not use it. 68 (66.6%) individuals consume alcohol whereas only 34 (33.4%) do not have the habit of consuming alcohol.

Table 2: Distribution based on oral hygiene aids used

<table>
<thead>
<tr>
<th>Variable</th>
<th>Categories</th>
<th>N</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral Hygiene aid used</td>
<td>Brush</td>
<td>64</td>
<td>62.7</td>
</tr>
<tr>
<td></td>
<td>Twig</td>
<td>4</td>
<td>3.92</td>
</tr>
<tr>
<td></td>
<td>Finger</td>
<td>34</td>
<td>33.3</td>
</tr>
<tr>
<td>Cleaning material used</td>
<td>Paste</td>
<td>66</td>
<td>64.7</td>
</tr>
<tr>
<td></td>
<td>Powder</td>
<td>14</td>
<td>13.7</td>
</tr>
<tr>
<td></td>
<td>Coal</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Brick powder</td>
<td>22</td>
<td>21.5</td>
</tr>
<tr>
<td></td>
<td>Salt</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 2 shows the different oral hygiene aids and cleaning materials used by the study participants. Majorly 64 (62.7%) participants use brush to clean their teeth. 34 (33.3%) use finger to clean their teeth and only 4 (3.92%) participants use twigs to clean their teeth. Tooth paste is majorly used by 66 (64.7%) participants to clean their teeth. 22 (21.5%) of them use brick powder to clean their teeth. None of them use coal or salt to clean their teeth.
Figure 1: Distribution based on place of dental treatment

Figure 1 shows the place the participants prefer to get their dental treatments done. 72.6% get it done in private dental clinics and 21.6% only get their treatments done in government hospitals.

Table 3: Distribution based on dental checkup, last visit, reasons and interest in knowing about oral health

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dental checkup</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>70</td>
<td>68.6</td>
</tr>
<tr>
<td>No</td>
<td>32</td>
<td>31.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Last visit to a dentist</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 6 months</td>
<td>8</td>
<td>7.8</td>
</tr>
<tr>
<td>6 Months to 1 year</td>
<td>32</td>
<td>31.3</td>
</tr>
<tr>
<td>1-5 Years</td>
<td>30</td>
<td>29.4</td>
</tr>
<tr>
<td>More than 5 years</td>
<td>6</td>
<td>5.8</td>
</tr>
<tr>
<td>Never</td>
<td>26</td>
<td>25.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reason for visit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tooth pain</td>
<td>36</td>
<td>35.3</td>
</tr>
<tr>
<td>Decayed tooth</td>
<td>40</td>
<td>39.2</td>
</tr>
<tr>
<td>Bleeding gums</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Food impaction</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Tooth discoloration</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Loose teeth</td>
<td>14</td>
<td>13.7</td>
</tr>
<tr>
<td>Missing teeth</td>
<td>8</td>
<td>7.8</td>
</tr>
<tr>
<td>Ulcers</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Swellings</td>
<td>2</td>
<td>1.9</td>
</tr>
<tr>
<td>No problems</td>
<td>2</td>
<td>1.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reason for no treatment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fear</td>
<td>24</td>
<td>23.5</td>
</tr>
<tr>
<td>No time</td>
<td>34</td>
<td>33.3</td>
</tr>
<tr>
<td>Expensive</td>
<td>18</td>
<td>17.9</td>
</tr>
<tr>
<td>Lack of knowledge</td>
<td>10</td>
<td>9.8</td>
</tr>
<tr>
<td>Don’t think it is important</td>
<td>16</td>
<td>15.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reason for a particular center</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others advice accessibility</td>
<td>44</td>
<td>43.3</td>
</tr>
<tr>
<td>Less expenditure</td>
<td>52</td>
<td>50.9</td>
</tr>
<tr>
<td>Quality of treatment</td>
<td>6</td>
<td>5.8</td>
</tr>
<tr>
<td>No treatment</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interest in knowing about oral health</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>88</td>
<td>86.3</td>
</tr>
<tr>
<td>No</td>
<td>2</td>
<td>1.9</td>
</tr>
<tr>
<td>Don’t know</td>
<td>12</td>
<td>11.7</td>
</tr>
</tbody>
</table>

Table 3 shows the distribution based on dental checkup, last visit, reasons and interest in knowing about oral health. Majority of the participants, 70 (68.6%) have had dental checkups done by a dentist. 32 (31.1%) participants have visited a dentist 6 months to 1 year back. The reason for dental visit was dental caries in 40 (39.2%) participants followed by 36 (35.3%) for tooth pain. Inspite of having a dental problem, 34 (33.3%) participants did not get their treatments done because of no time whereas 24(23.5%) did not because of fear. 52 (50.9%) prefer a particular center because of its easy accessibility from the place they live. Majorly 88 (86.3%) participants are interested in knowing about oral health.

Figure 2: Prevalence of dental diseases among the study population

Figure 2 shows the prevalence of dental diseases among the study population. 72.5% participants have dental caries which is in majority among other oral diseases. Periodontal problems were present in 35.3% participants. 23.5% had missing teeth. 3.9% had oral lesions. 1.9% of participants only had dental fluorosis and dental erosion.

Table 4: Association between use of tobacco products and dental caries

<table>
<thead>
<tr>
<th>Tobacco Products</th>
<th>Present N (%)</th>
<th>Absent N (%)</th>
<th>Total</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>User</td>
<td>11 (20.59)</td>
<td>49 (39.4)</td>
<td>60 (58.8)</td>
<td>&lt; 0.001 *</td>
</tr>
<tr>
<td>Non user</td>
<td>24 (14.41)</td>
<td>18 (27.5)</td>
<td>42 (41.1)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>35 (34.3)</td>
<td>67 (65.6)</td>
<td>102 (100)</td>
<td></td>
</tr>
</tbody>
</table>

*p value highly significant

Table 4 shows the association between use of tobacco products and dental caries. 11 (20.5%)
participants who use tobacco had dental caries whereas 24 (14.4%) participants who do not use tobacco product had dental caries. A significant p value was obtained while assessing the association between dental caries and use of tobacco products.

Table 5: Association between use alcohol consumption and dental caries

<table>
<thead>
<tr>
<th>Alcohol</th>
<th>Dental Caries</th>
<th></th>
<th></th>
<th>Total</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Present N (%)</td>
<td>Absent N (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>User</td>
<td>54 (49.3)</td>
<td>14 (18.6)</td>
<td>68 (66.6)</td>
<td>&lt; 0.05 *</td>
<td></td>
</tr>
<tr>
<td>Non user</td>
<td>20 (24.6)</td>
<td>14 (9.3)</td>
<td>34 (33.3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>74 (72.5)</td>
<td>28 (27.4)</td>
<td>102 (100)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p value significant

Table 5 shows the association between alcohol consumption and dental caries. 54 (49.3%) participants who consume alcohol had dental caries whereas 20 (24.6%) participants who do not consume alcohol had dental caries. A significant p value was obtained while assessing the association between dental caries and consumption of alcohol.

Discussion

Dental problems are generally not self-limiting in nature. If left untreated, these dental diseases may affect the one’s well-being and even their overall quality of life. [6] The world health organization acknowledges the importance of oral health care in the maintenance of general health. Various local, national, and international organizations put in lots of efforts to increase the oral health awareness among the people. Even then the oral health negligence continues to prevail among the people. [7] The nomadic gypsy population be one among them. A negative oral health care seeking behavior is seen to prevail among them due to lack of knowledge and awareness. Colonization of these indigenous people has also resulted in vast health inequalities. [8]

In the present study, use of tobacco products either in smoking or smokeless forms and use of alcohol is more among the narikuravar population. About 58.9 % of them use any form of tobacco products and 66.6% of them consume alcohol which is at a high. This might be due to the lack of awareness about the ill effects of using tobacco products and alcohol among them. This in-turn might be due to lack of education among them. [5] Majority of the participants, 70 (68.6%) have had dental checkups done by a dentist. 32 (31.1%) participants have visited a dentist 6 months to 1 year back. The major reason for visit in the present study was decayed tooth (39.2%) which is in contrast with was in contrast with the study conducted by Bommireddy VS et al [7] where tooth pain was the main reason for visit.

Majority of the participants underwent their dental treatments in a private dental clinic with accessibility being the main reason for preferring the particular center. This was in accordance with the Bommireddy VS et al study. [7]

Dental Caries was the majorly prevalent disease among the gypsy population (72.5%) followed by missing teeth among 23.5% population.

A significant association was obtained while assessing the association of use of tobacco products either in smoked or smokeless forms and dental caries. This increase in the susceptibility to dental caries can be due to lower pH levels, a decrease in the buffering capacity of smoker’s saliva, and the higher number of lactobacilli and Streptococcus mutans counts. [9] Nicotine, being the major ingredient in tobacco, would promote the attachment of Streptococcus mutans to the dental surfaces, and further may increase the incidence and severity of dental caries in tobacco users. [10] The dental caries experience can be more due to use of sugar constituents in the chewing tobacco products. [11] A significant association was obtained while assessing the association alcohol consumption and dental caries in the present study.

In the present study, 86.3% of the narikuravar population were interested in knowing about oral health. So, initiatives to improve their oral health knowledge by regular camps and awareness programmes can benefit these people.

The limitations of the present study were that the study was a cross sectional study done only among narikuravars who reside in Chennai, so the results cannot be generalized. Further researches in other parts of Tamilnadu can be conducted to know the oral health access and barriers of the nomadic narikuravar population.

Conclusion

The narikuravar community tend to have negligence towards oral health. This has led to increase prevalence
of dental diseases among them. They do not take proper care of their oral cavity. Initiatives to improve their knowledge must be undertaken. Measures to improve their access and limit their barriers to oral health care must be taken to improve their oral health status.

Conflict of Interest: The author declares no conflict of interest

Source of Funding: Self

Ethical Clearance: Obtained from ethical clearance board of SRM Dental College

References:


Assessment of Knowledge and Perception of Kishori Shakti Yojana Services among Adolescent Girls of a Selected Community at Mangaluru with a View to Develop an Information Guide Sheet

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Abstract

Background: Adolescence is a period of rapid growth which reaches its peak between 11 and 14 years for the girls and between 13 and 16 for the boys. Adolescence is the period of transition from childhood to adulthood with accelerated physical, mental and emotional development. To strengthen any nation, there is need of healthy mothers as they only produce healthy citizens.

Objectives: A descriptive study aimed to assess the knowledge and perception of Kishori Shakti Yojana services among adolescent girls.

Materials and Method: Convenient sampling technique was used to select the sample size of 100 adolescent girls. Data was collected using structured knowledge questionnaire with 19 items and Likert scale with 16 items.

Results: Overall grading of knowledge score and perception score revealed that one-third of the subjects (75%) had inadequate knowledge and 71 adolescent girls (71%) had unfavorable perception towards KSY Services. There was a significant association between knowledge of adolescent girls regarding KSY Services and age, annual family income, previous knowledge and source of knowledge. There was no significant association between perception scores of adolescent girls regarding KSY Services and selected demographic characteristics.

Conclusion: The adolescent girls are provided with some sort of educational interventions such as information booklets, teaching programmes, modules on KSY Services will definitely update their knowledge and develops favourable perception towards KSY Services, which in turn contribute to improve the total quality of one’s health.

Keywords: Knowledge, perception, adolescent girls, KSY.

Introduction

Adolescence is a period of rapid growth which reaches its peak between 11 and 14 years for the girls and between 13 and 16 for the boys. Several physical, biochemical and physiological changes take place with onset of puberty. The attitude towards diet is often very unhealthy during the period of adolescence because this period is accompanied with considerable stress.
due to physiological and psychological changes. On the contrary, an adolescent girl requires all nutrients in good quantities not just for the rapid growth but also to obtain optimal storage for later requirements during pregnancy.[1]

In India, social, economic and health factors may undermine the ability of adolescents to lead full and productive lives. This is of particular concern given the sheer number of young people in India- an estimated 31% (358 million) of national population is aged between 10 to 19 years olds (242 million). [2]India houses nearly 224 million adolescents within the age group of 10 to 19 years, of them 105 million are girls. Adolescent accounts to be 22% of India’s population which means every 5th person in India is an adolescent and every 10th person living in the country is an adolescent girl. Among adolescents, girls are more vulnerable and are most neglected group as far as their health, nutrition, education and their overall growth and development are concerned. As a result, most of the adolescent girls in India make the transition to adulthood with low health and nutritional status which increases the risk of reproductive morbidity and mortality. However, there are very few programmes implemented in the country which are meant for improving the health and nutrition status of adolescent.[3]

The Govt of India thus introduced a number of schemes for the welfare of the people and more specifically for the women and girls but the schemes also do not reach to the appropriate group of people because of lack of awareness and corruption along with a number of other reasons. This has motivated the investigator to assess the knowledge of adolescent girls regarding one of the Govt. Schemes i.e. KSY, so that appropriate intervention could be undertaken so that adolescent girls get the knowledge about the scheme & will get benefit of it.

Materials and Method

Sample setting and sample size: The research design selected for this study was descriptive correlational design. The study was carried out in Kumpala area of Kotekar PHC, Kotekar post, Mangaluru, Karnataka in January 2018. In the present study, convenient sampling technique was used to select the sample size of 100 adolescent girls.

Tools and techniques: A demographic proforma having 9 items, structured knowledge questionnaire with 19 items under 3 domains \( r=0.83 \) to assess the knowledge and Likert scale with 16 items under 2 domains \( r=0.76 \) to determine the perception was administered to collect the data from adolescent girls.

Data analysis: The data was collected after obtaining prior permission from the concerned authority to conduct the study. The participants were assured about the confidentiality of their responses. The data was analyzed in terms of objectives of the study using both descriptive and inferential statistics. The data obtained was plotted in the master sheets.

Results

More than half (52%) of the subjects were in the age group of 17 – 19 years. The mean age calculated was 16 years ± 0.75. Majority of the adolescent girls 89 (89%) belonged to the Hindu religion and 81 (81%) were residing in nuclear family structure. More than half (61%) of the subjects had higher secondary education. More than half (55%) of the adolescent girls had prior knowledge regarding KSY Services.

One-third of the subjects (75%) had inadequate knowledge and rest (25%) of the subjects had adequate knowledge regarding KSY Services [fig. 1]. The highest percentage of knowledge was seen in the domain of eligibility of KSY Services (54%) followed by the domain of benefits/services of KSY Services (50%). The least knowledge percentage was seen in the domain of administration of KSY Services (22%) [table 1].

Most of the adolescent girls 71 (71%) had unfavourable perception towards KSY Services and 29 adolescent girls (29%) had favourable perception towards KSY Services [fig. 2]. The highest percentage of perception was seen in the domain of perception related to benefits (74%). The least perception percentage was in the domain of perception related to benefits (67%) [table 2]. There was a positive weak correlation \( r=0.025 \) between the knowledge scores and perception scores of adolescent girls regarding KSY Services.

There was a significant association between knowledge of adolescent girls regarding KSY Services and age \( \chi^2=8.30, p=0.016 \), annual family income \( \chi^2=34.28, p=0.001 \), previous knowledge \( \chi^2=18.43, p=0.001 \) and source of knowledge \( \chi^2=43.71, p=0.001 \). There was no significant association between perception scores of adolescent girls regarding KSY Services and selected demographic characteristics.
Table 1: Grading of domain wise knowledge score on KSY Services n = 100

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Domain</th>
<th>Maximum score</th>
<th>Adequate</th>
<th>Adequate %</th>
<th>Inadequate</th>
<th>Inadequate %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Eligibility of KSY Services</td>
<td>5</td>
<td>54</td>
<td>54.0</td>
<td>46</td>
<td>46.0</td>
</tr>
<tr>
<td>2.</td>
<td>Administration of KSY Services</td>
<td>6</td>
<td>22</td>
<td>22.0</td>
<td>78</td>
<td>78.0</td>
</tr>
<tr>
<td>3.</td>
<td>Benefits/Services of KSY Services</td>
<td>8</td>
<td>50</td>
<td>50.0</td>
<td>50</td>
<td>50.0</td>
</tr>
</tbody>
</table>

Table 2: Grading of domain wise perception scores of KSY Services n = 100

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Domain</th>
<th>Maximum score</th>
<th>Favourable</th>
<th>Favourable %</th>
<th>Unfavorable</th>
<th>Unfavorable %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Perception related to administration</td>
<td>6</td>
<td>67</td>
<td>67.0</td>
<td>33</td>
<td>33.0</td>
</tr>
<tr>
<td>2.</td>
<td>Perception related to benefits</td>
<td>10</td>
<td>74</td>
<td>74.0</td>
<td>26</td>
<td>26.0</td>
</tr>
</tbody>
</table>

Discussion

Section I: Description of demographic characteristics of adolescent girls: The present study revealed that more than half 52 (52%) of the subjects were in the age group of 17-19 years. The mean age calculated was 16 years ±0.75 and 89% were Hindus. Most of the adolescent girls (61%) had qualification of higher secondary. More than half (55%) of the adolescent girls had prior knowledge regarding KSY Services. The study findings are supported by the studies conducted by Vishal R, et al. in Sewapuri block of Varanasi district in U.P in 2014 and Thakur A, et al. in Palampur where the results revealed that 54% of the adolescent girls were in the age group of 15–18 years and same proportion of the subjects had educational qualification of 11–12 standard and 63.3% had prior knowledge regarding KSY.\[^4\][^5\)

[4][5]
Section II: Analysis of knowledge of adolescent girls regarding KSY Services: The mean percentage of 43.68 depicts that the subjects had inadequate knowledge regarding KSY Services. The overall grading of knowledge score showed that one-third of the subjects (75%) had inadequate knowledge and rest (25%) of the subjects had adequate knowledge regarding KSY Services. Highest percentage of knowledge was seen in the domain of eligibility of KSY (54%) and least knowledge percentage was seen in the domain of administration of KSY (22%). The study findings are opposed by a study conducted by Vishal R, et al. in Sewapuri block of Varanasi district in U.P in 2014 where the results showed that all adolescent girls were aware about the KSY Services. They also specified that appliances were made available to the beneficiaries of KSY for income generation.[4]

Section III: Analysis of perception of adolescent girls regarding KSY Services: The present study interpreted that majority (71%) of the subjects had unfavorable perception towards KSY Services. Highest percentage of perception was seen in the domain of perception related to benefits (74%). The least perception percentage was in the domain of perception related to benefits (67%).

Section IV: Association of knowledge score and perception score of adolescent girls regarding KSY Services with selected demographic characteristics: The findings of the present study revealed that there was a significant association between knowledge of adolescent girls regarding KSY Services and age ($\chi^2=8.30$, $p=0.016$), annual family income ($\chi^2=34.28$, $p=0.001$), previous knowledge ($\chi^2=18.43$, $p=0.001$) and source of knowledge ($\chi^2=43.71$, $p=0.001$). There was no significant association between perception scores of adolescent girls regarding KSY Services and selected demographic characteristics. And rest of the demographic characteristics have no significant association. The study findings are consistent to a study conducted by Thakur A, et al. in selected schools of Palampur in 2015 where the results revealed that there were significant association of age and the source of knowledge with knowledge level of adolescent girls regarding KSY. [5]

Conclusion

The study concludes that if the adolescent girls are provided with some sort of educational interventions such as information booklets, teaching programmes, modules on KSY Services will definitely update their knowledge and develops favourable perception towards KSY Services, which in turn contribute to improve the total quality of one’s health.

Financial Support and Sponsorship: Nil

Conflict of Interest: There are no conflicts of interest

Ethical Clearance: Taken from Ethics Committee of Yenepoya University

References
2. Adolescence in India. A desk review of existing evidence and behaviours, programmes and policies. 2013 Nov; New Delhi: population council and UNICEF.
Factors Affecting Immunization Coverage of Children in Rural Area in Tamil Nadu

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1Final year MBBS Students, 2Post Graduate, 3Associate Professor, 4Professor and Head, Department of Community Medicine, Saveetha Medical College Hospital, Thandalam, District Kanchipuram

Abstract

Background: Vaccine preventable diseases (VPDs) are one of the greatest causes of morbidity and mortality among children in India. They are still responsible for over 0.5 million deaths annually in the country. Worldwide, about 2.5 million deaths of under-5 children are averted annually by immunization.

Objectives: To assess the current status of immunization of children during the first year of life and analyze the factors affecting immunization coverage during the first year of life in Kuthambakkam district in Tamil Nadu.

Methodology: A descriptive cross-sectional study was conducted in Kuthambakkam village in Tamil Nadu. The Sample size of 195 was calculated. The study population was selected by simple random sampling technique. A pre-designed, pre-tested semi-structured questionnaire was used to collect data after obtaining informed consent. Data entered in MS excel and analyzed using proportion.

Results: Out of the 195 cases studied, 87% of the children were completely immunized, 12% were partially immunized and only 1% was non-immunized. 59% had adverse effects following immunization (AEFI) and 39% waited for more than 1 hour to be immunized, but 94% were satisfied with the services they received. 41% of the mothers and 37% of the fathers received education up to a secondary school level, and 57% of the respondents worked in skilled and semi-skilled professions.

Conclusion: The delivery of routine immunization services to Indian children appears to have improved. Regular systematic reviews of the immunization coverage data and expansion of vaccination services are recommended.

Keywords: Immunization, childhood vaccination trends, inequity, immunization coverage.

Introduction

Vaccine preventable disease (VPD’s) is one of the greatest causes of morbidity and mortality among children in India. Vaccines not only protect children from potentially fatal illnesses, but also prevent disease transmission in a community1.

However, in India, VPD’s are still responsible for over 0.5 million deaths annually2. In 2003, the UN Millennium Declaration had outlined the reduction of under-five mortality as one of the eight goals with proportion of 1-year-old children immunized against measles as one of the monitoring indicators (UN 2003).

The World Health Organization (WHO) launched the Expanded Immunization Programme (EPI) in 1974 to prevent nine major VPDs namely tuberculosis, diphtheria, whooping cough (pertussis), tetanus, polio, measles, mumps, rubella and hepatitis-B3. It was subsequently renamed Universal Immunization Programme (UIP) in 1985. India was one of the first countries to adopt the programme in 1978. Since its inception, considerable progress has been made in terms of reduction in disease burden2.

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However, despite being operational for over 30 years, UIP has been able to fully immunize only 65% children in the first year of their life. Mission Indradhanush has been launched by the Health & Family Welfare Ministry of India, with the aim to immunize all children under the age of 2 years, as well as all pregnant women, against the nine VPDs. The Mission is to be implemented in 201 high focus districts in the first phase, where nearly 50% of all unvaccinated or partially vaccinated children reside. Mission Indradhanush aims to achieve 90% immunization of children by 2020. There are wide coverage disparities between the rich and the poor and between urban and rural children. There is wide inter-district, intra-district, urban-rural and rich-poor difference with respect to immunization coverage. This variation indicates a service coverage gap and reinforces the fact that those who need these services the most are the ones who are also neglected the most.

Despite a steady rise in overall immunization coverage, children living in rural areas and slums remain incompletely immunized. Children who are not immunized on time are more likely to be from families of low socio-economic status and having low parental educational level. These factors suggest the need for further investigation into specific populations and the identification of barriers within different subgroups.

Assessing immunization coverage helps to evaluate progress in achieving programme objectives and in improving service delivery. Equity in immunization should not be restricted to merely creating equal opportunities for immunization of children within the country. It should also identify the groups at highest risk of remaining unvaccinated and thereby bridging these gaps and imbalances as far as possible. Hence a systematic assessment of childhood vaccination trends must be undertaken to identify inequity in childhood routine immunization in India and to explore the reasons for the same.

Material and Method

A descriptive cross-sectional study was conducted in Mappedu village in Tamil Nadu. The study was conducted by interviewing heads of household who were selected randomly after the sample size calculation. Assuming 60% prevalence of primary immunization, with allowable error of 7%, the sample size of 195 was calculated using the formula $4pq/L^2$. Data was collected and the necessary details were sought in terms of age, sex, place of immunization, source of information, satisfaction level, parents’ education and socioeconomic status. Information regarding immunization status was obtained on the basis of documentary proof (immunization card) and if card was unavailable, status was determined by enquiring about received vaccines.

According to WHO guidelines, a fully immunized child was defined as the one who had received one dose of Bacillus Calmette Guérin (BCG), three doses of oral polio vaccine (OPV) (excluding Polio 0), three injections of diphtheria-pertussis-tetanus (DPT), and one dose of measles before first birthday and who had not received even a single dose were considered as non-immunized. Those children who had missed at least one dose were considered as partially immunized.

The collected data were entered into Microsoft Excel. Analysis was done using SPSS 21 software and the results were interpreted in terms of percentage, mean, chi-square and z-test.

Results

(a) Socio-demographic Profile: Out of 195 children, 102 (52.3%) were male and 93 (47.7%) were female. Modified Kuppuswamy scale was used to assess the socio-economic status of study population. Majority of the population belonged to lower middle class (32.81%). With regards to education status, 80 (41.0%) of the mothers received a High School level of certification. Maximum number of fathers 73 (37.4%) received a High School certification. The study found that majority of the people worked in skilled 57 (29.2%). Majority of the population are Hindu 164 (85.6%), followed by Christian 27 (13.8%) and only 4 (2%) being Muslim. (Table 1).

(b) Immunization status: Out of 195 respondents who were surveyed, 171 (87.7%) of the total were fully immunized and 24 (12.3%) were partially immunized. Only 1 (0.5%) was non-immunized. (Figure 1).
With respect to the place of immunization, 84 (43.1%) respondents reported availing of the services of Government hospitals, while 46 (23.6%) and 36 (18.5%) respectively reported use of public health dispensaries and private clinics respectively. Only a small minority of 13 (6.7%) of children were immunized at home by health care workers.

76 (39.0%) respondents reported waiting for more than 1 hour in order to avail of immunization services. 60 (30.8%) waited for at imeperiod ranging from 30 minutes to an hour. Only 42 (21.5%) waited for less than a half hour in order to get immunized.

The cross tabulation between the socio-demographic profile of the respondents and their immunization status was done, and assessed using the chi-square test.

Table 2 shows that there is statistically significant association between the immunization status and the gender of the child with P = 0.0011 (P < 0.05) as well as between the immunization status and the socioeconomic classification of the respondents with P = 5.5919 (P > 0.05).

### Table 1: Cross Tabulation between Immunization Status and Socio-demographic Profile

<table>
<thead>
<tr>
<th>Variables</th>
<th>Immunization Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Fully Immunized</td>
</tr>
<tr>
<td></td>
<td>Partially/Non-Immunized</td>
</tr>
<tr>
<td>Male</td>
<td>89</td>
</tr>
<tr>
<td>Female</td>
<td>81</td>
</tr>
</tbody>
</table>

P = 0.0011 (P< 0.05)

<table>
<thead>
<tr>
<th>Kuppuswamy Classification</th>
<th>Fully Immunized</th>
<th>Partially/Non-Immunized</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper (Class 1)</td>
<td>48</td>
<td>9</td>
</tr>
<tr>
<td>Upper Middle (Class 2)</td>
<td>39</td>
<td>3</td>
</tr>
<tr>
<td>Lower Middle (Class 3)</td>
<td>63</td>
<td>4</td>
</tr>
<tr>
<td>Upper Lower (Class 4)</td>
<td>42</td>
<td>8</td>
</tr>
<tr>
<td>Lower(Class 5)</td>
<td>3</td>
<td>1</td>
</tr>
</tbody>
</table>

P = 5.5919

There is no statistically significant association between the immunization status and the time taken for immunization with P = 3.3197 (P > 0.05); between the immunization status and the place of immunization with P = 4.4921 (P > 0.05); between the immunization status and presence of adverse effects following immunization with P = 0.1579 (P > 0.05). (Table 3)

### Table 2: Cross Tabulation between Immunization Status and Factors Affecting Immunization

<table>
<thead>
<tr>
<th>Variables</th>
<th>Immunization Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time Taken</td>
<td>Fully Immunized</td>
</tr>
<tr>
<td></td>
<td>Partially/Non-Immunized</td>
</tr>
<tr>
<td>&lt;30 min</td>
<td>40</td>
</tr>
<tr>
<td>30-59 min</td>
<td>51</td>
</tr>
<tr>
<td>1-2 hours</td>
<td>56</td>
</tr>
<tr>
<td>2-3 hours</td>
<td>5</td>
</tr>
<tr>
<td>&gt;3 hours</td>
<td>4</td>
</tr>
</tbody>
</table>

P = 3.3197

<table>
<thead>
<tr>
<th>Place of Immunization</th>
<th>Fully Immunized</th>
<th>Partially/Non-Immunized</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital</td>
<td>73</td>
<td>11</td>
</tr>
</tbody>
</table>

(c) Reasons for incomplete immunization: 12 (48.2%) of the respondents reported missing the government schedule for vaccination then finding it too expensive to vaccinate elsewhere at private clinics. 5 (20.6%) of the partially immunized children reported transportation difficulties. The guardian of the non-immunized child reported that she did not believe that her child needed vaccines hence did not immunize him.

114 (58.5%) of the respondents’ children had adverse effects following immunization (AEFI). When asked to enumerate the symptoms most respondents mentioned mild fever which was immediately relieved on taking medication.

However, only 11 (5.6%) of the respondents showed any dissatisfaction with the immunization services offered to them, with 183 (93.8%) feeling that the services afforded to them were satisfactory.
Table 3: Cross Tabulation between Immunization Status and Education of Mother

<table>
<thead>
<tr>
<th>Variable</th>
<th>Fully Immunized</th>
<th>Partially/Non-Immunized</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduate/Post Graduate</td>
<td>37</td>
<td>6</td>
</tr>
<tr>
<td>High School Certificate</td>
<td>74</td>
<td>5</td>
</tr>
<tr>
<td>Middle School Certificate</td>
<td>36</td>
<td>9</td>
</tr>
<tr>
<td>Primary School Certificate</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Illiterate</td>
<td>18</td>
<td>1</td>
</tr>
</tbody>
</table>

Discussion

The results of the present study revealed that 87% of the children, a majority of the respondents were completely immunized. 12% were partially immunized and only 1% of the children were non-immunized. This contrasts with the results of a similar study conducted by Santosh K. Prusty et al in urban slums in Odisha\(^2\) and Rup Kumar Phukan et al in Assam\(^4\).

The disparity in the immunization status between different states can be attributed to the higher literacy levels among South Indians compared to their Northern counterparts\(^9\), as well the relative success of programs like Universal Immunization Programme and Mission Indradhanush.

59% of the respondents’ children had adverse effects following immunization, which is considerably less than the 75% reported in studies in Odisha\(^2\). 39% reported waiting for more than 1 hour in order to avail immunization. Interestingly, only 6% showed any dissatisfaction with the services offered. This could be indicative of low-level of expectation among slum-dwellers from public health delivery system and lower level of understanding about quality of services.

When asked about sources of information regarding vaccines, 79% respondents largely attributed it to clinicians and health care workers.

In terms of literacy level of respondents, 41% of the mothers received a secondary level of education 22% of them received a primary level. This correlates with the study conducted in Odisha\(^2\) but is contradicts the level of literacy among mothers in the Assam study\(^4\).

The literacy level of mother has important role for better immunization coverage of the children. With respect to the fathers, 37% and 21% respectively received secondary level and primary level of education. The close association between parental, especially maternal education has also been documented in other studies from India and other developing countries.

With respect to the occupation the respondents were employed in, a total of 57% work in skilled and semi-skilled professions, with only 27% working in well-paying professional or semiprofessional jobs. This can be attributed to the rural setting of the survey, as well as affects the overall economic status of the family and their ability to access quality health care for them and their families.

Accordingly, a majority 32% of the respondents fell into the Lower Middle class (class III) by Kuppuswamy classification, with only 25% and 22% belonging to the Upper (class I) and Upper Lower classes (class IV) respectively. In general, people with higher socioeconomic status are more educated, have higher incomes and are more likely to be aware of the importance of immunization than those of a lower class. They also have better everyday access to health care, particularly through the private sector. Such similar findings are echoed by the study conducted by Rup Kumar et al in Assam\(^4\).

Conclusion and Recommendations

Total number of children surveyed is 195, out of which 52% were male and 48% were female. 87% of the children were completely immunized, 12% were partially immunized and only 1% were non-immunized. 59% had adverse effects following immunization and 39% waited for more than 1 hour to be immunized, but 94% were
satisfied with the services they received. 41% of the mothers and 37% of the fathers received education up to a secondary school level, and 57% of the respondents worked in skilled and semi-skilled professions.

The much higher vaccination coverage in this study reflects the efforts made by the Government of India to review the pre-existing data on state- and national-level vaccination coverage systematically and dramatically improve vaccine provision and documentation at all levels. Although these results indicate there have been substantial increases in coverage, much work is still needed to reach Mission Indradhanush’s coverage goals.

Recommendations for further improving immunization coverage in this community include regular vaccine supervision, more frequent assessment of vaccine coverage and continuous education of women at health facilities and in schools. Improvement in female literacy coupled with the reduction in the dropout rate would add to achieve a higher target of immunization. To strengthen the accuracy of vaccination coverage estimates, more attention should also be paid to immunization card retention. Additionally, improvement in vaccine information dissemination by clinicians and health care workers, and dispelling of taboos and myths regarding vaccination would be an affective foothold in achieving our nations’ vaccination goals.

Conflict of Interest: None

Source of Funding: Self

Ethical Clearance: Institutional ethical approval was obtained from Institutional Review Board, Saveetha Medical Research Cell, Saveetha Medical College.

References


Awareness of Parents of Children with Congenital Heart Disease about Oral Health and Disease

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Abstract

Introduction: Congenital defects of the heart are considered to be one of the common malformations in new-borns but with the advancements made in medicine has improved the quality of life in these patients, still infective endocarditis is considered to be a major complication of this disease. Transient bacteraemia induced due to dental procedures put these patients at a risk, hence proper oral health care and awareness should be provided. The aim of the article is to find out the perception parents of children with congenital heart disease towards general oral health and to assess their knowledge about the association of cardiac health and oral health.

Materials and Method: Questionnaires containing 15 questions were given to 20 parents of children with congenital heart disease at Madras Medical Mission and Frontier Lifeline Hospital, Chennai, Tamil Nadu, India.

Results: It was shown that very few parents knew about infective endocarditis and lacked the awareness of the connection between oral disease and cardiac disease.

Conclusion: A lack of oral health education are being provided to the children with cardiovascular disease and their parents, therefore provides an opportunity to improve the treatment outcomes and oral hygiene care.

Keywords: Congenital heart disease, Oral health, infective endocarditis, oral disease, awareness.

Introduction

“Congenital heart defect” is defined by Mitchell et al. (1971) as “a gross structural abnormality of the heart or intrathoracic great vessels that is actually or potentially of functional significance” (Mitchell, Korones and Berendes 1971). Congenital heart disease (CHD) is one of the major causes for infant mortality worldwide with a birth prevalence of 4-8 per 1000¹. In India, there is no data base about the incidence rate of CHD as most of the births take place at home without any medical supervision, so the birth prevalence is a low as 2.5 per 1000 births.² However, progress in cardiovascular diagnostics in the past few decades have improved the survival rates for many children with CHD Innovations in surgical and anaesthetic techniques with extensive development in paediatric care have improved treatment and care for CHD patients, but as these children reach adulthood, they form new patients with various individual needs that need constant medical surveillance.³,⁴ As the dental health of these children with CHD is compromised due to the attention given to the systemic disease, they are at a risk for many complications. CHD affects dental health either in dentition, increased of infective endocarditis or implications of treatment delivery Method.⁵
Many children with CHD have issues with nutrition with vomiting as the most common problem. In order to treat the issue, frequent meals and night feeds are given to maintain nutrition and often the medication given for heart disease contain sucrose can cause xerostomia. Systemic diseases that occur during the formation of the teeth, can lead to defective formation of the teeth such as thinner enamel because the ameloblasts that lay the enamel are extremely sensitive to metabolic changes. These findings were seen in studies done in children with lower body weights and children suffering from CHD. Hence the teeth of the children with CHD is more susceptible to dental caries and are more difficult to restore than healthy individuals, so proper planning and treatment is required.

Transient bacteraemia is a major risk factor for infective endocarditis, which occur due to dental procedures. Some recent studies have found that only one -eighth of the patients with infective endocarditis have had a dental procedure done prior to the onset of the symptoms. Transient bacteraemia can also be a cause for transient bacteraemia. Oral Streptococcus mutans is considered as the organism responsible for infective endocarditis and accounts for two fifth of the cases in children. Infective endocarditis is caused by endothelial damage due to CHD and cause deposition of fibrin and platelets which form a non-bacterial thrombotic endocarditis which in an environment of bacteria can become infective endocarditis.

Antibiotic prophylaxis before any dental procedure is mandatory for CHD patients but importance of good dental health should be instilled.

Despite all the advancements, not much importance is given to dental health due to lack awareness and understanding of the co-relation between CHD and oral health, since the key to protection is improved dental health awareness and hygiene so that the complications can be kept to a minimum. The purpose of this study is to assess the level of understanding about oral health and congenital heart disease of the parents of children with CHD.

Materials and Method

Patients: A total of 20 children with various kinds of congenital heart disease was included in the study. All the patients were in and out patients of the Department of Paediatric Cardiology at Madras Medical Mission and Frontier Lifeline, Chennai, Tamil Nadu, India. All patients with CHD were included, whereas children with cardiac dysrhythmia were excluded.

Study Design: The study was based on the null hypothesis that the parents of children with CHD were not aware of the relation of congenital heart disease and oral disease and health. The questionnaire used, is from a study done by Steffen Koerdt et al at the Department of Paediatric Cardiology and Congenital Heart Defects at the German Heart Centre, Munich of the State of Bavaria and the Technical University of Munich, Germany which was developed by paediatric cardiologist and two dentists. The study was designed according to the guidelines of the Declaration of Helsinki. The questionnaire consists of 15 close ended questions.

All parents were informed and written consent was obtained from them.

Data Collection and Analysis: The data collected was analysed using IBM SPSS 16 software (IBM Corporation, United States of America) and the frequencies and percentages for the different questions were calculated.

Results

In the study, a total of 20 parents of children with CHD participated, out of which 12 (60%) were boys and 8 (40%) were girls, all the participants were the parents of the outpatients at Madras Medical Mission and Frontier Lifeline, Chennai, Tamil Nadu, India. The mean age for the children were 11± 4 years (range 2-17 years old). The distribution in age group was 10 (50%) 2-5 years old, 6 (30%) 6-12 years old and 4 (20%) 13-17 years old.

Regarding the questions of general dental health, the following were answered as, only three (15%) of the children visit the dentist once a year, three (15%) visit the dentist less than one year and the remaining fourteen (70%) have never visited the dentist. In terms of receiving dental treatment only two (10%) have received dental treatment, where one patient had an extraction done and the other patient did a restoration done. One child (5%) received antibiotics in the context of dental
treatment and five (25%) were unsure if they were given antibiotics. Thirteen children (65%) brush their teeth once a day, six (30%) brush twice a day and only one (5%) brushes thrice a day. Fifteen parents (75%) never check the oral hygiene of their children, only four (20%) check the oral hygiene once a week and one parent (5%) checks the oral hygiene daily. Ten children (50%) use fluoride supplementation through toothpastes. None of the twenty children have undergone orthodontic treatment. Five children (25%) have more than two sweets per day and eight children (40%) have one or two sweets per day. Seven children (35%) consume sweetened beverages at least once a week.

Regarding the questions related to CHD, fourteen parents (70%) were informed about oral health by their doctors when their child was first diagnosed with CHD and seven parents (35%) gave importance to oral health due to CHD. No when asked if, oral health was mentioned when first diagnosed with CHD and 33.3% were not aware of the connection between oral health and cardiac disease. 24% were given antibiotic prophylaxis in the context of a dental procedure. 26% of the parents never check the oral health of their children and 36.7% check the oral health of their children on a daily basis. 48% of the parents of children with CHD stated that oral health is not of any importance to them, 26.7% of the parents provided no fluoride supplementation and 40.6% of the parents never even heard of the term Infective endocarditis. This proves the lack of awareness and knowledge about oral health care in medically compromised patients.

Fig 1: The bar chart about awareness of the term ‘Infective endocarditis’ and awareness of the connection between CHD and Oral health.

Discussion

Koerdt et al conducted a study with a total of 150 children with different types of CHD, it was a questionnaire survey containing 20 closed ended questions, found that 32% visited the dentist once a year and only 14% brushed their teeth once a day, 73% said no when asked if, oral health was mentioned when first diagnosed with CHD and 33.3% were not aware of the connection between oral health and cardiac disease. 24% were given antibiotic prophylaxis in the context of a dental procedure. 26% of the parents never check the oral health of their children and 36.7% check the oral health of their children on a daily basis. 48% of the parents of children with CHD stated that oral health is not of any importance to them, 26.7% of the parents provided no fluoride supplementation and 40.6% of the parents never even heard of the term Infective endocarditis. This proves the lack of awareness and knowledge about oral health care in medically compromised patients.

DA Silva et al stated in his study that 85.3% were not aware about maintaining good oral hygiene and treating dental caries due to the lack of knowledge of the guardians and patients. He stated that only 9.6% of the parents/guardians knew the meaning of the cardiac disease. Regarding oral hygiene habits, 46.6% of the children with CHD brushed their teeth thrice a day and 28.8% have never visited a dentist. On visiting the dentist, plaque was seen in 98% of the children and 99% had gingival bleeding. The National Diet and Nutrition survey conducted showed that only two fifth of the parents of children with CHD received diet counselling and only three tenth of the parents had received dental health education about brushing techniques.

A study stated that two fifth of the children has untreated dental caries which increases their risk to transient bacteraemia because of the requirements and reluctance of the dentist. This surprising percentage accounts for the misinformation of the parents. In addition, regular visits to the family dentist are less frequently than in the recommended guidelines in this current study. This is inaccordance with the results of Balmer and colleagues. In 1997, Das M et al reported that children with CHD had more severe gingivitis with more accumulation of plaque. Similarly, Hobson and Slattery found that one third of the 69 children examined had well established periodontal disease and half of them had untreated dental caries. Parry and Khan in 2000, sent out questionnaires to 524 dentists to get their opinion about treating medically compromised patients and found that in a five-year period most dentists come across only 2 patients with congenital malformations and one third of the practitioners felt confident in treating these patients.

A study conducted by Hallet et al, he found that children with CHD had a significantly higher prevalence
of mesioclusion and crowding, compared with unaffected children.\textsuperscript{21} Enamel hypoplasia and dental neglect was seen in a child with tetralogy of Fallot and also facial dysmorphism is also seen in many of the cases.\textsuperscript{22,23} It also possible that the enamel hypoplasia could be due to the systemic disturbances such as cardiac failure and surgical complications due to congenital heart disease during pre-neonatal and neonatal growth.\textsuperscript{24,25}

In India, very few children with CHD are properly diagnosed and reach tertiary and quaternary healthcare centres and receive proper treatment for their disease, and majority of the parents of these patients are unable to afford treatment. Therefore, oral health care is not given much importance because of limited medical and dental resources.

According to Soble et al, all medically compromised patients should be considered handicapped even if they have normal oral status but their medical condition prevents them from receiving regular dental treatment.\textsuperscript{26} In conclusion, the dental health should be given utmost importance as it can put the general health of the individual at risk, guidelines have been given for medically compromised patients who have a risk of getting dental caries and this risk is higher for patients who already have dental caries.\textsuperscript{6} Although it also, it is possible that the patients with CHD indulge more frequently in sweets and snack foods due to their chronic illness, the aetiology of Infective endocarditis and CHD is closely related, hence oral hygiene maintenance should be taken care of, especially in older individuals with CHD as it will improve the quality of life in both general and oral health. The study was done to evaluate the parents of the children with CHD about the connection of CHD and oral health and general dental health.

**Conclusion**

From the study, it is seen that the perception towards general oral health and knowledge about the connection between oral health and cardiac disease is poor. But can be improved if dentists are specifically trained to treat medically compromised patients and a system be introduced where it is mandatory for a dental appointment where immediate access to treatment is possible.

**Ethical Clearance:** Taken from the Institutional Ethics Committee of Saveetha Dental College.

**Source of Funding:** Self funded project.

**Conflict of Interest:** Nil

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Effectiveness of Coordination Exercise on Dynamic Balance of Knee Injured Male Professional Footballers

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School of Allied Health Sciences, Manipal University, Manipal

Abstract

Background of the study: Motor coordination is associated with timed movement of several limbs or parts of body to achieve a smooth and efficient action with respect to the intended goal. This research was aimed to find the effect of coordination exercise on dynamic balance of knee injured professional male footballers with specific intervention strategies.

Methodology: Total 106 professional footballers were selected on the base of inclusion and exclusion criteria. The samples were randomly divided equally into experimental and control group for the study. The experimental group received coordination exercises and the control group received traditional stretching and strengthening exercises. Dynamic balance for right and left lower limbs were evaluated for both group.

Results: Dynamic balance significantly improved in experimental group after coordination exercise. F ratio for right and left side was 42.36 and 112.31 respectively, which are more than the table value 3.024, so they are significant at 0.05 level.

Conclusion: The study concluded that coordination exercise can improve dynamic balance of knee injured male professional footballers.

Keywords: Footballers; Knee injury; Dynamic balance; Coordination.

Introduction

Football or Soccer is a most popular sport in the world. The majority of teenagers play this sport, as a result of forces generated and mismatch in body sizes injuries to various body parts are common. Anterior Cruciate Ligament injuries are very common in footballers. Sudden change in direction of movement while running and landing from a jump may cause tears in the ACL¹.

Motor coordination is associated with timed movement of several limbs or parts of body to achieve a smooth and efficient action with respect to the intended goal. The integration of neural processes in the brain and spinal cord are necessary for the real proprioceptive information on position and movement of the musculoskeletal system which control, plan and relay motor commands², ³, ⁴.

Balance is defined as an ability to maintain the line of gravity of a body within the base of support and minimal postural sway. Postural sway is described as the horizontal movement of the body in the centre of gravity even when a person is standing still. Many studies have proved the effect of balance training on prevention of knee injuries and its effect on dynamic balance of lower limbs among male professional footballers⁵, ⁶, ⁷.

This research was aimed to improve dynamic balance of knee injured professional male footballers with coordination training using appropriate intervention strategies. Effectiveness of specific exercise has
been assessed by intervention strategies targeted on neuromuscular and biomechanical variables for reducing injury rates.

Methodology

Study design and setting: This was an experimental study with randomized control trial conducted during 2013-2014. 106 samples were selected for this study based on selection criteria. The selected samples were randomly divided equally in to experimental and control group. The experimental group received coordination exercises and the control group received traditional stretching and strengthening exercises. Study samples selected from football clubs of Subang Jaya, Petaling Jaya, Sungai Buloh, Selangor, Shah Alam, Sepang and Klang football association of Malaysia.

Selection Criteria

Inclusion criteria: Professional Footballers were with minimum one year of experience and males with age group between 20 and 35 years. Footballers with full range of movement (0 to 140°) at both knee joints and with previous twenty weeks history of knee injuries along with hip and ankle injuries graded one and two as per Dr. Frank Gillard., et al. were selected for this study.

Exclusion criteria: Footballers with knee injury associated with menisci or cartilage tears within six months and medically not fit to play football, Footballers with inflamed knee joints due to any underlying pathology were excluded from the study.

Measurement Outcome: All the samples of control and experimental groups were measured for dynamic balance score of both lower limbs. Dynamic balance of all the samples was measured using Star Excursion Balance test in eight directions 8, 9, 10.

Study Materials: Computer, ladder drill sports equipment, step board, table, marker pen, measuring tape, injury record form and colour adhesive tape.

Procedure of intervention program: The control and experimental group trained under the supervision of coach and physiotherapist for three days per week for 16 weeks and follow-up for 12 weeks. Any joint injury in hip, knee and ankle of lower limbs during the training period and league matches were recorded for data collection.

Intervention for Control Group: Control group performed stretching exercise for 15 minutes with an interval of 3 minutes rest followed by strengthening exercises for 25 minutes with an interval of 10 minutes rest

1. Stretching exercises: Stretching exercise include four repetitions and holds 15 seconds for six groups of right and left side muscles (trunk flexors, hip flexors, hip adductors, quadriceps, hamstring and calf muscles). Fifteen (15) seconds of rest provided after each set of stretching exercises. Stretching exercise performed for 15 minutes including rest period. The stretching exercises were; 1. Right and left trunk side flexor stretching. 2. Right and left hip flexor stretching. 3. Right and left hip adductor muscle stretching. 4. Right and left quadriceps stretching. 5. Right and left hamstring stretching. 6. Right and left calf muscle stretching11, 12.

2. Strengthening exercises: Strengthening exercise included three repetitions with 30 seconds held for five groups of right and left side muscles (hip extensors, abductors, adductors, quadriceps and calf muscles). Sixty (60) seconds of rest provided after each muscle group strengthening exercises. Strengthening exercise performed for 25 minutes including rest period. The exercises were; 1. Right and Left hip extensor strengthening. 2. Right and Left hip adductor muscle strengthening. 3. Right and Left hip abductor muscle strengthening. 4. Right and Left quadriceps muscle strengthening. 5. Right and Left calf muscle strengthening13, 14.

Intervention for Experimental Group: Experimental group performed eight coordination exercise program15, 16. Each program was performed for 05 minutes with adequate interval of rest. The exercises included were; 1. Single leg cross jump (X Pattern). 2. Single leg step jump. 3. Single leg forward-backward right and left jump (V Pattern). 4. Single leg jump to right and left side. 5. Double leg forward jump on marking. 6. Double leg forward-backward right and left jump (V Pattern). 7. Double leg right and left lateral jump. 8. Carioca cross over exercise.

Results

The demographic data for age of control group and experimental group were 25.89 ± 5.10 and 24.57 ± 4.75 respectively. Professional players experience for control group and experimental group were 6.26 ± 4.97 years and 5.60 ± 4.61 years respectively.
Dynamic balance score for right and left lower limb has been analyzed separately to find the outcome of the study. The mean of dynamic balance score has increased from 57.86 to 61.08 and from 57.63 to 61.55 respectively on pretest to post test of right and left lower limb. Standard deviation has reduced from 9.63 to 9.53 and from 9.82 to 9.55 respectively on pretest to post test of right and left dynamic balance score of experimental group.

Table-1: One way repeated measures analysis of variance result on dynamic balance of right and left lower limb for pretest mid test and post-test of experimental group.

<table>
<thead>
<tr>
<th>Group</th>
<th>Sources of variance</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Squares</th>
<th>Obtained ‘F’ ratio</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dynamic balance score of right lower limb</td>
<td>Between</td>
<td>2997.794</td>
<td>2</td>
<td>1498.897</td>
<td>1119.34</td>
<td>$p&lt;0.0001$</td>
</tr>
<tr>
<td></td>
<td>Error</td>
<td>1132.873</td>
<td>846</td>
<td>1.339</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dynamic balance score of left lower limb</td>
<td>Between</td>
<td>4447.458</td>
<td>2</td>
<td>2223.729</td>
<td>1874.01</td>
<td>$p&lt;0.0001$</td>
</tr>
<tr>
<td></td>
<td>Error</td>
<td>1003.876</td>
<td>846</td>
<td>1.187</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table-1 shows F ratios for right and left side are 1119.34 and 1874.01 respectively, which are more than the table value 3.006, so they are significant at 0.05 levels. The table value required for significance at 0.05 levels with degree of freedom 2 and 846 is 3.006.

Table-2: Newman Keuls post hoc test for difference between treatment means of pretest mid test and post-test on dynamic balance of right lower limb of experimental group.

<table>
<thead>
<tr>
<th>Means</th>
<th>Ordered Means</th>
<th>Range (r)</th>
<th>Critical Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Post test</td>
<td>Mid test</td>
<td>Pre test</td>
</tr>
<tr>
<td></td>
<td>61.076</td>
<td>0.078</td>
<td>3.217*</td>
</tr>
<tr>
<td></td>
<td>61.153</td>
<td></td>
<td>3.294*</td>
</tr>
<tr>
<td>Post Test</td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Mid Test</td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Pre Test</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table-2 shows Newman Keuls post hoc test used to find the difference between treatment means. The mean difference (0.078) of mid test and post-test on dynamic balance score for right lower limb of experimental group is less than the critical value (0.186), so it is not significant at 0.05 level.

Table-3: Newman Keuls post hoc test for the differences between treatment means of pretest, mid test and post-test on dynamic balance of left lower limb of experimental group.

<table>
<thead>
<tr>
<th>Means</th>
<th>Ordered Means</th>
<th>Range (r)</th>
<th>Critical Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Post test</td>
<td>Mid test</td>
<td>Pre test</td>
</tr>
<tr>
<td></td>
<td>61.552</td>
<td>0.092</td>
<td>3.919*</td>
</tr>
<tr>
<td></td>
<td>61.644</td>
<td></td>
<td>4.011*</td>
</tr>
<tr>
<td>Post Test</td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Mid Test</td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Pre Test</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table-3 shows the mean difference (0.092) of mid test and post-test on dynamic balance score for left lower limb of experimental group is less than the critical value (0.175), so it is not significant at 0.05 level. Hence it is concluded that improved dynamic balance on left lower limb after the training program is maintained after three months follow up of the study.
Table-4: One way repeated measures analysis of variance result on dynamic balance score of pretest mid test and post-test for right and left lower limbs of control group.

<table>
<thead>
<tr>
<th>Group</th>
<th>Sources of variance</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Squares</th>
<th>Obtained ‘F’ ratio</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dynamic balance of right lower limb</td>
<td>Between</td>
<td>3.351</td>
<td>2</td>
<td>1.675</td>
<td>2.296</td>
<td>P&lt;0.108NS</td>
</tr>
<tr>
<td></td>
<td>Error</td>
<td>617.316</td>
<td>846</td>
<td>0.730</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dynamic balance of left lower limb</td>
<td>Between</td>
<td>10.67</td>
<td>2</td>
<td>5.337</td>
<td>2.949</td>
<td>P&lt;0.074NS</td>
</tr>
<tr>
<td></td>
<td>Error</td>
<td>1531</td>
<td>846</td>
<td>1.810</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4 shows the F ratios for right and left side was 2.296 and 2.949 respectively, which is less than the table value 3.006 so they are not significant at 0.05 level. The table value required for significance at 0.05 level with df 2 and 846 is 3.006. Hence it is concluded that there is no significant improvement in dynamic balance among control group.

Table-5: Analysis of covariance for experimental group and control group on dynamic balance score of right and left lower limb

<table>
<thead>
<tr>
<th>Group</th>
<th>Sources of variance</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Squares</th>
<th>Obtained ‘F’ ratio</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dynamic balance of right lower limb</td>
<td>Between</td>
<td>2860.027</td>
<td>1</td>
<td>2860.027</td>
<td>773.302</td>
<td>P&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>Error</td>
<td>3567.042</td>
<td>845</td>
<td>4.221</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dynamic balance of left lower limb</td>
<td>Between</td>
<td>2310.164</td>
<td>1</td>
<td>2310.164</td>
<td>677.515</td>
<td>P&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>Error</td>
<td>2524.356</td>
<td>845</td>
<td>2.987</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 5 shows the obtained F ratio for dynamic balance score at right and left lower limbs are 773.302 and 677.515 respectively, which are more than the table value of 3.85 so they are significant at 0.05 level.

**Discussion**

In our study the dynamic balance of right and left lower limb has significantly increased after coordination exercise in experimental group. F ratios for right and left side were 1119.34 and 1874.01 respectively. In control group there was no significant difference in effect on improvement of dynamic balance between right and left side of lower limbs. F ratio for right and left side is 2.296 and 2.949 respectively.

Newman Keuls post hoc test for the differences between treatment means of pretest, mid test and post-test on dynamic balance score for left lower limb of coordination exercise group. The mean difference (3.217) of pretest and post-test on dynamic balance score for right lower limb of coordination exercise group is more than the critical value (0.186), so it is significant at 0.05 level.

Analysis of covariance used to compare dynamic balance between control and experimental group for right and left lower limbs found significant difference in effect in increase of dynamic balance. The table value required for significance at 0.05 level with df 845 is 3.85.

Coordination exercises improve neuro-muscular control thereby increase dynamic balance among the athletes. Many studies have found the effects of jump and balance training on knee kinematics and electromyography of athletes during a single limb drop landing. A study on balance board training has reported that, which can prevent traumatic injuries of the lower extremities in female soccer players\textsuperscript{17,18}. A study on balance board training for prevention of traumatic injuries of the lower extremities in female soccer players have shown significant improvement in their balance index standing on the non-dominant leg with extended knee\textsuperscript{19}. A meta-analysis study included 270 articles matching their criteria with effect of balance training programs included were the use of tilt boards, unstable surfaces and dynamic body movements while maintaining a static stance. The study was concluded that there was significant improvement in static and dynamic balance after the prescribed balance training program\textsuperscript{20}. 


A study on proprioceptive balance training for 6 weeks progressive wobble board balance training for 4 weeks have shown there was significant improvement in static and dynamic balance for the intervention group. Static balance was improved from base line 20.7s to 30.5s, dynamic balance from base line 2.3s to 4.0s.

**Conclusion**

The study concluded that coordination exercise can improve dynamic balance of knee injured male professional footballers, which might be due to increased neuron-receptive mechanism in knee joint and neuromuscular coordination of lower limbs.

**Ethical Approval:** There was no ethical issue from the Rama Krishna Mission Vivekanandha University, Coimbatore to conduct this study. The researchers have received no objection letter from each footballers association and informed consent from each participant to conduct this study.

**Conflict of Interest:** There was no conflict of interest for any researcher to conduct this study.

**Source of Fund:** Self managed with all the expenses towards conduct of this study.

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Evaluation of Muscular Endurance among Dentists

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Abstract

Introduction: Dental surgeons often cannot avoid prolonged static postures. Even in optimal seated postures, more than one-half of the muscles of the body are contracted statically. This may result in damaging physiological changes that can lead to back, neck, or shoulder pain or MSDs. The aim is to determine the muscular endurance among dentists and to compare dentists with and without occupational cervicobrachial disorders.

Materials and Method: This study is questionnaire based survey. The survey comprises of questions pertaining to the muscular endurance among dentists. This survey was administered to the participants through a survey planet link. 100 people responded this survey. Based on the responses the results obtained and statistically analysed.

Results: The study reveals that the majority of the dentist had musculoskeletal skeletal disorders which in turn affected their practice.

Conclusion: The physical load among dentists seems to put them at risk for the occurrence of musculoskeletal disorders. Many dentists experience the MSDs, especially in cervical region, as a consequence of occupational stresses. Therefore, detecting occupational risk factors, standards of work position, regular exercise and following ergonomic policy are intensely recommended. Prevalence of musculoskeletal symptoms among dentists represents a major occupational health issue for dentists and result revealed necessitates the need of workshops to create awareness of ergonomics as effective measures for reducing MSD among dentists.

Keywords: Dentists, musculoskeletal disorders, physical load.

Introduction

Muscular endurance is the ability of a muscle or a group of muscles to exert force repeatedly against resistance. It is one of the components of muscular fitness, along with muscular strength and power. Musculoskeletal Disorders or MSDs are injuries and disorders that affect the human body’s movement or musculoskeletal system (i.e. muscles, tendons, ligaments, nerves, discs, blood. Other common names for MSDs are “repetitive motion injury”, “repetitive stress injury”, “overuse injury” and many more. MSD is prevalent world over and is one of the commonest causes of long-term pain and disability affecting hundreds of millions of people. This fact has been recognized by World Health Organization (WHO) and United Nations with their endorsement of the Bone and Joint decade 2000–2010 [1]. The common risk factors which contribute to the development of health disorders can be categorized as those related to personal background variables (e.g. anthropometric characteristics, age, hereditary factors) and those related to work (e.g. repetitive motion, static posture, force, awkward position, vibration, temperature, biological factors, chemical irritating or toxic factors, radiation\textsuperscript{[2,3]})

In the present society many groups develop several disorders related to muscular endurance. Athletes, people who work in IT companies, teachers, nurses, dentist are such groups. The reason as to why dentists were chosen for
this survey is in order to find out whether the occupation has a major influence towards such disorders. The major risk factors associated with musculoskeletal disorders in dentists are repeated unidirectional twisting of trunk (repetitive movements), working in static postures for prolonged period (prolonged static postures), awkward work postures, less flexibility and less core strength (muscle imbalances)\textsuperscript{[4,5,6]}. Dentistry is a demanding profession involving high degree of concentration and precision. Dentists require good visual acuity, hearing, depth perception, psychomotor skills, manual dexterity, and ability to maintain occupational postures over long periods \textsuperscript{[7]}. As a dentist it is the required level of control and accuracy, that requires the dental professional to maintain a rather controlled and static posture for these extended periods of time. Physiologically, a sustained tension on a muscle for extended periods of time with lack of rest cause ischemia and may lead to necrosis within the muscle \textsuperscript{[8]}.

It is revealed that approximately 81% of American dentists suffer from neck, shoulder and lower back pain \textsuperscript{[9]}. Comparing the prevalence of upper body symptoms of pathological conditions in dentists and people who work in a different environment, such as farmers, pharmacists and office employees, the symptoms occurred more often among dentists \textsuperscript{[10,11]}. These are all due to the common dental posture; seated with a forward lean, lateral neck flexion with rotation and arm abducted. It is revealed that Psychological stress, when dealing with patients as well as high concentration and precision, is associated with an increased risk. Their work includes risk factors that may lead to many pathologies such as tendinitis, synovitis, tenosynovitis, and bursitis \textsuperscript{[12,13]}. Occupational diseases have not only physical, psychological, and social consequences, but also economic and security impacts when they reach a level of severity that directly affects work capacity, causing absences and early retirement. If regularly occurring pain or discomfort is ignored, the cumulative physiological damage can lead to an injury (macro change) or a career-ending disability \textsuperscript{[14]}. A thorough understanding of the underlying physiological mechanism leading to these problems is necessary to develop and implement a comprehensive approach to minimize the risk of work-related injury \textsuperscript{[15]}.

It is essential that clinicians must become aware of the postures and positions into which they are placing themselves on a daily basis. Pain is not just an unavoidable consequence of either the aging process or being a dental professional. Biomechanical re-
education must be introduced, taking into consideration occupational, recreational, and daily activities. Oppositional movement patterns must be created to counteract imbalances and repetitive positions, hence the aim of my study is to evaluate the musculoskeletal disorders among dentists.

Materials and Method

This study is questionnaire based survey. The survey comprises of questions pertaining to the muscular endurance among dentists. The questionnaire involved information on the respondent’s job history, individual characteristics, physical and psychosocial risk factors at work, general health status, and the occurrence of musculoskeletal complaints. It also included individual characteristics and work history included questions on age, anthropometry, gender, family situation, duration of employment. This survey was administered to the participants through a survey planet link. There were about 100 people who had responded this survey and the results were analysed based upon their responses and the data were statistically analysed.

Results and Discussion

![Figure 1: Have you at any time during the last two months had (aches, pain) in the following region?](image)

Based on the survey, above pie chart reveals that over 59% of the surveyed dentists experienced musculoskeletal pain in the neck region. 29% dentist experienced pain in the shoulders. The prevalence of disorders in spine was found in 18.3% of the studied group. Pain in thoracic area was reported by 5.2% of respondents. Dentists are also exposed to psychological stress when dealing with patients due to the need to work with high concentration and precision, which is associated with an elevated risk of developing MSDs. As is already known, stress can increase muscle tension and cause pain, especially in the trapezius muscle \textsuperscript{[16]}.
Musculoskeletal disorders are a diverse group of disorders with regard to pathophysiology. The study reveals knee pain 46.7% as the most common complaint of the dental surgeons under study, followed by elbow and ankle/foot pain. Long working hours is considered to be correlated with job demand,[17] which means that dentists have to maintain static and/or awkward postures for prolonged periods contributing to musculoskeletal overload and pain. It has also been suggested that a tight work schedule has been shown to lead to an elevated risk of developing neck and upper limb WMSDs.

Dental surgeons cannot avoid prolonged static postures. Even in optimal seated postures, more than one-half of the muscles of the body are contracted statically and there is little movement of the vertebral joints. This may result in damaging physiological changes that can lead to back, neck, or shoulder pain or MSDs. 37.9% dentist feel that this is the major reason for such disorders. 22% believe that lack of rest is the cause whereas the majority 40% feel that both the causes may attribute.

An average work day by the practitioner, has a huge impact on the body, and it carries with it a high prevalence for MSD. The above diagram reveals the number of patients examine per day. 55% examine 20-50 patients. 26% examine 50-80 patients. During forward flexion and rotation, a position often assumed by dental operators, the pressure increases 400%, making the structure susceptible to injury [18]. As MSDs are known to increase with age, if dental professionals suffer pain at this point in their lives, the problem could grow, making it difficult for them to practice in the future. Strategies need to be developed that can help them to continue clinical practice without such problem.[19].

The most common complaint amongst dentists is how MSD is impacting their personal life, and the lack of time between working periods for recovery [20]. MSDs affects the physical, psychological, and social aspects of practitioners. This in turn impacts on their productivity and ultimately reducing the quality of life of the practitioners. According to the responses 56% feel that such disorders decreases their work efficiency.
Conclusion

The physical load among dentists seems to put them at risk for the occurrence of musculoskeletal disorders. Many dentists experience the MSDs, especially in cervical region, as a consequence of occupational stresses. Therefore, detecting occupational risk factors, standards of work position, regular exercise and following ergonomic policy are intensely recommended. Prevalence of musculoskeletal symptoms among dentists represents a major occupational health issue for dentists and result revealed necessitates the need of workshops to create awareness of ergonomics as effective measures for reducing MSD among dentists.

Conflict of Interest: Nil

Ethical Clearance: Saveetha university IHEC

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A Study of the Evolution of Medical Education in Ancient India

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Abstract

The story of evolution of medical education is a long one, stretching from prehistoric to modern times encompassing man through different ages and phases of evolution, culture and civilization. Study of medical history is not only to express our debt to our predecessors but is important in understanding the advances that are now taking place in theory and practice of medicine. In this regards the present study attempts to find out the history of Indian medical education, to analyze the history of Ayurvedic medicine in India and to know the evolution of Indian medicine throughout the time. The entire study is based on the secondary data such as different books, journals, magazines, internet and different research papers.

Keywords: Medical Education, Ayurvedic Medicine, India.

Introduction

The story of evolution of medical education is a long one, stretching from prehistoric to modern times encompassing man through different ages and phases of evolution, culture and civilization. Study of medical history is not only to express our debt to our predecessors but is important in understanding the advances that are now taking place in theory and practice of medicine.

Objectives:

The objectives of this paper are:

1. To find out the history of Indian medical education.
2. To analyze the history of Ayurvedic medicine in India.
3. To know the evolution of Indian medicine throughout the time.
4. To know the nature of medical science in India.

Methodology: The research method is very important in any research activity. The selection of research method to be used is of utmost importance in research process. The proposed study is conducted under the source method. The entire study is based on the secondary data such as different books, journals, magazines, internet and different research papers.

Results and Discussion

The Prehistoric Medicine: The ‘art of healing’ began thousands of years ago with the innovations of the primitive man trying to provide relief to those close to him, in sickness and suffering, motivated by feelings of sympathy and kindness. Prehistoric and primitive medicine was characterized by seeing and believing (mystic faith and magic). These are widened and developed into thinking and knowing in later ages.

In the absence of an obvious explanation, his limited intelligence attributed disease and other calamities to the anger of God, the invasion of the body by evil spirits or the influence of stars and planets. As a logical sequence, the medicine he practiced consisted in appeasing God by prayers and rituals and sacrifices, driving out evil spirits from the human body. There is also evidence that the prehistoric man improvised stone and flint instruments with which he performed circumcisions, amputations and repining of skulls. It is thus obvious that medicine in the prehistoric era (5000 B.C) was intermingled with superstition, religion, magic and witchcraft.

Elements of prehistoric medicine are still are still present in many countries. Primitive man may be extinct, but “the supernatural theory of disease” in which he believed is not yet extinct in our modern society.

Indian Medicine: Indian medicine has a long history. Hindu medicine is as ancient as Hindu Civilisation. Ayurveda by definition implies “The Science of Life”. Ayurveda is a Sanskrit word derived from two roots: ayur, which means life, and veda, knowledge. Its origin is traced back to the Vedic times about 5000BC. Ayurveda is a part of the Atharva Veda which solely deals with
medicine. Its earliest concepts are set out in the sacred writings called the Vedas, especially in the metrical passages of the Atharvaveda, which may possibly date as far back as the 2nd millennium BCE\(^1\). Atharva Veda includes eight divisions of Ayurveda:

1. Kayachikitsa (Internal Medicine)
2. Salakya Tantra (Surgery of Head & neck, Ophthalmology and Otolaryngology).
3. Shalya Tantra (Surgery)
4. Agada Tantra (Toxicology)
5. BhutaVidya (Psychiatry)
6. Kaumarabhrity (Pediatric)
7. Rasayana (Anti-aging or Gerontology or Science of Rejuvenation) and
8. Vajkarana (The Science of Fertility)

AtreyaSamhita is the oldest medical book in the world. Atreya was the son of Rishi Atri. Atri was the son of god Brahma and one of the seven immortal Rishis in Vedic literature. Rishi Atri was Acharya (Teacher) of Ayurveda. The Vedic Brahmanas were priests who performed religious rites and ceremonies. They were also considered as Vaidyas (Physicians of Ayurveda)\(^2\). These sage physicians were the surgeons in the ancient days It is believed that the Vaidyas received their training of Ayurveda during meditation which were later transcribed into book form.

Beginning of Medicine and Surgery in India is thought as the gifts from god Indra to Sages Bharadwaja, the patron saint of medicine and Dhanvantari, the patron saint of Surgery. These two main schools made Ayurveda a more scientifically verifiable medical system (around 1500BC). These two scholars passed their knowledge to two worthy men Atreya and Susruta. The period of Vedic medicine lasted until about 800 BCE. The Vedas are rich in magical practices for the treatment of diseases and in charms for the expulsion of the demons traditionally supposed to cause diseases. The chief conditions mentioned are fever (\textit{takman}), cough, consumption, diarrhea, edema, abscesses, seizures, tumors, and skin diseases (including leprosy). The herbs recommended for treatment are numerous.

The golden age of Indian medicine, from 800 BCE until about 1000 CE, was marked especially by the production of the medical treatises known as the \textit{Charaka-samhita} and \textit{Sushruta-samhita}, attributed respectively to Charaka, a physician, and Sushruta, a surgeon. Estimates place the \textit{Charaka-samhita} in its present form as dating from the 1st century CE, although there were earlier versions. The \textit{Sushruta-samhita} probably originated in the last centuries BCE and had become fixed in its present form by the 7th century CE of somewhat lesser importance are the treatises attributed to Vagbhata. All later writings on Indian medicine were based on these works. Because Hindus were prohibited by their religion from cutting the dead body, their knowledge of anatomy was limited. The \textit{Sushruta-samhita} recommends that a body be placed in a basket and sunk in a river for seven days. On its removal the parts could be easily separated without cutting. As a result of these crude Method, the emphasis in Hindu anatomy was given first to the bones and then to the muscles, ligaments, and joints. The nerves, blood vessels, and internal organs were very imperfectly known the Hindus believed that the body contains three elementary substances, microcosmic representatives of the three divine universal forces, which they called spirit (air), phlegm, and bile (comparable to the humours of the Greeks). Health depends on the normal balance of these three elementary substances. The seven primary constituents of the body—blood, flesh, fat, bone, marrow, chyle, and semen—are produced by the action of the elementary substances. Semen was thought to be produced from all parts of the body and not from any individual part or organ.

Both Charaka and Sushruta state the existence of a large number of diseases (Sushruta says 1,120). Rough classifications of diseases are given. In all texts, “fever,” of which numerous types are described, is regarded as important. Phthisis (wasting disease, especially pulmonary tuberculosis) was apparently prevalent, and the Hindu physicians knew the symptoms of cases likely to terminate fatally. Smallpox was common, and it is probable that smallpox inoculation was practiced. Hindu physicians employed all five senses in diagnosis. Hearing was used to distinguish the nature of the breathing, alteration in voice, and the grinding sound produced by the rubbing together of broken ends of bones. They appear to have had a good clinical sense, and their discourses on prognosis contain acute references to symptoms that have grave import. Magical beliefs still persisted, however, until late in the classical period; thus, the prognosis could be affected by such fortuitous factors as the cleanliness of the messenger sent to fetch the physician, the nature of his conveyance, or the types of persons the physician met on his journey to the patient\(^3\).
Dietetic treatment was important and preceded any medicinal treatment. Fats were much used, internally and externally. The most important Method of active treatment were referred to as the “five procedures”: the administration of emetics, purgatives, water enemas, oil enemas, and sneezing powders. Inhalations were frequently administered, as were leeching, cupping, and bleeding.

The Indian materia medica was extensive and consisted mainly of vegetable drugs, all of which were from indigenous plants. Charaka knew 500 medicinal plants, and Sushruta knew 760. But animal remedies (such as the milk of various animals, bones, gallstones) and minerals (sulfur, arsenic, lead, copper sulfate, gold) were also employed. The physicians collected and prepared their own vegetable drugs. Among those that eventually appeared in Western pharmacopoeias were cardamom and cinnamon.

As a result of the strict religious beliefs of the Hindus, hygienic measures were important in treatment. Two meals a day were decreed, with indications of the nature of the diet, the amount of water to be drunk before and after the meal, and the use of condiments. Bathing and care of the skin were carefully prescribed, as were cleansing of the teeth with twigs from named trees, anointing of the body with oil, and the use of eyewashes.

In surgery, ancient Hindu medicine reached its zenith. Operations performed by Hindu surgeons included excision of tumors, incision and draining of abscesses, punctures to release fluid in the abdomen, extraction of foreign bodies, repair of anal fistulas, splinting of fractures, amputations, cesarean sections, and stitching of wounds. A broad array of surgical instruments was used. According to Sushruta, the surgeon should be equipped with 20 sharp and 101 blunt instruments of various descriptions. The instruments were largely of steel. Alcohol seems to have been used as a narcotic during operations, and bleeding was stopped by hot oils and tar.

In two types of operations especially, the Hindus were outstanding. Stone in the bladder (vesical calculus) was common in ancient India, and the surgeons frequently removed the stones by lateral lithotomy. They also introduced plastic surgery. Amputation of the nose was one of the prescribed punishments for adultery, and repair was carried out by cutting from the patient’s cheek or forehead a piece of tissue of the required size and shape and applying it to the stump of the nose. The results appear to have been tolerably satisfactory, and the modern operation is certainly derived indirectly from this ancient source. Hindu surgeons also operated on cataracts by couching, or displacing the lens to improve vision.

Ancient history of Pathology in India: Nidanasthanam: Of the six divisions of Susruta Samhita, second division consists of sixteen chapters devoted to Pathology, mainly of surgical diseases. Nidana developed greatly in the 7th century and was established by Madhava Kara of Bengal. His Nidana as well as Charaka and Susruta Samhita were translated in Arabic by the order of Haran al-Rashid (786-806 AD) the Khalif of Bagdad.

According to Wilson, it is likely that it might have been translated from the translation of the book in Persian language.

Postmortem: In Arthasastra of Kautilya (other name of Chanakya, the greatest politician of the time), there is a mention of postmortem. Ashmritaparikshagara (examination of men who recently died). These reports of inquest were also necessary in higher courts of law (Kontaka Sodhana) during the reign of the Great Emperor Chandragupta. The dead bodies in cases of homicide, suicide or those who died of accidents, were kept in an examination room, which was set apart for the purpose and the cause of death had to be reported after post-mortem examination to higher authorities. To prevent decomposition dead bodies were preserved by immersion in oil.

Conclusion

The Golden Age of Indian Medicine was between 800 BC to 600 AD. Learned men from different countries such as China, Tibet, Afganistan, the Greeks, Romans, Egyptians, Persians came to the Indian Ayurvedic Schools to learn about this World Medicine. Ayurvedic texts were translated into Arabic by the physicians like Avicenna and Razi Sempion. Both of them quoted Indian Ayurvedic texts and established Islamic medicine “Unani System”. This Indian Ayurvedic System became popular in Europe and helped to form the foundation of the European tradition of medicine. Ayurveda grew tremendously during Buddhist Kings like King Asoka (226 BC), who patronized Ayurveda as State Medicine and established Schools of Medicine and Hospitals. Charaka (200 AD), the most popular name in Ayurveda
medicine was the Court Physician to the Buddhist king Kaniskaduring Buddhist time. Due to the doctrine of “Ahinsa” (non-violence) Indian Surgery suffered a setback. With the advent of Muslims in India, Hindu Medicine eroded due to the lack of State help and support by the rulers. Unani system of medicine was introduced into India by the Muslim rulers. By the 13th Century, Unani system of medicine was firmly established mainly in Delhi, Aligarh, Lucknow and Hyderabad. During Mughal period and subsequent years Ayurveda declined due to the lack of state support. With the advent of the British in the 18th Century Ayurveda system was revived in India along with Western system of Medicine.

**Ethical Clearance:** It is a review article.

**Source of Fund:** Self.

**Conflict of Interest:** Nil.

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Effectiveness of Structured Exercise Program on Functional Capacity and Quality of Life in Grade III Chronic Obstructive Pulmonary Disease Patients

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Abstract

Objective: To determine the effects of structured exercise program on functional capacity and quality of life in Grade III chronic obstructive pulmonary disease.

Method: A total of 35 subjects were screened as per inclusion and exclusion criteria and they were briefed about the study and interventions. Informed consent was taken from the subjects initially through the Borg scale and chronic respiratory questionnaire each subject taken as per data collection sheet. Subjects were selected by simple random sampling, lottery method & were allocated alternatively to group A and group B, who had Grade III COPD. The amount of breathlessness was noted by Borg scale and chronic respiratory questionnaire.

Conclusion: Various recent approaches are used in the treatment of subjects suffering from grade III COPD, but this study concluded that combine effect of structured exercise program was effective in decreasing the levels of dyspnea and improving quality of life.

It is proved from this study that effectiveness of structured exercise program was effective in improving functional capacity and quality of life. Thus Alternate Hypothesis H (1) states that there is significant effect of structured exercise program in grade III COPD patients.

Keywords: Stretching and strengthening exercise, functional capacity, quality life, dyspnea.

Introduction

Chronic obstructive pulmonary disease (COPD) is a major cause of chronic morbidity and mortality worldwide. The 2002 WHO world health organization report listed chronic obstructive pulmonary disease as the fifth leading cause of death in the world. In 2001, the global initiative for chronic obstructive lung disease (GOLD) issued and now updates yearly guideline that their aim is to improve prevention and management of chronic obstructive pulmonary disease through a concerted worldwide¹:

¹chronic obstructive pulmonary disease (GOLD) defines chronic obstructive pulmonary disease as common preventable and treatable disease characterized by predominantly fixed airway obstruction as a result of air exposure to inhaled noxious environmental particles or gases.

Clinical Feature: Although chronic bronchitis and emphysema frequently co-exist, rarely features of one type may be predominantly present.

In chronic bronchitis cough only during winter months over the year the cough become continue and episode of illness increase in frequency duration and severity progresses to peripheral edema secondary to overt right ventricular failure. Patients with chronic bronchitis are over-weight and cyanotic. Because the appearance these patients are referred to as ‘blue-bloaters’ in emphysema.

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The body build is asthenia with evidence of weight loss. The patient use accessory muscle of respiration, which serves to lift the sternum in an anterior superior and breathes with pursed lips, there by prolonging expiration and increases the intrabronchiolar pressure to prevent the collapse of the airway by the surrounding distended alveoli. While sitting, the patient often leans forward extending his arms to brace himself. Patients with this condition

Prevalence of Chronic Bronchitis and Chronic Obstructive Pulmonary Disease in India: In different cities of screening New Delhi number of people screened were 2098 in which 8.1% were males and 4.6% were females. Uttar Pradesh number of people screened were 1424 in that number of males were 9.0 and female were 4.5%. north India classified into 2 groups urban and rural number of people screened were 9946 in which 4.1 are males and 2.5 are females according to above information it is said that males are more prone to chronic obstructive pulmonary disease.

Prevalence of Chronic Obstructive Pulmonary Disease in Maharashtra: The prevalence of smoking in above 30 years age group was 40.9% among males and 3.9% amongst female in under 20 age group the prevalence was 4.5% and between 20 and 29 it was around 14% among males. Tobacco and pan masala chewing was very widely spread among both sexes especially in the hilly state and so was alcohol consumption in tribal population the rural residence lower socio economic strata, advancing age and smoking habit are likely to be major factors favoring chronic obstructive pulmonary disease. A study of 12,000 slum dwellers from Pune in Maharashtra revealed a questionnaire based chronic obstructive pulmonary disease prevalence rate of 6.5% (8.5% in males and 4.5% in females).

Functional Capacity: It is the volume of air remaining in the lungs after normal expiration.

In healthy elderly people walking percentage is more 11% and in COPD patient it is reduced to 5%. In healthy standing percentage is more 41% and in COPD patient it is less 14%, sitting percentage in healthy people is less 42% and in COPD patient it is more 52%, lying in healthy elderly is less 4% and in COPD patient it is more 12%.

Quality of Life in Chronic Obstructive Pulmonary Disease Patient: A broad definition of quality of life includes factors that health care may not directly affect (there may be indirect effect) include financial status, housing, employment and social support.

Interventions

1. Pursed Lip Breathing: Pursed lip breathing it id breathing technique designed to make your breath more effective by making them slower this is done after inhaling by puckering your lips and exhaling through them slowly and deliberately often to count.

2. Incentive Spirometry: This device will help the patient to inflate their lungs maximally and sustain that inflation. the effect of incentive spirometer chronic obstructive pulmonary disease improve oxygenation, lung function and quality of life.

3. Shoulder and Thoracic Mobility Exercise: Trunk flexion and extension, trunk side flexion, shoulder girdle circumduction. There is significant effect on physical work capacity and there is positive effect of exercise on activities of daily living.

4. Walking: Walking a relatively simple home program has proven beneficial to COPD patient. patient who walked at least 60min/day reduces their COPD re-hospitalization rate by 50 percent.

5. Biceps Curls: There is frequently experienced marked dyspnea and fatigue during the performance of arm tasks important to daily leaving it is possible that arm training in people with chronic obstructive pulmonary disease have similar effect on arm exercise capacity symptom and quality of life. COPD has endurance training effect on respiratory muscles and the upper limb training program did improve upper limb endurance.

6. Active Cycle of Breathing: Physiotherapeutic technique to aid sputum clearance my include active cycle of breathing, percussion, vibration, shaking, active cycle of breathing technique consist of breathing control, it assist bronchial clearance by enhancing mucociliary clearance ACBT is effective in the clearance of bronchial secretion and to improve lung function, without increasing hypoxaemia or airflow obstruction.

7. Stretching of Sternocleidomastoid and Pectoralis Major: Stretching: it is sustain or intermittent external, end range stretch force, applied with over pressure and by manual contact or mechanical
device elongates a shortened muscle-tendon unit and periparticular connective tissue by moving a restricted joint is termed stretching\textsuperscript{14}

8. **Strength Training:** The art of training or strengthening muscle lies in creating the condition under which they are called upon to work to full capacity against an ever increasing resistance.\textsuperscript{15}

**Method**

**Study Design:** Comparative study.

**Participants:** A total of 40 subjects, both male and female with Grade III COPD were taken in the study. Patients with Grade III chronic obstructive pulmonary function test values and lung capacities were included in the study whereas subjects receiving anti depressant drugs, symptomatic increase in cardio vascular individuals with spinal deformities and respiratory muscle dysfunction, patients with system failure were not included in the study. Written informed consent was taken from the subjects those willing to participate. The subjects were randomly allocated by simple random sampling, lottery method & were allocated alternatively to group A and group B, who had grade III chronic obstructive pulmonary disease. The functional capacity and quality of life were assessed by 6 minute walk test and chronic respiratory questionnaire. The outcome assessment was done post treatment.

**Interventions:** Two groups were formed Group A (study group) where subjects were treated with pursed lip breathing, incentive spirometry, conventional physiotherapy and Group B (control group) where subjects were treated with conventional physiotherapy + interventions stretching of sternocleidomastoid and pectoralis major and strengthening walking, bicep curls, ACBT, and shoulder and thoracic mobility exercise.

All the subjects were treated 3 times a week for 3 months.

Control group subjects were treated with conventional + intervention exercises only. This includes pursed lip breathing, incentive spirometry; walking, bicep curls, ACBT, shoulder and thoracic mobility exercise before this 20 minute walk 5 minute warm up, 10 walking, and 5 minute cooldown.

Study group was treated with all the exercises given for the control group in addition to the Grade III COPD patients.

Each patient in the study group repeated the exercise in 1\textsuperscript{st} month set I for 10 times in 2\textsuperscript{nd} month set II for 20 times in set III 30 times in 3\textsuperscript{rd} month. The exercises were performed with assistance once a day, three times per week for 3 months. Bicep curls were done to improve respiratory muscles strength, ACBT done followed by cough and huff, walking for 60 min per day stretching of sternocleidomastoid and pectoralis major done 3 times hold for 15 seconds. Shoulder and thoracic mobility exercise include flexion, extension and side flexion of trunk.

**Outcome measure:** 6 minute walk test: the purpose of six minute walk test is for measuring the response to medical interventions in patient with moderate to severe heart or lung disease. In early 1960 s Balkedeveloped a simple test to evaluate the functional capacity by measuring distance walked during a defined period of time. The walking test was also adopted to assess disability in patient with chronic bronchitis. A recent review of functional walking test concluded that ‘6MWT is easy to administer and better tolerable.

Chronic respiratory questionnaire: The purpose of chronic respiratory disease questionnaire was to measure the quality of life and evaluate the current airflow limitation of COPD patient. The questionnaire, chronic respiratory disease questionnaire examine four aspects of patient dyspnea, fatigue, emotional function and mastery. In this questionnaire we described the development of questionnaire validity and responsiveness.

**Result**

**Table No. 1: Comparison of dyspnea and COPD questionnaire:**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Group A</th>
<th>Mean difference</th>
<th>Standard deviation</th>
<th>Calculated ‘t’ value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dyspnea</td>
<td>Group A</td>
<td>7</td>
<td>2.474</td>
<td>5.12</td>
</tr>
<tr>
<td></td>
<td>Group B</td>
<td>11.73</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COPD Questionnaire</td>
<td>Group A</td>
<td>13.8</td>
<td>4.814</td>
<td>5.91</td>
</tr>
<tr>
<td></td>
<td>Group B</td>
<td>24</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Statistics:** Statistic was done by instat graph pad. Statistic analysis revealed very significant and extremely significant in post interventions in both group. Test done by paired ‘t’ test . Group A (p =0.0204), (‘t’ =5.12) group B (p=<0.0001), (‘t’ =5.91)

**Discussion**

The study aims in finding the effect of quality of life...
and functional capacity in grade III COPD patients. As patients with grade III COPD has (30% ≤ \( FEV_1 < 50\% \) predicted) have reduced air entry, difficulty in breathing, increased sputum, changes in posture, poor cough quality, respiratory muscle weakness which results in poor bronchial hygiene and functional capacity leading to poor quality of life.

In this study we focus not only on bronchial hygiene but also the other factors which reduces the functional capacity and quality of life. Exercises were framed accordingly focusing on aerobic, mobilization and strengthening of upper, lower limb and abdominals which remains unfocussed in many research studies. The exercise protocol is validated and the structured well enough and delivered to the interventional group.

The results of within group A and group B on functional capacity and quality of life improved statistically \((t = 5.12; p = 0.0204)\) and between group also showed statistically significant improvement \((t = 5.91; p < 0.001)\).

Jeffrey L. Alexander, et al stated that strength training for upper and lower extremities improve muscle strength and effective on functional fitness in older patient with chronic lung disease enrolled in pulmonary rehabilitation.

Sarah Bernard, Francois Whitton et al proved that addition of Aerobic and strength training along with conventional therapy showed significant improvement on exercise tolerance and peripheral muscle strength in patients with chronic obstructive pulmonary disease.

**Conclusion**

Various recent approaches are used in the treatment of subjects suffering from grade III COPD, but this study concluded that combine effect of structured exercise program was effective in decreasing the levels of dyspnea and improving quality of life.

It is proved from this study that effectiveness of structured exercise program was effective in improving functional capacity and quality of life. Thus Alternate Hypothesis H (1) states that there is significant effect of structured exercise program in grade III COPD patients.

**Conflict of Interest:** There were no conflicts of interest in this study.

**Funding:** This study was funded by Krishna Institute of Medical sciences Deemed to Be University, Karad.

**Ethical Clearance:** The study was approved by the institutional ethics committee of KIMSODU. The trial was registered with Clinical Registry of India with no: CTRI/2018/01/011545.

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Trends in Hyperbaric Oxygen Therapy

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Abstract

Background: The limited interdisciplinary recognition of hyperbaric medicine and the physicians’ unfamiliarity has lead to under utilization of HBOT as adjunct therapy in defined conditions.

Objective: To explore the trends in hyperbaric oxygen therapy in relation to demographic variables, applications and indications so as to form a baseline framework for further specific research studies.

Materials and Method: A quantitative retrospective study done in 530 subjects who underwent HBOT from 2015 to 2018 in a tertiary care hospital, Kochi. Data was collected from patients’ electronic medical record using a self developed observation record. Total enumerative sampling was used.

Results: Nearly half (48.9 %) of the subjects who underwent HBOT were elderly i.e. in the age group 57-70 years. Majority were males (64.9 %). 88.9 % were residents of Kerala and 6.2 % were from abroad. 48.7 % of the subjects received 6- 10 cycles of therapy. Only 13 % of the subjects received more than 10 cycles.

Majority 302 (57.0 %) of the sample underwent HBOT for acute indications. Among the 14 universally accepted acute conditions, post anoxic encephalopathy was found to be the main indication (49.7%). Malignancy related injury was the major condition (46.0%) found among the subjects with post anoxic encephalopathy to seek HBOT, and trauma being the least (7.3 %). Around one third of the patients 203 (38.3 %) had chronic indications. Among the four universally accepted chronic indications, diabetic wound was the main (45.3%) followed by radiation tissue damage (29.0%). 9 subjects (1.7%) had both acute and chronic indications for taking HBOT.

Conclusion: This study has shown a wide use of HBOT as an adjunct therapy for a variety of acute and chronic conditions. However more outcome oriented research is required to prove its efficacy in specific conditions.

Keywords: Hyperbaric Oxygen Therapy, Trends, Indications.

Introduction

Over the past 40 years hyperbaric oxygen therapy (HBO) has been recommended and used in a wide variety of medical conditions, often without adequate scientific validation of efficacy or safety. Consequently a high degree of medical skepticism had developed regarding its use.[1] Gabb and Robbin in the “Chest” (1987) have highlighted the controversies relating to HBO and have documented 132 past and present indications for HBO therapy.[2]

Hyperbaric facilities now form an important part of many hospitals all over the world. In 1996 there were 259 hyperbaric facilities in USA and there has been an annual increase in the number of hyperbaric centers and increase in patients at the rate of 15 and 620 respectively. The number of patients treated annually had increased from 896 in 1971 to 12,047 in 1989.[3,4]
Hyperbaric Oxygen Therapy has now slowly started capturing the interest of doctors in India. A Great lag has come to a pass in our country over the years as compared to the practice of Hyperbaric Medicine in the Western world where thousands of hyperbaric chambers are functioning.

HBOT has been described as a therapy in search of diseases [2]. The discovery of beneficial cellular and biochemical effects has strengthened the rationale for administering HBO as primary therapy or as adjunct therapy in many of the diseases, but it requires more scientific controlled studies.[5]

The primary and single most important effect of HBOT is hyper oxygenation which results in three fold increase of diffusion distance of oxygen through the tissues thus having anti ischemic effect. HBOT also improves the angiodynamics and red cell rheology [6]. This contributes to the improvement of microcirculation and reduces edema upto approximately 20% in the injured part. Local hypoxia predisposes wound to infection because the neutrophil mediated killing of bacteria by free radical is decreased [6, 7] which is restored by HBOT. In addition HBOT is bactericidal for anaerobes [8] and bacteriostatic for aerobes [9, 10, 11]. HBOT promotes the formation of collagen matrix and angiogenesis thus hasten the process of healing [12]. HBOT protects tissue from reperfusion injury [13] through increased cell re-oxygenation induced detoxifying toxic radical processes, prevention of cell membrane lipid peroxidation and reduced leucocyte tissue sequestration and leucocyte related injury. HBO at 2-3 ATA reduces the half life of carboxyhemoglobin from 4 to 5 hours in subjects breathing normal air to 20 min or less [14]. Thus it has a therapeutic effect in carbon monoxide poisoning. The HBO dissociates carbon monoxide from cytochrome ‘C’ oxidase thus preventing cellular asphyxiation [15].

Hyperbaric oxygen is administered in either a multi place or a mono place hyperbaric chamber. Normally, pressures of 2 to 2.5 ATA are used for a period of 90 minutes once or twice daily.[16] Duration of single treatment varies from 45 min for carbon monoxide poisoning to 5 hrs for severe decompression disorders. Protocols average 90 min for each of 20 to 30 treatments with HBO as an adjunct therapy of the wounds and other syndromes. De Sylva et al has used multi place hyperbaric chamber and HBOT at 2.2 ATA for 60 min daily for 12 days was administered. HBOT at pressures not exceeding 3 ATA and treatment sessions limited to 120 minute is safe.[5]

In Kerala though HBOT was first introduced in Jubilee Mission Hospital, Thrissur, the centre later closed. Next it was started in S P Fort Hospital, Thiruvananthapuram followed by Amrita Institute of Medical Sciences, Kochi in January 19, 2015. AIMS has a multi placed HBOT chamber. No studies have been conducted so far to get a framework on indications, applications and outcome of HBOT in Kerala and in AIMS.

Experiences with HBO therapy in India have been published in select journals with limited circulation but there has been no inter-disciplinary recognition of hyperbaric medicine at a national level. Thus though sufficient evidence supports use of HBO in certain defined conditions, many patients go untreated because of the physicians’ unfamiliarity with recent research of HBO as adjunctive therapy [17]. Studies focused on the specific indications, outcomes, the cost effectiveness and the transparency of the procedure itself only can help patients and professionals to use HBO as an adjunct therapy.

The purpose of study was to retrospectively explore the trends in hyperbaric oxygen therapy in relation to demographic variables, indications and applications so as to form a baseline framework for further specific research studies.

**Materials and Method**

A quantitative retrospective study done in 530 subjects who had undergone HBOT from 2015 to 2018 in a tertiary care hospital, Kochi. Data was collected from patients’ electronic medical record using a self developed observation record. Total enumerative sampling was used.

The universally accepted indications supported with peer reviewed proof of efficacy as described by T Sahni, P Singh, M J John [17] was used as the standard indications for collection of data (shown below). Accordingly there are 14 acute indications and 4 chronic indications. Indications which do not come under these two were included under the category of ‘others’.

Universally accepted indications for Hyperbaric Oxygen Therapy [17]

**Acute Conditions:** include non-healing ulcers, problem wounds, compromised skin grafts and flaps, crush injury, compartment syndrome, and acute traumatic ischamias, gas gangrene/clostridial infections,
necrotizing soft tissue infections (subcutaneous tissue, muscle, fascia), thermal burns, exceptional blood loss (anaemia), intracranial abscess, post-anoxic encephalopathy, burns, sudden deafness, ocular ischemic pathology, air or gas embolism, decompression sickness, carbon monoxide poisoning and smoke inhalation and curative/primary line of treatment.

**Chronic Conditions:** Include non-healing wounds/ problem wounds (diabetic/venous etc., radiation tissue damage, skin grafts and flaps (compromised) and chronic osteomyelitis (refractory).

**Ethical Consideration:** Ethical Clearance was obtained from the Institutional Ethical & Scientific Committee before data collection.

**Results**

**Section I – Sample characteristics**

Table 1: Distribution of the subjects based on demographic variables N= 530

<table>
<thead>
<tr>
<th>Demographic Variable</th>
<th>Frequency (f)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in Years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-30</td>
<td>64</td>
<td>12.1</td>
</tr>
<tr>
<td>31-43</td>
<td>73</td>
<td>13.8</td>
</tr>
<tr>
<td>44-56</td>
<td>134</td>
<td>25.3</td>
</tr>
<tr>
<td>57-70</td>
<td>259</td>
<td>48.9</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>344</td>
<td>64.9</td>
</tr>
<tr>
<td>Female</td>
<td>186</td>
<td>35.1</td>
</tr>
<tr>
<td>Residence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kerala</td>
<td>471</td>
<td>88.9</td>
</tr>
<tr>
<td>other states of India</td>
<td>26</td>
<td>4.9</td>
</tr>
<tr>
<td>outside India</td>
<td>33</td>
<td>6.2</td>
</tr>
<tr>
<td>Year of Treatment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>142</td>
<td>26.8</td>
</tr>
<tr>
<td>2016</td>
<td>183</td>
<td>34.5</td>
</tr>
<tr>
<td>2017</td>
<td>179</td>
<td>33.8</td>
</tr>
<tr>
<td>2018</td>
<td>26</td>
<td>4.9</td>
</tr>
</tbody>
</table>

From the above table it is clear that nearly half (48.9%) of the subjects who received HBOT were in the age group 57-70 years. Majority were males (64.9%). 88.9 % were residents of Kerala and 6.2% were from abroad. 68.3% had undergone the treatment in the year 2016 and 2017.

**Section II: Data on HBOT Application**

Table 2: Distribution of subjects based on HBOT application N= 530

<table>
<thead>
<tr>
<th>HBOT application Variables</th>
<th>Frequency (f)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 ATA</td>
<td>530</td>
<td>100.0</td>
</tr>
<tr>
<td>Number of cycle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-5</td>
<td>203</td>
<td>38.3</td>
</tr>
<tr>
<td>6-10</td>
<td>258</td>
<td>48.7</td>
</tr>
<tr>
<td>11-20</td>
<td>44</td>
<td>8.3</td>
</tr>
<tr>
<td>21-40</td>
<td>25</td>
<td>4.7</td>
</tr>
</tbody>
</table>

All the subjects received HBOT at a pressure of 2ATA. 48.7 % of the subjects received 6- 10 cycles of therapy. 38.3 % subjects received 1 -5 cycles of therapy. Only 13 % of the subjects received more than 10 cycles.

**Section III: Indications of HBOT N=530**

![Figure 1: Distribution of the subjects based on the indications for HBOT](image)

Majority (57.0 %) of the sample had undergone HBOT for acute conditions, 38.3 % had chronic conditions while a small group (1.7%) had both acute and chronic indications for taking HBOT.

Table 3: Distribution of the subjects based on acute indications for HBOT n= 302

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Acute indications for HBOT</th>
<th>Frequency (f)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Non-healing ulcers, Problem wounds, Compromised skin grafts and flaps</td>
<td>11</td>
<td>3.6</td>
</tr>
<tr>
<td>2.</td>
<td>Crush injury, compartment syndrome and acute traumatic ischermias.</td>
<td>47</td>
<td>15.6</td>
</tr>
<tr>
<td>S.No.</td>
<td>Acute indications for HBOT</td>
<td>Frequency (f)</td>
<td>Percentage (%)</td>
</tr>
<tr>
<td>-------</td>
<td>--------------------------------------------------------</td>
<td>---------------</td>
<td>----------------</td>
</tr>
<tr>
<td>3.</td>
<td>Gas gangrene/clostridia infections</td>
<td>23</td>
<td>7.6</td>
</tr>
<tr>
<td>4.</td>
<td>Necrotizing soft tissue infections</td>
<td>21</td>
<td>7.0</td>
</tr>
<tr>
<td>5.</td>
<td>Thermal burns</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>6.</td>
<td>Exceptional blood loss (anemia)</td>
<td>28</td>
<td>9.3</td>
</tr>
<tr>
<td>7.</td>
<td>Intracranial abscess</td>
<td>4</td>
<td>1.3</td>
</tr>
<tr>
<td>8.</td>
<td>Post anoxic Encephalopathy</td>
<td>150</td>
<td>49.7</td>
</tr>
<tr>
<td>9.</td>
<td>Burns</td>
<td>3</td>
<td>1.0</td>
</tr>
<tr>
<td>10.</td>
<td>Sudden deafness</td>
<td>1</td>
<td>0.3</td>
</tr>
<tr>
<td>11.</td>
<td>Ocular ischemic pathology</td>
<td>10</td>
<td>3.3</td>
</tr>
<tr>
<td>12.</td>
<td>Air or gas embolism</td>
<td>2</td>
<td>0.7</td>
</tr>
<tr>
<td>13.</td>
<td>Decompression sickness</td>
<td>1</td>
<td>0.3</td>
</tr>
<tr>
<td>14.</td>
<td>CO poisoning &amp; smoke inhalation</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>15.</td>
<td>Both Gas gangrene/clostridia infections and Exceptional blood loss (anemia)</td>
<td>1</td>
<td>0.3</td>
</tr>
</tbody>
</table>

Among the subjects who had acute indications for undergoing HBOT 302 (57.0%), post anoxic encephalopathy was the commonest (49.7%) followed by the group of Crush injury, compartment syndrome and acute traumatic ischaemias.

Specific conditions in post anoxic encephalopathy

**Figure 2: Distribution of the subjects with post anoxic encephalopathy who underwent HBO therapy based on specific conditions n= 150**

Malignancy related injury was the major (46.0%) condition in this study found among the subjects with post anoxic encephalopathy to seek HBOT, and trauma being the least (7.3 %)

Discussion

The present study has shown that nearly half (48.9 %) of the subjects who underwent HBOT were elderly i.e. in the age group 57-70 years. Majority were males (64.9 %). 88.9 % were residents of Kerala and 6.2 % were from abroad. 48.7 % of the subjects received 6- 10 cycles of therapy. Only 13 % of the subjects received more than 10 cycles.

Majority 302 (57.0 %) of the sample had undergone HBOT for acute indications. Among these 14 acute conditions, post anoxic encephalopathy was the main indication (49.7%), whereas the major clientele for HBOT in a study by Sourabh Bhutani, Guruswamy Viswanath (2012) was patients with non-traumatic wounds[18]. Data from an Armed Forces HBOT centre in a tertiary care hospital for the year 2008 and part of 2009 (January–September) also showed that, non-traumatic wounds formed 40% and 36% of the total HBOT workload respectively. Significant healing of wounds was seen in 87% of patients[19].

As post anoxic encephalopathy was found to be the indication for HBOT for nearly half of the subjects studied, the investigators were interested in exploring
the specific conditions under the same. Malignancy related injury was the major (46.0%) condition in this study found among the subjects with post anoxic encephalopathy to seek HBOT, and trauma being the least (7.3 %).

In the present study only one third of the patients 203 (38.3 %) had chronic indications for undergoing HBOT. Among these four chronic indications, diabetic wound that comes under non healing wounds/problem wounds was the main (45.3%) followed by radiation tissue damage (29.0%). The prospective controlled trial study conducted by Doctor et al. had taken one step further to find out the outcome of the therapy. Thirty diabetics with chronic foot lesions were randomized to study and control groups were assessed for average hospital stay, control of infection and wound healing. In the study group managed with HBOT, positive cultures decreased significantly compared to the control group (most pronounced for *Escherichia coli*) and the need for major amputation was significantly less. However the average hospital stay was not affected. They concluded that HBOT could be safely used and would be beneficial as an adjuvant therapy in chronic diabetic foot lesions.[19]

It is worth noting that 9 subjects (1.7%) had both acute and chronic indications for taking HBOT of which, 5 (55.6%) had Gas gangrene/clostridia infections along with diabetic wound.

The wide use of HBOT in post anoxic encephalopathy is to be noted as it may have a great impact in not only saving the lives of patients but also in minimizing their disabilities. Thus in the long run it makes HBO Therapy cost effective. Strokes, low blood pressure, near drowning, cardiac arrest, carbon monoxide poisoning, choking, drug overdose are the seven causes of anoxic brain injury.

**Conclusion:** This study has shown a wide use of HBOT as an adjunct therapy for a variety of acute and chronic conditions. However more outcome oriented research is required to prove its efficacy in specific conditions.

**Conflict of Interest:** Authors declare that there are no conflicts of interest.

**Source of Funding:** Self funded

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**References**


Role of p53 and p21 Polymorphisms in Cervical Cancer Risk among Rural Population of South-Western Maharashtra: A Case-Control Study

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Abstract

Background: Earlier discrepancies in the risk of cervical carcinogenesis due to p53 and p21 genes influenced us to elucidate their association with cervical cancer (CC) in the rural population of south-western Maharashtra.

Objective: The hospital based case-control study aimed to investigate association of polymorphisms in p21, p53 genes with risk of CC in Maharashtrian population.

Method: PCR-RFLP method was used to genotype polymorphisms in exon 4 and exon 7 of p53, exon 2 and exon 3 of p21 gene from 350 CC patients and 400 controls.

Results: The variant allele Ser/Ser showed association with increased risk CC as compared to Arg/Arg genotype of codon 249 of p53 whereas codon 72 was not associated risk of CC in rural population. Similarly when we studied C/T and T/T genotypes of exon 3 of p21, T/T genotypes showed significant risk of CC (OR=6.03, 95% CI: 2.63-13.81; p<0.0001).

Conclusion: The findings from this study showed possible association of p53 codon 249 and p21 exon3 polymorphisms with increased risk of cervical carcinogenesis in the women of rural population of Maharashtra.

Keywords: Cervical Cancer, PCR-RFLP, p53, Genetic Polymorphism.

Introduction

Cervical cancer (CC) is the most deadly disease in women worldwide with 570,000 new cases in 2018 conferring 6.6 % of all female cancers as per World Health Organization report. In India, CC is the second biggest reason of cancer causing mortality, accounting 1/3rd of global deaths representing almost 10% of all cancer related deaths occurring annually among women(1, 2). Earlier reports theorized that rural women are at higher risk of developing CC when contrasted to their metropolitan counterparts (3, 4). The conceivable factors responsible for CC are environment and lifestyle along with other etiological factors including sexually transmitted infections like human papillomavirus (HPV) infection. It won’t guarantee that every woman exposed with said risk factors will develop CC, signifying that some other components may also responsible for cervical carcinogenesis. In such circumstances, the developing affirmation on the genetic determinants and their association with carcinogenesis has been considered, suggesting that the genetic elements may influence the development of CC.
One of such host marker is tumor suppressor gene allied with several pathways including cellular transcriptional and translational control. \( p53 \) is a crucial gene recognized to stifle the development of cancer through the enlistment of cell cycle arrest and induction of apoptosis programs in different cellular response. It is clear from earlier evidences that polymorphisms in tumor suppressor molecules may play vital role in genetic susceptibility of the society to carcinogenesis. Few studies on the polymorphisms in \( p21 \) and \( p53 \) have been studied and some of them were evidenced to be associated with cancer risk with significance. A polymorphism of \( p53 \) at codon 72 of exon 4 i.e. substitution of arginine to proline, serine to arginine substitute in \( p21 \) at codon 31 of exon 2 have been distinctively explored in different populations in relation to carcinogenesis \( (5, 6) \). Also, epidemiologic studies from India reported the influence of polymorphisms in those genes for their association with development of different types of cancer \( (10-15) \), but results are conflicting where investigations verified non-association of \( p53 \) polymorphisms to cancer development \( (10-15) \).

Involvement of \( p53 \) Arg\( \rightarrow \)pro substitution at codon72 of exon 4 \( (16-18) \) and \( p21 \) polymorphism \( (19-21) \) has been investigated for their association with risk of cervical carcinogenesis. But, it’s not obvious at all the times and no significant differences in the distribution of \( p53 \) and \( p21 \) genotypes were observed, thus showed uncertainty in the findings \( (16, 18) \). Thus, there remained underlying heterogeneity between the earlier studies which still needs to be explored. Therefore, in this study we hypothesized that the polymorphism in \( p53 \) and \( p21 \) genes may contribute to the etiology of CC in rural women of Maharashtra. To judge this proposition we proposed a hospital based case-control study to investigate polymorphisms in tumor suppressor genes and their association with risk of CC in Maharashtrian population.

**Materials and Method**

The study population included 350 women with CC and 400 healthy women as controls. All cases ranged in age from 20-75 years were enlisted after being diagnosed during 2013-2018.

**Genomic DNA extraction:** Genomic DNA extraction was carried out from the peripheral blood sample using Purelink genomic DNA extraction and purification kit (Invitrogen, Life technologies) following the manufacturer’s instructions.

**Genotyping Assays:** The samples were then genotyped by PCR-RFLP. The genomic DNA was amplified using primers \( (p21 \) codon 31 exon 2: Forward Primer (FP); 5\'- gtcagaacctggctggagtg-3', Reverse primer (RP); 5\'- ctccteeacatcatgcggc-3', \( p21 \) exon 3: FP; 5\'- cccagggaggtctgcgg-3', RP; 5\'- gggggcagagttgtac-3' and \( p53 \) codon 72 exon 4: FP; 5\'- ttcaccactagtcgacctg-3', RP; 5\'- ctcaggccaactgacctgct-3', \( p53 \) codon 249 exon 7: FP; 5\'- ggcagacagagggaggta-3', \( p53 \) codon 429 exon 7: FP; 5\'- ggcagacgagggaggta-3'. The PCR conditions were optimized for amplification of 272 base pair (bp) fragment of \( p21 \)- exon 2 and 300 bp fragment of \( p21 \)- exon 3 were initial denaturation at 95\(^\circ\)C for 5 minutes (min) followed by 30 cycles of 95\(^\circ\)C- 20 seconds (sec), 58\(^\circ\)C-20 sec, 72\(^\circ\)C-20 sec and final extension at 72\(^\circ\)C for 10 min. Similarly PCR conditions were optimized for amplification of codon 72 of exon 4 (309 bp) and codon 249 of exon 7 (286 bp) of \( p53 \) gene were; initial denaturation at 95\(^\circ\)C for 5 min followed by 30 cycles of 95\(^\circ\)C- 20 sec, 52\(^\circ\)C-20 sec, 72\(^\circ\)C-20 sec and final extension at 72\(^\circ\)C for 10 min and 30 cycles of 95\(^\circ\)C- 20 sec, 60\(^\circ\)C- 20 sec, 72\(^\circ\)C- 20 sec and final extension at 72\(^\circ\)C for 10 min respectively. After confirmation of PCR amplification, 1\( \mu \)g of PCR product of each sample was subjected to restriction digestion with 10 Units of restriction enzymes. The restriction enzymes BstUI and Pvull were used for RFLP analysis of exon 2 and exon 3 of \( p21 \) respectively. Similarly RFLP analysis of \( p53 \) codon 72 exon 4 and \( p53 \) codon 249 exon 7 was carried out by BstUI and HaeIII restriction enzymes.

**Statistical analysis**

The association between the \( p21 \) and \( p53 \) genotypes and risk of developing CC were studied by logistic regression model which was used to calculate the Odds ratio (OR) and 95\% confidence intervals (CI) with adjustment of variables to determine the CC risk.

**Results**

The most of the patients in stage III well differentiated squamous cell carcinoma selected before receiving any either chemotherapy or radiation therapy. Based on clinico-pathological and demographic characteristics, it was observed that CC occurred in patients (78.90 \%) who were married at younger age and pregnant soon (15-20yrs) which showed significant association when compared to the controls.

**P53 genotyping:** The DNA from patients and controls was genotyped at codon 72 at exon 4 of p53 for
Pro/Pro, Pro/Arg, Arg/Arg and codon 249 at exon 7 of p53 Arg/Arg, Arg/Ser, Ser/Ser genotypes. The genotype frequencies of p53 exon 4 and exon 7 polymorphisms are summarized in Table 1. The p53 Pro/Pro allele frequency among patients was 23.43% where in controls 23.00% whereas Arg/Arg allele frequency in patients (24.86%) and in controls (23.75%). Neither of heterozygous allele (OR=0.95; 95% CI: 0.66-1.93, p=0.79) nor proline homozygous allele (OR=1.02; 95% CI: 0.67-1.55, p=0.89) of codon 72 of p53 associated with risk of CC. When we compared the frequencies of p53 Arg/Arg, Arg/Ser and Ser/Ser genotypes of codon 249 of exon 7 among patients, we found significant difference from those among controls. Logistic regression analysis estimated the association of Ser/Ser variant allele (OR=2.47; 95% CI: 1.75-3.49; p<0.0001) with increased risk of development of CC compared to Arg/Arg genotype of codon 249 of exon 7 of p53 gene.

**P21 genotyping:** When we studied frequency distribution of Serine and arginine allele in codon 31 of exon 2, the Ser/Ser allele of patients (76.29 %) and controls (56.50%) where arginine allele in p21 showed negative association for the development of CC (OR=0.38, 95% CI: 0.24-0.62; p<0.0001) Table-1. When we studied C/T and T/T genotypes of exon 3 of p21, T/T genotypes showed significant risk of CC (OR=6.03, 95% CI: 2.63-13.81; p<0.0001). Thus, p21 Arg/Arg genotype did not show increase in relative risk of developing CC, whereas T/T genotypes of exon3 of p21 associated with increased risk of CC.

Effect of confounding factors on the association of p53 and p21 polymorphisms with CC risk: The association of p53 and p21 with risk of CC was further examined after stratification of confounding factors such as age, age at first pregnancy. The logistic regression analysis showed that none of the polymorphisms except Arg/Ser allele of p53 codon 249 associated with CC risk (OR=2.85; 95% CI: 1.82-4.47 p=0.0001) after being adjusted for earlier age at first pregnancy whereas Ser/Arg allele of codon 31 of exon 2 of p21 showed negative association (OR=0.35; 95% CI: 0.23-0.52 p= 0.0001) with development of CC. There was an increase in the relative risk of CC associated with arginine/serine heterozygosity as compared with arginine homozygosity of p53 codon 249 between subgroups defined by age bellow 50 years (OR=3.09; 95% CI: 1.99 –4.81, p=0.0001) as compared to age above 50 years (OR=1.59; 95% CI: 0.90 –2.79, p=0.10).

### Table 1: The genotype frequencies of p21 and p53 gene variants and their association with cervical cancer in untreated CC patients and healthy controls.

<table>
<thead>
<tr>
<th>Gene</th>
<th>Genotype</th>
<th>Cases (n = 350) (%)</th>
<th>Control (n = 400) (%)</th>
<th>Odds’ Ratio (95%CI)</th>
<th>P value</th>
<th>Adjusted Odds Ratio (95% CI)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>p21</strong></td>
<td><strong>codon 31</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Exon-2</strong></td>
<td><strong>rs1801270</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Serine/Serine</td>
<td>267(76.29)</td>
<td>226(56.50)</td>
<td>1 (Reference)</td>
<td></td>
<td>&lt;0.0001</td>
<td>0.32 (0.20-0.50)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Serine/Arginine</td>
<td>54(15.43)</td>
<td>113(28.25)</td>
<td>0.39 (0.27-0.56)</td>
<td>&lt;0.0001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arginine/Arginine</td>
<td>29(8.28)</td>
<td>61(15.25)</td>
<td>0.38 (0.24-0.62)</td>
<td>&lt;0.0001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ser/Arg+Arg/Arg</td>
<td>83(23.71)</td>
<td>174(43.50)</td>
<td>0.39 (0.39-0.53)</td>
<td>&lt;0.0001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>p21</strong></td>
<td><strong>exon-3</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>rs1059234</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CC/CC</td>
<td>256(73.14)</td>
<td>309(77.25)</td>
<td>1 (Reference)</td>
<td></td>
<td>0.38</td>
<td>1.42 (0.91-2.21)</td>
<td>0.11</td>
</tr>
<tr>
<td>CC/TT</td>
<td>59(16.86)</td>
<td>84(21.00)</td>
<td>0.84 (0.58-1.22)</td>
<td></td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TT/TT</td>
<td>35(10.00)</td>
<td>7(01.75)</td>
<td>6.03 (2.63-13.81)</td>
<td>&lt;0.0001*</td>
<td>9.31</td>
<td>(3.88-22.23)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>CC/TT+TT/TT</td>
<td>94(26.86)</td>
<td>91(22.75)</td>
<td>1.25 (0.89-1.73)</td>
<td>0.19</td>
<td>2.10</td>
<td>(1.41-3.12)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td><strong>P53</strong></td>
<td><strong>Codon72</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Exon-4</strong></td>
<td><strong>rs1042522</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proline/Proline</td>
<td>82(23.43)</td>
<td>92(23.00)</td>
<td>1 (Reference)</td>
<td></td>
<td>0.79</td>
<td>0.98 (0.67-1.44)</td>
<td>0.94</td>
</tr>
<tr>
<td>Proline/Arginine</td>
<td>181(51.71)</td>
<td>213(53.25)</td>
<td>0.95 (0.66-1.93)</td>
<td>0.89</td>
<td>1.05</td>
<td>(0.67-1.64)</td>
<td>0.81</td>
</tr>
<tr>
<td>Arginine/Arginine</td>
<td>87(24.86)</td>
<td>95(23.75)</td>
<td>1.02 (0.67-1.55)</td>
<td>0.88</td>
<td>0.99</td>
<td>(0.69-1.42)</td>
<td>0.99</td>
</tr>
<tr>
<td><strong>P53</strong></td>
<td><strong>Codon249</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Exon-7</strong></td>
<td><strong>rs28934571</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arginine/Arginine</td>
<td>235(67.14)</td>
<td>334(83.50)</td>
<td>1 (Reference)</td>
<td></td>
<td>0.86</td>
<td>1.42 (0.02-71.84)</td>
<td>0.86</td>
</tr>
<tr>
<td>Arginine/Serine</td>
<td>0(0.00)</td>
<td>0(0.00)</td>
<td>1.42 (0.02-71.84)</td>
<td>0.86</td>
<td>1.42</td>
<td>(0.02-71.84)</td>
<td>0.86</td>
</tr>
<tr>
<td>Serine/Serine</td>
<td>115(32.86)</td>
<td>66(16.50)</td>
<td>2.47 (1.75-3.49)</td>
<td>&lt;0.0001*</td>
<td>2.32</td>
<td>(1.62-3.32)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Arg/Ser+Ser/Ser</td>
<td>115(32.86)</td>
<td>66(16.50)</td>
<td>2.47 (1.75-3.49)</td>
<td>&lt;0.0001</td>
<td>2.32</td>
<td>1.62-3.32</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

* Indicates significance (p<0.005), p value determined based on χ², 1.0 (Reference)
Discussion

In present study we used comparatively larger sample size to elucidate the interaction of p21 and p53 influencing the risk of CC in rural population of Maharashtra. Based on logistic regression analysis we found that no evident relationship of Arg 72 allele of p53 and Ser 31 allele of p21 genotype frequencies occurred to be associated with CC. But when we compared the frequencies of Arg/Arg, Arg/Ser and Ser/Ser genotypes of codon 249 of p53, we found significant association of Ser/Ser with increased risk of CC in rural women. Similarly when we studied genotype frequencies of p21 exon2 and exon 3, the frequency distribution of serine and arginine allele in codon 31 of exon 2 did not show risk to CC but we observed T/T genotypes of p21 showed significant risk of CC in rural women.

The polymorphism in p53 and p21 genes has been found to be associated with increased risk of ovarian, bladder, breast cancer (10-11, 22-24). But, in controversy no association of p53 was found with breast (10, 25) and ovarian cancer (41). Recently various studies have been carried out to review the outcome of SNPs on CC susceptibility (26, 27) however; the exact role of p53 and p21 in CC development remains controversial (28). Recent meta-analyses revealed that p53 polymorphisms are associated with increased risk of CC in Indian and other Asian population (7, 29) but in contrast, no prominent association between p53 polymorphism and CC risk was documented in patients of Africa, and eastern Asia (16, 30). Similarly, Martinez-Nava et al 2016(31) evidenced negative association of p21 polymorphism with CC risk. Thus our results revealed that the prevalence of C>T SNP of p21 and G>T polymorphism in of p53 increases the severity of CC in rural population of Maharashtra; however other studies reported negative association of codon 249 with CC risk (25). Our study also showed that p53 codon 72 polymorphism is not a significant predictor of advancement of CC in Maharashtrian population. Thus, this is preliminary information of its own kind to examine the polymorphisms in and their conceivable relationship with development of CC from a pool of unexplored rural Maharashtrian population and showed that polymorphism in exon3 of p21and codon 249 of p53 may contribute in cervical carcinogenesis in Maharashtrian women.

Conclusion

The findings indicated possible association between codon 249 of p53 and exon3 of p21 gene polymorphisms with increased risk of cervical carcinogenesis in the women of rural Maharashtra.

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Conflict of Interest: None declared

Ethical Clearance: The study protocol was approved by Institutional Ethics Committee of KIMSDU.

References
An Explorative Study to Prevent the Incidence of Inpatient Falls in a Tertiary Care Hospital

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Abstract

Improving patient care has become a top priority among healthcare providers, with the overall interest to achieve patient satisfaction. The quality of patient care is the adoption of a system which is patient centred or patient oriented. One such area in the hospital for improvising the quality of patient care is the prevention of patient falls. The study was carried out in the inpatients wards of a tertiary care hospital in Bangalore for a period of five months, from March 2018 to July 2018 which was cross sectional study descriptive in nature. Data on inpatient falls was collected through hospital incidence report for three years. An observational checklist was prepared to check for patient safety compliance to environmental circumstances and a self-administered questionnaire to assess the level of knowledge of nurses on fall prevention. Data analysis was done by using Quality control tools such as Pareto’s Chart, Cause and Effect Diagram and bar graphs to identify the gaps and analyse the root cause for inpatient falls in the hospital. As a result of data analysis, it was concluded that the major reasons for patient falls were due to patient related factors such as old age, weakness, loss of balance, impaired cognition and environmental factors such as wet bathroom floors, absence of patient call bells and bed rails not being raised. On the other hand evaluating the level of knowledge of nursing staffs on fall prevention revealed that 3.25% of the nurses had poor knowledge regarding the fall risk assessment, 31.33% of the nurses had less knowledge on risk factors and 15.25% were not aware of interventions for fall reduction. Overall the hospital had to improve on fall prevention strategies and conduct periodic training programs for nurses on fall prevention. An environmental safety checklist was prepared and Standard fall prevention guidelines was formulated and recommended to the hospital.

Keywords: Inpatient falls, Environmental Circumstances, Risk Factors, Patient Safety Practices.

Introduction

Patient falls has been one of the leading causes of adverse events recorded in a hospital, which constitutes around 70% of inpatient incidence. On an average the falls reported in hospitals ranges from 1.3 to 8.9 per 1000 patient bed-days¹. Inpatient fall leads to increased length of stay in hospitals, physical and emotional injury, increased healthcare costs and discharge to a long term care facility. Even when a fall doesn’t result in injury, it can cause a fear or anxiety of falling leading to depression and reduced physical activities². Patient fall results in physical injury which constitutes approximately around 30% out of which 4% to 6% relates to serious injury³. The serious fall related injuries include fractures, subdural hematomas with excessive bleeding and can even result in death of the patient⁴. It was seen that patients who had sustained injuries due to fall had an increased cost of hospital charges $4200 which was comparatively higher than patients who did not fall⁴,⁵. Since quality of care and patient safety is of prime concern, it is significant to reduce the incidence of patient fall in a hospital, thereby reducing the risk of injury and healthcare costs. Statistics in US has shown that every year more than thousands of patient’s falls have been reported in hospitals and 30%-40% are presented with injury⁶.

Epidemiology of Falls: Epidemiology of inpatient
falls has multifactorial causes and is not confined to just one factor. Patient falls related with injury in hospital is associated with several risk factors. These factors are divided into intrinsic and extrinsic factors. The intrinsic factors include gait of the patient, previous history of falling, increased age, mental status, dizziness, visual impairment, urinary frequency, specific group of diagnosis, and use of certain medications such as benzodiazepines, antipsychotics and sedatives. Extrinsic factors include environmental conditions, use of restraints, reason for hospitalization, and unit condition. Although intrinsic factors depend on the patient’s condition and mostly cannot be modified, extrinsic factors usually are related to environmental conditions which can be rectified through interventions.

**Challenges in Fall Prevention:** Prevention of falls and fall related injury has always been a challenging issue across all patient care areas. Not all patients in hospitals are prone for a fall, but a patient fall can cause a lot of distress not only to the patient but also healthcare staffs and patient members. Fall prevention comprises of multidisciplinary team in the organization which includes, nursing staffs, physicians, pharmacists, family members, physiotherapists and patients. It is important to have an effective communication of a patients fall risk factors, as well as specific plan care for individual patients, as each patient have their own set of risk factors which sometimes are very unique.

**Aim, Objectives & Methodology**

**Aim:** To assess the incidence of patient fall in a hospital in order to identify and analyse the causes and suggest measures to reduce the occurrence of the fall

**Objectives:**

1. To study the incidence of patient fall in the hospital
2. To identify the gaps and analyse the reasons for patient fall in the hospital
3. To assess the level of knowledge of nurses on fall prevention
4. To suggest measures for preventing patient fall

**Methodology:** A cross-sectional observational study which was descriptive in nature was conducted in a tertiary care hospital, Bangalore from March 2018 to July 2018. The following inpatient departments were considered for the study, Medical General Ward (MGW), Surgery General Ward (SGW), Paediatric General Ward (PGW), Orthopaedic General Ward (OGW), psychiatric General Ward (PSY GW), Ophthalmology General Ward (Ophal GW). Secondary data was collected from hospital incidence reports for 3 years (2015, 2016, and 2017). Secondly, an observational checklist was prepared on patient safety compliance to environmental circumstances which can trigger patient falls, based on literatures studied; observations were carried out in all the inpatient wards for a period of two weeks. Analysis was done through Cause and Effect Diagram. Finally a self-administered structured questionnaire on fall prevention was prepared based on studied literature reviews, to assess the knowledge of nursing staffs on fall prevention. The questionnaire was face validated through experts. Reliability check was done for 20 samples through Microsoft excel with Cronbach’s Alpha was 0.747899. All the nursing staffs working in the inpatient departments of General Wards were included for the study. A sample size of 107 nursing staffs was determined with a population size of 147. Confidence Level =95% and Margin of Error =5%. Out of which 98 were respondents Exclusion criteria was inpatient department of Private Wards, and nursing staffs who were on a long leave of absence.

**Results & Analysis**

**Incidence of Patient Falls:** As observed from the secondary data collected from hospital incidence reports on patient falls it was seen that, the total no: of inpatient falls in 2015, 2016 and 2017 was 14, 23 and 41 respectively. Pareto’s was plotted to analyze the area of inpatient falls. As per the data collected from hospital incidence reports, it was analyzed that the incidence of patient fall reported was high in D-block followed by Psy ward, PGW, MGW, Opthal ward, SGW and OGW.

**Patient Safety Compliance to Environmental Circumstances:** An observational checklist was used to check for compliance to environmental circumstances.

**Table: 1 Reasons for Non-Compliance to Environmental Circumstances**

<table>
<thead>
<tr>
<th>Department</th>
<th>Reasons for Non-compliance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paediatric General</td>
<td>Absence of patient call bells</td>
</tr>
<tr>
<td>Surgery General Ward</td>
<td>Absence of patient call bells and grab bars in washroom</td>
</tr>
<tr>
<td>Medical General Ward</td>
<td>Absence of patient call bells and grab bars in washroom, wet floor surfaces, slippery bathroom floors</td>
</tr>
</tbody>
</table>
Compliance to environmental circumstances in the 7 departments (MGW, SGW, Psy GW, OGW, Opthal GW, and D-block) showed that almost all departments did not have patient call bells, and even if it was present it was non-functional. Grab bars were absent in the wash room in all the wards except Psy GW and OGW. The floor surface of the bathroom was found to be wet which can increase the risk of patient for falling. The other common finding in the opthal GW and in D-block was that the bed rails were not raised, and patients could be at a risk of a fall. Presences of assistive devices were observed as obstructions in the pathway to the toilet.

**Nurses Level of Knowledge on Fall Prevention:**
A total of 15 items were included in the questionnaire, which covers four sections (a) Fall risk assessment, (b) Patient risk factors (c) Interventions for fall reduction, and (d) Fall prevention programs.

From the study done to assess the nurse’s knowledge on fall risk assessment, it was analysed that the most of the nursing staffs had a good knowledge on fall risk assessment tool, and 3.25% of the total nursing staffs who were involved in the study had stated that they were not trained on using the Morse Fall Risk Assessment tool, which was adopted by the hospital recently.

According to literatures a patient who is taking four or more oral medications is at risk of fall, therefore should be carefully monitored. But, as per the studies it was seen that only 37% of nursing staffs had the awareness that a patient who is on four or more oral medications is at a risk for a fall and has to be monitored closely.

**Fig: 1 Nurses Level of Knowledge on Fall Risk Assessment and Risk Factors**

Based on interventions for fall reduction, 85% of the nursing staffs were aware of individual intervention strategies.

All though most of the nurses were aware of the interventions for fall reduction, 10% of them had a negative attitude on fall prevention programs.

**Discussion**

The total number of inpatient falls obtained from hospital incidence reports for the three consecutive years 2015, 2016 and 2017 was 78.

The study showed that the rate of compliance to environmental circumstances was different in all the wards which were studied. Results analysed showed that most of the wards did not have patient call bells, or if they were present it was non-functional. Presence of patient call bells in wards or in the nursing station can be adopted as a fall prevention strategy.

Another key findings in the study showed that the floors of the bathrooms were wet, where patients may slip and fall. Previous studies have shown similar highest percentage of falls have occurred in patients bathroom/ toilets and suggested that bathroom is a location which can be hazardous for older adults. Studies conducted by Sebestina Anitha D’souza showed that bathing activity was rated with high risk of falling in the hospital. In order to prevent these falls, modifications in the bathrooms and toilets have found to decrease the falls such as rubber mats, and handrails have found to be useful. The study also revealed that presence of
obstructive devices like wheelchairs and patient assistive devices were present in the pathway to the toilet. This can be a very hazardous environmental factor which can impact on patient safety. Another common finding in the ophthalmology department and D-Block was the bed rails were not raised for required patients.

The analysis of the results, gave many intuitions regarding the knowledge of nurse on prevention of patient fall in the hospital.

**Table: 2 Overall Score Assessed on Nurses Knowledge on Fall Prevention**

<table>
<thead>
<tr>
<th>Variables on Fall Prevention</th>
<th>Mean</th>
<th>SD</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall risk assessment</td>
<td>94.5</td>
<td>±2.64</td>
<td>96.75%</td>
<td>3.25%</td>
</tr>
<tr>
<td>Risk Factors</td>
<td>95.66</td>
<td>±1.52</td>
<td>68.66%</td>
<td>31.33%</td>
</tr>
<tr>
<td>Interventions on Fall Prevention</td>
<td>82</td>
<td>±5.47</td>
<td>84.75%</td>
<td>15.75%</td>
</tr>
<tr>
<td>Fall Prevention Program</td>
<td>87.75</td>
<td>±11.26</td>
<td>78%</td>
<td>22%</td>
</tr>
</tbody>
</table>

In relation to the data collected regarding the knowledge of nurse on fall risk assessment, it was seen that 96.75% of nursing staffs had good knowledge on using the fall risk assessment with SD ±2.64. Data analysed on the assessment of knowledge on risk factors showed a SD ±1.52 with only 68.66% of staffs aware on risk factors. Results analysed on interventions on fall prevention and fall prevention program revealed SD of ±5.47 and ±11.26 respectively, they had expressed that adequate training and education on fall prevention can overcome the huddles caused due to hazardous environment. Almost all the nurses in the study had concluded that education to patient/family members is an effective fall prevention strategy where patients can be alerted on fall risks, and can be more careful during their activities.

**Recommendations & Conclusion**

Recommendations for the prevention of inpatient falls in the hospital were suggested based on the analysis of the problem areas.

1. **Standard Guidelines on Fall Prevention**
   - Ensure environmental safety such as adequate lighting near patient bed areas, beds at appropriate height, functioning of patient call bells, floor surface clean and dry
   - Educating patients on fall risk near bed areas
   - Identify high risk patients by using unique identifiers
   - High risk patients should be kept near the nursing station for closer observation
   - Conduct fall reduction programs to all staffs
   - Regular review of medications, especially high risk patients

2. **Environment Safety Checklist**

Prevention of patient falls and fall related injuries have been a challenging issue and also prime concern, for healthcare organizations, and for healthcare providers because providing patient safety is the highest quality of patient care. This study was conducted to analyse the root cause for patient fall in the hospital, which was carried out by obtaining the secondary data from the hospital incidence report for three years. The main gaps analysed through cause and effect diagram showed that, the environmental hazards which can trigger patient fall includes wet bathroom floors, absence of fall risk signage’s, wet floor surfaces, presence of obstructive devices in the pathway to the toilet, absence of patient call bells, insufficient bed rails, bed rails not raised and absence of grab bars in the bathroom.

By assessing the level of knowledge of nurse on fall prevention, it was seen that most of the nurses were well aware of the fall risk assessment tool, and expressed that using a fall risk assessment tool helped them to identify patients at risk of fall. Regarding their knowledge of risk factors and intervention for fall reduction, it was seen that, only few nursing staffs were aware of risk factors like a patient who is on four or more oral medications is at a risk for a fall, while majority of them lacked the knowledge and awareness.

Multi component interventions have been implemented across most of the hospitals to reduce patient falls, with varying success of around 30%\(^{13}\). New innovative technologies have been adopted by hospitals to reduce patient fall. Depth sensors were installed in inpatient units identified at high risk of falls, and events were captured through video clips. These sensors helped in analysing the nature of falls, for further developing of specific interventions for high risk fall patients\(^{14}\). Implementation of fall prevention programs can be made successful by identifying areas for specific interventions which includes patient and staff education, training for initial fall risk assessment, review of assessment if
required, patient-specific interventions, and an inter-
disciplinary team which can analyse the data on falls
periodically and support the organization with updated
fall prevention strategies.

**Ethical Clearance:** Taken from Ramaiah University
of Applied Sciences (RUAS) Committee

**Source of Funding:** Self

**Conflict of Interest:** Nil

**References**


Probiotics and Oral Health: A Review

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Abstract

The concept health-promoting micro-organisms and bacteriotherapy to support immune function was first introduced at the beginning of the 20th century. The development of modern dairy industry came into existence later. In milk fermentation, probiotic strains such as lactobacilli or bifidobacteria are used even today. Time has come to shift the paradigm of treatment from specific bacteria elimination to altering bacterial ecology by probiotics. Probiotics are food supplements containing beneficial bacteria. They help in stimulating health flora and also suppressing pathogens which cause and spread diseases. Various chronic diseases such as dental caries, periodontitis and recurring problems like halitosis, candidal infections, etc has been controlled in the oral cavity by use of probiotics. Probiotics may function not only by direct inhibition of, or enhanced competition with, pathogenic micro-organisms, but also by more subtle mechanisms including modulation of the mucosal immune system. This article summarizes on the potential benefits of probiotics for oral health.

Keywords: Probiotics, oral health, dental caries, periodontitis, halitosis, Candida infection.

Introduction

The term probiotic was derived from the Greek word, meaning “for life.” Every human being ingests a large number of living microorganisms, predominantly bacteria each day. Although probiotic strains are present in food and water naturally, but can also be added in sausages, cheese, yogurt and fermented milk products during the processing of foods due to their beneficial effects for human health. As declared by the Food and Agriculture Organization and the World Health Organization, the definition of probiotics (2001), as “livemicroorganisms which when administered in adequate amounts confer health benefits on the host." These bacteria are regarded safe as they can reside in the human body without causing any harm and, on the other hand, they are important microorganisms in milk fermentation and food preservation²³.²³.

History: The Ukrainian bacteriologist and Nobel Laureate Metchnikoff (1908) after studying the flora of the human intestine concluded to a theory in the 1900s that poisoning of a body by the products of some bacteria causes senility in humans. Hence, proposed a diet containing milk fermented by lactobacilli for high amounts of lactic acid production that could increase the life span of humans. Lilley and Stillwell (1965) introduced the term probiotics. Hull (1984) identified the first probiotic species, the lactobacillus acidophilus and Holcomb (1991) identified bifidobacterium bifid⁴.

Species of Probiotics: Probiotics can be yeast, bacteria or molds but bacterial species are predominant. Few of these species are:

(a) Lactic acid-producing bacteria (LAB):
Lactobacillus, Bifidobacterium, Streptococcus.

(b) No lactic acid-producing bacterial species:
Bacillus, propionibacterium.
(c) **Nonpathogenic yeasts**: Saccharomyces

(d) Non-spore forming and non-flagellated rod or cocccobacillus

Streptococcus thermophiles and lactobacillus bulgaricus are primary cultures used in yogurt production. Saccharomyces bollard is a noncolonizing lactic acid producing yeast.

The production of enzymes is stimulated by the lactobacillus species which further helps in digestion and metabolism of proteins and carbohydrates. Lactobacillus also aid in the synthesis of Vit B and Vit K and in the breakdown process of bile salts. More than 100 species of L. acidophilus, L. brevis, L. casei, L. rhamnose, L. salivarius has been identified. They are usually dispensed in gel, paste, powder and liquid forms. They enhanced innate and acquired immunity as well as help in inhibition of pro-inflammatory mediators. Bifidobacterium species are strictly anaerobic and predominate the large intestines. The benefits from these include metabolization of lactose, generate lactic acid and synthesize vitamins. They also ferment indigestible carbohydrates and produce beneficial short chain fatty acids.

**Mechanism of action**: The concept of treatment with probiotics came from a belief that modern humans do not consume or replenish the beneficial microbes in their bodies and that they can do so by taking probiotics. Ingested probiotic strains block pathogen adhesion and growth and also give a nonspecific boost to immunity, as adhere to the gut wall. Probiotics have many other roles, like producing anti-infectives, such as bacteriocins; strengthening of host-cell mucus barriers; and prevention of virulent factors, such as toxins production. Delivery systems, such as gel matrix coatings on the bacteria themselves and center coated capsules, allow bacteria get through the stomach and hydrate the small intestine. For example, Lactobacillus strains GR-1 and RC-14 can function in the gut, survive passage and pass in faeces. Various pathways of the mechanism of probiotics are in Fig. below. (Fig. 1)

**Role of Probiotics in dental caries**: Dental caries is an infectious disease that affects most of the population. This multifactorial and complex disease process occurs along the interface between the dental biofilm and enamel surface. Probiotic and molecular genetic techniques have been used to replace cariogenic organisms such as mutans streptococci and Lactobacillus species with strains of bacteria that are not cariogenic. Studies suggest that consumption of products containing probiotic lactobacilli or bifidobacteria could reduce the number of mutans streptococci in saliva. Nase et al. showed that administration of probiotic bacterium Lactobacillus reuteri ATCC55739 or Bifidobacterium DN-173010 induced significant reduction of cariogenic S. mutans in saliva. Nikawa et al. showed that bovine milk fermented with Lactobacillus reuteri was effective against S. mutans, resulting in a reduced risk for tooth decay.

**Probiotics in periodontitis**: Patients with various periodontal diseases; gingivitis, periodontitis and pregnancy gingivitis, were locally treated with a culture supernatant of a L. acidophilus strain. Significant recovery was reported for almost every patient. The probiotic strains used in such studies include L. reuteri strains, L. brevis (CD2), L. casei Shirota, L. salivarius WB21 and Bacillus subtilis. L. reuteri and L. brevis have improved gingival health, as measured by decreased gum bleeding. The use of probiotic chewing gum containing L. reuteri ATCC55730 and ATCCPTA 5289 also decreased levels of pro-inflammatory cytokines in GCF, and the use of L. brevis decreased MMP (collagenase) activity and other inflammatory markers in saliva. Use of tablets containing L. salivarius WB21 has been shown to decrease gingival pocket depth, particularly in high-risk groups such as smokers, and also affect the number of periodontopathogens in plaque. Twetman et al. used L. reuteri-containing chewing gum in 42 healthy patients and assessed its effects on crevicular fluid volume, cytokine (interleukin-1β, interleukin-6, interleukin-10, and TNF-α) levels and bleeding on probing. Crevicular fluid volume, as well as TNF-α, interleukin-8 levels and bleeding were significantly reduced. Due to the ability to inhibit P. gingivalis, L. salivarius TI 2711 was given for 4 or 8 weeks in a tablet to healthy volunteers at a concentration 2x107 CFU/ml. A significant reduction of blackpigmented rods in saliva was observed, whereas the number of S. mutans and lactobacilli did not change. Additional finding was the convergence of pH to neutral after treatment, thus highlighting both caries and periodontal prophylactic properties. The effectiveness of the latter Lactobacillus strain was confirmed by Matsuoka et al. who demonstrated by means of real-time PCR analysis that LS1 translocates to subgingival plaque decreasing the number of P. gingivalis. This also suggests that LS1 is an effective probiotic.
Probiotics in Halitosis: Halitosis is not a disease but a discomfort, although some oral diseases including periodontitis may be the underlying cause. *Streptococcus salivarius* is detected most frequently among people without halitosis and is therefore considered a commensal bacterium of the oral cavity. *S. salivarius* is known to produce bacteriocins, which contribute in reducing the number of bacteria that produce Volatile Sulphur Compounds (VSC). The use of gum or lozenges containing *S. salivarius* K12 reduce levels of VSC among diagnosed with halitosis. The common organisms involved in halitosis are *Fusobacterium nucleatum*, *P. gingivalis*, *P. intermedia* and *Treponema denticola*. These organisms degrade aminoacids, which are in turn transformed into volatile sulphur compounds which cause halitosis. Various strains of *Weissella cibaria* have the capacity to coaggregate with *Fusobacterium nucleatum* and to adhere to epithelial cells and these bacteria produce hydrogen peroxide as well asa bacteriocin which inhibited the proliferation of *F. nucleatum*. These properties could enable *W. cibaria* to effectively colonize the oral cavity and limit the proliferation of *F. Nucleatum* and thus can prevent halitosis. In the preliminary trials of the use of a chlorhexidine rinse followed by strain K12 lozenges, the majority (8/13) of subjects with confirmed halitosis maintained reduced breath levels of volatile sulphur compounds for at least 2 weeks. The replacement of bacteria implicated in halitosis with the bacteriocin-producing commensal bacterium *S. salivarius* K12 appears to provide an alternative therapy for the long-term reduction of halitosis.

Probiotics in orthodontic treatment: Fixed orthodontic appliances are considered to jeopardize dental health due to accumulation of microorganisms that may cause enamel demineralization, clinically visible as white spot lesions. White spot lesion formation can be seen as an imbalance between mineral loss and mineral gain and recently have examined Method to prevent this side effect of orthodontic treatment. Cildir et al. in 2009 conducted a clinical study with probiotics and found out that daily consumption of fruit yogurt with *Bifidobacterium animalis* subsp. Lactis DN-173010 could reduce the salivary levels of mutans streptococci in orthodontic patients with fixed appliances.

Probiotics in oral cancer: Probiotics can interfere at various stages of cancer process, more soby interference with chromosomal and DNA damage. However, more research is required to develop specific regulations on their consumption.

Probiotics in infections and oral diseases: Studies have investigated the effects of probiotic bacteria on oral candida infection in humans. When a test group of elderly people consumed cheese containing *L. rhamnosus* strains GG and *Propionibacterium freudenreichii* spp., for 16 weeks, the number of high oral yeast counts decreased but no changes were observed in mucosal lesions. Hundreds of bacteria taken from saliva of volunteers were screened where it was observed that some Lactobacillus strains had produced proteins capable of binding a particular type of sugar found on HIV envelope, called mannose. The binding of the sugar enables the bacteria to stick to the mucosal lining of the mouth and digestive tract, forming colonization. One strain secreted abundant mannose binding protein particles into its surroundings, neutralizing HIV by binding to its sugar coating. The immune cells trapped by lactobacilli formed a clump. This configuration would immobilize any immune cells harbouring HIV and prevent them from infecting other cells.

Delivery mechanisms of probiotics: Delivery mechanisms include encapsulating probiotics, such that they rehydrate at specific sites, and encasing probiotics in nano-aggregates that protect against stomach acid and deliver their payload when the pH reaches 7.4. Potentially, such nano encapsulation will also allow delivery in foods such as biscuits, whereas targeted, water protected macrocapsules containing probiotic organisms may prove useful in animal food pellets and perhaps in liquids, which currently cannot be used because of problems with shelf stability. At the macromolecular level, it will soon be possible to coat capsules with biosensors that detect the optimal conditions for the release of probiotic contents.

Conclusion and Recommendations: The oral cavity with a well maintained balance of the species and species interactions may be a potential source for health-promoting probiotic bacteria. On the other hand, daily intake of probiotic supplements can control common oral diseases. Furthermore, the dosage of probiotic administration in each indication needs to be defined. Finally, safety issues are of paramount importance with any kind of bacteriotherapy. Further research needed to understand the ability of probiotic bacteria to survive, grow, and deliver their payload when the pH reaches 7.4.
Fig. 1: Possible mechanism of action of probiotics in oral cavity

**Ethical Clearance:** Not applicable

**Source of Funding:** Self

**Conflict of Interest:** Nil

**References**


Effectiveness of Acupressure Therapy among Patients with Low Back Pain in Selected Acupuncture Clinics at Mangaluru

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Abstract

Aim: Acupressure is considering one of the safe alternative therapy. In low back pain acupressure is a best treatment until it is contraindicated and its natural ability helps to reduce the pain over conventional therapy and its side effects. This study evaluated the effectiveness of acupressure therapy on the level of pain among patients with low back pain.

Design: The pre-experimental one group pre-test post-test design was adopted as research design and Research approach was an evaluative approach. Non probability purposive sampling technique was used to select the study subjects (N=44, low back pain patients) from selected acupuncture clinics at Mangaluru.

Results: Acupressure therapy was found to have a substantial benefit in low back pain patients. Wilcoxon Sign Rank test was applied to analyze the effectiveness of acupressure therapy on patients with mild to moderate low back pain. The data analysis showed that the median pre-test score was 3 and while in post –test it improved to 2, < 0.05. Findings of the study revealed that the median post-test pain score was significantly lower than the median pre-test score after 10 days (9 minutes/day) of acupressure therapy. Likelihood Ratio was used to analyses the significant association. There was no association between the pre-test pain scores and the selected demographic variables.

Conclusion: The study findings showed that the acupressure therapy was effective in reducing the pain intensity among low back pain patients.

Keywords: Acupressure therapy, Effectiveness, Low back pain, Patients.

Introduction

Complementary and alternative medicine is a cluster of diverse medical & health care system and it is not a part of allopathic medicine, biomedicine, main stream medicine, orthodox medicine and western medicine. This therapy encloses with different directions including yoga, hypnosis, biofeedback, guided imagery, chiropractic therapy, aroma therapy, herbal remedies, relaxation, acupuncture and acupressure.¹

Acupressure is considering one of the safe alternative therapy which developed over 5,000 years ago in Asia, particularly in China. The aim of this therapy is to balance body, promote relaxation, healing and restoring of function. These points follow particular channels known as meridians, the same channel used in acupuncture. In LBP acupressure is a best treatment until it is contraindicated. The natural ability of this therapy helps to reduce the pain over conventional therapy and its side effects.²

It has some specific points (acu-points) on lower back. These points can be manipulated with the fingers instead of needles. Acupressure results, in positive outcome when it is applying properly. It is not only gives

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curative effect but also helps to prevent reoccurrence of low back pain. A person who is performing the therapy must know the proper techniques because these points can harm the patient if it applies in a wrong way. These points are located near to the spine/at waist level and the lower back points are also known as sea of vitality.

Manipulating the acupressure points are effective for serving to do diminish anxiety, stomach ache, manage nausea & vomiting, stress induced headache, tension and low back pain.

Low back pain is a common condition that affecting the lower portion of the spine. Severity is depends upon the causes either it may be acute or chronic pain. Mostly variations can occur from a dull constant ache to a sudden sharp feeling. The symptoms of the pain may start suddenly after the move. Low back pain can be sub divided into three on the basis of duration of pain, such as acute, sub-chronic and chronic.

In India, low back pain is one of the most common musculoskeletal disorder, prevalent from 6.2% to 92%, in both men and women equally. According to National Institute of Neurological disorders and stroke, LBP is extremely common in adults between 30-50 years. Symptoms and level of discomfort may vary according to the cause and associated risk factors.

Acupressure is not an age restricted therapy, but it is contraindicated in people with HTN, cardiovascular disease, cancer, TB, venereal disease, open wounds, broken bones, ulcer, contagious skin conditions and patient with weak back, in such case do not apply any pressure to lower back points. Pregnant women should refrain from acupressure therapy, because some particular points results in miscarriage.

Conventional health care practitioners are giving more importance to analgesics, muscle relaxant, opioids and NSAIDs for patients with low back pain. These medications will give quick and temporary relief with many side effects including HTN, severe GI problems, cardiovascular problems and kidney related problems. The pain will come back soon or later and in some cases will cause increased sensitivity to pain.

Materials and Method

The research approach adopted for this study was an evaluative approach. The pre-experimental one group pre-test post – test design was selected as research design. Setting of the study was selected acupuncture clinics at Mangaluru. Two types of variables are used in this study. In the present study, independent variable refers to the acupressure therapy among patients with low back pain and dependent variable refers to the pain intensity among patients with LBP. Non probability purposive sampling technique was used to select 44 LBP patients with above 18 years old & who are having mild-moderate pain.

Inclusion criteria were as follows

The inclusion criteria of the present study are:

- Those who are suffering with mild to moderate low back pain.
- Patient above 18 years old are diagnosed with low back pain.
- Those who are willing to participate in this study
- Those who are able to communicate with Kannada and English

Exclusion criteria were as follows

The exclusion criteria of the present study are:

- Patient with medication
- People with weak back
- Patient diagnosed with pathological condition of the spine, cardiovascular conditions, cancer, TB and pregnant lady.
- Who are physically disabled
- Demographic proforma and numerical pain scale were used to gather the data.

The reliability of the tool was obtained by Cronbach’s alpha method (r=0.81). The pre-test was conducted for 44 LBP patients. Then 9 minutes of (3 points - UB 25, UB 32, UB 54, bilaterally) acupressure therapy was administered daily from 1st – 10th day, after obtained the personal consent from the patients. The 10th day a post-test was conducted for the patients to assess the effectiveness of acupressure therapy. Analysis and interpretation of the data was done by descriptive statistics and inferential statistics. SPSS (version -23) was used for the statistical analysis.

Results

Section A: Description of the demographic variables of patients with low back pain
Table 1: Frequency and percentage distribution of demographic variables of patients with low back pain.  
N=44

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Variables</th>
<th>Frequency (f)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Age (in years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(a) 18-27</td>
<td>6</td>
<td>13.6</td>
</tr>
<tr>
<td></td>
<td>(b) 28-37</td>
<td>17</td>
<td>38.6</td>
</tr>
<tr>
<td></td>
<td>(c) 38-47</td>
<td>15</td>
<td>34.1</td>
</tr>
<tr>
<td></td>
<td>(d) 48 and above</td>
<td>6</td>
<td>13.6</td>
</tr>
<tr>
<td>2</td>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(a) Male</td>
<td>18</td>
<td>40.9</td>
</tr>
<tr>
<td></td>
<td>(b) Female</td>
<td>26</td>
<td>59.1</td>
</tr>
<tr>
<td>3</td>
<td>Educational</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(a) No formal education</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>(b) Primary education</td>
<td>2</td>
<td>9.1</td>
</tr>
<tr>
<td></td>
<td>(c) Secondary education</td>
<td>5</td>
<td>11.4</td>
</tr>
<tr>
<td></td>
<td>(d) PUC</td>
<td>8</td>
<td>18.2</td>
</tr>
<tr>
<td></td>
<td>(e) Graduation</td>
<td>20</td>
<td>45.5</td>
</tr>
<tr>
<td></td>
<td>(f) Post – graduation</td>
<td>7</td>
<td>15.9</td>
</tr>
<tr>
<td>4</td>
<td>Occupation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(a) Businessman</td>
<td>3</td>
<td>6.8</td>
</tr>
<tr>
<td></td>
<td>(b) IT workers</td>
<td>7</td>
<td>15.9</td>
</tr>
<tr>
<td></td>
<td>(c) Teacher</td>
<td>9</td>
<td>20.5</td>
</tr>
<tr>
<td></td>
<td>(d) Farmer</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>(e) Homemaker</td>
<td>8</td>
<td>18.2</td>
</tr>
<tr>
<td></td>
<td>(f) Health professionals</td>
<td>6</td>
<td>13.6</td>
</tr>
<tr>
<td></td>
<td>(g) Others</td>
<td>11</td>
<td>25.0</td>
</tr>
<tr>
<td>5</td>
<td>Travelling distance from residence to work place (in minutes)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(a) 1-30</td>
<td>17</td>
<td>88.6</td>
</tr>
<tr>
<td></td>
<td>(b) 31-60</td>
<td>16</td>
<td>36.4</td>
</tr>
<tr>
<td></td>
<td>(c) 61 and above</td>
<td>11</td>
<td>25.0</td>
</tr>
<tr>
<td>6</td>
<td>How many months before did the low back pain start</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(a) 0-1 months</td>
<td>18.2</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>(b) 1-6 months</td>
<td>56.8</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>(c) Above 6 months</td>
<td>25</td>
<td>11</td>
</tr>
<tr>
<td>7</td>
<td>Previous history of treatment for low back pain</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(a) Yes</td>
<td>44</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>(b) No</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>If yes specify - Ayurveda</td>
<td>8</td>
<td>18.2</td>
</tr>
<tr>
<td></td>
<td>Allopathic</td>
<td>36</td>
<td>81.8</td>
</tr>
<tr>
<td>8</td>
<td>Outcome of previous treatment</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(a) Good</td>
<td>4</td>
<td>9.1</td>
</tr>
<tr>
<td></td>
<td>(b) Moderate</td>
<td>27</td>
<td>61.4</td>
</tr>
<tr>
<td></td>
<td>(c) Poor</td>
<td>13</td>
<td>29.5</td>
</tr>
</tbody>
</table>

The data presented in table-1 describes that the highest percentages 38.60% of the subjects were in the age group of 28-37 years. Majority 59.1% of the subjects were females. Majority 45.5% of the subjects were graduates and 20.50% of them were teachers, 25% of the subjects were included in other category (majority sales man 6.82%, driver 4.54%, bank employee 4.50%, advocate, security, construction worker and catering worker were 2.30%). Majority 38.6% of the subjects travelling distance were 1-30 minutes. The highest percentage, 56.8% of the subjects were having pain for the duration of 1-6 months. All are having the previous history of treatment, In that 88.6% of the subjects were undergone for allopathic treatment. Majority 61.4% of
the subjects had moderate outcome after their previous treatment.

Section B: Assessment of level of pain among patients with low back pain.

Table 2: Level of pre-test and post test pain scores among patients with LBP. N=44

<table>
<thead>
<tr>
<th>Pain Score</th>
<th>Pre-test</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Percentage (%)</td>
</tr>
<tr>
<td>None</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Mild</td>
<td>10</td>
<td>22.7</td>
</tr>
<tr>
<td>Moderate</td>
<td>34</td>
<td>77.3</td>
</tr>
<tr>
<td>Severe</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

The data presented in table-2 describes the frequency and percentage distribution of LBP according to their pre and post-test pain score. In the pre – test, the majority of subjects 77.3% had moderate pain and 22.7% had mild pain. In the post – test, the majority of the subjects 81.8% had mild pain, 4.5% had moderate pain and 13.6% had no pain.

Section C: Effectiveness of acupressure therapy on patients with low back pain.

Table 3: Mean, SD and Z value of effectiveness of acupressure therapy. N=44

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>Median</th>
<th>IQR</th>
<th>Z test</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test</td>
<td>2.77</td>
<td>0.423</td>
<td>3</td>
<td>3 to 3</td>
<td>-5.453</td>
<td>0.001</td>
</tr>
<tr>
<td>Post-test</td>
<td>1.91</td>
<td>0.421</td>
<td>2</td>
<td>2 to 2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Wilcoxon Sign Rank test (Z test) was used to analyze the effectiveness of acupressure therapy on pain among patients with LBP and the data analysis showed that (table-3) the median pre-test score was 3 and while in post – test it improved to 2. Findings of the study revealed that the median post-test pain score was significantly lower than the median pre-test score. Therefore it concluded that the acupressure therapy is effective in reducing the pain intensity among patients with low back pain.

Discussion

Demographic variables of patients with low back pain: The present study demonstrated that acupressure therapy has large benefit on low back pain. In this study among 44 LBP patients majority 59.1% of the subjects were females and the highest percentage 38.60% of the subjects were in the age group of 28-37 years. Present study findings were supported with a descriptive study conducted by Deeksha Tiwai and Garima Gupta among 300 house wives between the age group of 25-70 years were selected randomly to identify the prevalence, social burden and its impacts among patients with LBP in Kanpur. Among the respondents 93% had fresh complaints of LBP. Chronic LBP was reported among 82% of the house wives and 71% were reported limited daily activity due to pain since one year. The study was concluded that prevalence of LBP was more in housewives of Kanpur city.

Effectiveness of acupressure therapy on patients with low back pain: Wilcoxon Sign Rank test (Z test) was used to analyze the effectiveness of acupressure therapy among patients with LBP and the data analysis showed that the median pre-test score was 3 and while in post – test it improved to 2. Findings of the study revealed that the median post-test pain score was significantly lower than the median pre-test score. Therefore it concluded that the acupressure therapy was effective in reducing the pain intensity among patients with low back pain. Present study findings were consistent with another study which was conducted in university of Pittsburgh, USA to assess the effectiveness of acupressure therapy among patient with chronic low back pain. Results of the study revealed that subjects who received true auricular point acupressure experienced 75% reduction in overall pain severity, 70% of the subjects experienced with reduction in worst pain intensity and 42% reported development in disability due to low back pain than in sham auricular point acupressure group subjects. The study was concluded that true auricular point acupressure was more effective than sham auricular point acupressure among patients with low back pain.
Association between the pre-test pain scores and the selected demographic variables: Likelihood Ratio was used to analyse the significant association between the pre-test pain scores and the selected demographic variables. Likelihood ratio of age was 6.469, gender - 0.437, education - 4.288 and occupation - 7.169, (p > 0.05). There was no association between the pre-test pain scores and the selected demographic variables. Present study findings were supported with another cross-sectional study which was carried out by Anita Shankar Acharya et.al among 1,355 administrative service and medical postgraduate aspirants, from coaching institutes in Delhi, aged between 18–35 years. Majority (90.6%) of the respondents were aged between 20–29 years. Results revealed that, age, gender, posture, dietary pattern, cigarettes smoking, alcohol consumption, caffeine intake, distance and method of travelling, frequency of heavy lifting, wearing high heels, and participating in sports activities were not associated with LBP.11

Conclusion

The focus of the study was to evaluate the effectiveness of acupressure therapy on low back pain patients. One group pre-test post-test design and evaluative approach was adopted for the study. The study involves selection of 44 samples by the purposive sampling technique and collection of data done by using demographic proforma and numerical pain scale. The pain scores of subjects after the acupressure therapy suggested that the reduction in pain was occurred due to the effect of the acupressure therapy. Reduced pain intensity will also keep the people very active in their day to day activities. Therefore it concluded that the acupressure therapy was effective in reducing the pain intensity among patients with low back pain. There was no association between the pre-test pain scores and the selected demographic variables. Analysis of the obtained data was based on the objectives and hypothesis; both descriptive and inferential statistics were used for data analysis.

Conflict of Interest: Nil

Ethical Clearance: Obtained from Yenepoya University Ethical committee

Source of Funding: Self

References

Awareness about Blood Donation Process and Transfusion Transmitted Malaria in a Tribal District of Odisha, India

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Abstract

Background: Voluntary blood donation from healthy and active student populations is the safest and most ideal way to improve the quality of blood in blood banks across the country. Studies are required to be conducted at educational institutes to investigate the awareness about blood donation process among students.

Method: A total of 585 students from four colleges were interviewed with the help of structured questionnaire to collect information regarding their knowledge about blood group and blood donation process, willingness for blood donation as well as awareness towards transfusion transmitted malaria (TTM).

Results: The majority of participants (68.8%) were unaware of their blood group. Out of total 585 students 37.3% had appropriate knowledge regarding the various aspects of blood donation and only 25.3% students were aware of TTM. Although 17.7% students have donated blood once, 56.2% were willing to be blood donors in future.

Conclusion: Compared to urban dwelling general category students, the rural students belonging to socially backward category were associated with significantly inappropriate knowledge about blood group and donation process. In spite of residing in a malaria endemic region majority of students demonstrated scarce knowledge regarding TTM. There is need for regular blood donation awareness campaigns in educational institutes to provide motivation and correct information about the process of blood donation to these young and potential blood donors.

Keywords: Blood donation; Blood group; Awareness; Transfusion; Malaria.

Introduction

Blood transfusion is considered an indispensable component of health care as it saves millions of lives each year worldwide. As there is no substitute to blood, blood donation is of utmost importance for patients with bleeding disorders, accidents, child birth, surgeries, hematological diseases and malignancies. The World Health Organization (WHO) recommended an increase of voluntary blood donation units and widespread awareness of blood donation, especially among young people. The healthy, active and huge student populations can be a good source of quality blood as they are less commonly affected with some popular diseases like hypertension, diabetes, cardiovascular problems etc. unlike the older candidates. Further, it is easy to access this group through internet and social media through mobile applications.

Transfusion transmitted malaria (TTM) poses a major threat to blood banking system. Ethical concern has been raised regarding rejection of parasitaemic blood donors in malaria endemic countries where blood supplies are insufficient and rejecting such donors will exacerbate already critical blood shortage. Donor deferral based on history of exposure to malaria is not feasible in endemic countries as the exposure is universal. Malaria rapid diagnostic tests (RDTs) have been recommended by WHO for confirming malaria
diagnosis in blood donors, however, they have not been widely evaluated as a screening tool in malaria endemic settings. Therefore, awareness is required about TTM among potential blood donors in malaria-endemic regions which can improve the quality of blood collected through voluntary blood donation.

There is lack of awareness among socially underdeveloped communities about the measures needed to protect their health. Hence, studies are needed to be conducted at school and college levels to educate these students from deprived backgrounds which they can propagate at higher community level. Therefore, the objective of this study was to determine the knowledge about blood donation process as well as awareness about the blood TTM among undergraduate students in this backward malaria-endemic region of Odisha, India.

**Materials and Method**

**Study design and Setting:** This was a cross sectional study conducted in four undergraduate colleges in district Kandhamal, Odisha, India, during the period of August 2017 to March 2018. A total 585 students from four colleges were selected by doing systematic sampling from each college. After approval from the institutional ethical committee, the principal investigator explained the nature and purpose of the study to all randomly selected students and written informed consent was taken from them. Data was collected through face to face interviews using a pre-tested, close-ended questionnaire.

**Data Analysis Procedure:** The data so collected was analysed by Statistical Package for Social Sciences (SPSS 19.0). Descriptive statistics was used to determine mean and standard deviation for continuous variables like age while frequency and percentage for qualitative variables (gender, college, class year, caste, place of residence etc.). Scoring was done for knowledge and willingness towards blood donation process and about TTM; each right response was given a score of 1 while a wrong or unsure response was scored 0. Multiple regressions were used to examine the effect of two or more independent variables on a single dependent variable to test the statistical significance at 95% confidence level. P-value of < 0.05 was considered as significant.

**Results**

A total of 585 interviews were performed during data collection period. The mean age of participants was 20 ± 1.58 years. Majority of respondents were males (54%), studying to Govt. College (60.3%), belonged to general category (53.3%) and resided in rural areas (57%). of the 585 students, only 31.2% (n = 183) knew their blood group. The main sources of data were the Personal Health Record (n = 83, 45.3%), verbal information from parents (n = 41, 22.4%), the results of laboratory examinations performed on a doctor’s recommendations (n = 28, 15.3%), results obtained from the blood donation campaign during blood donation (n = 22, 12%) and the results of analysis performed during college classes (n = 9, 5%).

Majority of participants (62.6%) had no proper knowledge regarding various aspect of blood donation process like frequency, exclusion criteria, minimum age, weight, haemoglobin levels and volume of blood required for donation. The sum of responses was summarized as a knowledge score and a logistic regression analysis was performed (Table 1). Male students were associated with appropriate knowledge of blood donation when compared against female gender (AOR: 0.5, 95% CI: 0.3-0.8). General category students scored much better in possessing appropriate knowledge regarding blood donation as compared to reserved backward communities (AOR: 0.2, 95% CI: 0.1-0.3). Students studying in 3rd year possess better knowledge as compared to 1st and 2nd year (AOR: 2.6, 95% CI: 2.0-3.4). Students of Urban residing students scored better than rural students in having appropriate knowledge (AOR: 0.2, 95% CI: 0.1-0.4) (Table 1).

Out of 585 study participants only 17.7% (n=104) subjects had ever donated blood. However, 56.2% (n=318) showed willingness towards blood donation in future. The major reason for donating blood was to save lives (43.5%, n=255) while ignorance (36.2%, n=212) was the major reasons of not donating blood (Figure 1). Male students (AOR: 0.5, 95% CI: 0.3-0.7) showed more willingness towards blood donation when compared against female students (Table 2).

Knowledge about TTM was generally low among the students. Almost 21.4% students had not heard about TTM. Almost 30% of students felt that a person who has suffered from malaria should not donate blood and 32% respondents were of the opinion that screening for malaria should be performed before blood donation to prevent TTM. Urban residing students (AOR: 0.5, 95% CI: 0.3-0.8) showed better scores as compared to rural students (Table 3).
Table 1: Comparison of knowledge level about blood donation process by Socio demographic characteristics among study participants (n=585)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Total Frequency (percentage)</th>
<th>Appropriate knowledge Frequency (percentage)</th>
<th>Inappropriate knowledge Frequency (percentage)</th>
<th>COR (95% CI)</th>
<th>AOR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>269 (45)</td>
<td>83 (30.8)</td>
<td>186 (69.1)</td>
<td>0.6</td>
<td>0.53</td>
</tr>
<tr>
<td>Male</td>
<td>316 (54)</td>
<td>128 (40.5)</td>
<td>188 (59.4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caste</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reserved</td>
<td>273 (46.6)</td>
<td>54 (19.7)</td>
<td>219 (80.2)</td>
<td>0.2</td>
<td>0.22</td>
</tr>
<tr>
<td>General</td>
<td>312 (53.3)</td>
<td>157 (50.3)</td>
<td>155 (49.6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st yr</td>
<td>196 (33.5)</td>
<td>34 (17.3)</td>
<td>162 (82.6)</td>
<td>2.6</td>
<td>2.6</td>
</tr>
<tr>
<td>2nd yr</td>
<td>218 (37.2)</td>
<td>76 (34.8)</td>
<td>142 (65.1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd yr</td>
<td>171 (29.2)</td>
<td>101 (59)</td>
<td>70 (40.9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>College</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private college</td>
<td>232 (39.6)</td>
<td>81 (34.9)</td>
<td>151 (65)</td>
<td>0.92</td>
<td>0.8</td>
</tr>
<tr>
<td>Govt. College</td>
<td>353 (60.3)</td>
<td>130 (36.8)</td>
<td>223 (63.1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Place of residence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>333 (57)</td>
<td>80 (24)</td>
<td>253 (76)</td>
<td>0.29</td>
<td>0.26</td>
</tr>
<tr>
<td>Urban</td>
<td>252 (43)</td>
<td>131 (52)</td>
<td>121 (48)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Knowledge score ≥ 10 is appropriate and <10 is inappropriate., *Statistically significant at p< 0.05.

Table 2: Comparison of willingness for blood donation by Socio demographic characteristics among study participants (n=585).

<table>
<thead>
<tr>
<th>Variables</th>
<th>Willingness Frequency (percentage)</th>
<th>Unwillingness Frequency (percentage)</th>
<th>COR (95%)</th>
<th>AOR (95%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>125 (46.4)</td>
<td>144 (53.3)</td>
<td>1.1</td>
<td>0.55</td>
</tr>
<tr>
<td>Male</td>
<td>193 (61)</td>
<td>123 (39)</td>
<td>(0.9-1.4)*</td>
<td>(0.39-0.77)*</td>
</tr>
<tr>
<td>Caste</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reserved</td>
<td>134 (49)</td>
<td>165 (60.4)</td>
<td>0.55</td>
<td></td>
</tr>
<tr>
<td>General</td>
<td>184 (59)</td>
<td>102 (32.6)</td>
<td>(0.39-0.76)</td>
<td></td>
</tr>
<tr>
<td>Class</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st yr</td>
<td>98 (50)</td>
<td>98 (50)</td>
<td>1.2</td>
<td></td>
</tr>
<tr>
<td>2nd yr</td>
<td>121 (55.5)</td>
<td>97 (44.4)</td>
<td>(0.92-1.8)</td>
<td></td>
</tr>
<tr>
<td>3rd yr</td>
<td>99 (57.8)</td>
<td>72 (42.1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>College</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private college</td>
<td>125 (53.8)</td>
<td>107 (46.1)</td>
<td>1.2</td>
<td></td>
</tr>
<tr>
<td>Govt. College</td>
<td>193 (54.6)</td>
<td>160 (45.3)</td>
<td>(0.89-1.71)</td>
<td></td>
</tr>
<tr>
<td>Place of residence</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>175 (52.5)</td>
<td>158 (47.4)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>143 (56.7)</td>
<td>109 (43.2)</td>
<td>(0.74-1.4)</td>
<td></td>
</tr>
</tbody>
</table>

Score ≥ 5 is willingness to donate blood and < 5 is unwillingness to donate blood., *Statistically significant at p< 0.05.
Table 3: Comparison of Knowledge level about TTM by Socio demographic characteristics among study participants (n=585).

<table>
<thead>
<tr>
<th>Variables</th>
<th>Appropriate knowledge Frequency (percentage)</th>
<th>Inappropriate knowledge Frequency (percentage)</th>
<th>COR (95% CI)</th>
<th>AOR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>56 (20.8)</td>
<td>213 (79.1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>65 (20.5)</td>
<td>251 (79.4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caste</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reserved</td>
<td>53 (19.4)</td>
<td>220 (80.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>General</td>
<td>68 (21.7)</td>
<td>224 (78.2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st yr</td>
<td>42 (21.4)</td>
<td>154 (78.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd yr</td>
<td>42 (19.2)</td>
<td>176 (80.7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd yr</td>
<td>37 (21.6)</td>
<td>134 (78.3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>College</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private college</td>
<td>48 (20.6)</td>
<td>184 (79.3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Govt. College</td>
<td>73 (20.6)</td>
<td>280 (79.3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Place of residence</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>41 (12.3)</td>
<td>292 (87.6)</td>
<td>0.58</td>
<td>0.58</td>
</tr>
<tr>
<td>Urban</td>
<td>80 (31.7)</td>
<td>172 (68.2)</td>
<td>(0.38-0.87)*</td>
<td>(0.38-0.88)*</td>
</tr>
</tbody>
</table>

Knowledge score ≥ 7 is appropriate and < 7 is inappropriate., *Statistically significant at p< 0.05.

Figure 1. Reasons for no donation of blood among study participants (n=585).

Discussion

Blood donation decision making has been investigated worldwide to understand the process better which would increase donation efficiency among young subjects especially students. The present study suggests that there is deficient basic knowledge regarding blood groups (31.2%) and blood donation process (28.2%) among undergraduate students in these backward areas. Majority of the students lack basic information about universal blood donors or acceptors, rare blood group types etc. Interestingly, few first time donors took part in blood donation camps so that they can get a free analysis of their blood types. Hence, clear and concise information regarding the blood donation process should be provided in blood donation camps to the first time donors. On the contrary, other studies have specified that the students possess very high knowledge regarding blood donation.[6] The difference could be a reflection of the perception of practice of blood donation in different societies. Further, most of the studies were carried
among medical students who possess better fundamental knowledge about blood donation in comparison to non-medical undergraduate students as in the present study.

There are several studies that predict the attitude of non donors, first-time donors, and repeated donors and analyze the most common causes of refusing blood donation. The present survey indicates that only 17.7% of students have donated blood. This is comparable (15%) with findings from a study performed in Nigeria but very low as compared to the study results obtained from university students in Nepal (43%).

Interestingly, majority of the student blood donors confirmed that they have donated only in blood donation camps especially which were organized in the college by Red Cross Society. This aspect indicates the importance of blood donation camps in educational institutes. In our survey students were more likely to donate blood in case of increased demand (32%), because they realized that blood transfusion is a noble act and might save someone’s life. This altruistic behaviour shown by students is in agreement with other studies and needs to be cultivated for retention of blood donors. However, a great majority of respondents (33%) considered donating blood to someone closely related, as observed elsewhere. Almost 36% of students have never considered becoming a blood donor due to lack of information about when, where and whom to donate blood. This finding has been corroborated by reports from other studies.

Startlingly, it was found that despite performing the surveys among adults, some respondents (16%) do not donate blood because their parents do not agree. This was found more amongst female students. Further, it was found that compared to males students (61%), female students (46.4%) were less willing to donate blood. These findings were comparable with other survey reports. Females may not be able to donate blood because of monthly menstrual cycles. About 7.6% of respondents stated that there is nothing that could convince them to become a blood donor. The reasons for the statement were probably based on one’s belief that the collected blood is wasted or not safe in blood banks or is never available on time when needed. Other causes of refusal for blood donation amongst non donors were attributed to health reasons, fear of needles, painful experience of blood collection and fear of complications and disease transmission. It is also important to note that all the reasons provided by the students for not donating blood could be addressed through blood donation awareness campaigns by providing emphasis on benefits to be derived from blood donation. In the current study it was found that about 56.2% have never donated blood, but do not refuse that they might become a blood donor in the future. These findings are aligning with other studies elsewhere. The Blood Transfusion Services should use this opportunity and come with customized schemes to target this group in order to increase their proportion of voluntary blood donation.

The risk of TTM is high in all malaria-endemic areas due to high prevalence of the infection in the blood donor community. This can create a major problem as semi-immune individuals with low level of parasitemia can remain asymptomatic and may qualify as blood donors. Donated blood is not routinely screened for malaria parasites in most malaria-endemic countries unlike that in nonmalaria-endemic regions. As a result there is a high prevalence of TTM due to blood donation from asymptomatic blood donors in malaria-endemic regions, but strategies to curtail its transmission are seldom applied. There is very little published data relating to knowledge and attitudes of blood donors to TTM. This is the first study conducted to investigate the awareness among undergraduate students about TTM in a malaria endemic district of Odisha, India.

Conclusion

This study indicated that the level of knowledge and awareness about blood group, blood donation process and transfusion transmitted malaria was very less among the undergraduate students especially from underprivileged backward classes residing in rural areas. Although, a major proportion of students had never donated blood, but most of them were willing to donate in future. There is need for regular blood donation awareness campaigns in educational institutes and the society at large to give these young and potential blood donors motivation and correct information on the process of safe blood donation as well as the knowledge on the value of blood as a lifesaver. At such social campaigns, potential donors should be encouraged to register themselves in some social networking sites so that donation reminders can be sent to them when required.

Conflict of Interest: Nil

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.
References


15. Giri PA, Phalke DB. Knowledge and attitude about blood donation amongst undergraduate students of Pravara Institute of Medical Sciences Deemed University of Central India. *Ann Trop Med Pub Health* 2012; 5: 569-73.


Reproductive and Sexual Health Knowledge and Utilization of Services among Adolescents: A Review Based on Available Literature

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Abstract

Introduction: Today adolescent’s RSH is one of the essential health concern which focussed as global attention. Adolescents often lack basic reproductive health (RH) information, knowledge and access to health services for RH.

Objectives: To determine the knowledge on reproductive and sexual health and utilization of services among adolescents.

Method: A comprehensive systematic session of published literature and journal articles from Pub Med and EBSCOHOST databases was done that are focussing from 2010 – 2017. Search strategy specific to each databases was used.

Result: Out of seven articles, one research study finding is showing good knowledge on RH and services. One research study found that the female adolescents had moderate knowledge regarding RSH. Two research studies revealed that lack of knowledge about RSH. Three research studies found that there was poor utilization of RSH services.

Conclusion: This review concludes that there is a need for intensified effort to increase the knowledge on RSH and utilization of services by adolescents. Hence, multiple approaches are needed to reach and meet the diverse needs of the different age group of adolescents.

Keywords: Knowledge, Reproductive and Sexual Health (RSH), Utilization, Services, Adolescents.

Introduction

Today’s generation of adolescents are the largest in history and the major source of human resource for the development of any nation. According to WHO estimates, one in every five people in the world is an adolescent.¹ Globally the adolescent is estimated to reach 1.25 billion where 85% of the adolescents are residing in the developing countries.² Adolescents are one of the heterogeneous group and that are the most vulnerable to a range of reproductive health problems, such as teenage pregnancy and childbearing, unsafe abortion and sexually transmitted infections (STI’s), including HIV.²⁻³ The reproductive and sexual health of adolescents has been recognised as an important health concern and has been focus as an important component of global attention.⁴ Globally, a number of strategies have been adopted. Universal access to sexual and reproductive health (SRH) services for adolescents as added as a target to the revise Millennium Development Goals framework in 2005. As a result, there is growing recognition of an appropriate and effective strategy to address sexual and reproductive health (SRH) needs of adolescents. Different SRH programs have been initiated at community and school levels in order to reach adolescents.⁵
A study conducted by UNICEF found that 6% of school going children in the age group of 14 – 19 years were engaged in heterosexual intercourse and reported that around 20% of them knowing the friends who were sexually active.\(^4\)

Young adults have insufficient access to preventive and curative services; however they have limited access to reproductive health information. The reproductive health of women in low income countries represents a growing concern as per the rates of HIV infection among women is become higher than men. A study conducted at reproductive health (RH) clinics in Egypt reported that there was lack of knowledge on RH and also poor attendance rate of female population at the clinics.\(^6\)

Hence, it was found necessary to design a narrative review to find the available literature for identifying the reproductive and sexual health knowledge and utilization of services among adolescents.

**Aim:** The aim of this review is to identify the knowledge on reproductive and sexual health and utilization of services among adolescents.

**Objectives:** To determine the reproductive and sexual health knowledge and utilization of services among adolescents.

**Methodology**

**Search Strategy:** An electronic search of articles published in various journals till 2017 (September) was conducted. Search was restricted to only English language. The database search done was Pub Med and EBSCOHOST. Articles containing following key search terms were retrieved.


**Types of Study:** Community based cross-sectional, comparative, survey and phenomenological study.

**Types of Participant:** Adolescents including females; School-going students and Young women.

**Settings:** Community-Town, Urban Slum, Schools and University.

**Outcome:** Knowledge of Reproductive and Sexual Health and its utilization among adolescents.

**Result**

The systematic search was conducted by framing the terms individually and in combination with all synonyms, also according to the database. In addition to this, a manual Pub Med search was undertaken using the keywords and search synonyms from already found articles. Additions of seven articles were found. Initial search retrieved 541245 articles over which 83363 articles were selected manually. Duplicates were removed and reviewed 410 articles for eligibility. 82953 articles were excluded because they didn’t match with the study criteria. 370 studies were excluded due to unavailability of full text. Hence seven articles were screened which included in qualitative synthesis.

**A detail description of study**

1. Tegegn. Ayyalew et al. conducted a Community-based Cross-sectional study in the year of 2008 on Reproductive Health Knowledge and Attitude among Adolescents in Jimma Town, Southwest Ethiopia. 1130 Adolescents were selected by Systematic sampling technique. Data was obtained by interview method using structured questionnaire. Findings revealed that majority of adolescents knew major health services for RH and the main health service providers of RH. The average index score of attitude for health services of RH was also moderately favourable.

2. Heewageegana. Rajapaksa. Neelamani et al. conducted a Survey in the year of 2015 on Sexual and reproductive knowledge, attitudes and behaviours in a school going population of Sri Lanka. Total 2020 adolescents were selected by simple random sampling technique. Data was obtained by Self-completion Questionnaire. Findings revealed that most of them reported good parent – child relationship (88%). A minority (34%) discussed sexual issues with parents. Health professional were the preferred source of information (32%) rather than parents (12.5%) or friends (5.6%). Less than 1% demonstrated satisfactory sexual and reproductive knowledge levels.
3. **Bobhate S. Prateek et al.** conducted a Cross-sectional study in the year of 2011 on knowledge and practices about Reproductive Health among Female Adolescents in an urban slum of Mumbai. 241 Females were selected by purposive sampling. Data was obtained by face to face interview method using Semi-structured questionnaire. Findings revealed that Seventy nine (32.8%) subjects had unsatisfactory menstrual hygiene practices. Two hundred twelve (88%) women were aware about availability of ANC services. Sixty six per cent of women had correct knowledge of mode of transmission of HIV while only 18.7% knew about safe sexual practices. Education status and early adolescents age group was found to be significantly associated with the knowledge of adolescents regarding menstruation.

4. **Gelany. El Saad. et al.** conducted a Cross-sectional, community-based survey in the year of 2013 on Reproductive health awareness among educated young women in Egypt. 220 Female students were selected by purposive random sampling technique. Data was obtained by interview method by using Structured in-depth questionnaire. Findings revealed that a large proportion of the participants exhibited misunderstanding or a complete lack of knowledge about important RH issues.

5. **Bilal M. Selamawit. et al** conducted a Cross-sectional survey in the year of 2015 on Utilization of Sexual and Reproductive Health Services in Ethiopia – Does it affect sexual activity among high school students. 1042 female and male high school students were selected by multistage sampling technique. Data was obtained by self-administered questionnaire. Findings revealed that one out of five students had used the SRH services in the past year. The primary reason for visiting the SRH services was to receive information. The mean age for the first sexual intercourse was 15.7 and one-quarter of the students had multiple sexual partners. Unwanted pregnancies and abortion were reported by female students.

6. **Prasad. Shailaja M. et al.** conducted a Comparative study in the year of 2015 on Adolescent Reproductive and Sexual Health Practices (ARSH) and adolescent gynaecological problems among the girls in Sweden and India. 400 Swedish and Indian adolescents’ girls were selected by purposive sampling technique. Data was obtained by interview method using questionnaire. Findings revealed that ARSH practices were safe in Sweden in sharp contrast to India. Gynaecological problems were similar in the adolescents of both countries.

7. **Goodia. Pamela et al.** conducted a phenomenological study in the year of 2014 on Young people’s perception of sexual and reproductive health services in Kenya. 57 young boys and girls were selected by purposive sampling technique. Data was obtained by focussed group discussion and In-depth interview method using semi-structured questionnaire. Findings revealed in the following themes that are: SRH problems faced by young people, Addressing the SRH needs of young people, Perceptions of existing SRH services, Suggestion on how to improve SRH service.

**Summary and Findings:** The available literature refined to get Six quantitative and One qualitative. Out of Seven articles, one research study finding is showing good knowledge on Reproductive Health and Services. One research study found that the female adolescents had average knowledge regarding Reproductive and Sexual Health. Two research studies revealed that lack of knowledge about Reproductive and Sexual Health. Three research studies found that there was poor utilization of Reproductive and Sexual Health services.

**Importance in Education and Society:** Adolescents are too often left out of policy planning and service delivery. More focus needs to be placed on providing learning and preparation for the world of work, building healthy lifestyles that reduce non-communicable diseases and improve sexual health, and protecting adolescents from involvement in violence.

Reproductive health is not just about sex. It is part of a holistic health program starting from early age teaching values and understanding the anatomy and physiology of their body. This education continues when they are young adults to have safe and acceptable access to method of fertility regulation of their choice and the right to have access to appropriate healthcare services.

To maintain one’s sexual and reproductive health, people need access to accurate information. They must be informed and empowered to protect themselves from sexually transmitted infections. When they decide to have children, women must have access to services that can help them have a fit pregnancy, safe delivery and healthy baby.
**Future Significance:** The review helps to understand the knowledge on reproductive and sexual health and utilization of services among adolescents. 30% of India’s total population comprises of adolescents. Hence, it is necessary to create awareness among people, especially the adolescents, regarding various reproduction related aspects as the adolescents are the future of the country and they are most susceptible of acquiring sexually transmitted diseases.

**Limitation**
- Search strategy was limited to two databases.
- Search strategy was refined to knowledge on reproductive and sexual health and utilization of its services only.
- Was limited to only in Adolescents.
- Seven articles were included only.

**Strength**
- Article search was carried out on significant criteria.
- Review could find out the gap between knowledge on reproductive and sexual health and its service utilization among the adolescents.

**Weakness**
- Articles mainly focus on only knowledge.
- Only six quantitative and one qualitative articles were included for data synthesis due to limitations.

**Conclusion**
Knowledge on reproductive and sexual health can be increased through awareness and also by providing Reproductive and Sexual Health education among adolescents at school level. Collaboration and networking are the key strategies to improve adolescent access to reproductive and sexual health services. There is a need to network with organized and unorganized sector such as education, ICDS, NGOs working in the field of adolescent health and development to work as a team and address the multifaceted needs of the adolescents.

**Conflict of Interest:** Nil

**Source of Funding:** Self

**Ethical Clearance:** Ethical permission was taken.

**References**
A Retrospective Study to Understand the Clinico-Social Profile of Neonatal Deaths in a Teaching Hospital

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Abstract

Introduction: The first 28 days of life is the neonatal period, which represents the most vulnerable time for a child’s survival. In 2015 neonatal mortality rate was 19 and 28 per 1000 live births for world and India respectively. It is important to reduce neonatal mortality to address the major causes of neonatal deaths.

Objective: (1) To understand the clinico-social profile of the neonatal deaths. (2) To correlate the causes of neonatal deaths with age, parity and other obstetrics parameters.

Methodology: A retrospective study was conducted in Department of Pediatrics, Belagavi Institute of Medical Sciences, Belagavi from January to December 2016. 114 study cases were included, the parents of the expired neonates who were admitted in Pediatric Department, BIMS Hospital were interviewed for the information about socio-demographic details, antenatal, natal and postnatal history by using pre-designed, pre-tested and structured questionnaire after taking written informed consent. The cause of neonatal death was recorded from case sheet after taking permission from the Department of Paediatrics. Data was analysed using Ms Excel 2007 and SPSS version 22, proportion and chi square test was applied and p value < 0.05 was considered as significant.

Results: 70 (61.4%) and 44 (38.6%) of them were found to be male and female respectively. 83 (72.8%) of them resided in rural area whereas, 31 (27.2%) resided in urban area. Majority (26.3) of the mothers were illiterate. The common causes of death among the deceased neonates were prematurity (43.9%) followed by, birth asphyxia (36%). Age of the deceased neonates (early neonates, late neonates) was significantly associated with educational status of the mothers (P < 0.05) and practice of washing hands with soap water after defecation (P < 0.05).

Conclusion: Most of the neonatal mortalities can be prevented by effective implementation of MCH services and timely interventions.

Keywords: Neonate, Mortality, Hospital.

Introduction

Today’s children are tomorrow’s citizens of the country. Thus, the normal health and growth of children plays an important role in the prosperity of the country¹. Neonatal period (first 28 days of life) represents the most vulnerable time for a child’s survival². The children are at an increased risk of mortality and morbidity than the general population, this is more so in the first year of life. More than half the infant deaths occur in the first 28 days of life¹. According to WHO (2016) neonatal deaths contribute about 46% of under-five mortality. Globally, neonatal mortality rate (NMR) was 19 per 1000 live births and in India it was 28 per 1000 live births (2016)³. So, it is essential to reduce neonatal morbidities and mortalities, as by doing so one can reduce the infant mortality, for which the neonatal mortality is the largest.
Sustainable development goal (goal three, target two) states that, by 2030, end preventable deaths of newborns and aim to reduce NMR to 12 per 1000 live births\textsuperscript{5,6}.

Despite several interventions implemented for the improvement of neonatal survival, the pace of decline in NMR has been slow. Neonatal mortality is an important public health problem. Hardly there are any study conducted in Karnataka and Belagavi regarding all the determinants of neonatal mortality. The present study is an attempt to fill the knowledge gaps in understanding the socio-demographic profile of the neonates dying in a teaching hospital and to assess the etiological factors responsible for the neonatal deaths.

**Material and Method**

A retrospective study was conducted among the expired neonates in Department of Pediatrics, BIMS, Belagavi during the period of January to December 2016. Ethical Clearance was obtained from Institutional Ethical Committee (IEC). A formal permission to conduct the study was obtained from the authorities of the hospital and consent was taken from mother or the close relatives of study participants. Sample size was estimated by considering the proportion of the most common cause of neonatal deaths. According to a study by Ramdurg U Yet al.\textsuperscript{4} The proportion of the most common cause of neonatal deaths was found to be contributed by birth asphyxia by 34.6%. Considering 10% of allowable error, minimal sample size being 101; however, the present study included 114 study participants. All neonatal deaths occurring in Paediatric Department (NICU, PICU and ward), BIMS Hospital, Belagavi, who fulfilled selection criteria were studied till the required sample size was reached.

A structured, pre-validated, questionnaire was used to collect relevant data from the informant of the deceased neonates i.e., either mother or the close relatives through personal interviewing. The information regarding condition of the neonates before the death and cause of death of each deceased neonates was collected from the treating doctors. Neonates admitted under Paediatric Department (Neonatal intensive care unit (NICU), Paediatric intensive care unit (PICU) and ward), BIMS Hospital, Belagavi, who expired during their stay in the Hospital and all inborn / outborn deceased neonates were included. Neonate age or date of birth not known, mothers or relatives not willing to give information and mothers seriously ill and relatives not knowing the details of antenatal, intranatal and postnatal were excluded. Data was entered in Microsoft excel sheet 2007 and analyzed in SPSS version 22. Chi square test was used to test the association between different qualitative variables. At 95% Confidence interval, a probability value (p value) of \( \leq 0.05 \) was considered as statistically significant.

**Findings:** As shown in table 1, nearly half of the mothers of deceased neonates belonged to the age group of 21 – 25 years (46.5%), followed by less or equal to 20 years (28.9%). 70 (61.4%) and 44 (38.6%) of them were found to be male and female respectively. 83 (72.8%) of them resided in rural area whereas, 31 (27.2%) resided in urban area. Majority (26.3%) of the mothers were illiterate.

In the present study, majority (50.9%) of deceased neonates were found in first birth order of the mother, followed by second birth order (29.8%), 32 (27.2%) of them were born within 1 – 2 years of birth interval, 13.2% of the study cases were found to have 3 – 4 years of birth interval. Most (85.1%) of them were born in Government health facilities, followed by private health facility (7.9%), home (5.3%). Surprisingly 2 (1.8%) cases were born in vehicle during travel to the health facility as seen in Table 2.

Table 3 shows, age of the deceased neonates (early neonates, late neonates) was significantly associated with educational status of the mothers (\( P < 0.05 \)) and practice of washing hands with soap water after defecation (\( P < 0.05 \)). No relationship was found with the sex of the study cases (\( P > 0.05 \)). The common causes of death among the deceased neonates were prematurity (43.9%) followed by, birth asphyxia (36%), sepsis (12.3%), pneumonia (2.6%) and congenital anomalies and other (2.6%) (figure 1).

**Discussion**

82.5% of the deceased neonates were early neonates and 12.5% of them were late neonates. Similar findings were found in studies conducted in Government hospitals in Andhra Pradesh and Maharashtra, majority of the study cases were neonates followed by post neonates\textsuperscript{6,7}. Nearly half of neonatal deaths occurred among the mothers of age 21 – 25 years (47.5%). Similar results were found in a studies conducted in other countries by Kananura M R et al.\textsuperscript{8}. In the current study majority of the deceased neonates were found to be male. Similar findings were found in studies conducted in by Patil RB.
et al., Upadhyaya S et al., Dube L et al., Manandhar S R et al., Titaley LC et al., and Weldearegawi B et al. This shows biological vulnerability of males to infection is more than females in their early ages. Most of the study cases resided in rural areas, similar findings were reported in a study done in India and also in other countries studies by Dube L et al., Titaley C R et al., and Mekonnen Y et al.

In this study majority (73.6%) of the mothers were literate. Most of the neonatal deaths occurred in less than secondary level of education and this association was statistically significant. Similar findings are seen in the studies conducted by Kusneniwar G N et al. and Mekonnen Y et al. Maternal education is argued to improve child health through increased knowledge about the practices to improve child health and increased use of maternal care services. However studies conducted in Ethiopia and Kenya showed no association between maternal education and neonatal mortality.

In this study, the common causes of death among the deceased neonates were prematurity (43.9%) followed by, birth asphyxia (36%) and sepsis (12.3%). Prematurity was the commonest cause of deaths in studies done by Patil R B et al. and Prasad V K et al. However, birth asphyxia was the commonest cause in studies done in southern India, Maharasta, Karnataka (Bagalkot) and Bangladesh. As this study was hospital based, the findings cannot be generalized at the community level and a prospective follow up study of all newborns would have been ideal to know the risks associated with neonatal deaths. These were the limitations of the study.

### Table No 1: Distribution of the study cases according to socio-demographic variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Males N= 70 (%)</th>
<th>Females N= 44 (%)</th>
<th>Total N=114 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mothers age (yrs)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 20</td>
<td>17 (24.3)</td>
<td>16 (36.4)</td>
<td>33 (28.9)</td>
</tr>
<tr>
<td>21-25</td>
<td>38 (54.3)</td>
<td>15 (34.1)</td>
<td>53 (46.5)</td>
</tr>
<tr>
<td>26 – 30</td>
<td>11 (15.7)</td>
<td>12 (27.3)</td>
<td>23 (20.2)</td>
</tr>
<tr>
<td>≥ 31</td>
<td>04 (05.7)</td>
<td>01 (02.3)</td>
<td>05 (04.4)</td>
</tr>
<tr>
<td>Residential area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>50 (71.4)</td>
<td>33 (75.0)</td>
<td>83 (72.8)</td>
</tr>
<tr>
<td>Urban</td>
<td>20 (28.6)</td>
<td>11 (25.0)</td>
<td>31 (27.2)</td>
</tr>
<tr>
<td>Religion</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hindu</td>
<td>66 (94.3)</td>
<td>41 (93.2)</td>
<td>107 (93.9)</td>
</tr>
<tr>
<td>Muslim</td>
<td>04 (05.7)</td>
<td>02 (04.5)</td>
<td>06 (05.3)</td>
</tr>
<tr>
<td>Christian</td>
<td>0 (0.0)</td>
<td>01 (02.3)</td>
<td>01 (0.9)</td>
</tr>
<tr>
<td>Poverty Line</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BPL</td>
<td>48 (68.6)</td>
<td>28 (63.6)</td>
<td>76 (66.7)</td>
</tr>
<tr>
<td>APL</td>
<td>21 (30.0)</td>
<td>16 (36.4)</td>
<td>37 (32.5)</td>
</tr>
<tr>
<td>No card</td>
<td>01 (01.4)</td>
<td>00 (0.0)</td>
<td>01 (00.9)</td>
</tr>
<tr>
<td>Mothers educational Status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>15 (21.4)</td>
<td>15 (34.1)</td>
<td>30 (26.3)</td>
</tr>
<tr>
<td>Primary</td>
<td>09 (12.9)</td>
<td>07 (15.9)</td>
<td>16 (14.0)</td>
</tr>
<tr>
<td>Secondary</td>
<td>34 (48.6)</td>
<td>14 (31.8)</td>
<td>48 (42.1)</td>
</tr>
<tr>
<td>≥ Higher secondary</td>
<td>12 (17.1)</td>
<td>08 (18.2)</td>
<td>17.6</td>
</tr>
</tbody>
</table>

### Table No 2: Distribution of obstetrical parameter of the mothers of deceased neonates

<table>
<thead>
<tr>
<th>Variables</th>
<th>&lt; 7 days n = 99 (%)</th>
<th>7 – &lt; 28 days n = 15 (%)</th>
<th>Total N= 114 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth interval</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 – 2 yrs</td>
<td>26 (26.3)</td>
<td>05 (33.3)</td>
<td>31 (27.2)</td>
</tr>
<tr>
<td>3 – 4 yrs</td>
<td>14 (14.1)</td>
<td>01 (06.7)</td>
<td>15 (13.2)</td>
</tr>
<tr>
<td>5 – 6 yrs</td>
<td>06 (06.1)</td>
<td>00 (00.0)</td>
<td>06 (05.3)</td>
</tr>
<tr>
<td>&gt; 6 yrs</td>
<td>03 (03.0)</td>
<td>01 (06.7)</td>
<td>04 (03.5)</td>
</tr>
<tr>
<td>Gestational age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 30 weeks</td>
<td>20 (20.2)</td>
<td>01 (6.7)</td>
<td>21 (18.4)</td>
</tr>
<tr>
<td>31 – 35 weeks</td>
<td>30 (30.3)</td>
<td>05 (33.3)</td>
<td>35 (30.7)</td>
</tr>
<tr>
<td>36 – 40 weeks</td>
<td>45 (45.5)</td>
<td>08 (53.3)</td>
<td>53 (46.4)</td>
</tr>
<tr>
<td>≥ 41 weeks</td>
<td>04 (04.0)</td>
<td>01 (06.7)</td>
<td>05 (04.3)</td>
</tr>
<tr>
<td>Place of delivery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government health facilities</td>
<td>85 (85.9%)</td>
<td>12 (79.9)</td>
<td>97 (85.1)</td>
</tr>
<tr>
<td>Private health facility</td>
<td>08 (08.1)</td>
<td>01 (06.7)</td>
<td>09 (07.9)</td>
</tr>
<tr>
<td>Home</td>
<td>05 (05.0)</td>
<td>01 (6.7)</td>
<td>06 (05.3)</td>
</tr>
<tr>
<td>Transit</td>
<td>01 (01.0)</td>
<td>01 (6.7)</td>
<td>02 (01.8)</td>
</tr>
<tr>
<td>Delivery assisted by</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doctors</td>
<td>81 (81.8)</td>
<td>11 (73.3)</td>
<td>92 (80.7)</td>
</tr>
<tr>
<td>Nurse</td>
<td>12 (12.1)</td>
<td>02 (13.3)</td>
<td>14 (12.3)</td>
</tr>
<tr>
<td>Relatives</td>
<td>06 (06.1)</td>
<td>02 (13.3)</td>
<td>08 (7.0)</td>
</tr>
<tr>
<td>Type of delivery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FTND</td>
<td>73 (73.7)</td>
<td>12 (80.0)</td>
<td>85 (74.6)</td>
</tr>
<tr>
<td>Caesarean section</td>
<td>21 (21.2)</td>
<td>02 (13.3)</td>
<td>23 (20.2)</td>
</tr>
<tr>
<td>Assisted delivery</td>
<td>05 (05.1)</td>
<td>01 (06.7)</td>
<td>06 (05.3)</td>
</tr>
</tbody>
</table>
### Table 3: Association of socio-demographic factors with the age of study cases

<table>
<thead>
<tr>
<th>Variable</th>
<th>&lt; 7 days</th>
<th>7 – &lt; 28 days</th>
<th>Total N = 114</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mother age (yrs)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 20</td>
<td>31 (93.9)</td>
<td>02 (06.0)</td>
<td>33</td>
<td>&gt; 0.05</td>
</tr>
<tr>
<td>21 – 25</td>
<td>43 (81.1)</td>
<td>10 (18.8)</td>
<td>53</td>
<td></td>
</tr>
<tr>
<td>26 – 30</td>
<td>21 (91.3)</td>
<td>02 (09.5)</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>&gt; 31</td>
<td>04 (80.0)</td>
<td>01 (20.0)</td>
<td>05</td>
<td></td>
</tr>
<tr>
<td><strong>Mothers Education</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>27 (90.0)</td>
<td>03 (10.0)</td>
<td>30</td>
<td>&lt; 0.01</td>
</tr>
<tr>
<td>Primary</td>
<td>11 (57.9)</td>
<td>05 (26.3)</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Secondary</td>
<td>45 (91.8)</td>
<td>03 (06.1)</td>
<td>48</td>
<td></td>
</tr>
<tr>
<td>&gt; Higher secondary</td>
<td>16 (72.7)</td>
<td>04 (18.1)</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td><strong>Wash hands</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>39 (73.6)</td>
<td>11 (20.8)</td>
<td>50</td>
<td>&lt; 0.05</td>
</tr>
<tr>
<td>No</td>
<td>60 (89.6)</td>
<td>04 (06.0)</td>
<td>64</td>
<td></td>
</tr>
<tr>
<td><strong>Sanitary latrine</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Present</td>
<td>70 (79.5)</td>
<td>13 (14.8)</td>
<td>83</td>
<td>&lt; 0.05</td>
</tr>
<tr>
<td>Absent</td>
<td>29 (90.6)</td>
<td>02 (06.3)</td>
<td>31</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 1: Causes of neonatal deaths**

**Conclusion**

Most common cause of deaths was prematurity, followed by birth asphyxia. Promotion of Institutional delivery is on greater need. Mothers and their close relatives should be explained about the warning signs of labor and the need for timely referral to the health care centers for safe delivery. Proper implementation of programmes related to mother and child health care is required.

**Conflict of Interest:** Nil

**Source of Funding:** Nil

**Ethical Clearance:** Obtained

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5. World Health Organization. SDG 3: Ensure healthy lives and promote wellbeing for all at all ages.-Available at: www.who.int (last accessed on 28/08/2016)


Hoarding Disorder Effects and its Management

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Abstract

Hoarding disorder is a persistent difficulty discarding or parting with possessions because of a perceived need to save them. A person with hoarding disorder experiences distress at the thought of getting rid of the items. Excessive accumulation of items, regardless of actual value, occurs where someone acquires an excessive number of items and stores them in a chaotic manner, usually resulting in unmanageable amounts of clutter. Hoarding disorder is also known as compulsive hoarding is a kind of behavior that is characterized by huge acquisition and not willing to discard the large quantities of objects that cover the living areas of the home that clutter and cause significant distress or impairment in areas of functioning.

Keywords: Hoarding, Cognitive behavior therapy (CBT), Compulsive hoarding, Schizophrenia, clutter.

Introduction

Hoarding disorder first defined as a mental disorder in the 5th edition of the Diagnostic and Statistical Manual (DSM) in 2013. Hoarding disorder occurs in an estimated 2 to 6 percent of the population and often leads to substantial distress and problems functioning. Some research show hoarding disorder is more common in males than females. It is also more common among older adults–three times as many adults 55 to 94 years are affected by hoarding disorder compared to adults 34 to 44 years old.1

Hoarding often creates such cramped living conditions that homes may be filled to capacity, with only narrow pathways winding through stacks of clutter. Countertops, sinks, stoves, desks, stairways and virtually all other surfaces are usually piled with stuff. And when there’s no more room inside, the clutter may spread to the garage, vehicles, yard and other storage facilities. Hoarding ranges from mild to severe. In some cases, hoarding may not have much impact on your life, while in other cases it seriously affects your functioning on a daily basis.2

The amount of clutter interferes with everyday living – for example, the person is unable to use their kitchen or bathroom and cannot access rooms the clutter is causing significant distress or negatively affecting the quality of life of the person or their family – for example, they become upset if someone tries to clear the clutter and their relationship suffers.2

Definition: Hoarding is a disorder characterized by an ongoing resistance to discarding unnecessary items like junk mail, old newspapers, and materials that most people would consider to be garbage. People with hoarding disorder also hold on to personal possessions that are no longer needed, either because they feel personally attached to the items or because they believe they will need them in the future. The accumulation of clutter and lack of order and cleanliness can cause health and safety risks within the home and create social, professional, and functional problems for a person with hoarding disorder. The disorder also affects the people around the hoarder.3

Causes: The exact cause of hoarding is disorder is not known. It can be a symptom of another condition. But there are certain known risk factors of hoarding disorder.

- Family history
- Brain injuries
- A stressful life event, such as the death of a loved one,
- Abnormalities of brain function and neuropsychological performance.3

Mental health problems associated with hoarding includes:

- Severe depression
- Schizophrenia
- Obsessive compulsive disorder (OCD).
- Attention-deficit/hyperactivity disorder (ADHD)
- Anxiety disorders.³

**Difference between hoarding and collecting:**
Many people have the habit of collecting various objects which is being considered as a hobby such as collecting the stamps, Old currency, books which may not be considered a problem. The major difference between hoard and collection is only how the items are being organized. A collection is usually well ordered, and the items are easily accessible. A hoard is usually much disorganized, takes up a lot of room and the items are largely inaccessible.³

![Fig. 1: Depicts the person with hoarding disorder](image)

**Fig. 1: Depicts the person with hoarding disorder**

**Fig. 2: Depicts that the difference between collection and hoarding**

**Types of items which may hoard are:**
- News Papers
- Books
- Clothes
- Leaflets, Letters and Junk mail.
- Bills, Receipts
- Containers including plastic bags and card boards.

- Household supplies.
- Animals hoarding.⁴

**Signs and symptoms:**
- Excessively acquiring items that are not needed or for which there’s no space.
- Persistent difficulty throwing out or parting with your things, regardless of actual value.
- Feeling a need to save these items, and being upset by the thought of discarding them.
- Building up of clutter to the point where rooms become unusable.
- Having a tendency toward indecisiveness, perfectionism, avoidance, procrastination, and problems with planning and organizing.
- Disorganized piles or stacks of items, such as newspapers, clothes, paperwork, books or sentimental items.⁴
- Possessions that crowd and clutter your walking spaces and living areas and make the space unusable for the intended purpose, such as not being able to cook in the kitchen or use the bathroom to bathe.
- Buildup of food or trash to unusually excessive, unsanitary levels.
- Significant distress or problems functioning or keeping yourself and others safe in your home.
- Conflict with others who try to reduce or remove clutter from your home.
- Difficulty organizing items, sometimes losing important items in the clutter.⁴

**Complications**

There are many complications which may leads due to hoarding are:
- Increased risk of falls.
- Injury or being trapped by shifting or falling items.
- Family conflicts.
- Loneliness and social isolation.
- Unsanitary conditions that pose a risk to health.
- A fire hazard.
- Poor work performance.
- Legal issues, such as eviction.⁴
Diagnosis

There are specific symptoms for a hoarding diagnosis includes:

- Lasting problems with throwing out or giving away possessions regardless of their actual value.
- The problems are due to a perceived need to save the items and to distress linked to parting with them.
- Items fill, block and clutter active living spaces so they cannot be used, or use is hampered by the large amount of items.\(^4\)

Treatment

**Cognitive Behavior therapy:** CBT is a type of therapy that aims to help you manage the problems by changing how they think (cognitive) and act (behavior). The goal is to improve the person’s decision-making and organizational skills, help them to overcome urges to save and, ultimately, clear the clutter, room by room.\(^5\)

**Antidepressants:** Antidepressant medication (selective serotonin reuptake inhibitors or SSRIs) are the primary treatments used to relieve symptoms of hoarding disorder. One or the other, or both, may be employed.\(^5\)

Conclusion

It is most important for all medical and Nursing professionals to be aware about newly arising mental ill disorders and to develop comprehensive assessment of the people with peculiar behaviors and to find out the association hoarding disorder with other mental ill problems, its early detection and prompt treatment and its prevention.

**Ethical Clearance:** No ethical clearance has been taken as it is not research study.

**Source of Funding:** Self

**Conflict of Interest:** Nil

**References**

Analysis of Trunk Muscle Activity in Hemiplegia During Sitting on Two Different Unstable Surfaces

Indira Sharma¹, Radhika C.M.², Sivakumar R.³, N. Venkatesh⁴

¹Post Graduate, ²Asst. Professor, ³Principal, ⁴Course Chairman, Faculty of Physiotherapy, SRMC & RI

Abstract

Background: Following stroke, the abdominal muscles demonstrate a remarkable loss of activity. This is characterized by asymmetry in performance of rotation and side bending activities. Paralysis of the core muscles increases the tendency to fall towards the paralyzed side causing asymmetry. Trunk function along with balance and walking ability has been a valid predictor of stroke rehabilitation outcome. The aim of the study is to analyze the trunk muscle recruitment in hemiplegic stroke subjects sitting on two different unstable surfaces.

Method: 30 subjects who fulfilled the inclusion criteria were considered for the study. Out of which 15 subjects were normal individuals and 15 were hemiparetic stroke subjects. Subjects in both the groups were tested for external oblique and erector spinae muscle recruitment during set of activities like flexion, extension and lateral flexion of trunk. They were made to sit on Swiss ball and wobble board, and the muscle activity was recorded in paretic side and non-paretic side in stroke patients, right and left side in normal individuals. Average EMG value was recorded in (micro-volt), Un-paired t test and Mann-Whitney U test was used for significance difference.

Result: Data was analyzed using SPSS version 16. In normal Individuals both external oblique and erector spinae muscle activity on the two unstable surfaces was similar and did not show any significant difference. Muscle recruitment on paretic and non-paretic side showed significant difference for both Erector Spinae and external oblique muscle. Result reveals that there was no significant difference between Swiss ball and wobble board both in external oblique and Erector Spinae muscle recruitment.

Conclusion: Trunk muscle recruitment during activity on wobble board had similar effect as Swiss ball. Hence we concluded that wobble board can be used as adjunct to Swiss ball for balance training in Stroke patients.

Keywords: Trunk muscle activity, unstable surfaces, EMG, Swiss ball, wobble board, stroke patients.

Introduction

The WHO (World Health Organization) defines stroke as the rapid development of clinical signs and symptoms of focal neurological disturbances lasting more than 24 hours or leading to death with no apparent cause other than vascular origin. It is also one of the largest causes for disability and half of all stroke survivors have disability and over one-third are dependent on care givers.¹

Trunk muscles play an important role in the support of our body in antigravity postures such as sitting and standing and in the stabilization of proximal body parts during voluntary limb movements.² After the onset of stroke, the abdominal muscles demonstrate a remarkable loss of activity and tone and it is characterized by asymmetry in performance of rotation and side bending activity. The function of trunk muscles in patients with stroke is compromised, and this is reflected in many aspects, such as decreased muscle strength, poor postural control and impaired functional activities. The common
First time stroke patients who were able to comprehend orally were screened for inclusion in the study. The Inclusion criteria includes (1) able to sit without support. (2) Able to sit on the Swiss ball with the guidance of the therapist. (3) Able to sit on the wobble board with the guidance of the therapist. Exclusion criteria: (1)congenital deformities, (2)severe balance impairment, (3)associated cardiovascular problems limiting the testing, (4) patients who are apprehensive to sit on Swiss ball and wobble board, (5) participants with severe orthopedic problems, (6) and visual problems that might interfere during the activities.

Based on the inclusion criteria after obtaining informed consent from the participants, 30 individual were recruited for the study. Stroke group included 15 patients, and 15 healthy aged matched control group (35 years and older). Subjects included acute (1 week) having (ischemic or hemorrhage) Cerebral vascular accident with left or right sided hemiplegic stroke, without any other neurological diseases that might affect their balance.

Procedure: Stroke subjects receiving conventional physiotherapy were included in the study. Participants both normal and hemi paretic stroke subjects were given the same sets of activities. Participants were made to sit on, multidirectional wobble board measuring 17cm (height), 17.5cm (breath), and Swiss ball (blue isokinetic anti burst exercise ball of 75cm 30”) and they were asked to sit keeping their feet completely resting on the ground with hip and knee flexed at 90degree on two surfaces. Preparation of EMG electrodes site were cleaned with scrubbing 70percent of alcohol (ethanol) to reduce skin resistance. The participants were asked to perform trunk activities like forward flexion, extension, side flexion (right and left) and, one activity lasted for 10second, rest period was given in between the activities, Average EMG recording was taken both from hemiparetic side (affected side) and normal side (non-affected) for stroke patients and right and left side from the normal individuals.

Apparatus: Surface EMG was recorded using wireless Neurotrac software 4.0 of VM (Verity Medical Ltd, United Kingdom). Surface bipolar electrodes were used to measure the EMG activity of external oblique and erector spinae muscle. Two active electrodes and one reference electrode was placed on hemiparetic side (affected) and normal side (non- affected) in stroke patients and right and left in normal individuals. For Erector Spinae electrodes were placed vertically at a distance of 30mm from the spinous process at both sides of ES(T6), ES(T10), ES(L3) muscle. Electrodes
for External Oblique muscle was placed approximately 3cm anterior to and midway along a line drawn from the lateral pelvic crest to the lateral lower ribcage parallel to muscle fiber orientation. Reference electrode was positioned over the manubrium bone of the sternum. For EMG measurement, the SENIAM recommendation (www.seniam.org) was followed. Normalization of EMG data was collected from each muscle determined by calculating the RMS (Root mean square), duration of 10sec maximum voluntary contraction of trunk activity was recorded on two unstable surfaces. Average EMG recording was taken for data analysis.

Results

Statistical Analysis: Statistical analysis was done using IBM SPSS statistics software. Descriptive statistical analysis for normal individuals and stroke patients was done. Age of the patients and age-matched healthy individuals were tested using un-paired t-test for base line similarity. Comparison between Swiss ball and wobble board on the paretic side was done using unpaired t-test and Mann Whitney U test was used to see the significant level between the two surfaces.

Table 1: Demographic data showing mean and standard deviation of males, Females, age, BMI in Normal and stroke subjects.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Normal individuals</th>
<th>Stroke patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Years)</td>
<td>46.5</td>
<td>53.1</td>
</tr>
<tr>
<td>Gender</td>
<td>Male 10(66.7%)</td>
<td>14(93.3%)</td>
</tr>
<tr>
<td></td>
<td>Female 5(33.3%)</td>
<td>1(6.7%)</td>
</tr>
<tr>
<td>BMI</td>
<td>24.55(1.87)</td>
<td>23.07(1.44)</td>
</tr>
<tr>
<td>Left CVA</td>
<td>0</td>
<td>14</td>
</tr>
<tr>
<td>Right CVA</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 2: Showing bilateral trunk muscle activity of external oblique and erector spinae of normal subject On two unstable surfaces, both did not show any statistical difference. WB- wobble board, SB-swiss Ball, p = <.05, is significant, Mann Whitney U test

<table>
<thead>
<tr>
<th>Activity (n=15)</th>
<th>External Oblique</th>
<th></th>
<th>Erector Spinae</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RT Mean rank</td>
<td>LT Mean rank</td>
<td>Mean Difference</td>
<td>p value</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flexion</td>
<td>WB 14.97</td>
<td>16.03</td>
<td>1.06</td>
<td>.740</td>
</tr>
<tr>
<td></td>
<td>SB 15.67</td>
<td>15.33</td>
<td>0.34</td>
<td>.917</td>
</tr>
<tr>
<td></td>
<td>SB 16.53</td>
<td>14.47</td>
<td>2.06</td>
<td>.520</td>
</tr>
<tr>
<td></td>
<td>SB 15.80</td>
<td>15.20</td>
<td>0.6</td>
<td>.852</td>
</tr>
</tbody>
</table>

Table 3: Muscle activity between paretic and non-paretic side in stroke subjects on two unstable surfaces. Erector spinae muscle recruitment showed high significant mean difference with p value (< .000) both in wobble board and swiss ball during flexion activity and extension in swiss ball with p value(<.001). p = <.05, is significant Mann Whitney U test

<table>
<thead>
<tr>
<th>Activity</th>
<th>External Oblique</th>
<th></th>
<th>Erector Spinae</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Normal side Mean rank</td>
<td>Affected Side Mean rank</td>
<td>Mean Diff</td>
<td>P value</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SB 19.53</td>
<td>11.47</td>
<td>8.06</td>
<td>.012</td>
</tr>
<tr>
<td></td>
<td>SB 19.07</td>
<td>11.93</td>
<td>7.14</td>
<td>.026</td>
</tr>
<tr>
<td>Lateral Flexion</td>
<td>WB 19.83</td>
<td>11.17</td>
<td>8.66</td>
<td>.007</td>
</tr>
<tr>
<td></td>
<td>SB 19.60</td>
<td>11.40</td>
<td>8.2</td>
<td>.011</td>
</tr>
</tbody>
</table>
Table 4: Muscle recruitment on paretic side between swiss ball and wobble board on the affected side showing no significant difference. \( p = <0.05 \), is significant

<table>
<thead>
<tr>
<th>Activity</th>
<th>External Oblique</th>
<th>Erector Spinae</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>WB Mean rank</td>
<td>SB Mean rank</td>
</tr>
<tr>
<td>Flexion AS</td>
<td>14.60</td>
<td>16.40</td>
</tr>
<tr>
<td>Lateral Flexion AS</td>
<td>15.37</td>
<td>15.63</td>
</tr>
</tbody>
</table>

Discussion

This study was conducted to analyse the recruitment of trunk muscles (external oblique and erector spinae) in hemiparetic (stroke patients) and age-matched normal individuals on two different unstable surfaces. Muscle activity during sitting was compared to analyse if there was any difference in the recruitment pattern during sitting in Swiss ball and wobble board.

The right and the left side of external oblique and erector spinae muscle activities were recorded in the normal individuals on two unstable surfaces and were statistically analysed. And results showed that there was no significant mean difference between the recruitment patterns of both the muscles on both the side. The muscle activity was similar on right and left and over the two unstable surfaces. There is lack of studies which has directly compared between the two unstable surfaces but there are studies which have showed both swiss ball and wobble board are effective in balance training.

EMG analysis on comparing the muscle activity between paretic side and non-paretic side, the results showed that there was a significant mean difference and the muscle recruitment was greater over the non-paretic side of the trunk. The recruitment was greater during flexion of the trunk on both the unstable surfaces. Task on Swiss ball lead to greater activation of external oblique, transverse abdominis, internal oblique, erector spinae and rectus addominis level when compared with stable surface\(^9\). Thus, proving the study that the recruitment of the muscles are greater on the unstable than over the stable surface.

Our Analysis showed even though the muscle activity was not significant, there was moderate level of muscle recruitment on the paretic side also. Thus, showing that when a hemiparetic patient is made to sit on an unstable surface and made to perform the movements it increases activation of erector spinae and external oblique muscle on the paretic side. Thus, supporting the study which showed that trunk exercises performed on an unstable surface on trunk muscle activation showed activation of external and internal oblique muscles\(^10\).

There was no significant mean difference between the Swiss ball and wobble in paretic side of stroke patients. However, muscle recruitment on comparison with wobble board and Swiss ball, it was slightly higher in Swiss ball with external oblique muscle, while the activity in Erector spinae muscle during flexion, extension, and lateral flexion, mean difference was higher in wobble board. There are many studies that have used wobble board as a balance training method in Sports and rehabilitation for balance training but there fewer studies that has used wobble board in stroke patients for rehabilitation purposes. To our knowledge previous studies has only compared stable versus unstable surface in stroke patients.

This was the first study which has compared two different unstable surfaces to see whether both surfaces has similar effect in trunk muscle recruitment in hemiparetic stroke patients when sitting on wobble board and Swiss ball.

Therefore our study concluded saying that wobble board had similar effect as Swiss ball in trunk muscle recruitment in hemiparetic stroke patients. So instead of Swiss ball, wobble board can be used for balance training as it is more easy, portable to carry to the beside of patients for rehabilitation and balance training. Further to conclude the muscle activity was also significant when the stroke subjects were made to sit on the unstable surfaces which can be utilized for trunk muscle training.

Limitation

1. This study was done with single time testing in stroke patients, in a smaller sample.
2. Patients were apprehensive sitting on the wobble board instead of taking precautions so a larger diameter of wobble board can be utilized for the study.
Conclusion

Therefore, this study concluded that Swiss ball and wobble board showed almost similar recruitment pattern in hemiparetic stroke patient as well as in normal individuals so it is inconclusive to make any remark on the use of wobble board and Swiss ball for muscle recruitment on balance training for treating hemiparetic stroke patient.

Future Studies: Should be performed in larger population in hemiparetic stroke patients.

Source of Funding: Self

Conflict of Interest: Nil

References

Physical and Psychological Health Issues among the Night Shift Workers

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Abstract

In this modern century shift work, particularly night shift can be an irresistible option for many employees due to the high wages and allowances. Though financial growth is mandatory to meet our requirements, night shift may lead to some serious risks to health. Shift work can have a negative impact on both physical health and well-being of workers. Shift work may cause disturbances in normal circadian rhythms and in maintaining both relationships at family and social level. Night work effects women’s health on both hormonal and reproductive function, and their family responsibility.

Keywords: Night shift, Health, Employees, Organization, Biological clock, Circadian rhythms, Physical and Psychological health.

Introduction

We need job to acquire an honest living and job is essential for survival. Apart from these reasons we started working for various other aspects like prosperity, keeping societal growth in motion and to pretend that we are efficient of something that we are lacking than anyone around. Our society and community measure people’s success, dignity and quality by their wealth. Hence, we are forced to take any position beyond the nature including jobs with night shifts which is also called as “graveyard shift”. One of the primary reason to prefer such shift is, urge for finance and monetary and for the shift differential paid by many organization to their employees for the work which is done outside the regular hours. Night shift employee’s working hour will stand outside the regular time, nine p.m. to five a.m. The graveyard shift is a suggestive term for the night shift, between middle of the night and eight in the morning. An employee who constantly works in night shifts faces a significant increase in overall risks to their both physical and mental health.

Statement of the Problem: Health illness is a major challenge faced by many countries which lead to Health care costs. People started working in night shifts for higher pay and allowance, but night shifts may lead to health risks and create severe impact on both health and economic conditions of the people which lead to huge medical expenses. This study throws light on the impact of night shift on both physical and psychological health illness.

Objective of the study: To examine and analyse the physical and psychological health issues among the night shift professionals.

Review of Literature: D’Ettorre G, Pellicani V, Greco M, Mazzotta M, Vullo A², stated about the enhancement of safety among workplace and about the action need to be taken to improve medical disorder in Organizations on both scheduling shifts and consequently to ensure workers wellness. Eiriksgötu, Reykjavik³, discusses about the “association between the disruption of the circadian cycle caused by shift work and adverse health effects.”

Nea FM, Kearney J, Livingstone MB, Pourshahidi LK, Corish CA⁴ in their works on, “Dietary and...
lifestyle habits and the associated health risks in shift workers’ summarized the data on the effects of shift work on the diet, lifestyle and health of employees.

Angerer P, Schmook R, Elfantel I, Li J*, in their works on “Night Work and the Risk of Depression”, stated that in addition to the direct effects of disrupted chrono-biological rhythm on sleep, hormone regulation, and many other biological functions, psycho-social working conditions with adverse effects on health, which are qualitatively and quantitatively different for shift workers and those who work during the day.

Giovanni Costa*, in his work “Shift Work and Health: Current Problems and Preventive Actions”, tells about the overview of the issue to be tackled by occupational health due to shift work and the guidelines at both the levels, organizations and medicines on how to protect worker’s health and well-being.

Types of Organization working later hours: Professions most likely to hire night shift workers include:

- Emergency services
- Military services
- Food services
- Public transportation
- Shipping
- Hospital especially Nurses
- Law enforcement
- Software and IT
- BPO

In modern times, service industries started influencing the world’s financial resources; hence, tremendous number of workers started working in night shifts. Hence, health illness correlated with later hours has become a serious issue.

Symptoms of later hour shifts: Signs and symptoms of night shift health concerns include

- Constant feelings of fatigue and sickness
- Problems attuning to the circumstances
- Depression
- Downheartedness
- Increase in sensitivity to cold and fever.

Disorders related to digestion like nausea, diarrhea and other matters of improper functioning of the bowels or digestive tract can emerge. Disruption of the Sleeping patterns of the night shift worker may become problematical as the individual worker may find it more complex to sleep even when time is available for sleep. This will lead to the effect of sleep deprivation.

Physical and psychological issues and risks associated with night shifts: Why health is getting affected for the workers working in night shift is that a very serious issue? of course, Yes. The foremost thing which leads to all types of diseases due to non-standard shift is lack of sleep. Let’s discuss this in detail. One of the foremost reasons for the disruption of circadian rhythms is night shift which causes significant alterations of sleep and biological functions that can affect physical and psychological well-being. Three mechanisms which promotes health, performance, and safety issues correlated with night-shift work are as follows

Physical Health: Shift work such as night shift is linked with certain chronic diseases and health illness. Employees working in night shift for prolonged period could suffer from certain cancers and lead to many health issues like metabolitic problems, heart diseases, ulcers, gastrointestinal problems and obesity. Insufficient or lack of sleep leads to changes in metabolism and appetite. Added to these biological factors, night shift workers have poor and irregular eating habits which will increase their risk of metabolic problems. Employees usually have irregular and unhealthy food habits. They usually skip meals and find hard to fit in exercise. The unfortunate fact is that shift workers are more at risk of weight gain and heart disease than those who work set daily hours.

Mental Health: Night shift work can increase the risk of mental health problems like depression, because of the disruption of the circadian system. It also causes certain social issues which will decrease the wellbeing and happiness. If we work in irregular hours, we might eventually feel “out of step” with the people in our family and social network.

Performance: Shift workers sleep less than the required amount, and which lead to “sleep debt” over time. Night shift workers work at night; hence they are going against the nature and biological clock. Our concentration may be decreased, and it can become harder to stay focused on any task and we will lose our productivity.
Safety: There are many reasons shift work can be dangerous. Lack of sleep leads to slower reactions and make harder in decision making. Employees working at night go against the nature, hence even if a shift worker sleeps enough, a dip in alertness can come at night. Supervision is sometimes reduced on night shifts. Driving to and from work with lack of sleep could result in accident. Employees who work in night shifts prone to commit mistakes frequently.

Circadian Rhythm: Circadian Rhythm is both physical and mental behavioral changes that follow daily cycle that lasts up to 24 hours and it is approximately 24-hour cycle in the physiological processes of humans. Sleep-wake cycle is one of the circadian rhythm. A disruption of thus rhythm is known as circadian rhythm sleep disorder. One of the gland called pineal gland produces a hormone called melatonin, which helps in maintaining circadian rhythm and regulate reproductive hormones.

CRSD - Circadian rhythm sleep disorder: Circadian rhythm sleep disorders refer to the disorder of sleep pattern. Some disorders lead to interruption in normal, physical, mental, social and emotional functioning.

"Misalignment between the internal clock and life activities, Chronic partial sleep deprivation and Melatonin suppression by light at night”.

Circadian syndrome rhythms of sleep can cause different disorders. Shift work sleep syndrome develops insomnia or excess sleepiness. Alternate night shifts and rotating shifts disturb sleep cycle and affect the performance. Both the psychological and physical health of an employee can be affected by extended night shift work. Fatigue and overtiredness due to lack of sleep may also lead to the risk of serious diseases like Cancer and heart attack. According to the research by Violanti, Vila and colleagues, “Night work and fatigue may also contribute to the risk of heart disease and cancer”.

Employees who work frequently in shift between 8 p.m. to 4 a.m. will have the highest chances of metabolic syndrome symptoms and those who frequently worked and averaged lesser than six hours of sleep were four times more likely to have metabolic syndrome. Further, another report from the year 2004, identified that employees who worked night shifts for 12-hours, were more likely to experience fatigue, and abuse to smoke and alcohol than their day-shift colleagues. Workers who work in night shift for long period are likely to get in to the risk of specific type of cancers, metabolic problems, gastrointestinal problems, obesity and heart diseases. In addition to these biotic factors, employees who work in night shift at times will have unstable eating habits and unhealthy diet which will increase their risk of metabolic problems. Workers who work in night shifts and rotating shifts won’t sleep enough, which will lead to long-term sleep deprivation. Shift work disorder can increase the risk of psychological problems like melancholy because of the disruption of the body clock and cause certain social issues which will decrease the prosperousness, wellbeing and happiness. Possibilities for the development of heart diseases increase by thirty-five to forty-five percent and the rate of risk for stroke increases for those workers who works night shifts for a period of ten to twenty years or longer. Correlated physiological risks incorporate increase in probability of high blood pressure, high cholesterol, high blood sugar, weight gain.

The graveyard shift theory at long last proves correct because the hormone melatonin, which prevents the tumor development, is produced only at night hence millions of people across the countries working in night shifts could be affected. In 1987 Richard Stevens, professor at the University of Connecticut Health Center and a cancer epidemiologist spot the connection between night shift and cancer. In recent years, many research found that women working in night shifts for a long period were prone to breast cancer and men working at night may have a higher rate of prostate cancer.

Things needed to be taken care by employees to reduce the health effects7

- Need to concentrate more on healthy things such as healthy diet and exercise.
- Need to keep same schedule for sleep even when we sleep during daytime
- Need to keep the room dark and calm where we sleep.
- Calls and messages can disturb or sleep, hence try to switch off the mobile or keep it in silent mode. Continuous sleep is more important.

Conclusion

Obviously, several workers can’t quit their job though they’re in night shift because of varied reasons. However, we can attempt to keep ourselves healthy.
Foremost concern is “how will night shift workers adapt to their schedules?” per discoverer theory, “we will shift the body’s time unit clock in order that it tolerates engaging ourselves at night and sleeping throughout the day”. Earlier analysis has found that we could detain the mechanism by one or 2 hours per day. If we tend to work nights, it’s necessary that we tend to implement a schedule that is simple to follow and healthy. Obtaining enough sleep and intake of healthy foods will create operating shifts easier and might improve overall health. Sleeping in dark space, Usage of sunglasses during to and from workplace will facilitate in orientating mechanism. Healthiness isn’t the thing that we can purchase with money. Choosing right job at right time, avoiding night shifts, regular exercises and healthy food habit is crucial to keep our body healthy.

Discussion

In a process of globalization and the development of Multi National Corporations shift work becomes order of the day among the countries in the world. The nature and pattern of work culture changes due to change in the world economic system and technologies. Night shift is mandatory among the MNCs. Change in the work culture such as night shift changes shift worker’s food habits, sleeping system and life style which in turn change the physical and psychological aspects among the night shift professionals. This creates biological contradictions in human metabolism which results in so many human ailments such as insomnia, sleep disorder, frustration, poor digestion, abnormal behavior etc.

Ethical Clearance: VELS Research Committee

Source of Funding: Self

Conflict of Interest: Nil

References

Insomnia—Some Issues and Remedial Measures

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Abstract

Sleep disorder, now-a-days is a common health issue among the people including rich and poor. This may be due to various reasons such as socio-economic, physical and psychological issues. Sleep deprivation is one of the most common causes of many human ailments. In modern times, people have less sleeping hours than their ancestors. Sleeping-disorder is a condition characterized by abnormal sleep or inadequate sleep or cannot sleep due to emotional, mental and physical dysfunction. Due to sleep disorders in humans, the metabolic activity of the brain decreases significantly and result in tiredness, feel lazy, no energy, strange appetite and resulted in gain weight or lose weight, affects focus and concentration that slows down our reaction time and committing numerous mistakes. Continuous practice of a few hand mudras, yogasanas and meditations may be useful to overcome the problem of sleep disorder.

Keywords: Insomnia, Physical and mental health, hand mudras, asanas. Cognitive behavioral therapy, REM and NREM and Acupressure.

Introduction

Sleep disorder, now-a-days is a common health issue among the people including rich and poor. This may be due to various reasons such as socio-economic, physical and psychological issues. Sleep deprivation is one of the most common causes of many human ailments. In modern times, people have less sleeping hours than their ancestors. Sleeping-disorder is a condition characterized by abnormal sleep or inadequate sleep or cannot sleep due to emotional, mental and physical dysfunction.

The word insomnia came from Latin and it means “without sleep”. The available literature reveals that one in three adults suffers from insomnia and 1 in 10 adults suffer from chronic insomnia. Insomnia affects women more often than men. However, aged people are more likely to get insomnia than the younger generation as the former have more chances of having pain and disturbances due to physical deterioration, stress, and too much responsibility.

Statement of the problem: Insomnia is a kind of ill health that is a major challenging health hazard prevails among the people throughout the world. It requires a special attention as it leads to human ailments. This is usually very common among the depressed or who have social and economic problems such as divorce or death of a spouse, having low incomes, working at night or have frequent changes in their work hours, traveling long distances with time changes, having certain medical conditions or sleep disorders that can disrupt sleep and an inactive lifestyle are the major reasons for this illness.

Objectives of this article: This article throws light on the causes and consequences of insomnia on both physical and psychological health and suggests a few remedies to overcome it.

Review of literature: A survey conducted in the United States with a sample of 1.1 million residents reveals that those who sleep about 7 hours per night had the lowest rates of mortality, whereas those who sleep less than 6 hours or more than 8 hours had higher mortality rates. Getting 8.5 or more hours of sleep per night was associated with a 15% higher mortality rate.
Severe insomnia was found those who sleep less than 3.5 hours in women and 4.5 hours in men which is associated with a 15% increase in mortality.  

T. Roth hassaid that they may have difficulty in falling asleep, or staying asleep as long as desired. Insomnia is resulted daytime sleepiness, low energy, irritability, and a depressed mood. It may also result in an increased risk of motor vehicle collisions, as well as problems infocusing and learning. Insomnia can be short term, lasting for days or weeks, and long term, lasting more than a month.

Tosman and others (2015)in their research article analyzed that between 10% and 30% of adults suffer from insomnia at any given point in time and it is found among 50% of people in a given year. A study by Wilson J.F (2008) revealed that people over the age of 65 are affected more often than younger people and females are more often affected than males. Jiang X and others concluded in their studies that the victims of insomnia is more among university students than the general population.

According to WHO Insomnia can occur independently or as a result of any physical, mental ailments suchas psychological stress, chronic pain, heart failure, hyperthyroidism, heartburn, restless leg syndrome, menopause, certain medications, and drugs such as caffeine, nicotine, and alcohol and people who indulge in night shift work. Where as Taylor and Mallory concluded that it may also be due to previous thoracic surgery and Heart disease and Lave and others stated that insomnia may be due to deviated nasal septum and nocturnal breathing disorders.

The National Heart Lung Institute examined that periodic limb movement disorder (PLMD), may cause insomnia. Ramakrishnan in his article said that pain due to injury and inability to find comfortable position to sleep may also cause insomnia. On the other hand, Santoro in his research pointed out that hormone imbalance, menstrual disorder may also lead to insomnia.

Significance of sleep: Sleep is a natural state of rest for both the mind and the body and it is occurred by closing the eyes and the loss of consciousness partially or completely. Further, during sleep there is less physical movements, less external stimuli but more internal stimuli. No one knows and understands the significance of sleep, but sleep has an impotent restorative function which is indispensable for the survival of man and animals. Sleep helps the body to recover from all the works it did. Good sleep in the night is essential for the normal healthy functioning of the human body as well as mental health, including the immune system which is must to fight against diseases. Body takes rest and restores its energy levels during sleep. Sleep is often helping us to come out from stress and frustration and also to recover from illness.

According to National Sleep Foundation (NSF) sleep is considered as a complicated physiological phenomenon that scientists still not able to understand fully. Neurotransmitters are chemicals involved in nerve signaling which controls whether one sleeps or awakes. Neurons located in the brainstem induce sleep by inhibiting other parts of the brain that keeps one awake. Sleep is must for a person’s physical and mental health and over all well-being. However, millions of people do not get enough sleep due to various reasons.

There are two basic forms of sleep: rapid eye movement (REM) sleep and non-rapid eye movement (NREM) sleep. Experiments have shown that if people are deprived of NREM may experience physical tiredness and if they are deprived of REM sleep then they suffer from anxious and irritable state. REM sleep has also been considering as important for memory and learning.

Classification of insomnia: Insomnia can be classified as transient, acute and chronic.

Transient insomnia lasts for less than a week. It can be caused by another disorder namely changes in the sleep environment and the timing of sleep, severe depression, or stress. It leads to sleepiness and impaired psychomotor performance.

Acute insomnia is inability to consistently sleep well for a period of less than a month. Insomnia is present when there is difficulty in initiating or maintaining sleep. These problems occur despite adequate opportunity and circumstances for sleep and they must result in problems with daytime function. Acute insomnia is also known as short term insomnia or stress related insomnia.

Chronic insomnia lasts for longer than a month. It can be caused by another disorder, or it can be a primary disorder. People with high levels of stress and hormone imbalance will have chronic insomnia. It leads to muscular weariness, hallucinations, mental fatigue and double vision.
Causes of Insomnia: The causes of insomnia may be classified into primary and secondary insomnia.

Primary insomnia is not a symptom or side effect of another medical condition. This type of insomnia usually occurs for periods of at least one month. Lifestyle disorder can trigger primary insomnia. It may be due to major or long-lasting stress or emotional upset, long travel or other factors, such as work schedules that disrupt routine sleep can also trigger primary insomnia.

Secondary insomnia is the symptom or side effect of another problem. It is a symptom of an emotional, neurological, or other medical or sleep disorder. Emotional disorders that can cause insomnia that include depression, anxiety, and post-traumatic stress disorder. Alzheimer’s disease and Parkinson’s disease are examples of common neurological disorders that can cause insomnia. Also conditions that cause chronic pain, such as arthritis and headache disorders, conditions that make it hard to breathe, such as asthma and heart failure, an overactive thyroid, gastrointestinal disorders, such as heartburn, stroke, restless legs syndrome and sleep-related breathing problems and Menopause and hot flashes.

In addition, psychological problems like fear, stress, anxiety, emotional or mental tension, work problems, financial stress, and unsatisfactory sex life, disturbances of the circadian rhythm, such as shift work and jet lag, can cause an inability to sleep at some times of the day and excessive sleepiness at other times of the day.

Consequences of insomnia: Sleep deprivation is affecting human’s brainpower, creativity and their psychological behaviors. In humans, the metabolic activity of the brain decreases significantly after 24 hours of continuous wakefulness and result in tiredness, feel lazy, no energy, strange appetite and resulted in gain weight or lose weight, affects focus and concentration of mind. This in turn leads to inability to handle stress and impossible to solve the problem with unnecessary anger even for minor mistakes and resulted in inability to judge and interact with other people in an acceptable manner. In addition, it causes a drastic change in body such as decrease in body temperature and immune system function.

Remedial measures: In recent days Cognitive behavioral therapy (CBT) is taught to improve sleeping habits among insomnia patients along with relaxation therapies^{11} and, of late, Meta cognition behavior therapy^{12}. For primary sleep disorder, as per the alternative medical practices, a few yoga asana such as savasana, sukhasana may be practiced. Savasana can be practiced by any person at any age. It is just lying down by back and completely relax the whole body with the relaxation techniques.

I. Relaxation Technique: For instance, we can relax our body while in savasana telling that “my toes are relaxed, my feet are relaxed, my ankles are relaxed, my keens are relaxed, my hip is relaxed, my abdominal muscles such as kidney and urinary bladder are relaxed, my liver and gall bladder are relaxed, my small intestine and large intestine are relaxed, my stomach and spleen are relaxed, my pancreas is relaxed, my diaphragm is relaxed, my lungs are relaxed, my heart is relaxed, my pericardium is relaxed, my triple warmer is relaxed, my central nerve system is relaxed, my chest is relaxed, my shoulders are relaxed, my hands are relaxed, my neck and throat are relaxed, my head is relaxed, my brain is relaxed, my eyes are relaxed, my nose and mouth are relaxed and my ears are relaxed. My body and all its organs, bones, muscles, nerves, tissues and cells are relaxed. This technique may also be practiced while we sit in sukkasana . sukkasana means comfortable way of sitting on the ground or chair.

II. Hand Mudras: A few hand mudras such as Gnana mudra and Prana mudra may also be practiced to induce sleep in humans. Gnana mudra can be done by sitting in a comfortable position by joining the tips of thumb and index fingers and stretching out the rest of the fingers. Prana mudra can be practiced by sitting in a comfortable position by joining the tips of thumb, little finger and ring finger and stretching out other fingers. In addition, one can give affirmative statement while we go to sleep like “All cells in my body feel sleepy” and this may be repeated with cent percent concentration, i.e., the concentration on the intention to sleep until we get sleep.

III. Acupressure and Acupuncture Points

a. Gentle stimulation or mild massage around the hand web – joining point of thumb and index point for few seconds. (LI 4 in acupuncture).  
b. Gentle massage around outer crease of the elbow. (LI 11 in acupuncture)
c. Gentle massage around the heel and the ankle bones on both sides of the legs (K6 and B62 in acupuncture)

d. Gently stretching arms and legs side to side and ups and downs.

e. Gentle eye rotation with closed eyes.

IV. Energy Medicines: Law of mind is one of the immutable universal law. As per the law of mentalism mind creates everything and everything is mind. The whole world is the projection made by human mind and it is the most powerful energy in the universe. By using the power or energy of mind we can overcome all physical and mental illness. Energy medicine is a practice in which we use the power of the mind to cure any ailments. Mind power may be enhanced and realized through the practice of be in the present i.e. think what you do and do what you think, true love towards the universe (love for sake of love without any expectation). These practices will improve the concentration of mind and that is the secret of energy medicines. With the enhanced mind power if we talk to ourselves like “I go to sleep…. I sleep…..” repeatedly very soon we get into sleep automatically.

V. Sleep-Friendly habits: Generally, the practice of early to bed and early to rise, keeping a regular time schedule, for sleep including weekends, taking dinner before 7 p.m., being and becoming polite and feeling happiness while go to bed, feeling happiness in every cells of the body, listening to melodious and devotional songs and music, avoid taking alcohol, tea or coffee, keeping proper ventilation for the bed room, and so on.

Conclusion

Good sleep at night naturally indicates healthy body and mind. Body needs good sleep at night to equip and rebuild energy to work next day. It is a natural energy and booster for the growth and expansion of cells in the human body. By nature, we take rest in night and we become active during the day time. Insomnia drains out the energy in the body and weakens the cell and the organ of the human body. It is indispensable to have a good sleep at night either through the conventional medical practices or through alternative medical practices. It is true that the deep sleep is possible when the mind is polite, calm, and pure and in harmony and let us practice this for good sleep and healthy life.

Discussion

Sleep is a natural state of rest for both the mind and the body, proper sleep at night make the mind and body healthy and active in the day time. Loss of sleep means loss of health. Good sleep at night is essential for improved immune system. Of late, life style disorder is the main reason for most of the non-communicable disease such as diabetic, obesity, cardio vascular disease including sleep disorders. In the era of globalization, shift work, less physical exercises, erratic food and sleep habit, too much of dependency on machines, cause sleep disorder among the people through out the world. At this juncture, it is pertinent that the natural way of life and being content with what we possess may lead us to healthy and wealthy life.

Ethical Clearance: VELS Research Committee

Source of Funding: Self

Conflict of Interest: Nil

Reference


Socio–Economic Conditions of Industrial Workers in Theni District of Tamil Nadu

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Abstract

Labour is the most dynamic agency in the processes of production. The productivity of the labour force of the country is therefore vital for rapid economic growth. The social aspects of minimum wage and job security regulations are necessary to promote the welfare of the workers. Rapid growth of employment and real wages should be of primary interest to workers in any country. Employment and real earnings per employee in the manufacturing sector have risen very slowly in India while the performance of the East Asian countries has been the most outstanding in this respect. The rapid growth of employment and real earnings per employee in East Asia is the combined result of labour policies along with a whole range of successfully implemented export orientated industrialization policies which yielded rapid GDP growth.

Keywords: Dynamic agency, Minimum wage, Human capital, Workforce, Job training, Migration.

Introduction

Labour is the most dynamic agency in the processes of production. Productivity of the labour force of the country is therefore crucial for rapid economic growth. Labour markets play a major role in determining the success of the economic restructuring policies. The social aspects of minimum wage and job security regulations are necessary to promote the welfare of the workers.

World Bank has emphasized the efficiency aspect of labour markets and the interventions such as the minimum wage and job security provisions may reduce employment, and increase productivity and growth thus improving the living conditions of workers in the long run¹. The rapid growth of employment and real earnings per employee in East Asia is the combined result of labour policies along with a whole range of successfully implemented export orientated industrialization policies which yielded rapid GDP growth².

Importance of Labour: Labour is not homogenous in that there are vast differences in skill formation, dexterity, innate talents, productivity and earning profits. Labour is of two types viz. skilled and unskilled labourers. Human capital is formed by way of formal education, on the job training, job market information, health and nutrition and migration. When the average worker produces more in an hour i.e. when there is an increase in labour productivity, then the total output of the economy grows.

Review of Literature: Manickam. S. (2010) highlighted that the instance of conducive works relations is critical for promoting economic development in general and industrial development in particular. A perusal of data on number of strikes and lock outs in India reveals a declining trend. The number of man days lost because of lockouts has continuously been on the decline³.

Deepita Chakaravarthy (2010): In her article argues that the increasing importance of unorganized manufacturing is not so much the results of weak trade unionism and the vulnerable workforce as it is of an implicit understanding between the trade unions and the management. Perpetuating in formalization is likely to
benefit the management, especially in the context of low-productivity, low-wage manufacturing in West Bengal.

Dipak Mazumdar and Sandip Sarkar (2009) in their paper that an important aspect of the recent growth pattern of the Indian economy has been apparent sluggishness in the output and employment growth in the manufacturing sector in spite of a period of relatively high growth rate of GDP.

Gala, S. and Breathey S. (2009) in their paper that An oligopolistic market, fluctuating market conditions, inadequate modernization and the subordinate status of hired workers have contributed to the poor living conditions of workers in Sircilla, a power loom centre of Andhra Pradesh.

Kannan, K. P, Raveendran, G (2009) in their papers stated that there have been considerable debates in India about the organized manufacturing sector for different periods since the early 1980’s. Good part of the resultant increase is with proportion to output growth. The workers as a class thus lost in terms of both additional employment and real wages in organized manufacturing sector.

Objectives of the Study:
1. To study the socio-economic conditions of industrial workers in the study area.
2. To examine the factors influencing wage of the industrial workers.
3. To offer practical suggestions for improving the welfare of the workers and
4. To suggest suitable policy options to ensure and enhance the holistic development of quality of life of the workers.

Limitations of the Study: Since majority of the factory owners did not have sufficient educational background, they hesitated and even some refused to grant permission to interview the workers. Hence it took long time to explain the purpose of the study to some factory employers.

Research Methodology: The study is a cross-section analysis pertaining to Industrial workers in Theni district of Tamil Nadu with special reference to income, standard of living, employment and economic entitlement. Therefore, Theni district is selected as a sample district in the state of Tamil Nadu. Out of 306 registered plants with Inspector of Factories, only 206 industries are presently functioning. A total of 5573 workers are working in the sample industries. Out of 5573 workers, 360 sample workers were randomly selected for the study.

Sources of Data: Primary data were collected through well-structured interview schedule, which covers details regarding their Employment, wage and, saving pattern, and debt position. Besides, secondary data pertaining to the study have been collected from the concerned Government Offices studies, books and journals.

Tools of Analysis: The study is primarily analytical in nature. Apart from the conventional statistical tools like Percentage Analysis, Garret’s Ranking Techniques, are employed to bring out scientific results.

Data Analysis:

<table>
<thead>
<tr>
<th>Sample Industries</th>
<th>Below 20</th>
<th>21 – 30</th>
<th>31 – 40</th>
<th>41 – 50</th>
<th>51 and above</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cotton spinning</td>
<td>29 (24.17)</td>
<td>36 (30.00)</td>
<td>22 (18.33)</td>
<td>12 (10.00)</td>
<td>21 (17.50)</td>
<td>120 (100.00)</td>
</tr>
<tr>
<td>Cotton weaving and processing</td>
<td>22 (18.33)</td>
<td>42 (35.00)</td>
<td>29 (24.17)</td>
<td>19 (15.83)</td>
<td>8 (6.67)</td>
<td>120 (100.00)</td>
</tr>
<tr>
<td>Power loom</td>
<td>18 (15.00)</td>
<td>38 (31.67)</td>
<td>41 (34.17)</td>
<td>16 (13.33)</td>
<td>7 (5.83)</td>
<td>120 (100.00)</td>
</tr>
<tr>
<td>Total</td>
<td>69 (19.16)</td>
<td>116 (32.22)</td>
<td>92 (25.56)</td>
<td>47 (13.06)</td>
<td>36 (10.00)</td>
<td>360 (100.00)</td>
</tr>
</tbody>
</table>

Source: Survey Data, Note: Figures in parentheses are percentages to respective totals.

It is clear from table 1 that among the 360 workers in all the three categories of industries, 32.22 per cent of workers belong to the age group of 21-30 years followed by 25.56 per cent workers in the age group of 31-40 years. It could be inferred that the age category of (32.22%) 21-30 years workers are larger in numbers among the sample industries.
Table 2. Gender-wise Distribution of Industrial Workers

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Sample Industries</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cotton spinning</td>
<td>64 (53.33)</td>
<td>56 (46.67)</td>
<td>120 (100.00)</td>
</tr>
<tr>
<td>2</td>
<td>Cotton weaving and processing</td>
<td>84 (70.00)</td>
<td>36 (30.00)</td>
<td>120 (100.00)</td>
</tr>
<tr>
<td>3</td>
<td>Power loom</td>
<td>6 (63.33)</td>
<td>44 (36.67)</td>
<td>120 (100.00)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>224 (62.22)</strong></td>
<td><strong>136 (37.78)</strong></td>
<td><strong>360 (100.00)</strong></td>
</tr>
</tbody>
</table>

Source: Survey Data, Note: Figures in parentheses are percentages to respective totals.

It is observed from table 2 that out of 360 sample workers, female workers constitute only a small proportion (37.78%) to the total workers. Majority of the workers i.e., 62.22 per cent are men.

Table 3. Family Type of Industrial Workers

<table>
<thead>
<tr>
<th>Sample industries</th>
<th>Nuclear</th>
<th>Extended</th>
<th>Independent</th>
<th>Total No. of Workers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cotton spinning</td>
<td>85 (70.83)</td>
<td>34 (28.34)</td>
<td>1 (0.83)</td>
<td>120 (100.00)</td>
</tr>
<tr>
<td>Cotton weaving and processing</td>
<td>49 (40.83)</td>
<td>63 (52.50)</td>
<td>8 (6.67)</td>
<td>120 (100.00)</td>
</tr>
<tr>
<td>Power loom</td>
<td>54 (45.00)</td>
<td>61 (50.83)</td>
<td>5 (4.17)</td>
<td>120 (100.00)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>188 (52.22)</strong></td>
<td><strong>158 (43.89)</strong></td>
<td><strong>14 (3.89)</strong></td>
<td><strong>360 (100.00)</strong></td>
</tr>
</tbody>
</table>

Source: Survey Data, Note: Figures in parentheses are percentages to respective total.

The details of family type of the industrial workers are presented in Table 3. There are three types of family, namely, nuclear, extended and independent in the study area. Among the three categories of sample industries, nuclear family is found to be larger (52.22 per cent) followed by extended family which accounts for 43.89 per cent. Therefore, it is seen that nuclear family concept is strongly practiced by cotton spinning, cotton weaving and processing and power loom industrial workers in the study area.

Table 4. Details of Income Received by the Sample workers (per month- in Rs.)

<table>
<thead>
<tr>
<th>Sample Industries</th>
<th>Below 2000</th>
<th>2001-3000</th>
<th>3001-4000</th>
<th>4001-5000</th>
<th>Above 5001</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cotton spinning</td>
<td>25 (20.83)</td>
<td>28 (23.33)</td>
<td>34 (28.34)</td>
<td>12 (10.00)</td>
<td>21 (17.50)</td>
<td>120 (100.00)</td>
</tr>
<tr>
<td>Cotton weaving and processing</td>
<td>22 (18.33)</td>
<td>31 (25.83)</td>
<td>46 (38.34)</td>
<td>14 (11.67)</td>
<td>7 (5.83)</td>
<td>120 (100.00)</td>
</tr>
<tr>
<td>Power loom</td>
<td>21 (17.50)</td>
<td>36 (30.00)</td>
<td>39 (32.50)</td>
<td>19 (15.83)</td>
<td>5 (4.17)</td>
<td>120 (100.00)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>68 (18.89)</strong></td>
<td><strong>95 (26.39)</strong></td>
<td><strong>119 (33.05)</strong></td>
<td><strong>45 (12.50)</strong></td>
<td><strong>33 (9.17)</strong></td>
<td><strong>360 (100.00)</strong></td>
</tr>
</tbody>
</table>

Source: Survey Data, Note: Figures in parenthesis are percentages to respective total.

The income analysis of the sample workers reflects that the 68 workers receive the lowest income range of less than 2000 rupees. 95 workers receive an income of Rs.2001 to 3000 per month.

Table 5. Expenditure Pattern of the Sample Workers

<table>
<thead>
<tr>
<th>Sample industries</th>
<th>1500 – 2500</th>
<th>2501 - 3500</th>
<th>3501 – 4500</th>
<th>4501 – 5500</th>
<th>5501 and above</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cotton spinning</td>
<td>11 (9.17)</td>
<td>4 (3.33)</td>
<td>33 (27.50)</td>
<td>11 (9.17)</td>
<td>61 (50.83)</td>
<td>120 (100.00)</td>
</tr>
<tr>
<td>Cotton weaving and processing</td>
<td>7 (5.83)</td>
<td>18 (15.00)</td>
<td>56 (46.67)</td>
<td>18 (15.00)</td>
<td>21 (17.50)</td>
<td>120 (100.00)</td>
</tr>
<tr>
<td>Power loom</td>
<td>17 (14.17)</td>
<td>23 (19.17)</td>
<td>55 (45.83)</td>
<td>12 (10.00)</td>
<td>13 (10.83)</td>
<td>120 (100.00)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>35 (9.72)</strong></td>
<td><strong>45 (12.50)</strong></td>
<td><strong>144 (40.00)</strong></td>
<td><strong>41 (11.39)</strong></td>
<td><strong>95 (26.39)</strong></td>
<td><strong>360 (100.00)</strong></td>
</tr>
</tbody>
</table>

Source: Survey Data, Note: Figures in parentheses are percentages to respective totals.
It is found from table 5 that out of 360 workers, 144 of them incur monthly expenditure of Rs.3501–4500 followed by 95 workers who spend Rs.5501 and above. 41 workers spend Rs.4501–5500 per month.

The survey states that out of 360 sample workers, 271 are non-savers and 89 are savers. It is noticed that 24.72 per cent workers have the habit of saving knowing that saving is a virtue.

The study reveals that the industrial workers possess both movable and immovable properties. The movable property includes gold, cash and vessels and the immovable property consist of land and buildings. Out of 360 workers only 58 and 52 workers have house and land respectively as immovable properties. It reflects that most of the workers do not have immovable properties like house buildings and land. The simple reason is the inadequate flow of income.

**Indebtedness Analysis:** Industrial workers borrow loan from various sources to meet out their expenses. Five sources are accessed by the workers for obtaining loans.. It is observed that out of 197 workers, 33 workers (16.75%) who have borrowed loan from various banks for meeting their expenses, 92 workers get the help of money lenders for availing loan. 41 of them borrow loan from their relatives and friends. 11 of them get loan from co-operative societies. 20 workers get loan from their employers. The amount of debt distribution ranges from Rs.10000 and below to Rs.40001 and above. It is observed that maximum number of workers (92) depend on money lenders for their unforeseen expenditure.

**Garrett’s Ranking Table:** Garrett ranking table is used to find out the influencing factors of wage determination according to the rank basis. The Factors are classified into eight categories. The industrial workers were asked about the factorial influence on wage determination according to their preferences. The following formula used to convert the order of the factors in to ranks.

\[
\text{Per cent position} = \frac{100 \times (R_{ij} - 0.5)}{N_j}
\]

\(R_{ij}\) = Rank given by the \(i^{th}\) factor and \(N_j\) = Number of factors ranked by the \(j^{th}\) individual

The per cent position is obtained and it is converted in to scores using Garrett’s rank table. After that, the scores of the individual workers for each of the factors are added and then divided by the total number of workers who had responded. The mean score is the rank in descending order of magnitude.

<table>
<thead>
<tr>
<th>Influencing Factors</th>
<th>Total Score</th>
<th>Mean Score</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labour cost</td>
<td>4699.73</td>
<td>91.67</td>
<td>I</td>
</tr>
<tr>
<td>Cost of living</td>
<td>7833.30</td>
<td>69.39</td>
<td>II</td>
</tr>
<tr>
<td>Labour unions</td>
<td>8599.99</td>
<td>63.85</td>
<td>III</td>
</tr>
<tr>
<td>Legislations</td>
<td>12974.82</td>
<td>27.93</td>
<td>VII</td>
</tr>
<tr>
<td>Society</td>
<td>13115.73</td>
<td>28.46</td>
<td>VIII</td>
</tr>
<tr>
<td>Employer decision</td>
<td>9316.66</td>
<td>56.03</td>
<td>IV</td>
</tr>
<tr>
<td>Business strategy</td>
<td>9616.82</td>
<td>54.03</td>
<td>V</td>
</tr>
<tr>
<td>Performance appraisal</td>
<td>12466.71</td>
<td>27.15</td>
<td>VI</td>
</tr>
</tbody>
</table>

The Garrett’s ranking table reveals that, wages mostly influenced by labour cost, cost of living, labour unions and employers decision and so on.

**Findings:**

1. The analysis Age-wise distribution of workers revealed that 57.78 per cent of the workers fell in the age group of 21 to 40 years in all the three category of industries.

2. The gender-study of Industrial workers explores that 224 (62.22%) are male and 136 (37.78%) are female workers. It is also to pin point that out of 360 industrial workers 31 are male children workers and 14 are female children workers. This reflects employment of child labour is seen in the industries.

3. The analysis on housing characteristics showed that only 58 workers possess own house and remaining workers are leading their life in either rented or leased houses. The sewage facility is found only with 187 workers dwellings.

4. The analysis of economic status and family type is reveals the information that nuclear type of family is found with 52.22 per cent of industrial workers in the study area.

5. The actual income pattern of the workers reflect that the category of Rs.3001-4000 and Rs.2001-3000 is earned by the 33.05 per cent and 26.39 industrial workers respectively. Only 6.67 per cent of workers are earning Rs.5000 and above per month.

6. The expenditure pattern shows that the food expenditure is ranked as number one followed by housing, loan repayment, clothing and health care.

7. The saving position of the workers indicated that 24.72 per cent are savers and 75.28 per cent are non-savers. LIC and Post Offices are preferred by 52 workers for saving their money.
8. The analysis of asset structure of industrial workers has brought out the fact that only 110 are holding movable assets which are in the form of house and land. The movable property particularly cash-holding is practiced is done by only 84 workers.

9. It is found that out of 360 industrial workers 197 get trapped in indebtedness. The loan amount is borrowed mostly for health care needs and educational needs and followed by the need to celebrate festivities.

10. The Garratt’s mean score value in cotton spinning industrial workers is 91.67 whereas under cotton weaving and processing industry and power loom the mean scores are 84.56 and 91.13 respectively. The society’s sector Garratt’s mean score value is the lowest i.e., 28.46 with cotton spinning workers. It is found that labour cost and cost of living sectors are the vital factors which determine the wage rate.

Suggestions:

1. The wage dispersal system requires systematic and rational revision with Government taking up the role of facilitators and regulators.

2. The payment of wages can be streamlined and connected with productivity of workers to ensure reasonable payment of wages to workers.

3. The practice of social security measures must be applied to the ground so as to elicit employee motivation and involvement and the consequent gratification. Nothing strokes employee motivation like assured social security measures.

4. Industrial workers clamoring for more wages and bonus payment produce the unpleasant effect of disturbing industrial peace and harmony. They must be brought to the mainstream through nurturing a shared vision where intellect and acumen reign supreme along with brawn power.

5. All industrial workers need to own themselves with full freedom to join trade unions to create the competing values framework of collaboration creation competition and control. Employers and Employees should not prey upon one another.

Conclusion

Labour is the most dynamic agency in the process of production. The inestimable importance of labour in terms of its productivity has been emphasized with the appearance of the Robinson Scarcity approach to theory of economics. It is incumbent on industrial establishment governments and industrial workers to create and promote the right atmosphere through intelligent and daring co-ordination to spell self-efficacy industrial peace and economic development. The study reiterates the obvious fact that business organizations must learn to adapt to the greater prevalence of human values at the center of their thinking in the context of ever-changing dynamics of support networks to ensure and sustain flourishing and progressive strategic agility.

Discussion

The results of the study highlighted some important socio-economic aspects of industrial workers such as age wise and gender wise distribution, family type, income and expenditure distribution. The research work also explained the significance and the determinants of the productivity of labour in the total output. In addition, the research work also analyzed the factors which determine the level of wage rate among the sample industrial workers

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References

The Pattern of Rural Employment in India

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Abstract

The experience of countries that succeeded in reducing poverty significantly indicates the importance of high rates of economic growth in achieving this. Every section of the Indian economy is now linked with the world outside, either through its direct involvement in international trade or through its indirect linkages with the export or import transactions of other sectors of the economy. The new policy regime is as much important, and relevant, to farmers, industrialists, traders and sundry service providers as to scientists, writers and singers. The present study is to attempts into some of the crucial dimensions of the changing employment scenario in rural India at the national as well as the state level. The present paper mainly focus on the agricultural sector is also heavily dependent on migrant, temporary and seasonal workers; the precarious conditions in which these workers labour often rob them and their families of food security. Low pay, however, is not the only problem facing agricultural workers. Agriculture is one of the most dangerous industries to work in, alongside construction and mining. Indeed, it is the sector with the most fatal accidents. Agricultural workers face many hazards: dangerous machinery, livestock, extremes of temperature and inclement weather, dehydration due to lack of access to potable water, and exposure to biological hazards arising from pesticides and other agro-chemicals. In doing so, the paper attempts to figure out the challenges and threats, as well as the potential for employment expansion that lies ahead.

Keywords: Rural Employment, Wages and agricultural occupation.

Introduction

The experience of countries that succeeded in reducing poverty significantly indicates the importance of high rates of economic growth in achieving this. High growth, however, is not a sufficient condition for poverty reduction; the pattern and sources of growth as well as the manner in which its benefits are distributed are equally important from the point of view of achieving the goal of poverty reduction. And employment plays a key role in that context. Indeed, countries which attained high rates of employment growth alongside high rates of economic growth are also the ones who succeeded in reducing poverty significantly.¹ Every section of the Indian economy is now linked with the world outside, either through its direct involvement in international trade or through its indirect linkages with the export or import transactions of other sectors of the economy. The new policy regime is as much important, and relevant, to farmers, industrialists, traders and sundry service providers as to scientists, writers and singers. It needs hardly to be emphasized that all categories of economic functionaries engaged in production and services sectors have to adjust to the changing technology-intensive investment, production, labour management and marketing requirements, dictated partly by compulsions of internal competitions and partly by international commercial pressures. Production and marketing management now needs new visions, initiatives and networking, both at home and abroad. Concerns for environment, labour standards and product acceptability, etc. have acquired added significance. Human element becomes the kingpin, from the beginning to the end; the era of captive domestic market is over and with that, quality consciousness and price competitiveness become prime considerations, for staying on in the market.²

The present study is to attempts into some of the crucial dimensions of the changing employment scenario in rural India at the national as well as the state level. The present paper mainly focus on the agricultural sector is also heavily dependent on migrant, temporary and seasonal workers; the precarious conditions in which these workers labour often rob them and their families of food security. Low pay, however, is not the only problem facing agricultural workers. Agriculture is one
of the most dangerous industries to work in, alongside construction and mining. Indeed, it is the sector with the most fatal accidents. Agricultural workers face many hazards: dangerous machinery, livestock, extremes of temperature and inclement weather, dehydration due to lack of access to potable water, and exposure to biological hazards arising from pesticides and other agro-chemicals. In doing so, the paper attempts to figure out the challenges and threats, as well as the potential for employment expansion that lies ahead.3

**Main Objectives of the Study:**

1. To understand the shifting the pattern of women employment in the rural areas in the total context of the Indian economy.

2. To analyze the state-wise picture on women Employment in MGNREGA and SSI in India.

**Data and Methodology:** To study the rural women employment in different sectors and the economic development, various sectors employment have been used. To analyze the present position of economic growth, time series data for a period of 20 years, from 1990-91 to 2009-10 have been used. Although we draw upon more than one source of data, yet, in the main, we base our analysis on National Sample Survey (NSS) data, gathered over different rounds.

**Rural Women Employment Shifting Scenario in India:** Lack of employment and lack of rights are the daily reality for millions of agricultural workers in India. In 2005 the Indian parliament passed historic legislation, the National Rural Employment Guarantee Act (NREGA), which guarantees 100 days of employment for rural households across the country. Initially focused on 200 districts, it was extended to 330 districts the following year and, from 1 April 2008, it has covered all rural districts in the country. The potential benefits of the NREGA are significant: its employment guarantee goes some way towards securing livelihoods for the most marginalised section of the workforce and contributes to a reduction in extreme levels of hunger and poverty; it can help to sustain livelihoods in the countryside and thus to reduce urbanisation; it can deliver greater employment opportunities to women; it can develop necessary basic infrastructure in rural areas, including education, health and environmental sustainability; it can deliver social justice in areas of significant inequality. The NREGA guarantees payment of the legal minimum daily wage and is specifically geared towards unskilled labourers working in water conservation, drought proofing, irrigation, repair (for example, de-silting), land development, flood control and road works. During employment, workers are entitled to drinking water, access to shade, medical kits and childcare. If workers are unable to obtain employment through the scheme, they are entitled to unemployment benefit. The act also specifies that records of funds received and projects carried out through the NREGA are publicly available at district level and can also be obtained through Right to Information legislation. Following implementation during 2006-7, the average number of days worked per household was 17. This covered a very significant range across different states, however: from 77 days in Rajasthan to 3 days in Kerala. In the initial stages of the NREGA schemes, concerns were raised about the take-up rate and problems of corruption. By organizing workers, trade unions have managed to achieve much greater adherence to the payment of the minimum wage and to get more workers participating in the scheme. For example, members of the IUF-affiliated Andhra Pradesh Vyavasaya Vruthidarula Union (APVVU) in the south of India were able to achieve three times as many workdays than the state average. In addition, while in 2006-7 40 per cent of workers in the scheme at a national level were women, in those schemes where APVVU members participated, women’s participation reached 52 per cent. While the average wages earned by agricultural workers before the introduction of NREGA in Andhra Pradesh ranged from Rs. 30 to a maximum of Rs. 60 per day, after the introduction of NREGA, the average wages earned have been between Rs. 81 and Rs. 93 per day. Similarly, the rate of distress migration of agricultural workers has fallen by 70 per cent in several districts of Andhra Pradesh. In Bihar, in the north of India, where the state-wide average work per household in 2006-7 was 8 days, members of the IUF-affiliated Hind Khet Mazdoor Panchayat (HKMP) were able to obtain 60–70 days’ employment. In the North Bengal district of West Bengal, in eastern India, following interventions from IUF affiliate Paschim Banga Khet Majoor Samity (PBKMS), rural workers in one area were able to get 45 days’ work per household in 2006, while the district average was 12.7 days per household. The NREGA is a major improvement in social protection for agricultural workers. It shows that by intervening actively trade unions can monitor and fight corruption and ensure that social justice is delivered to rural workers.5
Table 1: Growth Rate of Participation of Women Under Nrega (%)

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<td>47.88</td>
<td>48.65</td>
<td>47.73</td>
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</table>

Source: Government Report.

**Annual Growth of Participation of Women (In Employment) Under MGNREGA: Comparison of Different State:** The annual growth of participation of women in employment under MGNREGA has increased only in sixteen states and only in two union territories. These eight states are: Andhra Pradesh, Bihar, Haryana, Himachal Pradesh, Jammu and Kashmir, Kerala, Maharashtra, Punjab, Rajasthan, Sikkim, West Bengal, Chhattisgarh, Uttarakhand, Meghalaya, Odisha, Dadra & Nagar Haveli Puducherry, and Andaman & Nicobar is the two Union Territories where the annual growth of participation of women (in employment) under MGNREGA has increased. Since the implementation of MGNREGA, the annual growth of participation of women (in employment) has been reduced in 11 states and in only one union territory. These states are: Andhra Pradesh, Arunachal Pradesh, Assam, Gujarat, Karnataka, Madhya Pradesh, Tripura, Uttar Pradesh, Manipur, Mizoram, and Nagaland. The only one union territory is Goa. Another important point to be noticed here is that the annual growth of women employment participation in MGNREGA has most positive states.
is Tamil Nadu, its contribution of MGNREGA is very high. This means that the contribution of agriculture is declining year by year in the state and the agricultural sector is not able to develop and it is not in a position to retain even its earlier positions. 

### Conclusion

Occupational distribution of workforce shows that labour absorption in self cultivation is saturated and declining. But the increase in the size of agricultural labourers is more than the size decline in cultivators indicating farmers those who are leaving farming activity and those who enter newly in to agriculture are becoming agricultural labourers. The decelerating but a high rate of growth in workforce engaged non-agriculture compared to that of agriculture could not bring any drastic change in the structure of workforce a small change in workforce shifting towards non-agriculture. This is contrast with the highest ever growth of non-agricultural GDP of India that is registered during the last decade. Within the non-agriculture, growth of workforce engaged in household industry is decelerating. Moreover, the rate of growth in marginal workers engaged in non-agricultural activities is found to be higher than those of main workers increasing share of marginal workers in the total workforce of non-agriculture sectors is a cause of concern. Moreover, relatively high growth of female workforce engaged in non-agricultural appears to be a welcome feature but one needs to be prudent in interpreting it so, especially in the context of increasing informalisation of labour market.

**Ethical Clearance:** Completed

**Source of Funding:** Self

**Conflict of Interest:** Nil

### References


Clinical Spectrum of Idiopathic Inflammatory Demyelinating Disorders in a Tertiary Care Centre in North–West India

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Abstract

Background: Idiopathic inflammatory demyelinating disorders of the central nervous system (IIDCDs) represent a broad spectrum of disorders whose varied clinical profile has important implications for diagnosis, management and identifying grey areas in categorization.

Objective: To study clinical, imaging & laboratory profile of IIDCDs pts. and categorize them into specific groups.

Method: Retrospective case series of 81 pts. Cases effectively categorized into 4 groups: MS, NMOSDs, CIS & ADEM and their subgroups. Cases with diagnostic difficulty later sorted out into 3 groups: Atypical, crossovers & converters.

Results: 32% categorized as NMOSDs, 28.4% as MS, 25.9% as CIS & 13.6% as ADEM. Monophasic (64.2%) course and polysymptomatic presentation were most common. 23.46% had optico-spinal presentation; LETM seen in 44% cases. Aquaporin-4 positivity seen in 31.25% NMOSDs.

Discussion: NMOSDs had higher relapse rate & disability, while longer duration of disease & frequent relapses seen in MS group. 30% CIS had abnormal brain MRI. Gray matter involvement commoner in MS & ADEM groups. Low Aquaporin-4 seropositivity in tested IIDCDs. No significant difference between seropositive & negative pts. in terms of relapses, cord length & disability.

Conclusion: Clinical features, course & severity play a dominant role in categorization. IIDCDs considered a spectrum because of common & overlapping clinical presentation.

Keywords: IIDCDs, MS, NMO spectrum disorders, ADEM, CIS, ON, LETM, ATM, EDSS, Aquaporin-4 antibody, annual relapse rate, monophasic, multiphasic, relapsing remitting, BON, RION, visual acuity, disability, clinical spectrum.

Introduction

IIDCDs represent a broad spectrum of central nervous system (CNS) disorders thought to be of autoimmune origin.¹ The spectrum includes monophasic, multiphasic and progressive disorders ranging from highly localized forms to multifocal or diffuse variants.² Multiple sclerosis (MS) is the most common IIDCD worldwide³, while Neuromyelitis optica (NMO) is more commonly seen in Asian countries.⁴ Lack of a formal classification system as well as clinical, radiologic and pathologic features that reliably differentiate among these entities creates confusion in the nosology of IIDCDs.⁵ It is unclear as to what degree the various IIDCD clinical phenotypes reflect fundamental pathophysiologic differences. The

Conclusion

Clinical features, course & severity play a dominant role in categorization. IIDCDs considered a spectrum because of common & overlapping clinical presentation.

Keywords: IIDCDs, MS, NMO spectrum disorders, ADEM, CIS, ON, LETM, ATM, EDSS, Aquaporin-4 antibody, annual relapse rate, monophasic, multiphasic, relapsing remitting, BON, RION, visual acuity, disability, clinical spectrum.
confusion seems to be in part due to the pronounced variation in the frequency of the syndromes in different ethnic groups. We cannot ignore conditions faced in our own clinical experience which provide important clues in the classification of IIDCDs.

Understanding the spectrum of IIDCDs is important for accurate diagnosis & advancing research on pathogenesis as well as treatment strategies. It is also important to acknowledge problems in the categorization of cases. The study of IIDCDs in India has been limited by various factors, including lack of facilities & financial constraints preventing use of radiological & other paraclinical tests on a wide scale in diagnosis. Also record keeping & long-term follow up of patients have serious limitations, hindering data collection and analysis. The objective of the present study was to study the clinical profile of patients presenting with IIDCDs & categorize them into specific groups according to current definitions & internationally fixed criteria.

Materials and Method

This was a retrospective case series to evaluate clinical, laboratory & radiologic data obtained from 81 cases of IIDCDs admitted to the Department of Neurology of SMS Medical College, a tertiary-care facility in Jaipur, Rajasthan in north-west India over a period of 31 months from October 2010 to April 2013. Included were cases of Primary IIDCDs within the 2nd-6th decade & excluded were cases with suspected infectious etiology, vasculitis, systemic autoimmune diseases with CNS manifestations, sarcoidosis, leukodystrophies & mitochondrial disorders (Fig 1-3).

Of the 81 cases taken up for evaluation, clinical data, lab parameters & imaging were obtained from the medical & discharge records. Lab parameters included routine hematologic & biochemical investigations, vasculitis profile, B12 levels, & electrophysiologic tests (VEP, BAER, NCS), CSF profile including oligoclonal bands, Aquaporin-4 antibody status, MRI brain & spinal cord imaging. The data was entered into a Microsoft excel spreadsheet and analyzed.

Results

Of the 81 cases 28.4% (n=23) were MS, 32.1% (n=26) NMOSD, 25.9% (n=21) CIS & 13.6% (n=11) ADEM. Males constituted 53.1% & females 46.9% giving a M:F ratio of 1.1:1. Mean age of the study population was 32.23 ± 11.15 (Range: 10-55 yrs). The maximum no. of cases (n=46) were in the age group 20-39 yrs (56.8%) while 16.1% (n=13) were under 20 yrs of age. The course of disease was monophasic in 64.2% (n=52), multiphasic in 29.6% (n=24) & progressive in 6.2% (n=5). In the MS group (RRMS=17, SPMS=1, PRMS=2, PPMS=3), 78.3% (n=18) had a relapsing course while 21.7% (n=5) had a progressive course (Table 1).

In the NMOSD group (n=26), 34.6% (n=9) fulfilled Wingerchuk’s 2006 criteria for NMO although only 3 tested positive for Aquaporin-4 antibody. The rest were categorized as LETM (42.3%;n=11) or BON/RION (23.1%; n=6) as per predefined criteria.In the CIS group (n=21), 61.9% (n=13) were ON, 23.8% (n=5) were ATM & 14.3% (n=3) had a multifocal presentation. In the ADEM group (n=11), 90.9% were monophasic & 9.1% (n=1) were multiphasic. The mean no. of attacks/pt. in the MS group was 3.39±2.43 which was significantly higher (p=0.000) than the NMO spectrum group (1.62±1.75). However the annual relapse rate (ARR) was higher in the NMO spectrum group (3.91±2.75) than the MS group (2.01±2.50).

65.4% (n=53) of our cases were polysymptomatic at presentation, while pyramidal features (61.7%, n=50) were the most common clinical findings, followed by optic nerve involvement (59.3%, n=48), sensory (58%, n=47), urinary (49.4%, n=40), cerebellar (21%, n=17), brainstem (16.1%, n=13) & ophthalmoparesis (8.6%, n=7). In the ADEM group, 63.6% had history of a febrile illness. Mean visual acuity was lowest in the NMOSD group. of the 59.26% (n=48) cases with a history of optic neuritis, it was an isolated (primary) event in 37.5% (n=18) while it was associated with other disorders in 62.5% (n=30) cases (secondary). 23.46% (n=19) cases had both optic neuritis & myelitis at presentation.

MRI brain was abnormal in 66.7% (n=50) & MRI spinal cord was abnormal in 83.6% (n=51). Compared to the MS & ADEM groups where all brain MRI were abnormal, only 43.5% (n=10) were abnormal in the NMOSD group which was statistically significant. Similarly cord imaging revealed abnormality in 90.9% (n=20/22) of NMOSDs. In the spinal cord MRI group, LETM was observed in 44.3% (n=27) of the cases & the average length of LETM was 9.43 segments.79.5% of the VEP recordings were abnormal & subclinical ON was detected in 17.24% additional cases. VEP abnormality was significantly more in the MS & NMOSD. Only 22.86% of BAER records available were
abnormal (87.5% MS). CSF-OCB was negative in all noted records. Aquaporin-4 antibody had been tested in 30 cases belonging to the NMOSD. Only 5 cases tested positive (NMO=3, LETM=1, BON/RION=1) giving a positivity rate of 16.7% overall.

Aquaporin-4 antibody had been tested in 30 cases belonging to the NMOSD. Only 5 cases tested positive (NMO=3, LETM=1, BON/RION=1) giving a positivity rate of 16.7% overall. 91.36% (n=74) cases had received steroids at some time during their disease course while interferons (β1A) were the most commonly used disease modifying agents with 52.2% of our MS cases on interferons. Azathioprine (14.8%, n=12), Glatiramer, methotrexate & cyclophosphamide were other agents used. Plasmapheresis was done in 3.7% cases (Table 2).

The mean EDSS & MRS at discharge was significantly higher in the NMO spectrum group (4.67±2.50, 2.85±1.41) compared to the MS & CIS groups. Also the mean EDSS, MRS & visual disability was higher in cases with a multiphasic/relapsing course (EDSS=3.65±1.97, MRS=2.34±1.19, VA (logMAR)=0.53±0.49) compared to monophasic course (EDSS=3.45±2.52, MRS=2.01±1.53, VA (logMAR)=0.44±0.46). At least 32.1% (n=26) of our cases had an EDSS≥4 indicating moderate to severe disability of which 57.14% were NMOSD while 42.86% were MS (Table 3).

Within the NMO spectrum group we compared the Aquaporin 4 antibody positive & negative groups in terms of sex ratio, no. of attacks, course, presentation, length of cord lesion & disability and found female preponderance, higher no. of attacks, greater relapsing course, higher no. of cases with ON, longer cord lesions & greater disability (EDSS & MRS) in the antibody positive group. We also correlated VA & length of cord lesion with disability indices in various groups and found a positive correlation with both in only the NMO group (r=0.015, 0.312). Of the 15 cases (atypical=11, cross-over=3, convertor=1) which posed a diagnostic dilemma, 5 were categorized in the MS group, 4 as NMOSD, 4 CIS & 2 ADEM (Table 4).

### Table 1: Demographic data and interpretation of participated patients

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<th>Variables</th>
<th>MS (n=23)</th>
<th>NMO spec (n=26)</th>
<th>CIS (n=21)</th>
<th>ADEM (n=11)</th>
<th>p Value</th>
<th>Total (n=81)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual Relapse Rate (ARR=Attacks/yr)</td>
<td>2.01±2.50</td>
<td>3.91±2.75</td>
<td>-</td>
<td>-</td>
<td>0.114</td>
<td>-</td>
</tr>
<tr>
<td>Visual Acuity (log MAR)</td>
<td>0.36±0.42</td>
<td>0.60±0.54</td>
<td>0.53±0.45</td>
<td>0.26±0.35</td>
<td>0.063</td>
<td>0.47±0.48</td>
</tr>
<tr>
<td>CSF-Sugar</td>
<td>64.88±17.83</td>
<td>57.62±24.63</td>
<td>64.00±12.68</td>
<td>65.29±10.84</td>
<td>0.785</td>
<td>61.91±18.92</td>
</tr>
<tr>
<td>CSF-Protein</td>
<td>88.88±48.52</td>
<td>57.15±33.96</td>
<td>55.50±30.01</td>
<td>59.43±26.46</td>
<td>0.239</td>
<td>65.38±37.31</td>
</tr>
<tr>
<td>CSF-Cells</td>
<td>5.75±5.04</td>
<td>15.85±19.39</td>
<td>4.25±0.96</td>
<td>4.71±2.56</td>
<td>0.172</td>
<td>9.44±13.48</td>
</tr>
<tr>
<td>CSF-OCB +</td>
<td>0/4</td>
<td>-</td>
<td>0/1</td>
<td>-</td>
<td>-</td>
<td>0/5</td>
</tr>
<tr>
<td>VEP abnormality</td>
<td>20/23</td>
<td>19/25</td>
<td>15/18</td>
<td>4/7</td>
<td>0.037</td>
<td>58/73</td>
</tr>
<tr>
<td>BAER abnormality</td>
<td>7/17</td>
<td>0/9</td>
<td>1/6</td>
<td>0/3</td>
<td>0.200</td>
<td>8/35</td>
</tr>
<tr>
<td>Aquaporin-4</td>
<td>0/6</td>
<td>5/16</td>
<td>0/6</td>
<td>0/2</td>
<td>0.205</td>
<td>5/30</td>
</tr>
<tr>
<td>MRS</td>
<td>2.17±1.03</td>
<td>2.85±1.41</td>
<td>1.29±1.27</td>
<td>1.91±1.76</td>
<td>0.002</td>
<td>2.12±1.44</td>
</tr>
<tr>
<td>EDSS</td>
<td>3.33±1.47</td>
<td>4.67±2.50</td>
<td>2.33±1.98</td>
<td>3.36±3.17</td>
<td>0.007</td>
<td>3.51±2.37</td>
</tr>
</tbody>
</table>

### Table 2: Status of AQUAPORIN of the patients

<table>
<thead>
<tr>
<th>Aquaporin 4 Status</th>
<th>Positive (n=5)</th>
<th>Negative (n=11)</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEX, F/M ratio</td>
<td>5/5 (100%)</td>
<td>4/7 (57%)</td>
<td>-</td>
</tr>
<tr>
<td>No.of Attacks</td>
<td>3.60±3.44</td>
<td>1.00±0.00</td>
<td>0.166</td>
</tr>
<tr>
<td>Relapsing course</td>
<td>3 (60%)</td>
<td>1 (9.1%)</td>
<td>-</td>
</tr>
<tr>
<td>Optic neuritis (BON/RION)</td>
<td>3/5 (60%)</td>
<td>4/11 (36.3%)</td>
<td>-</td>
</tr>
<tr>
<td>Length of cord lesion</td>
<td>13.50±5.80</td>
<td>8.00±6.03</td>
<td>0.139</td>
</tr>
<tr>
<td>MRS</td>
<td>4.00±1.22</td>
<td>2.36±1.12</td>
<td>0.020</td>
</tr>
<tr>
<td>EDSS</td>
<td>5.60±2.94</td>
<td>3.77±2.32</td>
<td>0.200</td>
</tr>
</tbody>
</table>
### Table 3: Significant of MS and NMO for the patients

<table>
<thead>
<tr>
<th>Variables</th>
<th>MS (n=23)</th>
<th>NMO Spectrum (n=26)</th>
<th>‘P’ Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>31.61±8.08</td>
<td>33.65±12.13</td>
<td>0.813</td>
</tr>
<tr>
<td>Sex, F/M ratio</td>
<td>13/10</td>
<td>13/13</td>
<td>--</td>
</tr>
<tr>
<td>Total No. of Attacks</td>
<td>3.39±2.43</td>
<td>1.62±1.75</td>
<td>0.006</td>
</tr>
<tr>
<td>Duration of Disease (Yrs)</td>
<td>4.71±4.59</td>
<td>0.32±0.87</td>
<td>0.000</td>
</tr>
<tr>
<td>Annual Relapse Rate (ARR=Attacks/yr)</td>
<td>2.01±2.50</td>
<td>3.91±2.75</td>
<td>0.114</td>
</tr>
<tr>
<td>Visual Acuity (logMAR)</td>
<td>0.36±0.42</td>
<td>0.60±0.54</td>
<td>0.088</td>
</tr>
<tr>
<td>Avg.Length of cord lesion</td>
<td>9.43 (n=20)</td>
<td>3.5 (n=22)</td>
<td>--</td>
</tr>
<tr>
<td>VEP abnormality</td>
<td>20/23</td>
<td>19/25</td>
<td>0.037</td>
</tr>
<tr>
<td>BAER abnormality</td>
<td>7/17</td>
<td>0/9</td>
<td>0.200</td>
</tr>
<tr>
<td>Aquaporin-4</td>
<td>0/6</td>
<td>5/16</td>
<td>--</td>
</tr>
<tr>
<td>MRS</td>
<td>2.17±1.03</td>
<td>2.85±1.41</td>
<td>0.065</td>
</tr>
<tr>
<td>EDSS</td>
<td>3.39±2.43</td>
<td>1.62±1.75</td>
<td>0.029</td>
</tr>
</tbody>
</table>

### Table 4: Results of the output data

<table>
<thead>
<tr>
<th>Category</th>
<th>Pt no.</th>
<th>Age/ Sex</th>
<th>Presentation</th>
<th>Prev. Diagnosis/ Differential</th>
<th>Group/ Subgroup</th>
<th>MRI brain</th>
<th>LETM</th>
<th>Aqu4 Ab</th>
<th>ON</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atypical</td>
<td>#77</td>
<td>22/F</td>
<td>Hemiparesis, h/o Ac. Myelitis, Brainstem demyelination, Peripheral neuropathy</td>
<td>RRMS</td>
<td>MS/T-RRMS</td>
<td>MS, DIS (Tumefactive lesions)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Atypical</td>
<td>#6</td>
<td>17/F</td>
<td>Hypersonmolence+/ Ataxia+ Facial palsy</td>
<td>PRMS</td>
<td>MS/PRMS</td>
<td>MS (DIS,DIT)</td>
<td>-</td>
<td>-</td>
<td>2+</td>
</tr>
<tr>
<td>Atypical</td>
<td>#19</td>
<td>12/F</td>
<td>Optic neuritis, acute myelitis, ataxia</td>
<td>NMO spec</td>
<td>NMO spec/ NMO</td>
<td>Not s.o.MS</td>
<td>+</td>
<td>-</td>
<td>2+</td>
</tr>
<tr>
<td>Atypical</td>
<td>#72</td>
<td>18/F</td>
<td>Recurrent ON, facial weakness, pyramidal signs</td>
<td>?NMO</td>
<td>NMO Spec/ Rec.BON</td>
<td>BON</td>
<td>-</td>
<td>+</td>
<td>2+</td>
</tr>
<tr>
<td>Atypical</td>
<td>#33</td>
<td>34/M</td>
<td>Acute myelitis, ↓ visual acuity on examination, no h/o ON</td>
<td>-</td>
<td>NMO spec/ LETM</td>
<td>WNL</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>#23</td>
<td>20/M</td>
<td>22/F</td>
<td>Rt.ON+ Numbness of face, B/l Papillitis</td>
<td>NMO spec</td>
<td>CIS/Multifocal</td>
<td>MS, DIS</td>
<td>-</td>
<td>-</td>
<td>2+</td>
</tr>
<tr>
<td>#79</td>
<td>32/M</td>
<td>22/F</td>
<td>Acute myelitis, paraparesis (MRC=3/5)</td>
<td>NMO spec</td>
<td>CIS/ATM</td>
<td>WNL</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>#46</td>
<td>42/M</td>
<td>22/F</td>
<td>Acute myelitis, paraparesis (MRC=2/5)</td>
<td>NMO spec</td>
<td>CIS/ATM</td>
<td>WNL</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>#40</td>
<td>47/M</td>
<td>22/F</td>
<td>Lt.ON, Papillitis, Poor recovery (VA=1.3)</td>
<td>NMO spec</td>
<td>CIS/ON</td>
<td>WNL</td>
<td>-</td>
<td>-</td>
<td>1+</td>
</tr>
<tr>
<td>#46</td>
<td>42/M</td>
<td>33/F</td>
<td>Hemiparesis</td>
<td>Tum. Demyelination</td>
<td>ADEM/Monophasic</td>
<td>Large cortical+ subcortical demyelin. lesions</td>
<td>-</td>
<td>ND</td>
<td>-</td>
</tr>
<tr>
<td>#32</td>
<td>33/F</td>
<td>33/F</td>
<td>Prev ADEM—BON+ hemiparesis 6m later</td>
<td>RRMS</td>
<td>ADEM/Multiphasic</td>
<td>Large cortical+ subcortical demyelin. lesions</td>
<td>-</td>
<td>-</td>
<td>2+</td>
</tr>
<tr>
<td>Cross-Over</td>
<td>#4</td>
<td>29/F</td>
<td>PKND</td>
<td>CIS</td>
<td>MS/RRMS</td>
<td>MS (DIS,DIT)</td>
<td>-</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>Cross-Over</td>
<td>#57</td>
<td>45/F</td>
<td>Ataxia, Urgency, Sensory</td>
<td>ADEM</td>
<td>MS/RRMS</td>
<td>MS (DIS,DIT)</td>
<td>+</td>
<td>0</td>
<td>+</td>
</tr>
<tr>
<td>Cross-Over</td>
<td>#11</td>
<td>28/F</td>
<td>Unilateral ON, acute myelitis, Hemiparesis</td>
<td>NMO Spec</td>
<td>MS/OSMS</td>
<td>Tum Demyelination</td>
<td>+</td>
<td>0</td>
<td>+</td>
</tr>
<tr>
<td>Converter</td>
<td>#1</td>
<td>32/M</td>
<td>BON→Acute myelitis</td>
<td>BON</td>
<td>NMO Spec/ NMO</td>
<td>Not s.o.MS</td>
<td>+</td>
<td>-</td>
<td>+</td>
</tr>
</tbody>
</table>
Figure 1: Brain involvement in IIDCDs: a) & b) Large confluent lesions of ADEM, c) & d) Lesions of Tumefactive demyelination perpendicular to corpus callosum, e) & f) Black holes on T1 and T2-FLAIR images in SPMS, g) Balo’s concentric sclerosis h) rt. optic neuritis

Figure 2: Brain involvement in NMOSD: a), b) & c) MS-like lesions in subcortical, juxta-cortical white matter and corpus-callosum involvement, d) Bilateral optic neuritis, e) medullary lesions, f) & g) MCP lesions h) cortical lesions, i) mid-brain lesions.
Discussion

In this study IIDCDs constituted 2.37% of all neurologic admissions. Hospital-based studies in India showed increase in MS-related admissions from 1.58% to 2.54%. The mean age of our study population (32.23±11.15) was higher than most series on MS & lower than mean age for NMO & ADEM. Most of our cases presented in the 3rd-4th decade & the F:M ratio was 1:1.1 which was unusual for demyelinating series the world over which show a female preponderance. However several Indian studies have reported a male preponderance. Disease course was monophasic in 2/3rd of our study population while the rest had a multiphasic/progressive course. NMOSD were the most common IIDCDs constituting around 1/3rd of the total cases followed by MS, CIS & ADEM. However NMO per se constituted only 11.1% of our total IIDCDs admissions. This is in concordance with data compiled by Wingerchuk et al from India where NMO constituted 9-24% of all demyelinating disorders. This figure was higher than those in Western countries but remarkably lower than some South Asian countries (33.1%-39.3%).

In our MS patients a relapsing-remitting course was most common, occurring in 78.3% of cases. Surprisingly around 25% of our NMOSD had a relapsing course which increased to 44% in the NMO subgroup. This was much lower than seen in other series. In the CIS group isolated optic neuritis followed by ATM was the most common presentation. No isolated brainstem syndrome was noted. Review of large database of CIS pts. showed 21% presented with ON, 46% with long tract signs, 10% as a brainstem syndrome & 23% with multifocal abnormalities. Almost 2/3rd of our cases were polysymptomatic at presentation with pyramidal features & optic nerve involvement being the most common. Although single series data on spectrum of IIDCDs was lacking, our data was corroborating with similar series from India & the world.

MRI revealed a high incidence of gray matter involvement (56.3%) in the MS group similar to other series (59%). 44% of our NMO spectrum cases had an abnormal brain MRI at presentation compared to 50-85% reported in various series. MS-like demyelinating lesions on brain MRI, was the most common of the 5 types of presentation described. Disease severity had a positive correlation with both visual acuity & length of cord lesion only in the NMOSD.

The Aquaporin-4 seropositivity was only 16.7% of all tested case of IIDCDs which increased to 32% in the NMO group. This was comparatively lower than reported by Lennon et al in their NMOSD (61.3%). However other Indian studies also reported a low seropositivity (4%-11.4%). Wingerchuk et al tried to explain this discrepancy by 3 possible causes:
(a) Inadequate clinical diagnostic criteria, (b) suboptimal assay sensitivity & c) closely related autoimmune disorder with a different target autoantigen.\textsuperscript{16} Comparison between our Aquaporin-4 positive & negative cases within the NMOSD showed higher female preponderance, more & frequent relapses, higher incidence of ON, longer cord lesions & higher disability (EDSS) in the positive group, as seen in some other studies\textsuperscript{17,18}.

**Limitations of our study:** Retrospective study & not all suspected cases of NMOSD had Aquaporin-4 antibody testing done & OCB data was available in only a few cases.

**Conflict of Interest:** Nil

**Funding Source:** Nil

**Ethical Clearance:** This study was approved from the competent authority of our Institutional ethics committee.

**References**

Factors Associated with Fear of Falls in Indian Elderly: A Systematic Review

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Abstract

Background: Fear of falls (FOF) is a risk for falls and collateral morbidity as it imposes self-limitations on activity. Given the increasing population of elderly in India, its unique unstructured physical environment, cultural practices and paucity of research, it was important to have a strong understanding of FOF and the factors associated with it.

Objective: Determination of prevalence and factors associated with fear of falls in the Indian elderly from review of literature.

Methodology: A systematic review based on PRISMA guidelines was used to synthesize and analyse existing literature.

Results: Six Indian studies met the inclusion criteria and were utilized for synthesis. The prevalence of FOF ranged from 33.2% to 44.2%, and various biological, psychological and social factors were found to be associated with FOF.

Conclusion: There is high prevalence of FOF in India. Inspite of its serious impact on health and quality of life of elderly, this construct is inadequately studied within the Indian context.

Keywords: Fear of Fall, Indian, Elderly, Factors associated, Falls.

Introduction

Worldwide, elderly population is estimated to reach 2 billion by the year 2050¹ ². This increased life expectancy is associated with physical, social and psychological challenges that hamper quality of longer life³.

‘Falls’, a common problem in the elderly, are a deterrent to “active ageing” and are experienced by approximately one-third of community-dwelling older adults each year⁴. They result in physical injuries, sometimes serious enough to require hospital admission incurring high financial costs, and are also the second leading cause of accidental deaths especially among frail elderly⁵ ⁶ ⁷. Regardless of physical injury, the mere fear of falling can lead to a loss of self-confidence and may lead to reduction in physical activities, setting up vicious cycle of fear-reduced confidence-decreased activity² ⁸ ⁹.

Fear-of-fall (FOF), first identified in 1982 by Murphy and Isaacs⁹, is defined as a perceived fear of falling that limits an individual’s ability to participate in physical activity that he/she is capable of performing⁴. It is protective when the older adult is being more careful to avoid risk of a fall; however, it becomes a risk in itself when it imposes self-limitations on activity⁸. FOF is an umbrella term encompassing balance confidence, fall related fear and self-efficacy¹⁰. It becomes a risk factor for falls, functional decline, social isolation⁶ ¹¹ ¹² ¹³ ¹⁴. This may lead to depression, anxiety and an impaired quality of life¹⁴.

Initially, FOF was believed to be a key symptom of ‘post-fall syndrome’, but recent studies have reported a
high prevalence (30% to 90%) of FOF in older population regardless of history of fall\textsuperscript{9,15}. The symptoms of FOF are associated with the type of fall rather than with the fall itself\textsuperscript{6,14}.

Factors associated with FOF that have been reported in literature are previous falls, age, female gender, poor physical function, use of walking aid, poor self-rated health, poor balance, frailty, dizziness, functional decline and reduced quality of life\textsuperscript{9,10,11,16,17}. Conflicting results are presented for association with depression, anxiety and use of drugs\textsuperscript{10}. Stereotypically, older people are often offered aid when none is required, this reduces their self-efficacy and increases FOF\textsuperscript{16}. These factors can be explained according to the biopsychosocial model proposed by a German psychiatrist George Engel\textsuperscript{18}. It integrates psychosocial dimension with biological aspects of the disease\textsuperscript{19,20}.

India is changing demographically and socially due to increasing population of elderly, urbanization, migration, more women entering work force, smaller families and loss of traditional support structures\textsuperscript{21,22}. The Indian lifestyle and environment are also more demanding than many other countries because of high density living in architecturally constrained areas, cultural activities that necessitate sitting on the floor, daily activities that require visiting unorganized markets and congested places of worship\textsuperscript{23}. Given this uniqueness of the lifestyle, this systematic review is aimed to synthesize the existing literature to determine the prevalence and factors associated with fear of falls in India.

Method

Identification and selection of trials

Data sources and search strategy: This systematic review was conducted in accordance with the PRISMA statement. Research articles from India were electronically searched on Pubmed, Medline, Google Scholar, Embase and Cochrane Library. The keywords used for the search were, ‘fear of falls’, ‘elderly’, ‘India’, and ‘factors associated’.

Study selection and eligibility criteria: Studies were included if they investigated the factors associated with fear of falls in elderly living in India. Studies were excluded if they discussed falls in relation to any condition other than normal physiological ageing e.g. Parkinsonism, Stroke.

The title and abstracts of included articles were reviewed and full texts were retrieved.

Data extraction and analysis

Quality: Selected studies were assessed for methodological quality. Qualitative studies were assessed using Critical Appraisal Skills Programme (CASP) checklist and quantitative studies were assessed using Methodological Quality Appraisal Tool (MQAT). If more than 60% of the criteria on the checklist were met, the study was rated as strong quality, if 40%-60% were met, the study was rated as moderate quality and if less than 40% were met, then the study was rated as poor-quality evidence.

Study characteristics: The characteristics extracted from the studies were study population in terms of age range and mean age of study subjects, their gender ratio, whether they were institutionalized or non-institutionalized, place of study, percentage prevalence of fear of falls and factors that were found to be associated with fear of falls.

Outcome data: Data was analysed for prevalence of fear of falls and factors associated with it. Factors associated with FOF were categorized as biological, psychological or social in nature using George Engel’s biopsychosocial model.

Results

Flow of studies through the review: Following the search and removal of duplicates, 63 articles were retrieved in full text, out of which, 52 were excluded as they were not related to fear of falls in elderly. 11 full texts were assessed for eligibility, out of which 5 were excluded as they were related to falls rather than fear of falls, discussed specific medical condition or balance intervention. Theremaining 6studies were analysed and utilized for synthesis.

Characteristics of included studies: The systematic search resulted in 6 articles\textsuperscript{12,14,24-27} published between 2008 to 2017. The participants in all studies were non-institutionalized elderly who belonged to age range of 60-96 years of age except one study\textsuperscript{25} that had lower age limit as 40 years (one study did not mention the age range). There was equal representation of males and females in all studies except two\textsuperscript{26,27} which did not report the gender ratio. The recruitment was done using non-probability sampling method. Most of the studies were
cross-sectional and relied on correlation statistics to infer the association of various factors with fear of fall. These studies were undertaken in Puducherry, Manipal and Udupi, Kanpur, Dehradun and Surat.

**Prevalence of Fear of Fall:** The prevalence of fear of fall was reported to be between 33.2% to 44.2%.

**Factors associated with Fear of Fall:** The various factors that have been associated with FOF were age, presence of more than one disease, education, low socio-economic status, previous experience of fall, activity restriction, balance ability, low back pain and disability associated with it, muscle mass, strength, physical performance, depression and quality of life. These factors are further categorized as per the George Engel’s Biopsychosocial Model.

**Quality:** Two out of six studies were qualitative but had strong evidence. Four studies were quantitative, of which three were rated as moderate quality of evidence and one as strong evidence.

**Discussion**

A significant outcome of the systematic review was that there is a severe paucity of studies that have addressed this very important problem, which is increasingly affecting the quality of life of the Indian elderly population. In this review, the evidence from studies was rated as moderate to strong, however the studies lacked proper sampling, details on the non-responders, and measures to control non-response bias.

The studies reviewed reported moderately high (33.2 – 44.2%) prevalence rate of FOF in community living Indian elderly, and interestingly only 34.6 – 45.7% of the subjects sampled had fallen previously. Thus, the current data highlights the magnitude of the problem (FOFs) in community living Indian elderly and also importantly, that the fear of falling is independent of a history of fall. In a study conducted by Verma and Pal in 2015, that included subjects aged 40 - 75 years, surprisingly a significant prevalence of FOF was also found in the young elderly, suggesting that people transitioning into old age developed a fear of falls much before an actual biological decline.

The biopsychosocial model has emphasized the significant contribution of psychosocial variables, in addition to biological pathologies to sickness and health. The model explicitly describes how deficits within each of the sub-dimensions of biology, psychology and sociology impacts disease, disability and health. Using Engel’s Biopsychosocial model factors associated with FOF found in this systematic review were categorized under the three sub-domains of biological, psychological and social. The few Indian studies reviewed identified biological factors as age, presence of more than one disease, balance ability, decreased muscle strength, physical performance and low back pain. Factors classified as psychological were also previous falls and depression, while social factors identified were activity restriction, disability, education, low socio-economic status, and poor quality of life. Similar findings have been reported in several studies conducted internationally. In addition, these studies have reported that FOF is significantly associated with gender, frailty, dizziness, visual problems, cognitive impairment, poor self-rated health, generalized anxiety, functional dependence in activities of daily living, living alone and rural living. However, interestingly, none of these factors were studied or identified as factors associated with FOF in the Indian elderly studies. Additionally, the role of India specific factors, such as living in high density areas with poor physical infrastructure, unorganized markets, places of worship; and culturally-specific behaviours such as sitting and eating on the floor etc. have not been addressed in the studies reviewed and need to be comprehensively examined.

Fear of falling is a major obstacle to ‘Active Ageing’. Reducing FOFs with a goal to increase physical activity, should be a high priority in the care of the elderly. The limited data from studies on the Indian elderly appear to be in alignment with global norms suggesting that the FOF is a health challenge across the world with serious quality of life ramifications.

**Conclusion**

There are very few studies in the literature that discuss fear of falls in Indian elderly in spite of its moderately high prevalence rate. A number of biological, psychological and social factors have been associated with FOF, such as the presence of more than one disease, balance ability, muscle mass, muscle strength, physical performance, low back pain, previous falls, depression, activity restriction, disability, education, low socio-economic status, quality of life etc. However, given the paucity of research in the Indian context, it is imperative that current and future research initiatives...
be directed towards studying the fear of falling within the environmental and cultural context of the Indian elderly. This will help in development of inter-sectoral policies and programmes for enhancement of health, participation and security of older citizens in order to enact “active ageing”.

Conflict of Interest: None

Source of Funding: Self

Ethical Clearance: Not Applicable

References


Green Marketing in Food Industry and Impact on Health Issues

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¹Research Scholar, ²Professor & Research Supervisor, Department of Commerce, VISTAS Pallavaram, Chennai

Abstract

The main aim of this study is analyse the green marketing in food industry and its impact on health issues of consumers. The researcher used one way anova to find the result. There is a negative relationship between green foods and health issues. The consumers used green foods the feel there is no health issues and vice-versa. Finally, it concludes that most of the consumers are using organic/green foods for avoid the health issues.

Keywords: Health issues, Organic foods, Food Industry.

Introduction

Green marketing refers to an organization’s effort at designing, distributing, pricing, and promoting the final products that do not harm the consumer, production resources and the environment. Green products should be compatible to the Indian consumers in terms of price, promotion and delivery system. Green marketing is as one of the major trends in modern business as revealed in a number of studies (Kassaye, 2001; Pujari and Wright, 1996). Getting environment conscious not only responds to the social, legal and political pressures, it also ensures business sustainability on the market front. Greener market strategies may exert leverage in taking full advantage of consumer preferences and to some extent cost efficiencies.

The food processing industry, which is globally referred to as the sunrise sector, has gained importance in India in the recent years. It contributes immensely to economic development of the country, provides employment opportunities and assists in income generation. This sector has the capacity to provide jobs to our rural poor and thus reduce the burden on Indian agriculture for their livelihood (Rais M et al., 2013). India is counted among the world’s largest consumer of processed food products. India is only next to China in Food production and has the potential to be the biggest with food and agriculture (ASA & A, 2013).

Marketers these days are trying to capitalize on the fact that, now people are more concerned for a safe and healthier environment and prefer environment-friendly products for consumption. Consumers are offered a wide range of competitively priced products. As a result, quality control is getting essential in the food industry, and efficient quality assurance has become increasingly important to this industry. One of the major concerns is the ability to trace and authenticate each and every ingredient of a food product. As the consumer awareness increases for organic foods and sustainable products, the trade and industry is bound to meet their expectations. Increased marketing efforts and publicity are needed to communicate the advantages of a ‘green’ image to consumers (Ottman, 1993).

The catalysts and pressure groups world over have made the leading firms in the corporate sector conscious of the need of becoming eco-friendly. But the business and the industry as a whole in India will acknowledge its significance only on the popular demand of consumers and marketing intermediaries. In the Western world green movement has reached to majority of consumers and their huge percentage shows a strong interest in eco-products (Ghose, 2008).

Review of Literature: Joyce I. Boye (2013) Current Trends in Green Technologies in Food Production and Processing. This review summarizes key highlights from the recently published book entitled Green Technologies in Food Production and Processing which provides a comprehensive summary of the current status of the agriculture and agri-food sectors in regard to environmental sustainability and material and energy stewardship and further provides strategies that can be used by industries to enhance the
use of environmentally friendly technologies for food production and processing.

Chinkala (2013) Green marketing in food industry, Commerce and Management. This study was conducted in Coimbatore city. Most the people preferring green products often read the nutritional and ingredients section of food labels before buying the new food products. Most of the Respondents agreed that the green foods are safe for human consumption. They also opined that by implementing green marketing strategy the companies are able to gain competitive advantage over others. It was observed that more than half of the respondents surveyed were willing to buy green foods even if they were costly.

Khan and S Ahmad (2014) The initiatives are needed by the government to upgrade the standards and enforce them through designated agencies. The standards should save the wastages of material and energy and hence not add extra costs to the food for the consumers. Green products should be compatible to the Indian consumers in terms of price, promotion and delivery system. Green claims must also be supported by authentication and certification to differentiate them from products with false claims. Comparative advantages should be publicised to convince the customers. Retail chains should also obtain and guarantee certification by the designated 126 F M Khan and S Ahmad authority, compliance of safety laws and procedures and should be under scrutiny by them. This paper aims at designing the marketing mix strategies and outlining the managerial initiatives necessary for achieving green marketing in the food processing industry.

Heiyantuduge Lakmal (2015) Green Marketing Practices and Customer Satisfaction: A Study of Hotels Industry in Wennappuwa Divisional Secretariat. In the last decade, consumers have become more open-minded on ecological issues. Green marketing is rising quickly and consumers are willing to pay a lot for green product. There has been little analysis of the impact of this new market on the consumers and the environment so far. Green marketing affects all areas of our economy, Companies that are green stewards stand a chance of gaining many satisfied and loyal customers. Hotel company managers increasingly have to take environmental issues into account.

Farheen Khan (2015) A Study of Green Marketing Practices in the Food Processing Industry of India. This article analyses the green marketing process and practices prevalent in the food industry of India. With the conscious-consumer at the helm, green marketing is increasingly viewed as a relevant marketing strategy in India towards sustainable development of the food industry. A questionnaire-based survey method was used for the data collection from food companies in India. In the long-term, both the consumers and the food processing industry stand to benefit greatly from such green marketing initiatives and awareness but the policies and strategies need to be formulated and implemented accordingly. This article recommends that the Government of India and various business organizations work together to adjust and promote the marketing elements to Indian consumers so as to increase the acceptance, accessibility and affordability of the green products.

Cesare Zanasi (2017) An Assessment of the Food Companies Sustainability Policies through a Greenwashing Indicator. The goal of this paper is to provide a monitoring tool able to support the food companies definition of effective green marketing strategies, avoiding the risk of greenwashing; moreover supporting the other food system stakeholders’ critical analysis of the sustainability communication coming from the food companies. The results showed that the sustainability actions related to possible greenwashing represent a relatively low share of the total action implemented by Barilla. Most interesting is the capacity of this analytical tool to encompass a broad range of dimensions related to the companies green marketing strategies evaluation; this allows also other stakeholders to more clearly analyse the capacity of a company to provide a clear honest and complete report on their sustainability activities.

Yaty Sulaiman (2017) A study of consumption patterns on green food among students in University Utara Malaysia. Journal of advances research in social and behavioural sciences. Volume 7. Issue 1. This aim of this study is to identify the green food consumption pattern on under graduate students. It finds to environmental consciousness, perceived consumer effectiveness and health consciousness is related to use the green foods by under graduate students in Malaysia.

Objectives of the Study:

1. To find the factors causing usage of green marketing foods
2. To know the relationship between green marketing foods and health issues of customers
Hypotheses of the Study:

1. There is no significant difference among the factors causing usage of green marketing foods
2. There is no significant relationship between green marketing foods and health issues

Influence of Age on the Customer Perceptions Towards Green Marketing Food Products and Customer Satisfaction: The perceptual difference between age of the customers towards Green Marketing food products and customer satisfaction is presented in the following anova table.

Table 1: Anova Descriptives

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error</th>
<th>95% Confidence Interval for Mean</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Lower Bound</td>
<td>Upper Bound</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No side effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25-35</td>
<td>30</td>
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<td>3.538</td>
<td>.646</td>
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<td>35.95</td>
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<td>6.052</td>
<td>.856</td>
<td>20.76</td>
<td>24.20</td>
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<td>.255</td>
<td>8.07</td>
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<td>23.35</td>
<td>10.245</td>
<td>1.024</td>
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<tr>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25-35</td>
<td>30</td>
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<td>3.234</td>
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<td>33.23</td>
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<td>.284</td>
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<td>9.74</td>
<td>8</td>
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<tr>
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<td>100</td>
<td>24.74</td>
<td>9.761</td>
<td>.976</td>
<td>22.80</td>
<td>26.68</td>
<td>8</td>
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<tr>
<td>Stay healthy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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<td>25-35</td>
<td>30</td>
<td>46.13</td>
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<td>.660</td>
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<td>3.517</td>
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<td>10.80</td>
<td>14.10</td>
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<td>32.75</td>
<td>12.739</td>
<td>1.274</td>
<td>30.22</td>
<td>35.28</td>
<td>10</td>
</tr>
<tr>
<td>No Pesticides</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>30</td>
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<td>4.315</td>
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<td>42.32</td>
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<td>33.06</td>
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<td>.450</td>
<td>10.66</td>
<td>12.54</td>
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<td>31.10</td>
<td>12.413</td>
<td>1.241</td>
<td>28.64</td>
<td>33.56</td>
<td>10</td>
</tr>
<tr>
<td>No Artificial flavours</td>
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<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
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<td>59.20</td>
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<td>.925</td>
<td>57.31</td>
<td>61.09</td>
<td>53</td>
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<td>35-45</td>
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<td>4.308</td>
<td>.963</td>
<td>16.33</td>
<td>20.37</td>
<td>13</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>43.47</td>
<td>15.739</td>
<td>1.574</td>
<td>40.35</td>
<td>46.59</td>
<td>13</td>
</tr>
<tr>
<td>Customer satisfaction</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25-35</td>
<td>30</td>
<td>32.57</td>
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<td>.373</td>
<td>31.80</td>
<td>33.33</td>
<td>29</td>
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<td>45-60</td>
<td>20</td>
<td>10.00</td>
<td>3.277</td>
<td>.733</td>
<td>8.47</td>
<td>11.53</td>
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<tr>
<td>Total</td>
<td>100</td>
<td>24.38</td>
<td>8.422</td>
<td>.842</td>
<td>22.71</td>
<td>26.05</td>
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</tr>
</tbody>
</table>

Source: Computed data

Table 2: Anova

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>No side effects</td>
<td>8208.503</td>
<td>2</td>
<td>4104.252</td>
<td>182.432</td>
<td>.000</td>
</tr>
<tr>
<td>Within Groups</td>
<td>2182.247</td>
<td>97</td>
<td>22.497</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>10390.750</td>
<td>99</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long live</td>
<td>7688.603</td>
<td>2</td>
<td>3844.302</td>
<td>213.739</td>
<td>.000</td>
</tr>
<tr>
<td>Within Groups</td>
<td>1744.637</td>
<td>97</td>
<td>17.986</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>9433.240</td>
<td>99</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stay healthy</td>
<td>13615.613</td>
<td>2</td>
<td>6807.807</td>
<td>269.409</td>
<td>.000</td>
</tr>
<tr>
<td>Within Groups</td>
<td>2451.137</td>
<td>97</td>
<td>25.269</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>16066.750</td>
<td>99</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Source: Computed data</td>
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<td></td>
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<td></td>
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<tr>
<td>-----------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

It was observed in the above table No side effects \( (F=182.432, P=.000) \) Long live \( (F=213.739, P=.000) \), Stay healthy \( (F=269.409, P=.000) \), No Pesticides \( (F=224.648, P=.000) \), No Artificial flavours \( (F=218.014, P=.000) \), Customer satisfaction \( (F=356.937, P=.000) \) are statistically significant at 5% level. This established to the mean comparison of age Below 22 -35 years, 35 -45 years and 45 - 60 years of customer perception. It is found that Below 25 – 35 years of customers strongly agree for the existence of No side effects \( (\text{Mean}=33.31) \) Long live \( (\text{Mean}=33.23) \)Stay healthy \( (\text{Mean}=44.78) \) No Pesticides \( (\text{Mean}=42.32) \)No Artificial flavours \( (\text{Mean}=57.31) \)Customer Satisfaction \( (\text{Mean}=31.80) \) in the Green Marketing food products.

It illustrates that below 25-35 years of age customers are impressed by feel happy while using green products, feel healthy and confident. It admires many customers for the reason of no health issues.

**Findings and Conclusions**

Green Marketing in food Industry attracts many customers. In the heavy competitive markets the companies are using many artificial ingredients to attract and admire the customer and stay back in the marketing field long. So the customers are preferring Green Marketing foods to avoid many health issues.

Green Marketing foods and health issues are negatively correlated. Customers are using Green marketing they have no health issues. They prefer the products for the reason of avoid artificial colouring and flavours in the food products, pesticides using in the food products, stay healthy and no side effects by the green marketing foods.

To maintain the customer’s long and getting long lasting customer relationship the companies are preferred the Green products in the marketing. This will give good profit and high equity to the firm.

**Conflict of Interest:** Nil

**Ethical Clearance:** Taken from UGC Committee.

**Source of Funding:** Self

**References**

Burnout: “Lived Experience” of Working Mothers: 
A Phenomenological Study

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1PG Scholar, 2Assistant Professor, Department of Nursing, Symbiosis College of Nursing, SIDU, Pune, India

Abstract
Burnout is a stress related outcome that occurs due to prolonged exposure to chronic stressors. There are various causes of burnout; research has determined that aspects of the work-family interface, particularly in the work to family direction could be important contributors to burnout. Working mothers may be at greater risk of burnout compared with other working populations because of greater home demands, and demand on time and energy.

Purpose: The purpose of the study was to obtain a lived experience of working mothers regarding burnout.

Method: A Qualitative, Phenomenological research design was used in this study. Ten working mothers were taken as a sample and data was collected by interview method. The interviews were audio recorded lasting from 25 to 30 minutes and all recordings were transcribed into word file. Analysis was done by Colaizzi’s Strategy.

Result and Discussion: By using phenomenological method several themes and sub themes emerged which provided a description of the experience of working mothers regarding burnout. Six themes such as Burnout, Affect, Time, Demand, Complaints, Strategies and several sub themes emerged from the data. This work explores the reasons of the burnout among working mothers and provides recommendations for further study. Interview results show that participants are going through the same level of burnout at the certain stage.

Summary & Conclusion: In summary, this research study used a qualitative, phenomenological method by which to gain a greater understanding of the lived experience of burnout among the working mothers. The various themes and sub themes were identified from the collected data. The specific circumstances associated with pivotal moment were different for each participant, but the clarity of the moment was universal. Although not exhaustive in their scope, the identified themes were reported to be a part of the burnout.

Keywords: Burnout, Lived Experience, Working mothers.

Introduction
Burnout is a stress related outcome that occurs due to prolonged exposure to chronic stressors. There are three types of burnout such as personal burnout, work burnout and client-related burnout. Various studies indicate that burnout affects the physical and psychological health of employees, impairs the productivity and also related to lower job satisfaction.  

In 1974, Herbert Freudenberger coined the term burnout for the first time. He has characterized burnout as a set of symptoms which includes exhaustion resulting from work’s excessive demands as well as physical symptoms such as headaches and sleeplessness, “quickness to anger”, and closed thinking. He also observed that the burned out worker “looks, acts and seems depressed”.  

Burnout is a state of chronic continuous stress. There are three dimensions of burnout such as; a) Physical and emotional exhaustion b) Cynicism and detachment c) Feelings of ineffectiveness and lack of accomplishment.

According to Leiter, Jackson, & Shaughnessy, 2009; job burnout is a form of job stress in which workers
become physically, mentally and emotionally depleted or exhausted. It is a result of steady and prolonged exposure of chronic job stress (Schaufeli & Enzmann, 1998). Characteristics of job burnout are like decrease in energy, Lack of motivation, negative feelings about self, cynical or detachment from work and interpersonal interactions (Maslach, Schaufeli, & Leiter, 2001; Maslach & Jackson, 1996).3

Bischoff, De Tienne, and Quick’s (1999) study main focus were to find out the factors which affect the mental health of female staff in both private and public sectors. It was clearly understood from the studies that office politics and task clashes were major stressors which increased job burnout rate. The gaps of the researchers in these years were found that they only focused on a single profession of female employees such as teachers, doctors and industry workers rather than conducting a survey to find out the main stress factors faced by female employees regardless of their fields. 4

In these modernize eras, due to increasing demand; it gets tremendous for women to work without being stressed. In this research main focus was on burnout among working mothers in private and public sector. The word stress generally represents the feeling when one is attached with a problem that is unable to handle. Various stress factors such as inter role distance, role overload, role ambiguity, role expectation conflict, role isolation, personal inadequacy and resource inadequacy. The employee feels suffocated and starts feeling pressured by that problem. So, stress can be defined as a threat or a challenge to one’s well-being. 5

Job stress causes job burnout. Job burnout refers that when one is unclear of one’s ability to perform in their job, keeping in view the value of their job hopelessly. Research findings reveal that the jobholders at senior level face more workloads and more role-overload. Working mothers have a higher risk of having a burnout compared to other working populations. Higher burnout not only negatively affects individuals and organizations, but also family functioning and child welfare.

D.K. Creedy, M. Sidebotham, J. Gamble, Julie Pallant, J. Fenwick conducted a study to assess the prevalence of burnout, depression, anxiety, & stress in Australian midwives. The identified burnout prevalence was 64.9% reported personal burnout; 43.8% reported work-related burnout; and 10.4% reported client-related burnout6.

Yashika Negi, Rajni Bagga, conducted a study on Burnout among Nursing Professionals in Tertiary Care Hospitals of Delhi, India. Burnout prevalence rate was declared in three dimensions of burnout such as emotional exhaustion (14.39 ± 6.87) and depersonalization (4.84 ± 3.34), and an average score (34.72 ± 6.33) for personal accomplishment7.

Innstrand, S. T, MelbyeLangbelle, E., Arild Espnes, G. and Gjerlow Aasland, O., identified the Positive and negative work-family interaction and burnout among working mothers. Researcher identified that Working mothers may be at greater risk of burnout compared with other working populations because of greater home demands, and demand on time and energy. Higher burnout not only negatively affects individuals and organizations, but also family functioning and child welfare8.

Materials and Method

- **Research approach**: Qualitative Research
- **Research design**: Phenomenological research design
  Interpretative phenomenological research design
- **Inclusion Criteria**:
  a. Mothers who are working in public or private hospitals.
  b. Mothers who having at least two children.
  c. Mothers who can speak Hindi or English.
  d. Mothers who are living in nuclear family or separated.
- **Exclusion Criteria**:
  a. Mothers who are not willing to participate.
  b. Mothers who are not available at the time of data collection.
  c. Mothers who have working experienced more than five years.
- **Research Setting**: Selected private hospital of Pune.
- **Population**: Primary source (staff nurse)
- **Sample**: Staff Nurse
- **Sample Size**: 10
- **Sampling Method**: Non probability sampling Purposive Sampling Method
Tools For Data Collection: Open Ended Questionnaire

Techniques of Data Collection: Interview Method (semi structured & in depth interview)

Data analysis: After collecting data,

- Creating a meaning/theme from collected information.
- Formulating meaning into several themes and sub themes.
- Description given regarding the particular theme.

Results

Table 1: Frequency and Percentage wise distribution of working mothers among selected organisation N=10

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• 25-30 years</td>
<td>04</td>
<td>40%</td>
</tr>
<tr>
<td>• 30-35 years</td>
<td>06</td>
<td>60%</td>
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<tr>
<td>Educational status</td>
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</tr>
<tr>
<td>• Certified course</td>
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<td>10%</td>
</tr>
<tr>
<td>• Diploma</td>
<td>01</td>
<td>10%</td>
</tr>
<tr>
<td>• Under graduate</td>
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<td>50%</td>
</tr>
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<td>• Post graduate</td>
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<tr>
<td>• Nursing faculty</td>
<td>02</td>
<td>20%</td>
</tr>
<tr>
<td>• Accountant</td>
<td>02</td>
<td>20%</td>
</tr>
<tr>
<td>• Staff nurse</td>
<td>02</td>
<td>20%</td>
</tr>
<tr>
<td>• HR</td>
<td>02</td>
<td>20%</td>
</tr>
<tr>
<td>• Police women</td>
<td>02</td>
<td>20%</td>
</tr>
<tr>
<td>Work experience</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• &lt;5 years</td>
<td>02</td>
<td>20%</td>
</tr>
<tr>
<td>• 5-10 years</td>
<td>08</td>
<td>80%</td>
</tr>
</tbody>
</table>

Burnout Characteristics by Semi-Structured Questionnaire of working mother’s among selected organisation (N=10)

- Most of the working mother reported that they having difficulty in managing time between work and home. From ten working mothers only two mothers have reported that they can manage it due to supportive family and caring, understanding husband. Mostly mothers have reported that they having some physical complaints such as sleep disturbances, headache, backache, mood swings etc. from that only 1 mother reported that she have chest pain when she stressed out. Most of the working mother uses some coping strategies to manage stress and burnout such as Yoga, Meditation, Deep Breathing Exercise and Physical exercise, sharing(talk it out), maintain silence but they were not doing regularly.

Themes and Subthemes According To Interview Questionnaire (N=10)

- Researcher has identified six themes such as Burnout, Affect, Time, Demand, Complaints and Strategies and also identified various subthemes.

Burnout: Circumstances which create burnout among working mothers were overwork, inspection, sick baby, long working hours, family responsibility and working environment. Below I have mentioned some participants’ comments related to it:

I have to do daily routine work and after that NABH work also because hospital is going to be NABH so too much work load creates stress or burnout in me.

During time of inspection I have to do extra work and managing everything creates stress in me.

When my kids are sick that time I feel stressed out because they were under 5 and more prone to get infection.

Affect: Almost all participants said that burnout affect them by physically such as headache, fatigue, vomiting and emotionally such as anxiety, frustration and irritation. Below I have mentioned some participants comments related to it:

When I get frustrated or tiered I shout on the person

I usually get frustrated due to hectic routine at work as well as home.

Yes, I use to have headache and when it is severe then I take pain killer.
Time: All participants mentioned that they having difficulty in managing time between work and home. Only 2 participants stated that;

They are able to manage time between work and home (family) due to supportive family.

Other all participants stated that,

Yes, facing difficulty to manage time between work and home.

Demand: Most of the participants said that they having difficulty in fulfilling occupational demand to work with client/employees. Most of the participants mentioned that during audit work or too much workload and due to miscommunication they experiences of stress and burnout. Below I have mentioned some participants comments related to it:

During inspection due to too much work arguing with co-workers affect me a lot.

Due to miscommunication between employees created delay in work and get scolding from superiors affect me.

Complaints: Almost all participants mentioned that due to stress and burnout having physical complaints such as headache, sleep disturbances, backache etc. All participants stated that,

Yes, I use to have headache and backache.

Yes, I do not sleep properly because my younger son is ten month old so he teases a lot like he wakeup in the midnight and cry for milk.

Strategies: Most of the participants mentioned about strategies which used by them were yoga, deep breathing exercise, physical exercise and maintain silence but they were not doing it regularly. Below I have mentioned some participants comments related to it:

Not daily but sometime I use to do deep breathing exercise and after that I feel so good so now my planning is to do deep breathing exercise daily.

I use to maintain silence. I do not talk to any person till my anger comes down. Mostly I maintain silence up to 4-5 hours.

Discussion

The finding of the study shows that working mothers was experiencing stress and burnout due to different circumstances or factors such as work overload, family responsibility, working environment in either public or private sector. To explain this study finding in the light of some previous studies, the researcher found it was partially related to the study of Kumar S. which found that Occupational stress is a problem of great concern for working women. The main sources of stress which were identified were sex determination, household responsibilities, and lack of funding, resources and support services, lack of knowledge and experience, task overload, job insecurity, lack of promotion, reward and recognition.

Present studies also found that working mothers was facing difficulty in managing time between home and work. Researcher was found that due to work overload, long working hours mothers not able to give spend time with their family. In addition, Maryam Zarra-Nezhad, Ali Moazami-Goodarzi, suggest that Balancing work and family roles has become a key personal and family issue for women. Employers and family studies specialists find that the changing family structure is a major source of stress and role strain in both the work place and the home. Women usually have a feeling of guilt for sparing less time for their maternal responsibilities and family. This dual responsibility proves the double burden on her and that makes her to fight concurrently on two fronts. Sources of work stress, including role ambiguity, relationships, tools and equipment, lack of autonomy, career advancement, job security, workload and work/home interface have been implicated in affecting family functioning.

Study findings also found that due to long working hours they face difficulties in managing time between work, home and family. The study of Sirpa Weckström, it can be concluded that, besides time spent at work, strain related to work may also prevent mothers from giving time to family members. Due to long working hours, working conditions Finland mothers feels that they cannot spend time with their family and family was fed up with these work-time interferences.

Conclusion

The results obtained from this study indicated that there are various factors influencing burnout among working mothers in Pune, India. Findings also revealed that working mothers were physically and emotionally affect due to burnout and also having some physical complaints. In addition study result shows that most of the working mothers having under five years of age
children, so due to role overload, family responsibility, working responsibility, working hours are major influencing factors of burnout.

Conflict of Interest: Nil declared

Source funding: Self

Ethical Clearance: This study is ethically approved by symbiosis college of nursing, Symbiosis International (Deemed University)

References
5. The World’s Women 2015, Trends and Statistics; United Nations Statistics Division; Work Chapter 4; 87-90
7. Yashika Negi, Rajni Bagga; Burnout among Nursing Professionals in Tertiary Care Hospitals of Delhi; Journal of Health Management; June 1, 2015, 17(2). https://doi.org/10.1177/0972063415575802
Prevalence of Cognitive Impairment among Elderly

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Abstract

Introduction: Cognitive impairment is the decline of intellectual abilities that leads to inability of an individual to manage his/her social or occupational activities. Elderly people are at high risk for cognitive impairment. The study was aimed to assess the prevalence and level of cognitive impairment among elderly.

Methodology: The study was conducted among 200 elderly attending Geriatric outpatient department in Kerala who were selected by convenience sampling. This descriptive study used Rowland’s Universal Dementia Assessment Scale and Mini Mental Status Examination Scale to collect the data which were analyzed using descriptive statistics involving frequency and percentage.

Result: Cognitive impairment was prevalent in 132(66%) of the elderly with predominantly mild level of cognitive impairment (CI) 61(46.2%) followed by moderate (58, 43.9%). Cognitive impairment increased with advancing age (46.6% in young old versus 88.24% in old). Widows/widowers and single individuals had higher prevalence than married people. Parkinsonism, anemia, stroke, asthma and alcoholism increased the risk for cognitive impairment.

Conclusion: The study finding indicated that elderly are at high risk for cognitive impairment. An in depth study of the contributing factors and its impact on the overall quality of life is needed. Health care should focus on early detection of the underlying disease to prevent the occurrence of further complications.

Keywords: Cognitive impairment, elderly, prevalence, geriatrics.

Introduction

Ageing is a series of processes that begin with life and continue throughout the life cycle.¹ Once beyond 65 years, men and women pass into the final stage of existence; they have become bureaucratically defined as geriatrics and senior citizens.² Ageing is a physiological process and all the body systems undergo age-related changes. The brain shrinks with advancing age and there are changes at all levels from molecules to morphology. The most widely seen cognitive change associated with ageing is that of memory. Memory decline occurs with ageing and brain activation becomes more bilateral for memory tasks.³ According to the census of India, the Indian population has nearly tripled in last 50 years and the number of older persons has increased more than fourfold. Cognitive impairment is the symptomatic pre-dementia stage on the continuum of cognitive decline, characterized by objective impairment in cognition. Studies report that the prevalence of cognitive impairment in adults aged 65 years and older to be 10-20%.⁴

During aging, the size, efficiency and complexity of arborization decreases, making communication between cells less effective. Damage to white matter tracts with aging contributes to decreased brain size. These and other structural brain changes associated with aging correspond to age related differences in performance across cognitive tasks.⁵ The brain begins to structurally deteriorate as early as 30 years of age. Maintaining youthful cognitive function is a crucial challenge of aging. Declining memory function may also begin as early as age 30 and is often evident after 50 years of age.⁶

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Cognitive impairment varies from mild to severe form. Mild cognitive impairment (MCI) causes a slight but noticeable and measurable decline in cognitive abilities, including memory and thinking skills. A person with MCI is at increased risk for Alzheimer’s or another dementia. With mild impairment, people may begin to notice changes in cognitive functions but still be able to do their everyday activities. Severe levels of impairment can lead to losing the ability to understand the meaning or importance of something and the ability to talk or write, resulting in the inability to live independently.\(^7\)

A descriptive cross-sectional study carried out in urban and rural areas of Shimla, among 400 elderly people between 60 and 90 years of age reported that cognitive impairment in both areas are as increased steeply with age.\(^7\)

As per the Alzheimer’s Disease International Delphi consensus study, of all the people with dementia, 71% will be living in developing countries by 2040. In the next four decades, the number of people suffering from dementia in India, i.e., 1.5 million is going to increase by almost 300%. In India, the prevalence of cognitive impairment in the elderly vary from 3.5% in Himachal Pradesh to 5.1% in Uttar Pradesh and 6.5% in Kashmir.\(^8\)

Dementia is emerging as an important health problem in Kerala. Studies in Kerala report a prevalence of cognitive impairment to be 11.5% in those aged >65 years.\(^9\)

Early recognition of cognitive impairment is important for diagnosis of potentially reversible medical conditions, and initiation of treatment interventions. Patients and care givers will have time to prepare for lifestyle changes and plan for the future. Nurse practitioners who work in a variety of practice settings commonly provide care to the older adults with varying levels of cognitive ability. The failure to evaluate memory or cognitive complaints is likely to hinder treatment of underlying disease and co-morbid conditions, and may present safety issues for the patient and others.

**Material and Method**

The study was conducted among 200 elderly attending the Geriatric outpatient department of a hospital in Kerala. Descriptive survey design and convenience sampling was used for the study. Elderly above 65 years were included while mentally and physically handicapped were excluded. Obtained ethical clearance from the Institutional Ethics Committee and informed consent from the subjects. Data collected using Rowland’s Universal Dementia Assessment Scale (RUDAS) and Mini Mental Status Examination Scale were analyzed using frequency and percentage distribution.

**Findings**

### 1. Sample characteristics

**Table 1: Distribution of subjects based on socio-demographic data n= 200**

<table>
<thead>
<tr>
<th>Socio-demographic data</th>
<th>Frequency (f)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age in Years</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>65-74 (young old)</td>
<td>88</td>
<td>44.0</td>
</tr>
<tr>
<td>75-84 (middle old)</td>
<td>95</td>
<td>47.5</td>
</tr>
<tr>
<td>≥ 85 (old old)</td>
<td>17</td>
<td>8.5</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>87</td>
<td>43.5</td>
</tr>
<tr>
<td>Female</td>
<td>113</td>
<td>56.5</td>
</tr>
<tr>
<td><strong>Marital Status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>4</td>
<td>2.0</td>
</tr>
<tr>
<td>Married</td>
<td>131</td>
<td>65.5</td>
</tr>
<tr>
<td>Widow/ Widower</td>
<td>65</td>
<td>32.5</td>
</tr>
<tr>
<td><strong>Living Status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With family</td>
<td>190</td>
<td>95.0</td>
</tr>
<tr>
<td>With friends</td>
<td>1</td>
<td>0.5</td>
</tr>
<tr>
<td>With paid care giver</td>
<td>3</td>
<td>1.5</td>
</tr>
<tr>
<td>Alone</td>
<td>6</td>
<td>3.0</td>
</tr>
<tr>
<td><strong>History of Alcohol intake</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-alcoholic</td>
<td>186</td>
<td>93</td>
</tr>
<tr>
<td>Alcoholic</td>
<td>14</td>
<td>7</td>
</tr>
</tbody>
</table>

Middle old constituted majority of the subjects (95, 47.5%) followed by young old (88, 44%). Majority were females (113, 56.5%), married (131, 65.5%) and lived with their families (190, 90%). A considerable number were widowed (65, 32.5%). [Table 1].

**Table 2: Distribution of subjects based on clinical variables n= 200**

<table>
<thead>
<tr>
<th>Clinical Variables</th>
<th>Frequency (f)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertension</td>
<td>114</td>
<td>57</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>103</td>
<td>51.5</td>
</tr>
<tr>
<td>Cardiovascular diseases</td>
<td>31</td>
<td>15.5</td>
</tr>
<tr>
<td>Asthma/ COPD</td>
<td>29</td>
<td>14.5</td>
</tr>
<tr>
<td>Parkinson’s disease</td>
<td>7</td>
<td>3.5</td>
</tr>
<tr>
<td>Cancer</td>
<td>5</td>
<td>2.5</td>
</tr>
<tr>
<td>Kidney disease</td>
<td>3</td>
<td>1.5</td>
</tr>
<tr>
<td>Anemia</td>
<td>3</td>
<td>1.5</td>
</tr>
<tr>
<td>Stroke</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Others</td>
<td>110</td>
<td>55</td>
</tr>
</tbody>
</table>

Hypertension was the major co-morbidity (114, 57%) followed by diabetes mellitus (103, 51.5%) and cardiovascular diseases (31, 15.5%).
2. Prevalence of Cognitive Impairment

Table 3: Distribution of subjects based on the prevalence of cognitive impairment n= 200

<table>
<thead>
<tr>
<th>Cognitive Impairment</th>
<th>Frequency (f)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present</td>
<td>132</td>
<td>66</td>
</tr>
<tr>
<td>Absent</td>
<td>68</td>
<td>34</td>
</tr>
<tr>
<td>Total</td>
<td>200</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 3 indicates that majority (132, 66%) of the elderly had cognitive impairment in the present setting.

3. Level of Cognitive Impairment

Table 4: Distribution of subjects based on the level of cognitive impairment n= 132

<table>
<thead>
<tr>
<th>Level of Cognitive Impairment</th>
<th>Frequency (f)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Questionably significant</td>
<td>12</td>
<td>9.1</td>
</tr>
<tr>
<td>Mild</td>
<td>61</td>
<td>46.2</td>
</tr>
<tr>
<td>Moderate</td>
<td>58</td>
<td>43.9</td>
</tr>
<tr>
<td>Severe</td>
<td>1</td>
<td>0.8</td>
</tr>
<tr>
<td>Total</td>
<td>132</td>
<td>100</td>
</tr>
</tbody>
</table>

Significant number of subjects had mild to moderate level of cognitive impairment with maximum having mild (61, 46.2%) followed by moderate level of cognitive impairment (58, 43.9%) [Table 4].

4. Cognitive impairment with socio-demographic and Clinical variables

Table 5: Distribution of subjects based on the presence or absence of cognitive impairment and socio-demographic data n= 200

<table>
<thead>
<tr>
<th>Socio-demographic variables</th>
<th>Cognitive Impairment</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Present (f) (%)</td>
<td>Absent (f) (%)</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Young old (65-74 years)</td>
<td>41 (31.1)</td>
<td>47 (35.9)</td>
</tr>
<tr>
<td>Middle old (75-84 years)</td>
<td>76 (57.6)</td>
<td>19 (15.9)</td>
</tr>
<tr>
<td>Old old (≥85 years)</td>
<td>15 (11.4)</td>
<td>2 (1.5)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>65 (49.2)</td>
<td>22 (17.4)</td>
</tr>
<tr>
<td>Female</td>
<td>67 (50.8)</td>
<td>46 (36.6)</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>3 (2.3)</td>
<td>1 (0.8)</td>
</tr>
<tr>
<td>Married</td>
<td>83 (62.9)</td>
<td>48 (38.4)</td>
</tr>
<tr>
<td>Widower/widower</td>
<td>46 (34.8)</td>
<td>19 (15.9)</td>
</tr>
<tr>
<td>Living Status</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Data presented in table 5 indicate that on the whole, cognitive impairment is higher among the middle age (75-84 years) with 76 (57.6%) followed by young old (65-74 years) with 41 (31.1%). Among the cognitively impaired elderly (n= 132), old old (> 85 years) had higher prevalence with 15 (88.2%) out of 17. There is a steady increase as the age advances (i.e., 76 (80%) out of 95 middle old and 41 (46.6%) out of 88 young old). Both male and female had almost equal chance of cognitive impairment i.e., 65 (49.2%) males vs. 67 (50.8%) females. Marital status seemed to be a significant factor among the elderly for cognitive impairment as depicted in the given data where widowed [46 out of 65 (70%)] and single [3 out of 4 (75%)] had higher prevalence than married [83 (63.4%) out of 131]. Prevalence of CI was lesser among those elderly who lived with their family members than their counterparts who lived with their friends/paid care giver/ who lived alone.

Table 6: Distribution of subjects based on the presence or absence of cognitive impairment and clinical variables

<table>
<thead>
<tr>
<th>Socio-demographic variables</th>
<th>Cognitive Impairment</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Present (f) (%)</td>
<td>Absent (f) (%)</td>
</tr>
<tr>
<td>Clinical Variables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Present</td>
<td>68 (51.5)</td>
<td>35 (25.5)</td>
</tr>
<tr>
<td>Absent</td>
<td>64 (48.5)</td>
<td>33 (24.5)</td>
</tr>
<tr>
<td>Hypertension</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Present</td>
<td>76 (57.6)</td>
<td>38 (26.8)</td>
</tr>
<tr>
<td>Absent</td>
<td>56 (42.4)</td>
<td>34 (23.2)</td>
</tr>
<tr>
<td>Cardiac Diseases</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Present</td>
<td>25 (18.9)</td>
<td>6 (4.2)</td>
</tr>
<tr>
<td>Absent</td>
<td>107 (81.1)</td>
<td>62 (75.8)</td>
</tr>
<tr>
<td>Asthma</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Present</td>
<td>24 (18.2)</td>
<td>5 (3.7)</td>
</tr>
<tr>
<td>Absent</td>
<td>108 (81.8)</td>
<td>63 (86.3)</td>
</tr>
<tr>
<td>Kidney Disease</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Present</td>
<td>2 (1.5)</td>
<td>1 (0.8)</td>
</tr>
<tr>
<td>Absent</td>
<td>130 (98.5)</td>
<td>67 (98.2)</td>
</tr>
</tbody>
</table>
Disease conditions like diabetes (66.02% of the total diabetics \( n=103 \)), hypertension \( n=114 \), 76(66.7%), cardiac diseases \( n=31 \), 25(80.65%), asthma \( n=29 \), 24(82.8%) had higher prevalence of cognitive impairment (Table 6). In addition to this, all the elderly with Parkisonism, anaemia, and stroke developed cognitive impairment.

### Discussion

Cognitive impairment was prevalent in 132 (66%) subjects; with mild level of cognitive impairment in 61(46.2%) and moderate level in 58(43.9%). Advancing age seemed to contribute to cognitive impairment where 41(46.6%) out of 88 young old, 76 (80%) out of 95 middle old and 15 (88.2%) out of 17 old old developed cognitive impairment. Prevalence was higher among males. A cross-sectional survey among 2943 older adults reported that for every one year increase in age, there was a 5% increase in the likelihood of having cognitive impairment (OR 1.05, 95% CI 1.04, 1.06). More than one fifth of the older adults had mild and more than one tenth (11.0%, \( n=307 \)) had severe impairment. A study among 538 Chinese people to explore the prevalence of cognitive impairment and depression among elderly \( \geq 60 \) years recorded a prevalence of CI as 12.6%; female had a higher prevalence which increased with age. In the present study, males 65 (74.7%) had a higher prevalence than females 67 (59.3%). A study conducted in the Emergency Department reported that age was significantly associated with cognitive impairment (75-84 years: RR= 1.35, \( p<0.001 \); 85+ years: RR 1.69, \( p<0.001 \)). The findings suggested that a higher proportion of elders are either admitted to the hospital from the ED or are being discharged from the hospital with cognitive deficits. A community based cross-sectional study reported that prevalence of cognitive impairment was significantly associated with the age (\( p<0.001 \)) and was found to be highest in the age group of 80 years and above, followed by 70-79 years. Another study reported that 124 (22%) out of 554 subjects included had MCI. Clinical studies reported a prevalence of MCI in adults aged 65 years and above is 10-20%; risk increased with age. Results highlights that cognitive impairment is a threatening problem among the elderly. The prevalence of cognitive impairment among the study population was considerably high. This difference could be due to the nature of the setting i.e., a tertiary care hospital where many attend due to some or other health related issues or due to different language and versions of tools used for the different studies. Hence the study can be generalized only to the study population and future studies can be conducted in a community or natural setting for a better generalization.

A camp based study conducted among 728 elderly >60 years to determine the prevalence of cognitive decline and dementia and its various risk factors in the elderly population of Uttar Pradesh using Hindi version of Mini Mental Status Examination reported a low cognitive scoring among 43% of the elderly. Prevalence of dementia was 2.7%. In the present study, elderly with any form of co-morbidities had a higher rate of cognitive impairment than their counterparts without co-morbidities i.e., 68(66.02%) of those with diabetes, 76(66.7%) of those with hypertension, 25(80.6%) of those with cardiac diseases and 24(82.8%) of the elderly with asthma had cognitive impairment. Invariably, all those with Parkinson’s disease, stroke and anemia had cognitive impairment. History of alcoholism also contributed to cognitive impairment (10, 71% of the alcoholics; \( n = 14 \)). Literature support the role of co-morbidities as contributing factor of cognitive impairment. Hence, it is evident that co-morbidity of any type could be a contributing risk factor for cognitive impairment. People with MCI are three to four times more likely to develop Alzheimer’s Dementia (AD) than those without and the risk of progressing to dementia in 6% to 25% approximately. The present study did not include patients with Alzheimer’s disease as the focus was only to determine the prevalence of cognitive impairment. Further study must be conducted to study the contributing factors of cognitive impairment.

### Conclusion

Findings provide evidence that advancing age is a risk factor for cognitive impairment. Owing to the fact that mild cognitive impairment is a precursor of many diseases including Alzheimer’s disease, attention must be given for screening the elderly for the early identification and treatment. Health care members, especially nurses play an important role in the assessment of cognitive impairment and to provide appropriate need based care.

**Conflict of Interest:** No conflict of interest.

**Source of Funding:** No external source of funding.
Ethical Clearance: Obtained approval from the Institutional Ethics committee and informed consent from all the subjects.

Reference


Prevalence of Shoulder Girdle Dysfunction in Computer Users with Non-specific Neck Pain

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³PhD, Amar Jyoti Institute of Physiotherapy, University of Delhi

Abstract

Aims: Prolonged improper postures while using computers/laptops/smartphones result in many health problems such as neck pain, shoulder girdle pain, forearm and wrist pain etc. High prevalence of non-specific neck pain was reported in office workers who use computers compared to the general population. The purpose of the present study was to determine the prevalence of neck pain, shoulder girdle dysfunction and the physical factors associated with computer users.

Settings and Design: A Cross sectional, observational study that was carried out at a call center that used computers terminals.

Method and Material: One hundred and eleven (111) male computer users with mean age of 34.3±9.13 years, that worked more than 8 hours a day on computers, were included in the study. They were evaluated for the following physical factors–Pectoralis minor tightness, scapular asymmetry, scapular kinematics, Forward Shoulder Posture, cervical range of motion and Posterior Capsular Tightness. The data were analyzed using descriptive statistics.

Results and Conclusions: There was a high prevalence (n = 72; 64.8%) of non-specific neck pain in our sample. Computer users with neck pain demonstrated increased deficits of cervical flexion-extension ROM (88.2%) followed by cervical side flexion (96.3%) and cervical rotation (79.2%). Shoulder girdle examination revealed a higher frequency of inferomedial scapular border prominences with neck pain, along with a high prevalence of posterior capsular tightness (75%), tight pectoralis minor muscle length (26.3%), abnormal lateral scapular slide test values with arms abducted (84.7%) and protracted shoulders (37.5%), observed in computer users with non-specific neck pain

Keywords: Nonspecific neck pain, Computer users, scapular asymmetries, shoulder girdle dysfunction.

Introduction

Prolonged improper postures when using computer/laptops/smartphones and long hours in front of visual display terminals result in a whole host of musculoskeletal disorders (MSDs), such as neck and upper back pain[1]. Moreover, continuous use of these devices result in repetitive movements, awkward postures of the neck and the upper limbs leads to muscle weakness and joint dysfunction.[2] Several studies have reported postural and/or mechanical problems such as forward head posture, rounded shoulders, kyphotic posture etc. among computer users[3, 4, 5, 6, 7] which could leads to “nonspecific neck pain”. Neck pain is a great personal discomfort, results in disability, reduction in work productivity, poor quality of life, and economic losses due to inefficiency and lost days at work [8, 9, 10, 11] Clinically, it is observed that patients with non-specific neck pain exhibit scapular deviations, similar to those with shoulder disorders.[12, 13] Sustained bad postures such as forward head postures, rounded shoulders etc. result in the asymmetrical shortening of the anterior
structures and lengthening of the posterior structures of the shoulder complex, leading to muscle weakness and biomechanical deficits.\textsuperscript{[14,15]} A vicious cycle of neck pain–sustained aberrant postures-biomechanical deficits of the neck and shoulder girdle complex develops in patients with non-specific neck pain. To the best of our knowledge the prevalence of scapular asymmetries and factors associated with it have not been investigated in computer users with nonspecific neck pain. Thus, the purpose of this study was firstly, to determine the prevalence of shoulder girdle dysfunction in computer users with non-specific neck pain and secondly to identify physical factors associated with scapular dysfunction in computer users with non-specific neck pain.

**Method and Materials**

One hundred and eleven (111) male computer users, between the ages of 20-50 years working at an academic institution and a government technology facility volunteered for this study. Computer users involved in field work, having congenital spinal abnormalities, undergone neck/shoulder surgery and with a BMI≥30 kg/m\(^2\) were excluded from the study. Following written informed consent, participants were asked to fill out a questionnaire that included relevant demographic data, such as information regarding workplace, lifestyle, ergonomics, neck pain etc. Each subject was then tested for cervical and shoulder girdle deficits using the following standardized tests protocols: Cervical Range of Motion\textsuperscript{[16]} Scapular asymmetries\textsuperscript{[17]}, Lateral Scapular Slide Test\textsuperscript{[18]}, Pectoralis Minor Index (PMI)\textsuperscript{[19]}, Forward Shoulder Posture\textsuperscript{[20]}, and Posterior Capsule Tightness\textsuperscript{[21]}

**Subject Characteristics:** The study participants were all males in the age ranging from 20-50 years (mean = 34.3±9.1 years) and mean BMI of 23.7±2.9 kg/m\(^2\). Sixty six percent (n=73; 66%) of the subject used their computers for more than 6 hours a day. Most computer users (60%) have work experience more than 5 years and 62% prefer using laptop against desktop (38%). Surprisingly (n=61;55%) computer users took less than one hour break during their working hours and only 28% of the computer users participated in physical activity on a regular basis.

**Prevalence:** As seen in Table 1, 64.8% of computer users reported having nonspecific neck pain, while 35.1% reported no neck pain. The mean age and body mass index (BMI) for individuals with neck pain was 34.6±9.42 years and 23.9±3.05 kg/m\(^2\), while for individuals without pain it was 34.5±7.90 years and 23.7±3.15 kg/m\(^2\) respectively.

<table>
<thead>
<tr>
<th>N=111</th>
<th>No Neck Pain</th>
<th>Neck Pain</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Deficits %</td>
<td>Deficits %</td>
</tr>
<tr>
<td>Frequency</td>
<td>39</td>
<td>35.1%</td>
</tr>
<tr>
<td>Age (Years)</td>
<td>34.5±7.90</td>
<td>34.6±9.42</td>
</tr>
<tr>
<td>BMI (Kg/m(^2))</td>
<td>23.7±3.15</td>
<td>23.9±3.05</td>
</tr>
</tbody>
</table>

On visual examination as reported in Table 2, it was observed that out of the computer users that suffered from neck pain 38.8% had inferior scapular prominence, 51.3% had medial scapular prominence and 54.1% had Inferomedial scapular prominence deficits.

**Table 2: Frequency of Observed Scapular Prominence deficits regardless of side.**

<table>
<thead>
<tr>
<th>Scapular Prominence deficits</th>
<th>No Neck Pain</th>
<th>Neck Pain</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Deficits %</td>
<td>Deficits %</td>
</tr>
<tr>
<td>Inferior angle</td>
<td>10</td>
<td>25.6%</td>
</tr>
<tr>
<td>Medial border</td>
<td>18</td>
<td>46.1%</td>
</tr>
<tr>
<td>Infero-medial border</td>
<td>16</td>
<td>41.0%</td>
</tr>
</tbody>
</table>

As seen in Table 3, the cervical range of motion deficits were greater in computer users that reported neck pain. 88.2% of users that reported neck pain had flexion/extension deficits, 96.3% had side-to-side flexion deficits and 79.2% had deficits in rotation towards the right and/or left.

**Table 3: Frequency of Cervical Range of Motion deficits.**

<table>
<thead>
<tr>
<th>CROM Deficits</th>
<th>No Neck Pain</th>
<th>Neck Pain</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Deficits %</td>
<td>Deficits %</td>
</tr>
<tr>
<td>Flexion/Extension</td>
<td>46</td>
<td>41.4%</td>
</tr>
<tr>
<td>Left/Right flexion</td>
<td>60</td>
<td>54.0%</td>
</tr>
<tr>
<td>Left/Right Rotation</td>
<td>50</td>
<td>45.0%</td>
</tr>
</tbody>
</table>

Overall, regardless of the dominance as reported in Table 4 computer users with neck pain had higher percentages of tight Pectoralis Minor deficits (47.2%) compared to users who did not have neck pain (33.3%). Also, individuals with neck pain had greater PMI deficits on the dominant side (26.3%) compared to the non-dominant side (20.8%).
Table 4: Frequency of Pectoralis Minor tightness deficits

<table>
<thead>
<tr>
<th>PMI</th>
<th>No Neck Pain</th>
<th>Neck Pain</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Deficits %</td>
<td>Deficits %</td>
</tr>
<tr>
<td>DOMINANT</td>
<td>8</td>
<td>20.5%</td>
</tr>
<tr>
<td></td>
<td>19</td>
<td>26.3%</td>
</tr>
<tr>
<td>N DOMINANT</td>
<td>5</td>
<td>12.8%</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>20.8%</td>
</tr>
<tr>
<td>Total</td>
<td>13</td>
<td>33.3%</td>
</tr>
<tr>
<td></td>
<td>34</td>
<td>47.2%</td>
</tr>
</tbody>
</table>

As seen in Table 5, individuals with neck pain demonstrated a higher percentage of protracted shoulder deficits (69.4%) compared to individuals with no pain (58.9%) and furthermore the deficits on the dominant side were greater (37.5%) than the nondominant side (31.0%). On the other side it was surprising that computer users with no neck pain had a higher percentage of posterior capsule tightness deficits (82.0%) than individuals with neck pain (77.7%).

Table 5: Frequency of Protracted Shoulder deficits & Frequency of Posterior Capsule Tightness deficits

<table>
<thead>
<tr>
<th></th>
<th>No Neck Pain</th>
<th>Neck Pain</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Deficits %</td>
<td>Deficits %</td>
</tr>
<tr>
<td>DOMINANT</td>
<td>14</td>
<td>35.8%</td>
</tr>
<tr>
<td></td>
<td>27</td>
<td>37.5%</td>
</tr>
<tr>
<td>N DOMINANT</td>
<td>9</td>
<td>23.0%</td>
</tr>
<tr>
<td></td>
<td>23</td>
<td>31.9%</td>
</tr>
<tr>
<td>Total</td>
<td>23</td>
<td>58.9%</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>69.4%</td>
</tr>
<tr>
<td>PCT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DOMINANT</td>
<td>30</td>
<td>76.9%</td>
</tr>
<tr>
<td></td>
<td>54</td>
<td>75%</td>
</tr>
<tr>
<td>N DOMINANT</td>
<td>2</td>
<td>5.1%</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>2.7%</td>
</tr>
<tr>
<td>Total</td>
<td>32</td>
<td>82.0%</td>
</tr>
<tr>
<td></td>
<td>56</td>
<td>77.7%</td>
</tr>
</tbody>
</table>

The Lateral Scapular Slide Test (LSST) was used to measure scapular position and/or asymmetry in three positions. As seen in Table 6, it was observed that regardless of the presence of neck pain the incidence deficits increased from position I (5.1%, 6.9%) to position II (30.7%, 18%) to position III (84.6%, 84.7%). Interestingly, there were greater deficits in position II in individuals with no pain (30.7%) compared to computer users with neck pain.

Table 6: Frequency of Lateral Scapular positional deficits

<table>
<thead>
<tr>
<th>LSST</th>
<th>No Neck Pain</th>
<th>Neck Pain</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Deficits %</td>
<td>Deficits %</td>
</tr>
<tr>
<td>POSITION I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DOMINANT</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>5.5%</td>
<td></td>
</tr>
<tr>
<td>N DOMINANT</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>1.3%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>6.9%</td>
<td></td>
</tr>
</tbody>
</table>

Discussion

The prolonged use of computers has been purported to lead to neck pain and/or disorders of the neck and shoulder girdle region. In this pilot study a total of one hundred and eleven (111) young males between the ages of (34.04±8.50), a representative sample of young adults working predominantly on computers in academic institutions and tech companies, were assessed for the presence of neck pain, scapular asymmetries and the factors associated with it. Not surprisingly, it was observed that almost three-fourths of the sample reported constant, non-specific neck pain and more than 75% experienced neck movement deficits. Neuroanatomical evidence in the literature provides evidence of a strong link between the neck and scapula. Cagnie B et al.[23] reported that a mobile scapula shares common muscle attachments with the neck, and hence abnormal position of scapula during rest or movement, in addition to other musculoskeletal factors may alter cervico-scapular muscle activity, and its mechanics. These alterations become significant contributory factors to non-specific neck pain in computer users.

Clinical evidence suggests that an altered alignment of the shoulder girdle has the potential to create mechanical dysfunction in the cervical spine causing non-specific neck pain[12,13,24,25]. In the present study, a large proportion of computer users had Inferomedial border and inferior border prominence of the scapular. In addition, 47% had a shortened pectoralis minor length. Evidence suggests that continuous anterior pull due to a shortened pectoralis minor, and other anterior muscles abnormally tilts the scapula[26,27]. Furthermore 51% computer users demonstrated a medial border prominence, which may be due to the tightness and over activity of the levator scapulae and rhomboid muscles[12,28]. Almost three fourths of computer users demonstrated a protracted shoulder as computer user’s...
work in prolonged static position for long periods of time. This may result in shortening and tightness of the anterior shoulder muscles and lengthening of the posterior structures, causing more forward or rounded shoulder. This imbalance in muscle dynamics cause pain, tenderness along with compressive, rotational, and shear forces in the cervical and the upper thoracic spine leading to non-specific neck pain in computer users. Almost 80% of the computer users sampled had posterior capsular tightness and alteration in the flexibility of the posterior capsule, leads to an anterosuperior positioning of the humeral head in the glenoid cavity along with a reduction in scapular posterior tilt. This abnormal shortening of the posterior structures over a period of time will alter shoulder girdle movements, in computer users. When performing the lateral scapular slide test (LSST), the different test positions place the scapula and glenohumeral joint in various degrees of medial/lateral rotation/abduction, which requires the synchronized activity of the shoulder girdle musculature to stabilize the scapula on the chest wall. Improper muscle activation alters the scapulohumeral rhythm and force production thereby modify scapular kinematics.

In this study, almost 85% of computer users with non-specific neck pain showed scapular asymmetries, when the arms were held in abduction (at 90 degrees), suggesting an imbalance in scapular stabilization.

**Conclusion**

It is noteworthy, that a large percentage of computer users with non-specific neck pain sampled in this study exhibited scapular asymmetries, which was objectively corroborated by specific tests. It is suggested that given the significant biomechanical linkages between the neck and scapula, a muscular imbalance triggered by chronic pain and/or movement dysfunction leads to reciprocal instability and consequently the observed deficits. Thus, clinically it is imperative that clinicians evaluate and address problems of scapular asymmetries in patients suffering from non-specific neck pain in computer users.

Finally, it is important to note and acknowledge the limitations of this study. Most importantly, there is limited internal and external validity, given the small sample size, lack of gender representation and the inclusion of work environment diversity. In addition, and importantly, the study design is descriptive and did not explicitly test the proposals. Future studies should address these limitations, so that future clinical interventions can be based on stronger evidence regarding this close linkage between neck pain and scapular dysfunction that is observed in long-term computer users.

**Ethical Clearance:** Taken from Institutional Ethics Committee of AUUP(AUUP/IEC/2018/10)

**Source of Funding:** Self

**Conflict of Interest:** Nil

**References**


20. Lewis JS, Valentine RE. The pectoralis minor length test; a study of the inter-rater reliability and diagnostic accuracy in subject with and without shoulder symptoms, BMC Musculodisord 2007;8:64.


Comparison of Antimicrobial Efficacy of Chlorhexidine Mouthwash, Lemongrass (Cymbopogon) Oil and Neem (Azadirachta indica) Oil Against Oral Microflora: An in Vitro Study

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¹Post-Graduate Student, ²Reader, ³Professor and Head, Department of Public Health Dentistry, Saveetha Dental College, Saveetha Institute of Medical and Technical Sciences, Chennai, India

Abstract

Objective: Chlorhexidine is considered to be the “gold-standard” among the chemotherapeutic agents. Essential oils are ideal for use in oral care products because they are both antibacterial and nontoxic—a rare combination. Lemongrass oil and neem oil have a potent antibacterial and antifungal activity. Hence, the aim of this study was to compare the antimicrobial efficacy of chlorhexidine mouthwash, lemongrass oil and neem oil against oral microflora.

Materials and Method: It was an in vitro study. The organisms used were Streptococcus mutans, Lactobacillus and Candida albicans. These bacteria were inoculated in their respective medium and incubated overnight. A suspension was made in saline and was inoculated in the respective solid media by swab method. The concentrations used for lemongrass and neem oil were 1:1, 1:2, and 1:4 dilution. A standard concentration of 0.2% Chlorhexidine mouthwash was used. Sterile discs (5 discs/concentration/micro-organism) were incorporated with equal amount of the chemicals using sterile micropipette and then were incubated overnight at 37°C aerobically. The diameters of the zones of inhibited growth were measured.

Results: The mean zone of inhibition was found to be the maximum for lemongrass oil against all the three micro-organisms as compared with neem oil and chlorhexidine mouthwash. Zone of inhibited growth was maximum against C. albicans at 1:1 dilution which means lemongrass oil highly effective against resistant C. albicans strains. The mean zone of inhibition for neem oil and chlorhexidine mouthwash was maximum against S. mutans strains.

Conclusion: Results from this study have shown that herbal oils were more effective in controlling the oral microflora compared to commercially available mouthwash. Thus turning to nature can be as good as the latest advances.

Keywords: Antimicrobial efficacy, Chlorhexidine, Lemongrass oil, Neem oil, Oral Microflora.

Introduction

Plaque leads to gingival and periodontal diseases, which affects patient’s oral health as well as overall health[1]. Many studies have shown that tooth brushing alone removes 50% of dental plaque, hence additional mechanical and chemical measures are required to further reduce the bacterial load. Mouthwashes are nonsterile aqueous solutions. They are used for reducing oral bacteria, cleaning food remnants, and decreasing oral malodour[2,3].
Among the chemotherapeutic agents used in mouthwashes, chlorhexidine is considered to be the “gold-standard”[4,5]. Chlorhexidine has a wide spectrum of antimicrobial activity and is also capable of inhibiting the candidal adhesion to biological and inert surfaces [6]. The predominant microorganisms found in dental plaque associated with a caries lesion are Streptococcus mutans, Lactobacilli, and Candida albicans[7]. Even though it is effective, it has certain side effects like brown discoloration of the teeth, oral mucosal erosion, and bitter taste. Therefore natural or Ayurvedic remedies have been put forward.

Essentials oils are known to possess antimicrobial activity[8]. Essential oils can inhibit the growth of microorganisms by making their cell membrane permeable which leads to leakage of vital contents[9]. Impairment of bacterial enzyme systems may also be a potential mechanism of action [10].

Lemongrass (Cymbopogon) belongs to the family Germaineae; and from it the lemongrass oil is extracted. It has many medicinal uses; antibacterial, antifungal, antioxidant, antiseptic, astringent, anti-inflammatory, analgesic, antipyretic and carminative property [11], and its antibacterial and antifungal properties can be compared to that of penicillin in its effectiveness [12]. Lemonene and citral present in lemongrass is the reason for its antibacterial and antifungal property.

Neem (Azadirachtaindica) is a tree of the Meliaceae family. Neem has become a wonder tree of modern medicine and is been used extensively in Ayurveda, unani and homeopathic medicine[13]. Neem oil is extracted from the seed. Quercetin and Beta-sitosterol present in the leaves are the reason for antibacterial property of neem.

Herbal products have antimicrobial properties which could therefore be an added advantage over the commercial products in maintaining oral hygiene[14]. They are also relatively safe and economical.

Many studies have been conducted to assess the antimicrobial efficacy of chlorhexidine mouthwash, lemongrass oil and neem oil separately. But no study has been conducted to compare the antimicrobial activity of the above mouthwash and oils. Hence, the aim of this study was to compare the antimicrobial efficacy of chlorhexidine mouthwash, lemongrass oil and neem oil against oral microflora.

**Materials and Method**

**Study Design, Study Location and Study Organisms:** An in-vitro study was conducted in the month of January 2019 in the Department of Public Health Dentistry and the Department of Microbiology, Saveetha Dental College, Chennai. The organisms used in this study were Streptococcus mutans, Lactobacillus and Candida albicans.

**Table 1: Composition of the tested products**

<table>
<thead>
<tr>
<th>Group</th>
<th>Commercial Name</th>
<th>Ingredients</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Hexidine</td>
<td>Chlorhexidine Gluconate Solution I.P. diluted to Chlorhexidine Gluconate 0.2% w/v</td>
</tr>
<tr>
<td>B</td>
<td>Essential Lemongrass Oil</td>
<td>100% Lemongrass oil concentration</td>
</tr>
<tr>
<td>C</td>
<td>Essential Neem Oil</td>
<td>100% Neem oil concentration</td>
</tr>
</tbody>
</table>

**Ethical Clearance:** Prior to the start of the study ethical clearance was obtained from the Institutional Review Board, Saveetha Dental College, Saveetha Institute of Medical And Technical Sciences.

**Anti-Microbial Assays:** Standard strains of Streptococcus mutans, Lactobacillus and Candida albicans were isolated. The media used was Nutrient Agar media for Streptococcus mutans and Lactobacillus acidophilus. Sabouraud Dextrose Agar media was used for Candida albicans. These bacteria were inoculated in their respective medium and incubated overnight. A suspension was made in saline(0.5 Mc Farland standard) and 50 microliters of the suspension was inoculated in the respective solid media by swab method.

**Agar Disc Diffusion Method:** The concentrations used for lemongrass and neem oil were 1:1,1:2, and 1:4 dilution. A standard concentration of 0.2% Chlorhexidine mouthwash was used. Sterile discs (5 discs/concentration/micro-organism) were incorporated with equal amount of the chemicals using sterile micropipette. So in total 105 sterile discs were used. The discs were then placed in hot air oven for 30 minutes for drying. 20 microliters of the chemicals was used for 1:1 dilution, 10 microliters for 1:2 dilution and 5 microliters for 1:4 dilution. Then these discs were placed equidistant to each other in the plates containing solid media and were incubated overnight at 37°C aerobically.
**Measurement of Zone of Inhibition:** The test plates were held in front of a desk lamp, and the zones were measured with a ruler held against the back of the petri plate. The diameters of the zones of inhibited growth were measured to the nearest whole millimeter.

**Statistical Analysis:** Data was entered in Microsoft excel spread sheet and analysed using Statistical Packages for Social Sciences (SPSS) software version 20. Descriptive statistics were used. Comparison between the groups was done using One-way Anova. A p value of <0.05 was considered to be statistically significant.

**Results**

**Table 2: Mean Zone of Inhibition of Chlorhexidine mouthwash, Lemongrass Oil and Neem Oil against Streptococcus mutans**

<table>
<thead>
<tr>
<th>Concentrations</th>
<th>Zone of Inhibition (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lemongrass Oil (Mean ±SD)</td>
</tr>
<tr>
<td>1:1 dilution</td>
<td>34.4 ± 5.02</td>
</tr>
<tr>
<td>1:2 dilution</td>
<td>41.2 ± 2.68</td>
</tr>
<tr>
<td>1:4 dilution</td>
<td>55 ± 0.00</td>
</tr>
</tbody>
</table>

Table 2 depicts the zone of inhibition of various oils and mouthwash against Streptococcus mutans. Zone of inhibition was found to be highest in Lemongrass oil (1:4 dilution) - 55 mm, followed by 1:2 dilution - 41.2 mm and 1:1 dilution - 34.3 mm.

**Table 3: Mean Zone of Inhibition of Chlorhexidine mouthwash, Lemongrass Oil and Neem Oil against Lactobacillus acidophilus**

<table>
<thead>
<tr>
<th>Concentrations</th>
<th>Zone of Inhibition (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lemongrass Oil (Mean ±SD)</td>
</tr>
<tr>
<td>1:1 dilution</td>
<td>21.4 ± 0.54</td>
</tr>
<tr>
<td>1:2 dilution</td>
<td>22.4 ± 0.54</td>
</tr>
<tr>
<td>1:4 dilution</td>
<td>23.8 ± 1.09</td>
</tr>
</tbody>
</table>

Table 3 depicts the zone of inhibition of various oils and mouthwash against Lactobacillus acidophilus. Zone of inhibition was found to be highest in Lemongrass oil (1:4 dilution)-23.8 mm, followed by 1:2 dilution-22.4 mm and 1:1 dilution-21.4 mm.

**Table 4: Zone of Inhibition of Chlorhexidine mouthwash, Lemongrass Oil and Neem Oil against Candida albicans**

<table>
<thead>
<tr>
<th>Concentrations</th>
<th>Zone of Inhibition (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lemongrass Oil (Mean ±SD)</td>
</tr>
<tr>
<td>1:1 dilution</td>
<td>70 ± 0.00</td>
</tr>
<tr>
<td>1:2 dilution</td>
<td>69 ± 0.00</td>
</tr>
<tr>
<td>1:4 dilution</td>
<td>60 ± 0.00</td>
</tr>
</tbody>
</table>

Table 4 depicts the zone of inhibition of various oils and mouthwash against Candida albicans. Zone of inhibition was found to be highest in Lemongrass oil (1:1 dilution)-70mm, followed by 1:2 dilution-69mm and 1:4 dilution-60mm.
Table 5: Comparison of the zone of inhibition of oils against the three oral microflora

<table>
<thead>
<tr>
<th>Micro-organism</th>
<th>Oils</th>
<th>Concentration</th>
<th>Zone of Inhibition (Mean ±SD)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lemongrass oil</td>
<td>1:1 dilution</td>
<td>34.4 ± 5.02</td>
<td>0.000*</td>
</tr>
<tr>
<td>Streptococcus mutans</td>
<td></td>
<td>1:2 dilution</td>
<td>41.2 ± 2.68</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1:4 dilution</td>
<td>55 ± 0.00</td>
<td></td>
</tr>
<tr>
<td>Neem oil</td>
<td>1:1 dilution</td>
<td>26 ± 2.74</td>
<td></td>
<td>0.390</td>
</tr>
<tr>
<td></td>
<td>1:2 dilution</td>
<td>23.6 ± 2.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1:4 dilution</td>
<td>25.2 ± 2.86</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lactobacillus acidophilus</td>
<td>Lemongrass oil</td>
<td>1:1 dilution</td>
<td>21.4 ± 0.54</td>
<td>0.001*</td>
</tr>
<tr>
<td></td>
<td>1:2 dilution</td>
<td>22.4 ± 0.54</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1:4 dilution</td>
<td>23.8 ± 1.09</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neem oil</td>
<td>1:1 dilution</td>
<td>12 ± 1.41</td>
<td></td>
<td>0.526</td>
</tr>
<tr>
<td></td>
<td>1:2 dilution</td>
<td>13 ± 1.22</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1:4 dilution</td>
<td>12.8 ± 1.09</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Candida albicans</td>
<td>Lemongrass oil</td>
<td>1:1 dilution</td>
<td>70 ± 0.00</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>1:2 dilution</td>
<td>69 ± 0.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1:4 dilution</td>
<td>60 ± 0.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neem oil</td>
<td>1:1 dilution</td>
<td>21.8 ± 1.09</td>
<td></td>
<td>0.328</td>
</tr>
<tr>
<td></td>
<td>1:2 dilution</td>
<td>22.2 ± 0.83</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1:4 dilution</td>
<td>21.2 ± 1.09</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

One-way Anova (*P<0.05)

Table 5 depicts the comparison of the zone of inhibition of oils against the three oral microflora. All the values were found to be statistically significant using One-way Anova (*P<0.05).

Table 6: Comparison of the zone of inhibition of chlorhexidine mouthwash against the three oral microflora

<table>
<thead>
<tr>
<th>Micro-organism</th>
<th>Mouthwash</th>
<th>Concentration</th>
<th>Zone of Inhibition (Mean ±SD)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Streptococcus mutans</td>
<td>Chlorhexidine</td>
<td>0.2%</td>
<td>21.6 ± 2.19</td>
<td>0.000*</td>
</tr>
<tr>
<td>Lactobacillus acidophilus</td>
<td></td>
<td></td>
<td>13.2 ± 0.44</td>
<td></td>
</tr>
<tr>
<td>Candida albicans</td>
<td></td>
<td></td>
<td>16 ± 0.00</td>
<td></td>
</tr>
</tbody>
</table>

One-way Anova (*P<0.05)

Table 6 depicts the comparison of the zone of inhibition of chlorhexidine mouthwash against the three oral microflora. The values were found to be statistically significant using One Way Anova (*P<0.05).

**Discussion**

The organisms used in this study were Streptococcus mutans, Lactobacillus acidophilus and Candida albicans. The association of Streptococcus species and Lactobacillus species with dental caries is well documented - S. mutans plays an important role in caries initiation while L. acidophilus causes caries progression.

Streptococcus mutans, a gram positive coccus (round bacterium) is a significant contributor to tooth decay. Lactobacillus acidophilus is a species of gram positive bacteria which ferments sugar into acid and grows readily at rather low pH values (below 5.0). Curd like white patches (oral thrush) is formed inside the mouth, on the tongue, palate and around the lips due to Candida albicans.

Various chemical antimicrobial agents are used as antiplaque agents but due to resistance, toxic and harmful side effects of few agents, there is a need for alternate agents which are easily affordable, non-toxic and effective. Natural plant extracts or herbal agents could be used as effective antiplaque agents.

Out of the various chemical antiplaque agents, chlorhexidine (CHX) is considered the gold standard
agent for its antimicrobial efficacy. Lemongrass oil and neem oil are promising new herbal agents which have antibacterial and antifungal properties. Hence a comparison was done between gold standard-chlorhexidine mouthwash, lemongrass oil and neem oil.

The present study confirms that all three agents have a potent antibacterial and antifungal ability. Lemongrass oil showed an excellent antimicrobial activity which was in accordance with studies conducted by Bhoj R Singh et al [15] and Silva Cde B et al [16]. Zone of inhibition against S. mutans was found to be much higher than the study conducted by BringelRegoCamilla et al [17].

The findings of the antimicrobial efficacy of Neem oil was similar to the studies conducted by Gayathri R Menonet al [18] and SistlaDatta Prasad et al [19]. The results for chlorhexidine mouthwash was in accordance with study conducted by Ann Thomas[20].

The mean zone of inhibition was found to be the maximum for lemongrass oil against all the three micro-organisms as compared to neem oil and chlorhexidine mouthwash. The reason could be that lemongrass is composed of citral (65-85% w/w) and l-limonene (96-100%) which have strong antibacterial and antifungal properties.

The mean zone of inhibition for lemongrass oil was maximum against C. albicans at 1:1 dilution which means lemongrass oil highly effective against resistant C. albicans strains. The mean zone of inhibition for neem oil and chlorhexidine mouthwash was maximum against S. mutans strains which means they are most effective against S. mutans as compared to other micro-organisms.

Thus we can say that essential oils do possess antibacterial and antifungal activity and can be used as an ideal treatment against oral microflora who prefer herbal products.

**Limitations:** The test was conducted *in vitro*, so it cannot be assumed that the results of antimicrobial efficacy could be translated into clinical effectiveness. In further studies, *in vivo* studies are recommended with persons’ acceptance as well.

**Conclusion**

The present study was based on In vitro experiments. Results of this study indicated that herbal oils were more effective in controlling the oral microflora compared as to commercially available mouthwash. Thus turning to nature could be a good option. These traditional method have numerous other claims which are also of great benefit for health.

**Conflict of Interests:** There are no conflict of interest

**Source of Support:** Nil

**Acknowledgement:** We would like to thank Dr. N. P. Muralidharan, from the department of Microbiology, Saveetha Dental College for guiding us in the study.

**References**


Assessment of Microhardness of Enamel Carious Like Lesions After Treatment with Nova Min, Bio Min and Remin Pro Containing Toothpastes: An in Vitro Study

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Abstract

Introduction: The initial stage of dental caries is known as incipient lesions and if the process is not interrupted here, they might progress from demineralisation to non cavitated lesions and finally to cavitated lesions. Nova Min is reactive when exposed to body fluids release calcium, sodium and phosphate ions. Bio Min contains calcium and phosphate but also has fluoride within the glass rather than assoluble addition; this allows longer term delivery of fluoride. Remin Pro contains calcium and phosphate in the hydroxyapatite form and also includes fluoride and xylitol. These agents help in remineralisation of enamel.

Materials and Method: A sample of 21 non-carious premolar teeth extracted for orthodontic reasons were used for the study. Surface microhardness value was obtained at baseline, post demineralisation and post treatment using Vickers hardness test. All the teeth were first demineralised and then the test agents were applied for 3 minutes daily for 15 days. The samples were then placed in demineralising and remineralising agents for 1 week followed by assessing the increase in surface microhardness.

Results: The mean difference in Vickers hardness value at baseline and Post treatment was found to be highest for Remin Pro group-59.5, followed by Bio Min group-32.5 and the least increment was found in Nova Min group-26.5.

Conclusion: The microhardness of artificial carious like lesions increased significantly with Nova Min, Bio Min and Remin Pro containing toothpastes. However, Remin Pro group was found to be more effective as compared to Bio Min and Nova Min.

Keywords: Nova Min, Bio Min, Remin Pro, Microhardness, Carious lesions.

Introduction

Dental caries is defined as an irreversible microbial disease of the calcified tissues of the teeth, characterised by demineralisation of the inorganic portion and destruction of the organic portion of the tooth, which often leads to cavitation.[¹] In the initial stage the disease is known as incipient carious lesions which is characterised by white, chalky appearance.[²] If the process is not interrupted here, they might progress from demineralisation to non cavitated lesions and finally to cavitated lesions.[³] It is a reversible disease at an early stage but becomes irreversible and destructive after cavitation.[¹]

Demineralisation is the process by which there is loss of mineral from tooth structure.[¹] Remineralisation is the gain of mineral in the tooth structure in the form of hydroxyapatite.[¹] Remineralising agents force calcium and phosphate ions into the demineralised areas thus maintaining a supersaturated state and preventing mineral loss.[⁴]
The most common treatment for enamel caries is fluoride application in various modalities and improving oral hygiene by following proper brushing technique.\textsuperscript{[5]} Fluoride converts hydroxyapatite to the more acid resistant fluorapatite which is effective in enamel remineralisation.\textsuperscript{[6]} Nova Min (Calcium Sodium Phosphosilicate) is a bioactive glass which was originally developed as bone regenerative materials.\textsuperscript{[11]} These materials are reactive when exposed to body fluids release calcium, sodium and phosphate ions.\textsuperscript{[7]} There is a localised transient increase in pH due to release of sodium. This increase in pH helps the calcium and phosphate to form Nova Min particles, followed by calcium and phosphorus found in saliva to form a calcium phosphate layer.\textsuperscript{[8]} As the deposition of calcium phosphate complex takes place, this layer crystallizes into a calcium Hydroxylapatite, also known as hydroxyl carbonate apatite thus contributing to remineralisation process.\textsuperscript{[9]} An addition of soluble fluoride in the formulation process of the toothpaste is required.

Bio Min contains calcium and phosphate but also has fluoride (600 ppm) within the glass rather than assoluble addition; this allows longer term delivery of fluoride.\textsuperscript{[10]} The ration of these three ions reflects the molecular stoichiometry of Fluoroapatite and also the phosphate concentration is three times that of Nova Min. The particle size of BioMin is also smaller than Nova Min which allows greater physical occlusion of open dentin tubules.\textsuperscript{[10]}

Remin Pro (VOCO, Germany) is a water based remineralising cream which contains calcium and phosphate in the hydroxyapatite form and also includes fluoride and xylitol.\textsuperscript{[11]} The hydroxyapatite fills the eroded enamel, fluoride seals the dentinal tubules and xylitol acts as an antibacterial agent.\textsuperscript{[12]} The high fluoride content in Remin Pro (1450 ppm) helps in remineralising the tooth.

Several studies have been conducted to test the efficacy of Nova Min, Bio Min and Remin Pro toothpastes on the surface microhardness of demineralised enamel lesions but no attempt has been made to compare all these modalities.\textsuperscript{[13-16]}

Hence, the aim of the present study was to test the efficacy of Nova Min, Bio Min and Remin Pro toothpastes on the surface microhardness of enamel carious like lesions.

Materials and Method

Study Design: This was an experimental, randomized in-vitro study.

Inclusion Criteria and Exclusion Criteria: Sound maxillary premolars were included in the study. Endodontically treated teeth, teeth affected with fluorosis, teeth with enamel defects, teeth affected with wasting diseases such as attrition, abrasion, erosion and fractured teeth were excluded from the study.

Ethical Clearance: Prior to the start of the study ethical clearance was obtained from the Scientific Review Board, Saveetha Dental College, Chennai, India.

Pre Study Procedures

Collection and preservation of teeth: In this in vitro study, 21 fully erupted sound human maxillary premolars were used. Teeth extracted for orthodontic reasons were collected from the Department of Oral Surgery, Saveetha Dental College, Chennai. The specimens that were not fulfilling the inclusion criteria were rejected while those fulfilling the criteria were stored in distilled water until further use.

Specimen preparation and Enamel window formation: The roots of the teeth were cut using a water cooled Diamond saw. Then enamel blocks of 4mm (length) x 2mm (breadth) x 4mm (width) were cut from each tooth.

All the 21 enamel blocks were subjected to enamel window formation. This was done to limit the area of demineralization followed by remineralization only in the window area. This would help in surface microhardness measurement compared to unaffected area covered by nail varnish. The teeth were then placed in distilled water until further use.

Mounting the enamel specimen: The enamel blocks were subjected to mounting. The enamel blocks were mounted using blacklite powder in a casting machine.

The mounted 21 enamel blocks were analysed using Vickers hardness testing machine to record the surface microhardness of the sound enamel surface. All examinations were performed at the centre of each block. The Vickers hardness number values were noted and tabulated.
Preparation of solution: The buffered de/re mineralising solutions were prepared using analytical grade chemicals and deionized water.

(a) Demineralizing solution:

It was prepared using following chemicals:
2.2mM calcium chloride, 2.2mM sodium phosphate and 0.05M acetic acid and 1 M potassium hydroxide to adjust the pH to 4.4. 1050ml of distilled water was taken in a beaker and 2.2gm of calcium chloride was added to it. To this, 2.2gm potassium hydrogen orthophosphate, 3gm of acetic acid and 56gm of potassium hydroxide was added.

(b) Remineralizing solution:

It was prepared using the following chemicals:
1.5mM calcium chloride, 0.9mM sodium phosphate and 0.15mM potassium chloride which had a pH of 7.152 ml of distilled water was taken and 0.1665gm of calcium chloride, 0.108 gm of sodium hydrogen phosphate and 11.25gm of potassium chloride was added to it.

Study Procedure

Lesion Formation: The 21 enamel blocks were subjected to demineralizing solution. The enamel blocks were kept in demineralizing solution, 10ml solution per specimen for a period of 96hours. This was done to create artificial carious lesions of approximately 200 to 250 micrometres deep among the selected teeth.

Allocation to experimental groups: After 96hours, these 21 enamel blocks were then randomly allocated into three groups, with 7 enamel blocks in each group (Group A- Sensodyne Repair and Protect toothpaste; containing Nova Min, Group B- Elsenz Anti cavity and Anti sensitivity toothpaste; containing Bio Min, Group C- Voco Remin Pro toothpaste). After demineralization, the enamel blocks were subjected to alternate remineralization and demineralization (pH cycling) to simulate the changes occurring in the oral cavity.

Treatment procedure: The mounted enamel blocks were stored in distilled water. Teeth specimens were cleaned and dried and then subjected to the application of the three toothpastes. The toothpastes were applied for 3 minutes twice daily for 15 days with a cotton applicator and then rinsed with water.

pH cycling model: The specimen were placed in the pH cycling system for 7 days. All solutions (demineralizing, remineralizing) were freshly prepared for each cycle and separate containers were used for each group throughout the experimental period. The pH of the demineralizing and remineralizing solutions was measured before every cycle. The process of pH cycling is described as below:

The specimens were first immersed in demineralising solution (10ml/section) for 3 hrs followed by immersion in remineralising solution (10ml/section) for 2 hrs. Second immersion was done in demineralising solution for 3 hrs followed by immersion in remineralising solution overnight.

The treated enamel blocks were then analysed using Vickers Hardness testing machine to quantitatively analyse the surface microhardness. These values were noted and tabulated and then compared with evaluated sound and demineralised zones of the same specimen. This was done for all the three groups.

Evaluation Technique

Vickers hardness test: Vickers hardness testing was done at Omega Inspection and Analytical Laboratory, Guindy, Chennai to measure the surface microhardness. The test specimens were placed on the stage of the tester and stabilised. Then area to indent was selected by focusing with 10 x objective lens. After this, the test was carried out where the pyramid shaped indentations were made with a rate of 100g load for 30 seconds, never close to any edge of the specimen (Figure 1). The indentation formed was viewed and measured on the display monitor with 10 x objective lens (Figure 2). The average microhardness of the specimen was determined from two indentations to avoid any discrepancy since the enamel surface has a curvature. The test provides the Vickers hardness number of the specimens.

Statistical Analysis: Data was entered into Microsoft excel spreadsheet and analysed using Statistical Package for the Social Sciences (SPSS) software version 20. Kruskal Wallis test and Wilcoxon signed ranks test to estimate differences between the surface microhardness of sound enamel, Demineralized enamel and Treated enamel within and between the three groups. For test, a p value of <0.05 is to be considered statistically significant.
Results

Table 1: Difference in Mean Vickers Hardness Value between Baseline and Post Demineralisation among various groups

<table>
<thead>
<tr>
<th>Groups</th>
<th>Vickers Hardness Value (Mean ± SD)</th>
<th>Mean Difference</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Baseline</td>
<td>Post Demineralisation</td>
<td></td>
</tr>
<tr>
<td>Nova Min</td>
<td>$315 \pm 19.79$</td>
<td>$265 \pm 32.52$</td>
<td>50</td>
</tr>
<tr>
<td>Bio Min</td>
<td>$44 \pm 11.31$</td>
<td>$273 \pm 4.24$</td>
<td>71</td>
</tr>
<tr>
<td>Remin Pro</td>
<td>$395.5 \pm 79.9$</td>
<td>$266.5 \pm 40.30$</td>
<td>128.8</td>
</tr>
</tbody>
</table>

Table 1 depicts the difference in Mean Vickers Hardness Value between baseline and post demineralisation among various groups. The difference in the surface microhardness between baseline and post demineralisation for NovaMin, BioMin and Remin Pro groups were 50, 71 and 128.8 respectively. The mean difference among various groups was found to be significant using Wilcoxon Signed Ranks Test.

Table 2: Difference in Mean Vickers Hardness Value among various groups at Post Demineralisation and Treatment

<table>
<thead>
<tr>
<th>Groups</th>
<th>Vickers Hardness Value (Mean ± SD)</th>
<th>Mean Difference</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Post Demineralisation Post Treatment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NovaMin</td>
<td>$265 \pm 32.52$</td>
<td>$288.5 \pm 24.74$</td>
<td>23.5</td>
</tr>
<tr>
<td>BioMin</td>
<td>$273 \pm 4.24$</td>
<td>$311.5 \pm 0.70$</td>
<td>38.5</td>
</tr>
<tr>
<td>Remin Pro</td>
<td>$266.5 \pm 40.30$</td>
<td>$336 \pm 38.18$</td>
<td>69.5</td>
</tr>
</tbody>
</table>

Table 2 depicts the difference in Mean Vickers Hardness Value between post demineralisation and treatment among various groups. The difference in the surface microhardness between post demineralisation and post treatment for NovaMin, BioMin and Remin Pro groups were 23.5, 38.5 and 69.5 respectively. The mean difference among various groups was found to be significant.
Table 3 depicts the difference in Mean Vickers Hardness Value between baseline and post treatment among various groups. The difference in the surface microhardness between baseline and post treatment for NovaMin, BioMin and Remin Pro groups were 26.5, 32.5 and 59.5 respectively. The mean difference among various groups was found to be significant.

**Discussion**

Clinical evidence suggests that fluoride is effective in preventing caries onset and arresting or possibly reversing the process of demineralization. Although the demineralizing efficacy of fluoride is substantially justified, the material is not able to surpass the high caries challenge posed in few individuals, and this highlights the need to find newer method to enhance remineralization process. The key requisite in the remineralization of enamel and dentin is the availability of calcium in the oral environment. This has led to the development of various calcium based systems that enhance the availability of calcium and phosphate.\[17\]

The NovaMin technology was developed by Dr. Len Litkowski and Dr. Gary Hack.\[18\] Originally it was used to treat hypersensitivity of dentin. Recently, it is also tried as a remineralizing agent.\[19\] BioMin contains calcium and phosphate but also has fluoride within the glass rather than solublable addition; this allows longer term delivery of fluoride. It is considered as a breakthrough in remineralization because current systems are dependent on adequate saliva as a source of calcium and phosphate, but bioactive glasses are enriched with these ions.\[20\] The fluoride content in Remin Pro is 1450 ppm which helps in remineralising. It also contains xylitol which has cariostatic property.

Vickers method was chosen in the present study because the pyramid shaped indent obtained is accurate to measure and detect visually and digitally.\[21\]

The mean difference in Vickers hardness value at baseline and Post treatment was found to be highest for Remin Pro group-59.5, followed by BioMin group-32.5 and the least increment was found in NovaMin group-26.5. This could be due to the presence of high fluoride content in Remin Pro toothpaste.

Farzin Heravi et al\[22\] conducted a study to compare the effectiveness of MI Paste Plus and Remin Pro on remineralisation of white spot lesions. The mineral content increase for MI Plus and Remin Pro was 16% and 22% respectively. Saranya Mony et al\[23\] conducted a study to compare the remineralising efficacy of calcium sodium phosphosilicate agent and fluoride. Fluoride achieved better hardness as compared to NovaMin. However, Vahid et al\[8\] found superior surface hardness with NovaMin as compared to fluoride. However, the outcome was not statistically significant.

There were a few limitations to this study. The sample size was small. The lesions were artificially induced and were not natural carious lesions. Similar studies can be conducted by storing the tooth samples in artificial saliva which would mimic the oral environment and improve the validity of the study.

**Public Health Significance:** Since the fluoride content in Remin Pro containing toothpaste is very high, it can be recommended for elderly people whose enamel layer has been lost due to acid erosion or abrasion. Since NovaMin has no fluoride content, toothpastes containing NovaMin can be prescribed for children below 6 years and special children.

**Conclusion**

Within the limitations and based on the findings of this study, it can be concluded that the microhardness of artificial carious like lesions increased significantly with NovaMin, BioMin and Remin Pro containing toothpastes. However, Remin Pro group was found to be more effective as compared to BioMin and NovaMin.

**Conflict of Interest:** Nil

**Source of Support:** Nil
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10. http://www.biomin.co.uk


18. https://www.rdhmag.com


Effect of Present Day Video Games on Adolescent Cognitive Abilities

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Abstract

Background: In recent days, video games have become a popular mode of entertainment; especially among adolescents and children. Proficient video gaming demands fast reflexes, good visual-motor coordination, and fast decision making abilities to cope with its tricky challenges. Earlier studies have revealed that video games influence several cognitive processes, by stimulating some of the important brain areas associated with cognition, especially the grey matter in the hippo campus. Thus regular involvement in video games improves one’s performance in terms of sensory, perceptual, attentional tasks and reflex action. There is also a common belief that video gaming has negative impact on one’s mental wellness and therefore playing video game is being restricted in young population.

Objectives: In this study we aimed at evaluating the impact of video gaming on cognitive abilities such as reaction time, memory, visual, verbal, numerical and abstract reasoning skills in adolescent population.

Method: Reaction time was measured using a phone application. A questionnaire designed to test the cognitive abilities with respect to visual, verbal, numerical and abstract reasoning were distributed to 195 volunteers, which included gamers and non-gamers. Following this, the volunteers participated in a memory test for assessing the short term/active memory. The scores were evaluated and results were analyzed using SPSS software version 16.

Results: We found that video-game players outperformed non-gamers on several cognitive measures. Habitual gamers were found to have a lower reaction time, better active memory, and higher numerical, abstract and verbal reasoning skills.

Conclusion: From the present study we can conclude that, habitual video gaming may have beneficial role on the cognitive functions among young minds.

Keywords: Video games, adolescent, cognitive abilities.

Introduction

In present days, playing video games (VG) has become a major medium of entertainment, and is increasing among children and adolescents. It has been estimated that more than 97% of the children in US play VG for at least one hour in a day¹. Wide variety of games is available in the market such as shooting, action, adventure, role-playing, simulation, strategy, sports etc. Proficient video gaming demands fast reflexes, good visual-motor coordination, and fast decision making abilities to cope with its tricky challenges. Although the outcomes of playing VGs depend on factors like nature of the VG, hours of play, age of onset, etc.², both positive and negative impact of long term exposure to...
VG have been documented. While sedentary life style with prolonged immobilization during VG has proven to causenegative outcomes like obesity, cardio-metabolic deficiencies, etc.\textsuperscript{3,4}, regular habitual VG playing has been reported to improve the cognitive abilities of gamers\textsuperscript{5}. Video-gamers have shown to outperform non-gamers on visual tasks\textsuperscript{6-9}, sensory, perceptual, attentional tasks and reflex action\textsuperscript{10,11}. Very recently, adventure VGs have been considered as a Psychotherapeutic tool to treat the adolescents with problems of depression\textsuperscript{12}. Good VGs designed to mimic real-world problems, positively influence players by helping them design and employ various levels of strategies and find solutions to overcome such problems\textsuperscript{13}. Improvement of cognitive aspects like reasoning skills, attention processes, visual perception, spatial skills, memory, visuomotor coordination, RT (reaction time) and executive functions in VG players can be attributed to favorable alterations inspecific brain areas. In a systemic study, Palaus and his colleagues\textsuperscript{14} analyzed results from 116 scientific publications that examined then eural and cognitive outcomes of video gaming and reported that, improvement in visuospatial skills in VG players is a result of increase in size and efficiency of hippocampus and entorhinal cortex of the brain. This may positively contribute to good performances in VG players. Individuals who were trained to play VG regularly were also found to have benefited wherein, an increased hippocampal gray matter, which is crucial for working memory, spatial navigation and strategic planning, was identified\textsuperscript{6}. Contrary to the above reports, recently, few studies have presented differing views that VGs cause negative impact on one’s mental health. Also in the present days many parents consider video gaming as detrimental to one’s mental wellness and therefore children are restricted from playing video games. These conflicting views led us to examine the cognitive implications of video games with respect to RT, memory, visual, verbal, numerical and abstract reasoning abilities using cognitive tasks in a group of students in medical college.

**Material and Method**

195 undergraduate medical students (64 male gamers, 14 male non-gamers, 32 female gamers and 85 female non-gamers) of mean age 21 years took part in the study. A minimum of 5 hour a week of video-game usage at least for the previous one year were considered as VGP\textsuperscript{s} in our study group. Those who play video games rarely (less than one hour/week) or have no/very little interest with any of games were considered as non-gamers. Students who declared themselves as addicted to video games were excluded from our study. We chose this age group of volunteers for the study because of the fact that, cognitive abilities are at a maximal level during adolescence, and later begin to decline with advancing age\textsuperscript{15}. RT was recorded using a phone application. Basic information viz. age, gender, race, type of video games preferred and duration of play were also collected via pre-test questionnaire. Following this, they completed a questionnaire containing assessment tests to measure the different cognitive abilities like visual, verbal, numerical and abstract reasoning. Memory test was performed by displaying images of 20 items on power point slides for 20 seconds, following which the students were asked to write them down on a paper. The answers were evaluated and the results were analyzed using SPSS software version 16. Informed consent was taken before they were asked to respond to the questionnaire. Institutional Research Committee (IRC-MMMC) approved this study.

**Results**

The minimum time duration of game played by VGP\textsuperscript{s} was estimated to be 10 hours/week. We observed that, majority of them liked to play adventure type of games (30%) followed by action (26%), shoot (24%) and sports (20%). The sample number versus RT plot of gamers and non-gamers is shown in Figure 1. Regardless of participant’s gender differences, the RT\textsuperscript{s} of all gamers were found to be significantly (p<0.05) lower i.e. in the range of 4.5 to 6/sec. (average RT: 5.22/sec), than that of non-gamers (with average RT of 5.99).This difference clearly indicates that gamers would require lower RT than non-gamers to visual processing stimulus.

![Figure 1: Reaction time in gamers and non-gamers](image-url)

Figure 2 shows the performance in memory test among gamers and non-gamers. It is clear from the figure that, VG players scored significantly better (p<0.05) in memory test than the non-gamers. This result indicates...
that regular habitual video game playing enhances short term memory.

Figure 2: Mean of memory test scoring in gamers and non-gamers. Data are expressed as mean ± SEM. Gamers Vs Non-gamers *p < 0.05

Figure 3 shows the scoring in tests performed to evaluate cognitive abilities like numerical, verbal, abstract and visual reasoning skills. Abstract reasoning, numerical and verbal skills were significantly (p<0.05) better among gamers when compared to non-gamers. The visual reasoning skill was also higher among gamers but the difference was not statistically significant. We did not find any significant gender based variation in any of the cognitive abilities tested.

Figure 3: Mean scoring of various cognitive abilities in gamers and non-gamers. Data are expressed as mean ± SEM. Gamers Vs Non-gamers *p < 0.05

Discussion

The present study evaluated the impact of video games on enhancement of cognitive abilities in a population of healthy young adults. Our results indicated that the speed of reaction was significantly higher in VGP's when compared to non-gamers. RT is a measure of one’s ability to detect, process, and respond to a stimulus. This has an important role to play in one’s life due to its great practical implications. Previous studies in this area have shown that video gaming improves vision and increases speed of processing, increases visual selection attention by decreasing the attentional blink, enhances attentional control to task related distractors and reduces the Simon’s effect in goal directed actions. Together, these factors may facilitate to improve RT. Although the exact mechanism by which VG improves speed of reaction remains unclear, development of specific brain areas that are stimulated during regular video gaming is thought to play a major role. fMRI studies have been able to prove this fact to a certain extent, wherein activation of prefrontal cortex, an area of the brain in front of the occipital lobe was found to be associated with reduction in RT.

In the present work, we also assessed student’s cognitive abilities, in terms of numerical, verbal, visual and abstract reasoning abilities. The numerical reasoning test measures one’s ability to logically interpret and analyze a numerical data presented in the form of graph/table. Verbal reasoning test was used to assess verbal logic in terms of one’s ability to understand and extract the correct meaning from complex written information. Abstract reasoning is a conceptual reasoning test, which measures person’s ability to detect patterns and relationships and to solve problems in a complex level. This needs logical problem solving capacity, creative thinking and proper judgment. Visual reasoning is a nonverbal intelligence which measures one’s ability to understand, interpret and analyze visual data and solve problems using visual reasoning. Together, both visual and abstract reasoning questions measure the ability of a person to solve general problems using his reasoning skills and thereby indicate fluid intelligence. In our study we observed that, VGP’s outperform non-gamers in numerical, abstract and verbal reasoning skills. This finding directs us to an understanding that regular and habitual VG playing improves these reasoning abilities that are, to a certain extent important for a student in his/her career. More importantly, improvement of these cognitive domains is thought to potentially improve the mental health and well-being in adolescent population who are consistently exposed to a competitive environment as compared to earlier decades. The available research in the perceptual and cognitive domain indicates that VG play improves spatial skills such as spatial visualization, mental rotation, and the ability to mentally work in three dimensions. Neuroimaging studies in VG players have revealed significant increase in gray matter volume in the right hippocampus, right prefrontal cortex, and bilateral cerebellum. To assess
the effect of VG on short term memory, we performed a memory test, wherein we found that short term memory was significantly higher among the gamers when compared to non-gamers; a finding which indicates that modern day VGs enhance short term memory in habitual players. Earlier studies have also reported that action VG playing enhances visual short term memory\textsuperscript{27}. Hippocampus is a very important area of the brain which is generally thought to exhibit neuroplasticity so as to adapt to various environmental stimulations. Video gaming is believed to improve hippocampal function and performance and thus to enhance hippocampal mediated memory tasks\textsuperscript{28}. These reports offer evidence that video gaming meaningfully stimulates the development of those brain areas that are maximally activated during the course of playing.

**Conclusion**

As the above discussed cognitive domains are seen to be better among the video game players, these young minds could be smarter and better performers amongst their peers. Thus in present generation of competence based life, these individuals can fare much better in their social life as well. From the present study we can conclude that video gaming has beneficial role on cognitive functions of the brain with a note of caution that long term effects of video gaming needs to be studied in larger population before recommending this game to children and young adults.

Ethical Clearance was obtained by Institutional Research Committee (IRC-MMMC).

**Source of Funding:** Self

**Conflict of Interest:** Nil

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Development of Frame Work to Minimize Waste in the Surgical Unit of a Tertiary Care Hospital

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Abstract

Introduction: Bio medical waste is generated from the treatment or immunization of human beings and other animals which is contaminated with body fluids, used syringes, needles, dressings, disposables, plastics and micro biological wastes. Operating rooms (ORs) have a large environmental impact; from hospital information statistics, the standard quantity of hospital waste generated is estimated to range from 0.5 to 2.0 Kg/bed/day, they account for 20\% to 30\% of total hospital supply costs, Waste management initiatives offers tremendous opportunity for healthcare facilities, especially ORs, to reduce disposal costs and their environmental footprint.

Method: A cross-sectional study using convenient sampling was conducted from May-July 2018 at a tertiary care hospital in Bangalore. A self-designed questionnaire and checklist as per BMW Rules, 2016 was used for data collection where sample size was 45.

Results: It was observed that wastes generated by OR department in which highest wastes segregated into infectious waste in the month of May whereas contaminated recyclable waste in June. In addition, 20.63\% of glassware wastes generated in Feb whereas 16.67\% sharp waste in May. From the correlation test, it was observed that the value is -0.225 which represents negative correlation between surgeon’s experience and waste generated at OR. Cronbach alpha table revealed that 0.822, which indicated high level of internal consistency for BMW management.

Conclusion: A frame work was developed based on the results and analysis of the data which can be taken into consideration for promotion of recyclable and reusable items in the surgical unit. The goal of waste minimization is to reduce, to the greatest extent possible, the waste that is destined for ultimate disposal by means of reuse, recycling and other programs. The potential benefits of waste minimization are: environmental protection enhanced occupational safety and health, cost reductions, reduced liability, regulatory compliance, and improved community relations.

Keywords: Biomedical waste, Recycle and Reuse, Waste minimization, environmentally preferable purchasing.
associated with wastes. The quantity of the hospital waste generated differs from one place to other or varies from one surgeon to another with regards to the ratio of waste generated affects the individuals.2

The trouble in waste management has arisen lately in developing nations where there is little history of functioning of official and unofficial community on environmental education, awareness program. The data from developing nations specify that the biomedical waste production ranges from 1-2 kg/day/bed.

The main issue is to decrease waste generation, segregation, collection and storage of waste so that it controls contamination and provides protection for employees working in operation theatre.3

Literature Review

Healthcare waste is a possible health risk to the hospital employee’s, public and environment. It was found that the minor hospitals were not capable of carrying out usual training/education which had a negative impact on separation of waste. The local government institute’s training programs for healthcare employee at taluk level or District level was given to make sure an optimal level of awareness about biomedical waste management practices is useful in minor hospitals.

Hospital acquired infections in patients is due to poor infections control practices and poor waste management. Inappropriate management of waste generated from hospitals causes a direct impact on the society. The pollution which is caused due to biomedical wastes affects the air, soil and water. The micro-organism of Human Immunodeficiency Virus, Hepatitis B Virus, Hepatitis C Virus which leads to Acquired Immunodeficiency Syndrome and Hepatitis B,C and other viral and bacterial infections.4

There were certain regulations and awareness created by government which imposes how important is it to manage bio medical waste management. Though varied techniques were available, it has some threats for Health care sector. There were some challenges identified like Lack of proper operational strategy, poor regulative measures, waste picking and reusing, lack of top management commitment, institutional arrangements, reluctant to change and adoption of the rules laid by the government.5

Wastes generated from the medical hospital became a threat to the nature as well as human world. The study has focused on disposal, reduction, recycle, treatment, segregation and modification. Based on various authors, it was revealed that it was possible for generation of plastic wastes at hospitals which can be eliminated with the help of implementation of policies at health care.6

Minimization of waste materials in OR has included the wastes to recyclable materials. The author has stated in their study that comparing the daily weight of solid waste with regulated and recyclable waste for a period of two weeks. Then the weight reduced to 12% and bags to 6% in operating room/day. Regulated medical waste has reduced to 19% and 45%/day. The importance of waste segregation in operating room is due to the fact that practice reduces the disposal cost which in turn decreases the environmental foot print of the hospitals.7

Methodology

Aim: The study has aimed to formulate a frame work in minimizing waste by promoting the use of recyclable and reusable items in surgical unit of a tertiary care hospital

Objectives:
1. To quantify the different categories of biomedical waste
2. To assess the current practice and knowledge among different health care professionals on biomedical waste management in the surgical unit
3. To analyze the correlation between surgeon’s experience and the amount of waste generated per patient
4. To conduct an audit on reusable and recyclable items in surgical unit
5. To formulate the framework to minimize the waste and promote recycling and reuse of items in the surgical unit

Method: A cross-sectional study using convenient sampling was conducted from May-July 2018 at a tertiary care hospital in Bangalore. The study quantified the waste generated by the surgical unit with the help of retrospective data from Jan-Jun 2017. The primary data was collected by direct observation of waste generated from each department in the surgical unit, knowledge and practice based questionnaire was designed by use of BMW Rules,2016 and amendment 2018; it was validated by the expert. The study had 45 respondents which represented the Nurses, OT technicians, Anesthesia
technician and Housekeeping from the surgical unit. The knowledge based questionnaire comprised of (a) Demographic profile of the respondents which includes age, designation, work experience and department (b) Knowledge on Biomedical waste management in regards to segregation, collection, handling, storage, personal protective equipments and (c) Practice on Biomedical waste. Surgeon’s experience and the waste generated per patient were the two variables used for Pearson’s correlation; audit checklist was prepared for few items from the literature review for checking the usage of reuse and recyclable items in the surgical unit. The respondents were explained about the data collection. They were assured of maintaining their privilege and anonymity. The study has used percentage method for the quantification of waste from the retrospective study, wilcoxon signed rank test and fried man test for the amount of waste generated from each department in the surgical unit. Cronbach’s alpha test was done for knowledge based questionnaire to check the reliability of the answers, observational study for the practice checklist; wilcoxon signed rank test was used to check the difference in items which are reused and recycled from two OT complex of the same hospital.

**Results**

The outcome of the study is given as per the above mentioned objectives.

From the retrospective study it was found that 22.25% and 16.5% of infectious waste and contaminated recyclable waste was generated in the month of June, 20.63% and 22.22% of glassware and sharp waste was generated in the month of Feb and June (Figure 1).

![Quantification of biomedical waste](image)

**Figure 1: Quantification of waste**

From the primary data collection it was found that orthopedics and gynecology generates the highest waste compared to other department and then next in line is urology and general surgery (Table 1).

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Mean Rank</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orthopedics</td>
<td>7.50</td>
<td>1</td>
</tr>
<tr>
<td>Urology</td>
<td>6.00</td>
<td>2</td>
</tr>
<tr>
<td>General surgery</td>
<td>4.00</td>
<td>3</td>
</tr>
<tr>
<td>Gynecology</td>
<td>7.50</td>
<td>1</td>
</tr>
<tr>
<td>ENT</td>
<td>4.50</td>
<td>4</td>
</tr>
<tr>
<td>Oncology</td>
<td>3.50</td>
<td>5</td>
</tr>
<tr>
<td>Plastic surgery</td>
<td>2.00</td>
<td>6</td>
</tr>
<tr>
<td>Vascular surgery</td>
<td>1.00</td>
<td>7</td>
</tr>
</tbody>
</table>

**Table 1: Fried man test table**

Totally 53 questionnaire was distributed to the respondents among Nurses, Anesthesia technician, OT technician and housekeeping in a tertiary care hospital, Bangalore (Table 2 and Figure 2).

<table>
<thead>
<tr>
<th>Respondents</th>
<th>No. of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nursing staff</td>
<td>31</td>
</tr>
<tr>
<td>OT technician</td>
<td>3</td>
</tr>
<tr>
<td>Anesthesia Technician</td>
<td>6</td>
</tr>
<tr>
<td>House keeping</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>45</strong></td>
</tr>
</tbody>
</table>

**Table 2: Numbers of respondents**

Only 45 questionnaires were returned completely filled and given back. 45 participants with age 20-30 are having mean work experience of 4.28 years, 31-40 with mean work experience 10.44 years and 41-50 with mean work experience 15 years. Among them n31 (68.8%) were Nurses, n6 (13.3%) were Anesthesia technician, n3 (6.67%) were OT technician and n5 (11.1%) were Housekeeping.
For the knowledge based questionnaire Cronbach alpha table was used to check the reliability, it revealed that 0.822, which indicated that high level of internal consistency for the BMW management (Table 3). Practice checklist was by direct observation which reveals around 90% are complied with the BMW Rules.

**Table 3: Cronbach’s alpha Reliability test**

<table>
<thead>
<tr>
<th>Cronbach’s Alpha</th>
<th>Cronbach’s Alpha Based on Standardized Items</th>
<th>N of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>.822</td>
<td>.856</td>
<td>11</td>
</tr>
</tbody>
</table>

The correlation value is –0.225 which represents negative correlation between surgeon’s experience and waste generated per patient (Table 4).

**Table 4: Correlation of surgeon’s experience and waste Generated per patient**

<table>
<thead>
<tr>
<th>Correlation</th>
<th>Value</th>
<th>Assumption Std error</th>
<th>Approximate value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson’s</td>
<td>-.225</td>
<td>.223</td>
<td>-.864</td>
</tr>
<tr>
<td>Spearman</td>
<td>-.214</td>
<td>.243</td>
<td>-.821</td>
</tr>
<tr>
<td>No. of Valid cases</td>
<td></td>
<td></td>
<td>16</td>
</tr>
</tbody>
</table>

There is a significant association between wastes ($z = 1.000$ and $p= 0.317$) in which OT complex-1 had higher recyclable and reusable items than OT complex-2 in the same hospital (Table 5).

**Table 5: Wilcoxon signed rank test**

<table>
<thead>
<tr>
<th></th>
<th>OT-1– OT-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z</td>
<td>–1.000b</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.317</td>
</tr>
</tbody>
</table>

The frame works for waste minimization was drawn on the basis of the segregation, reuse; recycle, source control method for the items used in the surgical unit, the waste can be segregated based on infectious and non-infectious waste based on the knowledge and practice level of the staffs which requires periodic training and pictogram near the place of segregation, reuse and recycle also requires periodic training for the staffs with advantages to the organization which can be done by segregating the recyclable waste separately and giving to recycling centers which is converted to by products and given away to multiple buyers which would be cost saving to the organization. The other method is source reduction which is achieved by controlling the outgoing of the items through operational control and changes in technology which can lead to invention and innovation of the products which also could be cost saving to the organization. By this we can achieve waste minimization which would benefit the environment from the pollution.

**Discussions**

The study revealed that the huge amount of waste was generated by the operating room and anesthesia services. The nurses showed inadequate knowledge on the BMW which was due to gender, poor education and socio-economic was too low. [8]

It was found that the minor hospitals were incapable to carry out education which had a negative impact in separation of waste. A charge involved in treatment of BMW management is an important part of healthcare costs. Investment costs and the functioning expenses were analyzed and it was found that functioning expenses had a higher impact on the hospital’s end result. The expenses were found to be higher in the minor healthcare centre. The major healthcare would be purchasing items in large volumes, which would allow them to negotiate for a lower price. [9]

The study conducted considered surgeon experience and how much waste did the surgeon produced per patient at operating room. Based on correlation, it was identified that there were negative correlation between these two factors.

The study showed that medical personnel had awareness and proper practice of BMW at hospital. [10] Likewise, in Tertiary care Hospital, personnel had awareness about the biomedical waste and segregated the waste at the time of generation in the operating room. Hospitals generated 31.4% of medical wastes in each department. [11] Further it was revealed from the fried man test that mean value for orthopedics and gynecology was 7.50 which generated more amount of waste than compared to the other department and following is the department of urology and general surgery. 100% of medical personnel in operating rooms are utilizing the personal protective equipment (gloves, mask) as safety measures but the staff in surgical unit, didn’t not use the eye glasses and aprons while cleaning likewise in their study that 93% of glove usage observed. [4]

The highest number of patients admitted monthly in Emergency rooms, hence average number of generation of wastes increased rapidly. [9] Likewise in the study, highest number of surgeries i.e. 1312 within three months which accelerated the wastes in operating rooms.
Conclusion

From the study it concludes that the OR waste minimization is a helpful method for reduction of the cost in the surgical units. The hospital can promote the reuse and recycling of the items which would be cost effective method for the organization and the profit which is gained from the reusable and recyclable items can be used for other operational expenses in the healthcare settings.

The waste products were segregated into recyclable and non-recyclable items, during the intra operative procedure the amount of waste generated was weighed using weighing scale. Almost 23.1% of total waste is produced from peri-operative procedures and 89% of the wastes are recyclable so executing recyclable policies will be the simplest intervention to minimize the environmental footprint the surgical unit.

The positive results from the study became an initiate and encouraged the employee’s to work towards the recycling program which will benefit towards the waste management and the resource distribution. It shows that the surgeons have the strategies and capacity to minimize the waste produced in the health care setting.

Recycling can have a considerable financial impact on the hospital waste. Recycling has becoming a growing trend in the United States, with 34.7% of all the waste successfully recycled in 2011 which represents an increase from 16% in 1990s and 28.5% in 2000. As per university of Minnesota medical centre USA, blue wrap is estimated to account for 19% of OR waste and 5% of all hospital waste. It is not biodegradable and also not widely recycled. The comparisons of reusable and single use in the peri-operative have made transformation in technology which has helped the medical professionals and patient protection.

Limitations: Infectious waste and contaminated recyclable waste was considered for the study, fluid waste was excluded from the study, The study took place from 9am to 5pm, waste generated in the night must be checked as there are no supervisor in the night they would tend to make mistake.

Conflict of Interest: None

Ethical Clearance: None

Source of Funds: None

Abbreviations

BMW : Bio Medical Waste
OR : Operating Room
OT : Operation Theatre
USA : United States of America

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Antifungal Sensitivity of Candida Sp. Isolated from Skin Infections at a Tertiary Care Teaching Hospital

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Abstract

**Objective:** In this study, we have found the prevalence Candidal Sp. in skin infections of the patients attending at the department of medicine and Skin and VD. We have also evaluated the drug sensitivity patterns of identified Candida sp.

**Method:** This prospective, cross-sectional study was conducted at the IMS and SUM hospital from January 2016 to February 2017, and comprised the causative organisms for skin infections. Species differentiation was confirmed by specific culture medium method. Antifungal susceptibility of isolated Candida species were evaluated with disc diffusion method.

**Results:** of the 219 Candida isolates, majority of them were isolated from the department of skin and VD 78(35.6%) and Medicine department 59(26.9%). Moreover, 144(65.8%) samples were of females and 75(34.2%) were of males. *Candida albicans* 128(58.45%) was the most predominant species followed by *Candida glabrata* 30(13.69%), *Candida tropicalis* 26(11.87%), *Candida krussei* 17(7.76%), *Candida parapsilosis* 12(5.47%), *Candida dubliniensis* 3(1.37%) and *Candida lusitaniae* 3(1.37). All isolates were least susceptible to amphotericin B with a susceptibility rate of 213(97.26%). The highest resistance was found for voriconazole 40(18.26%) compared to fluconazole 32(14.61%).

**Conclusion:** Candida species were resistant to many antifungals and in this study it is revealed that Amphotericin B is the most sensitive antifungal for skin infections.

**Keywords:** *Candida albicans*, Non-albicans (NAC), Antifungal sensitivity test, CHROMagar Candida.

Introductions

Fungal infections, a serious clinical condition causes substantial morbidity and mortality amongst the patients globally.1 *Candida species* are the normal commensal of the oral cavity, GIT and the mucosal surfaces in the body as well as the pathogens leading to colonization and infection. In the recent times incidence of fungal infections has increased with the increased incidence of immunocompromised patients.2 *Candida* species are frequently isolated from such patients as well as those who are diabetic 3, on immune-suppressants or neutropenic 4 with malignancy undergoing chemotherapy/radiotherapy 5, long term steroid therapy, long term antibiotic therapy etc. 6. It has been implicated as a cause of UTI, respiratory infections, sepsicaemia as well as cutaneous and mucocutaneous infections. The invasive fungal infections often lead to sepsis, severe sepsis and septic shock in critically ill patients in ICU with *Candida species* being the most common cause of fungal sepsis, especially in the hospital acquired infections 7. More than 17 different *Candida species* are known to be aetiological agents of human infections. Though *Candida albicans* is the most commonly isolated fungal pathogen from clinical samples, gradually non-albicans *Candida species* are becoming predominant pathogens 8. Moreover, the increased use of anti-fungal agents for treatment and also for prophylaxis especially in ICU

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patients has lead to development of resistance against commonly used anti-fungal agents in the treatment like various azoles. However the Candida species have variable resistance towards various antifungal agents. Thus this study was carried out to identify different Candida species from specimens of clinically diagnosed sepsis patients and their antifungal susceptibility pattern which can be utilized for better management of sepsis patients in our set up. The objectives of this study were to isolate and identify the species of Candida from skin infection samples and to determine the susceptibility pattern of the Candida species isolates.

**Materials and Method**

In this prospective study all the patients attending at the department of medicine and the department of skin and VD were participated for a period of 1 year. Thus the specimens whose Gram stained smears showed presence of any yeast cells or yeast-like cells with budding and with or without pseudohyphae were processed for fungal culture and inoculated on Sabourad’s Dextrose Agar (SDA). Plates were incubated aerobically at 37°C for 24 hours. The colonies of Candida species were obtained after overnight incubation. The colonies were identified by colony morphology on SDA, colony colour on Candidal differential agar Media, germ tube test and chlamydospore formation as follows. The colonies were identified according to colour. In addition to the colour of the colonies on HiCrome, a germ tube test and observation of chlamydospore formation on cornmeal agar were carried out for identification of Candida albicans. For germ tube test, a well isolated colony from SDA was emulsified in 0.5 ml of human serum using sterile straight wire. The test tubes were incubated at 35°C and no longer than 2 hours. A drop of serum sample was placed on a clean, grease free slide and a coverslip was placed over it. This slide was then observed first under 10X and then under 40X objective lens of microscope for the presence of germ tubes. Germ tube is a filamentous extension from yeast cell without constriction at the neck (true germ tube) and is seen in C. albicans. Antifungal Susceptibility test was carried out for Candida species according to CLSI guidelines for testing anti-fungal agents for yeasts.

**Results**

Of all, 219(7.28%) samples were positive for candida infections, including 78(35.62%) from the Skin and VD department, and rest from the department of Medicine. All these positive samples produced cream to white, smooth and glossy colonies - characteristic of Candida species on the SDA. These Candida-positive colonies were gram stained and only those which were round to oval with purple-coloured budding yeast cells were further processed for germ tube (GT) test. A total of 131(59.82%) strains produced germ tubes, hence were categorised as either C. albicans or C. dubliniensis, while 88(40.18%) strains which were GT negative and were designated as Candida species. Species level identification was performed by using CHROM agar Candida and corn meal agar. On the basis of growth on both the media, out of all the positive isolates C. albicans 128(58.45%) was the most predominant species followed by C. glabrata 30(13.69%), C. tropicalis 26(11.87%), C. krusei 17(7.76%), C. parapsilosis 12(5.47%), C. dubliniensis 3(1.37%) and C. lusitaniae 3(1.37). Among NACs, C. glabrata was the most abundant species. The Candida species were also identified through various biochemical tests and the results confirmed microscopic and morphological observations. Moreover, 139(63.5%) of the infections were acquired in hospitals compared to 80(36.5%) community-acquired infections. C. albicans was the most abundant species in both the OPD and IPD, followed by C. glabrata, C. tropicalis, C. krusei and C. parapsilosis. C. krusei was more prevalent in OPD, while other species were abundant in IPD. Highest prevalence of Candida species was in skin and VD (Table-1). It was observed that the number of C. albicans and all the NAC species was high in females as compared to males. Among the NACs, C. tropicalis, C. glabrata and C. krusei were the predominant species in females. In case of males, C. tropicalis, C. glabrata were high in number after C. albicans (Table-2). Patients were divided into six age groups. The highest rate of Candida species was obtained from the patients aged above 60 years with highest prevalence of C. albicans followed by C. glabrata, C. tropicalis and C. krusei. In the age group 26-40 and 41-60 years, C. glabrata, and C. tropicalis were prevalent. C. krusei was most abundant within the middle-aged group, i.e. 41-60 years (Table-3). In our study, amphotericin B was the most effective antifungal against all the Candida species with a susceptibility rate of 213(97.26%). Resistance towards amphoteracin B was noted for 3(2.34%) C. albicans, 1(3.33%) C. glabrata and 1(5.88%) C. krusei species. Interestingly, the highest resistance was found for voriconazole 40(18.26%) compared to fluconazole 32(14.61%). C. krusei 4(23.5%) were the most resistant Candida species to fluconazole followed by C. albicans.
24(18.75%), C. glabrata 3(10%) and C. parapsilosis 1(8.3%). However, C. parapsilosis was the most resistant to voriconazole 4(33.3%), followed by C. krusei 4(23.5%), C. albicans 26(20.3%), C. glabrata 4(13.3%) and C. tropicalis 2(7.7%). A 100% susceptibility rate was noted in C. dubliniensis and C. lusitaniae for both the azole antifungals (Table-4). According to the antifungal resistance data of this study, cross-resistance between fluconazole and voriconazole was found among 18(8.2%) of the isolates. of them, 16(88.9%) were C. albicans while 2(11.1%) were C. glabrata. Both the C. glabrata isolates were cross-resistant to fluconazole and voriconazole. Among C. albicans, 14(87.5%) isolates were cross-resistant to fluconazole and voriconazole, 1(6.25%) isolate was resistant against amphotericin B and voriconazole while 1(6.25%) C. albicans isolate was resistant to all the three antifungals i.e., amphotericin B, fluconazole and voriconazole.

Table 1: Candida Species isolated from the study

<table>
<thead>
<tr>
<th>Candida Species</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. albicans</td>
<td>47</td>
</tr>
<tr>
<td>C. glabrata</td>
<td>9</td>
</tr>
<tr>
<td>C. tropicalis</td>
<td>10</td>
</tr>
<tr>
<td>C. krusel</td>
<td>5</td>
</tr>
<tr>
<td>C. parapsilosis</td>
<td>7</td>
</tr>
<tr>
<td>C. dubliniensis</td>
<td>7</td>
</tr>
<tr>
<td>C. lusitaniae</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 2: Gender wise distribution of Candida albicans and Non albicans (Nacs) species

<table>
<thead>
<tr>
<th>Gender</th>
<th>C. Albicans</th>
<th>C. Glabrata</th>
<th>C. tropicals</th>
<th>C. krusel</th>
<th>C. parapsilosis</th>
<th>C. dubliniensis</th>
<th>C. lusitaniae</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>81</td>
<td>21</td>
<td>17</td>
<td>12</td>
<td>8</td>
<td>3</td>
<td>2</td>
<td>63</td>
</tr>
<tr>
<td>Male</td>
<td>47</td>
<td>9</td>
<td>9</td>
<td>5</td>
<td>4</td>
<td>0</td>
<td>1</td>
<td>28</td>
</tr>
<tr>
<td>Total</td>
<td>7</td>
<td>3</td>
<td>16</td>
<td>12</td>
<td>12</td>
<td>3</td>
<td>28</td>
<td>219</td>
</tr>
</tbody>
</table>

Table 3: Age wise Candida species distribution.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Children (0-1)</th>
<th>Teenagers (12-18)</th>
<th>Young adults (19-25)</th>
<th>Age group Adults (26-40)</th>
<th>Middle aged (41-60)</th>
<th>Senior citizen (&gt;60)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>4</td>
<td>2</td>
<td>13</td>
<td>42</td>
<td>35</td>
<td>48</td>
<td>144(65.8%)</td>
</tr>
<tr>
<td>Male</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>9</td>
<td>20</td>
<td>38</td>
<td>75(34.2%)</td>
</tr>
<tr>
<td>Total</td>
<td>7</td>
<td>4</td>
<td>16</td>
<td>51</td>
<td>55</td>
<td>86</td>
<td>219(100%)</td>
</tr>
</tbody>
</table>

Fig 1: Colony of Candida Species on SDA
Fig 2: Antifungal susceptible of Candida species
Discussion

The virulence factors and antifungal susceptibility profile of \textit{C. albicans} and NACs vary which has necessitated correct and rapid species identification as this has a direct impact on the choice of treatment.\textsuperscript{8} In our study, \textit{C. albicans} (58.4\%) was the leading pathogen as compared to NACs similar to earlier reports.\textsuperscript{8-11} Nucci et al.\textsuperscript{12} also reported \textit{C. albicans} (37.6\%) as major contributor of Candida infection followed by \textit{C. parapsilosis} and \textit{C. tropicalis}. The order of prevalence of NACs in our study was \textit{C. glabrata} (13.7\%), \textit{C. tropicalis} (11.9\%), \textit{C. krusei} (7.8\%), \textit{C. parapsilosis} (5.5\%), \textit{C. dubliniensis} (1.4\%) and \textit{C. usitaniae} (1.4\%). A significant finding of our study is \textit{C. glabrata} among NACs being the most common species in clinical samples. This could be a perturbing threat due to high incidence of increased resistance of this species to the routinely used antifungal agents. Patel et al.\textsuperscript{10} isolated highest number of Candida isolates from urine and sputum, which is similar to our work where urine 78 (35.6\%), vagina 59 (26.9\%) and sputum 32 (14.6\%) had predominant Candida species. Farooqiet al.\textsuperscript{13} reported a different epidemiological trend where \textit{C. tropicalis} was the most common organism followed by \textit{C. parapsilosis} and \textit{C. glabrata}. Candida infection was higher in females 144 (65.8\%) as compared to males (30.9\%) in our study, which is in accordance with findings of Nardin et al.\textsuperscript{14} The reason of high distribution and virulence of Candida species in females is that it has a receptor for female reproductive hormones. Rashwaset al.\textsuperscript{15} observed candiduria in 34.4\% females and 14.9\% in males. Aslam et al.\textsuperscript{16} also reported nosocomial candidiasis more frequent in female patients (56\%) as compared to male patients (44\%). In our results, high percentage of female patients visiting the QIH maybe due to problem in personal hygienic conditions. In this study, Candida infection was most prevalent within the age group of >60 years and middle aged group, which is in accordance with studies of Furnaletoet al.\textsuperscript{17} and Al-Hussainiet al.\textsuperscript{18}

In the present study, Candida infection rate was high in Skin and VD wards. However, other studies reported that Candida infection was more common in ICU and surgical ward.\textsuperscript{19} Amphotericin B was found to be highly effective against all tested species except for \textit{C. albicans}, \textit{C. glabrata} and \textit{C. krusei}, which is similar to report of De Almeida et al.\textsuperscript{20} Antifungal susceptibility data of this study also observed marked rise in azole resistance in NACs as compared to \textit{C. albicans}. \textit{C. krusei} was the most resistant species among all the isolates followed by \textit{C. albicans}, \textit{C. glabrata} and \textit{C. parapsilosis}. Oberoiet al.\textsuperscript{21} reported high fluconazole sensitivity in \textit{C. tropicalis}, high resistance in \textit{C. glabrata} and less resistance in \textit{C. parapsilosis}. All tested \textit{C. tropicalis} isolates were fluconazole sensitivity in contrast to \textit{C. parapsilosis} and \textit{C. glabrata}. Badiee and Alborzi\textsuperscript{22} report 89.5\% susceptibility of \textit{C. albicans} to fluconazole; which is quite similar to our results. Fluconazole resistance was 18.8\% similar to the Sojakova et al.,\textsuperscript{23} which reported 13\% fluconazole resistance in 227 Candida isolates. Kaya et al. reported an alarming increased fluconazole resistance in \textit{C. albicans} (68.7\%) and NACs (63.2\%).\textsuperscript{24}

Conflict of Interest: Nil

Funding Source: Nil

Ethical Clearance: This study was approved from the competent authority of our Institutional ethics committee.

References

6. Pahwa N, Kumar R, Nirkhiwale S, Bandi A. Species distribution and drug susceptibility of candida


Effectiveness of Emotional Freedom Techniques: A Pilot Study

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¹Assistant Professor, ²Associate Professor, Manikaka Topawala Institute of Nursing, Charotar University of Science and Technology, Gujarat

Abstract

Objective: To determine Effectiveness of add on Emotional freedom technique (EFT) on reduction of depression among depressive patients.

Design: Quasi Experimental study

Setting: Selected Mental Hospital

Participants: Ten patients who are aged above 18 years and diagnosed with depression and who were scored 21-40 for depression on the beck depression Inventory. Participants were randomly assigned to Experimental (EFT) (n=05) and Control (treatment as usual) (n=05) groups.

Intervention: This research is a pretest–post‐test; single‐blind randomized experimental study. An Emotional Freedom Technique group (EFT) and a Treatment as usual (TAUG) were formed, each consisting of 05 depression patients in each group determined by beck depression inventory (with moderate to severe level of depression). 40 min Emotional freedom technique was administered to the depressive patients along with routine treatment and TAUG group received the routine treatment. 3 days EFT session was planned and on 3rd day beck depression inventory is administered to determine the depression level in both groups. Data were compelled using descriptive and inferential statistics.

Results: EFT participants (n=5; M=11.80, SD= 2.59) depicts significant reduction in level of depression compared with treatment as usual group (n=5; M= 4.20, SD= 2.95) (p = 0.05, d = 1.75, 95% CI [-3.55-11.65]). In the pre-test no substantial difference was found between the two arms before the intervention in terms of the mean depression level score. After the administration of Emotional freedom technique, it was determined that the mean frequency of level of depression statistically significantly lower compare to treatment as usual.

Conclusion: Emotional freedom technique is a simple non invasive tool, which helps to reduce the depression level.

Keywords: Energy psychology, EFT, Acupressure, Meridians, Tapping Depression, Emotional Freedom Techniques.

Introduction

Depression is the most common Psychological disorder, characterized by hopelessness, helplessnessworthlessness and aloofness in activities that we usually relish, followed by lack of ability to perform daily activities, for at least two weeks. Additionally individuals suffering from depression usually have many of the following: decrease in appetite; loss of energy, impaired sleeping; decreased concentration; anxiety indecision; restlessness, guilt and ideas of self-harm or suicide.¹

Depression is a commonest mental health issue, with an approximately Three hundred and fifty million people suffering from depression. Depression is completely different from usual mood swings and temporary emotional reactions to challenges in daily life.²
According to the National Mental Health Survey (NMHS) 2016, conducted by National Institute of Mental Health and Neuro Sciences and other agencies, experts estimated 1.24% of adults in Gujarat are depressed. The National Crime Records Bureau (NCRB) data on depression and suicide shows that in 2014, Gujarat had a suicide rate (suicides per one lakh people) of 11.7, which went to 11.6 in 2015. However, in both these years, the national average suicide rate was 10.6. The suicide rate for women in Gujarat was 9.06 against a national average of 7.24 in 2014.3

Especially on long-term living with moderate or severe intensity, depression could lead to significant health issue. Even World Health Organization declared the theme Depression: Let’s Talk’ on occasion of World Health Day observed on 7th April 2017.

The main medical treatment for depression is antidepressant drugs. Antidepressants are the medicine offered on doctor’s written prescription. Drugs can treat moderate to severe depression, however don’t seem to be counselled for kids, and can be administered solely with caution for adolescents. The drug of choice includes selective serotonin reuptake inhibitors (SSRIs), tricyclic antidepressants, atypical antidepressants, monoamine oxidase inhibitors (MAOIs), selective serotonin and nor epinephrine reuptake inhibitors (SNRI), every category of antidepressant acts on a unique neurotransmitter. Prophylactic dose to be maintained even after symptoms have improved, to prevent relapse. Food and Drug Administration (FDA) warns medications like mood elevators could enhance dangerous ideas or actions in some kids, teenagers, and youngsters during initial treatment.”4

Complementary and various treatments for depression includes nutrition and, acupuncture, herbal supplements shiatsu and relaxation techniques, like attentiveness, yoga, meditation or t’ai chi.5

Emotional freedom technique (EFT) has demonstrated some Progress in reducing symptoms of stress, tension, depression and concern in a very type of settings.

Need for the Study: Person affected with Depression suffer a lot and functions poorly at school, at work and in the family. Even it can lead to suicide. Approximately 80 Lakhs people commit suicide every year. It accounts for the second leading cause of death in age group between 15-29-year-olds.6

It was found that an article published in the journal Review of General Psychology of American Psychological Association’s (APA), investigators found that EFT “demonstrated consistently strong effect sizes and other positive statistical results that exceed chance after relatively few treatment sessions.” Other recent study shows how EFT can accomplish progress in a short duration for people with a history of trauma.

In 2009 a study was conducted in which sixteen institutionalized adolescent boys with the history of psychological or physical abuse evidenced considerably reduced intensity of traumatic memories just after onesession of EFT.

A study was conducted among college students which involve thirty moderately to severely depressed students. 90-minutes, four EFT sessions were given to the depressed students. When students were evaluated after three weeks, students who undergone EFT demonstrated significantly less depression compare to control group.

The researcher assumes that based on review of literature EFT is a non-invasive technique which can be tested on the depression patients to reduce the depression.

Objectives:
1. To assess the depression level among depressive patients of EFT and Treatment as usual group.
2. To assess the Emotional freedom technique effectiveness on depression level.

Research hypothesis:
\( H_0 \): There will be no significant difference between mean Pre and post intervention scores of depression level among EFT group at 0.05 level of significance

Methodology

Research approach: Quantitative research approach was considered the best to assess the level of depression among adults attending selected OPD of Mental Hospital, Gujarat.

Research design: Quasi experimental design with pre and posttest control group is used to assess the Emotional freedom technique effectiveness on reduction of Depression among patients attending selected OPD of Mental Hospital of Central Gujarat.

Sample size: 10 patients who are meeting the Beck Depression Inventory (BDI) standards with moderate to
severe level of depression were assigned randomly, 05 samples in EFT & 05 samples in TAU (Treatment–as–usual) Group

**Setting:** Selected Mental Hospital, Gujarat.

**Independent variable:** Emotional freedom technique.

**Dependent variable:** Depression

**Sample technique:** Simple random sampling

**Inclusive criteria:**
- Willing to participate in the study.
- Patient who are identified with moderate to severe level of depression on Beck Depression Inventory criteria.

**Exclusive criteria:**
- Patients who are undergoing antidepressant treatment or any other psychological therapies

**Description of Tool:** Tool consist of 2 sections, First section consist of demographic variables and Second section consist of Beck Depression Inventory, consisting of 21 items, rating from 0-3, interpreted as Considered normal (1-10), Mild mood disturbance (11-16), Borderline clinical depression (17-20), Moderate depression (21-30), Severe depression (31-40).

### Results

**Section-I**

<table>
<thead>
<tr>
<th>Sr No</th>
<th>Demographic variable</th>
<th>EFT group n=05</th>
<th>TAU group n=05</th>
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<tr>
<td></td>
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<td>Percentage (P)</td>
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<td>Age(Year)</td>
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</tr>
<tr>
<td>b.</td>
<td>30- 39 Years</td>
<td>01</td>
<td>20</td>
</tr>
<tr>
<td>c.</td>
<td>40- 49 Years</td>
<td>01</td>
<td>20</td>
</tr>
<tr>
<td>d.</td>
<td>≥50 Years</td>
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<tr>
<td>b.</td>
<td>Female</td>
<td>02</td>
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</tr>
<tr>
<td>b.</td>
<td>10th standard</td>
<td>01</td>
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<td>c.</td>
<td>12th standard</td>
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<td>b.</td>
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<td>c.</td>
<td>15001-20000</td>
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<tr>
<td>d.</td>
<td>≥200000</td>
<td>01</td>
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<td>b.</td>
<td>Joint</td>
<td>01</td>
<td>20</td>
</tr>
</tbody>
</table>

Table 1: Findings related to demographic variables of patients of both EFT and TAU group. N = 10
The table 1 portrays that majority of the Patients in both EFT 02 (40%) and TAU group 02 (40%) were in the age group of > 50, Years. Participants in both EFT 3 (60%) and TAU 3 (60%) were males and EFT 2 (40%) and TAU 2 (40%) were females. All of them in EFT 5 (100%) were Hindus and majority 4 (80%) were Hindus in TAU group. While comparing the Educational status majority 3 [60%] has studied up to 12th Standard in EFT group while 3 [60%] have studied up to 9th Standard in TAU group. Majority of the participants in EFT group 3 [60%] earns 5000-10000 rupees where as in TAU group 3 [60%] earns 10001-15000 rupees. Majority of the participants in both EFT 04 (80%) and TAU 04 (80%) group belonged to Nuclear family

Section II: Findings of Emotional freedom technique effectiveness on depression level among depressive patients of EFT and TAU group.

Table 2: Level of depression before and after intervention between EFT and TAU group n=10

<table>
<thead>
<tr>
<th></th>
<th>EFT group</th>
<th>TAU group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Standard deviation</td>
</tr>
<tr>
<td>Pre-intervention</td>
<td>29</td>
<td>2.12</td>
</tr>
<tr>
<td>Post-intervention</td>
<td>17.2</td>
<td>3.76</td>
</tr>
</tbody>
</table>

The data presented in table no 2.1 indicates that mean value and SD of pre-intervention in EFT and TAU group is 29±2.12 and 29.6±3.04 Mean value of post intervention in EFT and TAU group is 17.2±3.76 and 25.4 ± 2.30

Table 3: Comparison of Level of depression between EFT and TAU group. n=10

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean difference</th>
<th>Standard deviation</th>
<th>'t' Value</th>
<th>df</th>
<th>p value</th>
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<tr>
<td>EFT group</td>
<td>11.8</td>
<td>2.6</td>
<td>1.59</td>
<td>08</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>TAU group</td>
<td>4.2</td>
<td>2.9</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Depression level among Patient is different in EFT group in both the condition. The Mean depression level in EFT group before intervention is 29 while in after intervention it became 17. While mean depression level in Treatment as usual in pre-test is 29.6 and reduced to 25.4 in treatment as usual. In comparing both the group statistically it is observed significant reduction in depression level in EFT group. Which means the depression level is difference in both the situation and it is statistically significant. Hence null hypothesis is rejected at 0.05 level of significance.

Discussion

After three session of EFT it is observed significant change in depression level in EFT group who are receiving 40-45 Minutes EFT sessions along with treatment as usual and routine treatment, The Treatment as usual group received standard protocol of drugs and other routine therapies. Beck depression inventory is administered for both the groups on 1st and 3rd day by independent assessor; EFT groups experienced statistically significant decrease in depression level in this study. Results depicts that EFT is an efficacious add on intervention in Hospital settings, also it is a handy tool for nurses who can administer EFT technique after undergoing appropriate training for reducing depression within a few sessions along with routine treatment. EFT is non invasive, evidence-based techniques which can be easily practiced by depression patient along with treatment as usual for better outcome and to prevent the relapse of depression, well it also facilitate reduction in anxiety, stress, PTSD, craving for drugs like alcohol, tobacco.

Recommendation: Results of this pilot study recommends the following to assess effectiveness of EFT (1) Sample size to be enhanced for generalization (2) Treatment sessions frequency can be enhanced, (3) Follow-up sessions need to be planned at different intervals of 1 month, 3 months, 6 months to observe the treatment efficacy for long term. EFT sessions can be monitored with EEG changes, EFT efficiency can be observed from vitals like heart rate, BP, Pulse, breathing. Hormonal changes can be observed in EFT and TAU group for advanced results.

Conclusion

From the above pilot study it is observed EFT group has significant changes in depression level comparing to treatment as usual, also it is found that methodology of the study is found feasible and intervention can be administered for 3 days of 40-45 minutes each to observe clinically significant changes in depression level.

Conflict-of-Interest Statement: The manuscript is original, it has not been published elsewhere and that it has not been submitted simultaneously for publication elsewhere. No part of the manuscript has been published before, nor is any part of it under consideration for publication at another journal, there are no conflicts of interest to disclose.
Source of Funding: Self

Ethical Clearance: Obtained from Institute ethical committee, No ethical issues encountered during study.

Reference


Effectiveness of Warm Footbath on Quality of Sleep among Elderly

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¹Post Graduate Student, ²Associate Professor, ³Lecturer, ⁴Professor, Department of Medical Surgical Nursing, Yenepoya Nursing College, Yenepoya (Deemed to be University), Mangalore

Abstract

Sleep disturbance is one among the biggest worldwide health threats. Regardless of the age groups, people are affected with symptoms of insomnia one or the other way. To mention, the geriatrics. The objectives of the study are to assess the effectiveness of warm foot bath on quality of sleep among experimental group. Evaluative approach and quasi experimental, nonrandomized control group design were adopted for the study. Sixty subjects were selected by non-probability purposive sampling technique. The quality of sleep was assessed by Pittsburgh sleep quality index. Independent sample t test was used to compare the quality of sleep between experimental and control group. In the experimental group, the mean post test score of quality of sleep among elderly (11.73±3.9) was much less than of control group, (15.16±4.24). In experimental group the mean difference was (4.16) and it was more than the difference of control group (-2.26), indicate that warm footbath is effective in improving quality of sleep among elderly people. There was no association between pretest sleep quality scores and selected demographic variables.

Keywords: Elderly, insomnia, quality of sleep, warm footbath.

Introduction

Sleep is defined as a period of rest for the body and mind, during which volition and consciousness is in partial or complete abeyance and the bodily functions partially suspended.¹

There are mainly three important theories which clarify about the essentiality, purposes and functions of sleep. The first one, Evolutionary theory explains that wakefulness during the bedtime is found to be most unhealthy episodes in one’s life. Secondly, the information consolidation theory suggests that, sleep is an interval for the body to rest and support the mind to process the message that has been collected during the last day and also prepares the brain for the next day to come. According to the Repair and Restoration theory, sleep is a fundamental plan for body to preserve health and maintain entire physiological process.²

Sleep is very important for a healthy life. However, sleeplessness happens due to various reasons. It is either due to physical, mental or environmental causes. Sleep disturbances varies with type of causes, acute insomnia happens due to life stresses whereas, chronic insomnia occur because of depression, chronic stress or discomfort at night. Other agents include genetics, adults above 65 years of age, dependency on drugs, working at night shift, are results in wakefulness. It contributes the increased risk of chronic health problems like high blood pressure, diabetics, heart disease, stroke etc. According to a survey, around 90% of human suffers above causes.³

According to the statistics, 93% of people are sleep-deprived in India.⁴ Treating insomnia with medications can improve the overall sleep-health among elderly, but chronic use of sedatives can cause drug-withdrawal effects and daytime drowsiness that affects the normal sleep-wake functioning.⁵

However, complementary and alternative therapies are preferred and may results in durable benefits. Warm foot bath is an alternative and powerful medicine for
sleep disorders, by immersing the feet in warm water at 35°C till 40°C for about 10-30 minutes. It helps to circulate more blood throughout the body, boosts the immunity, induce relaxation improves lymph flow, relieves fatigue and insomnia.  

Researches revealed that administration of warm footbath can do wonders for the mood, energy level, sleeping habits, pain and any aches. Reflexology says, the entire body is connected to the feet, by caring and nurturing that part of the body provides health and wellbeing to limbs and organs. When the body temperature increases with footbath relieves stress, muscle and mental tension, and increases white blood cells activity. Thereby, boosts the immune system, prevents sickness. Warm footbath flush out the harmful toxins from the body with the help of bentonite clay prepositive and negative ions act as cleanser to detox the body. Warm footbath relaxes both mentally and physically. This reduces cognitive impairment, increases creativity and work habits, aids in good sleep and decreases mood fluctuation.

### Materials and Method

An evaluative approach and quasi experimental, nonrandomized control group design were adopted to assess the effectiveness of warm foot bath on quality of sleep among elderly. Selection of sampling was done by non-probability purposive sampling technique. Sample consists of 60 elderly people, 30 samples were assigned to experimental group and rest was assigned to control group based on inclusion and exclusion criteria.

#### Inclusion criteria
- Conscious and well oriented.
- Willing to participate in the study.
- Elderly between the age group of 60 to 89 years

#### Exclusion criteria:
- Any lesions at the foot.
- Acutely ill
- With psychiatric disorders.
- With diabetes foot ulcer.
- Insulin dependent Diabetics
- Peripheral vascular disease.
- Peripheral neuropathy.
- Swelling in the feet/legs,
- Buerger’s disease
- Frostbite
- Atherosclerosis

The ethical clearance was obtained from Yenepoya Ethics committee. Data was collected by demographic variables and Pittsburgh sleep quality index using interview method. The reliability of the tool was obtained by Cronbach’s alpha (r = 0.8), which indicates tool was reliable. The purpose of study was explained and written consent was obtained from the study participants. Warm foot bath was administered for 3 consecutive weeks in the evening 6:50 to 7pm for 10 minutes. Warm water at 40°C-37°C was measured by lotion thermometer.

### Results

The results of the study data was analyzed based on the objectives and hypothesis using descriptive and inferential statistics.

**Hypothesis:** Hypothesis tested at 0.05 level of significance,

- H₁: The mean post-test level of quality of sleep will be significantly higher than that of the mean pretest level among elderly in experimental group.
- H₂: The mean post-test level of quality of sleep among elderly in experimental group will be significantly higher than that of the control group.
- H₃: There will be significant association between pretest scores of quality of sleep and selected demographic variables.

#### Table 1: Distribution of demographic characteristics among elderly in terms of frequency and percentage. n=30+30

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Experimental Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(f)</td>
<td>(%)</td>
</tr>
<tr>
<td><strong>Age in Years</strong></td>
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<tr>
<td>60-69</td>
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<td>50</td>
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<tr>
<td>70-79</td>
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<td>30</td>
</tr>
<tr>
<td>80-89</td>
<td>6</td>
<td>20</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Description of demographic characteristics: As shown in table 1, among the 60 subjects, 29(48.33%) belonged to the age group of 60-69 years. Most of the 50(83.33%) subjects were females. Majority of the 60 subjects, 23(38.33%) were married. Most of the 53(88.33%) subjects had no other relaxation techniques followed before bedtime. Majority of the 53(88.33%) subjects were consumed vegetarian food at night.

Table 2: comparison of pretest and post test scores of quality of sleep in terms of frequency and percentage in each group. n = 30+30

<table>
<thead>
<tr>
<th>Quality of sleep</th>
<th>Pretest</th>
<th>Post test</th>
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<tbody>
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<td>Experimental Group</td>
<td>Control Group</td>
</tr>
<tr>
<td></td>
<td>(f)</td>
<td>(%)</td>
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</tr>
<tr>
<td>Average (8-14)</td>
<td>12</td>
<td>40</td>
</tr>
<tr>
<td>Poor (15-21)</td>
<td>16</td>
<td>53.3</td>
</tr>
</tbody>
</table>

As shown in the table 5, in pretest, the experimental group, (6.7%) had good quality of sleep, (40%) of the subjects had average quality of sleep and (53.3%) of the subjects had poor quality of sleep. In control group, (16.7%) of the subjects had good quality of sleep, (50%) of the subjects had average quality of sleep, (33.3%) of them had poor quality of sleep.

In posttest, the experimental group (16.7%) of the subjects had good quality of sleep,(63.3%) of the subjects had average quality of sleep, (20%) of them had poor sleep quality. In control group (16.7%) of the subjects had good quality of sleep, (46.7%) of subjects had average quality of sleep and (36.7%) of them had poor quality of sleep.

Section 3: Effectiveness on warm footbath on quality of sleep on pretest and posttest level of each group

H₀₁: The mean post-test level of quality of sleep will be no significantly higher than that of the mean pretest level among elderly in experimental group.
Table 3: Effectiveness of warm footbath on quality of sleep on pretest and posttest level of each group in terms of mean, SD, mean difference, paired ‘t’ test and ‘p’ value. n = 30+30

<table>
<thead>
<tr>
<th>Groups</th>
<th>Mean</th>
<th>SD</th>
<th>Mean difference</th>
<th>df</th>
<th>t value</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>Pretest</td>
<td>15.9</td>
<td>4.3</td>
<td>4.16</td>
<td>18.088</td>
<td>&lt;0.05*</td>
</tr>
<tr>
<td></td>
<td>Posttest</td>
<td>11.73</td>
<td>3.9</td>
<td>29</td>
<td>-2.26</td>
<td></td>
</tr>
<tr>
<td>Control group</td>
<td>Pretest</td>
<td>12.9</td>
<td>4.5</td>
<td>-2.26</td>
<td>-4.025</td>
<td>&lt;0.05*</td>
</tr>
<tr>
<td></td>
<td>Posttest</td>
<td>15.6</td>
<td>4.24</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(*t*29=2.05) [*indicates significant]

Paired “t” test was used to assess effectiveness of warm footbath on quality of sleep on pretest and posttest level of each group.

The above table shows, in the experimental group, the mean post test score of quality of sleep among elderly (11.73±3.9) was much less than of control group, (15.16±4.24). In experimental group the mean difference was (4.16) and it was more than the difference of control group (-2.26). Also in experimental group, the calculated ‘t’ value (*t*(29)=18.08) was found to be greater than the table value (*t*(29)=2.09) at <0.05 level of significance. Therefore *H*01, was rejected and *H*1, was accepted, indicate that warm footbath is effective in improving quality of sleep among elderly people.

Section 4: Effectiveness of warm footbath on quality of sleep between experimental and control group.

*H*02: The mean post-test level of quality of sleep among elderly in experimental group will be no significantly higher than that of the control group.

Table 4: Effectiveness of warm footbath on quality of sleep in terms of mean, standard deviation, independent t value and p value obtained in experimental and control group. n = 30+30

<table>
<thead>
<tr>
<th>Groups</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>df</th>
<th>t value</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td></td>
<td></td>
<td>58</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental Group</td>
<td>15.9</td>
<td>4.3</td>
<td></td>
<td>2.629</td>
<td>0.011*</td>
</tr>
<tr>
<td>Control Group</td>
<td>12.9</td>
<td>4.5</td>
<td></td>
<td>-3.62</td>
<td>0.002*</td>
</tr>
<tr>
<td>Posttest</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental Group</td>
<td>11.73</td>
<td>3.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control Group</td>
<td>15.16</td>
<td>4.24</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(*t*58=2.02) [*indicates significant]

Independent sample “t” test was used to compare the quality of sleep between experimental and control group.

The obtained p value were <0.05 for both pretest and posttest quality of sleep between experimental group and control group. It indicates that between the groups there was a difference in mean quality of sleep Hence *H*01 was rejected and *H*2 was accepted.

Section 5: Association between pretest scores of quality of sleep and selected demographic variables

*H*03 : There will be no significant association between pre-test scores of quality of sleep and selected demographic variables.
Table 5: Association between pretest scores of quality of sleep and selected demographic variables. N=60

<table>
<thead>
<tr>
<th>Demographic Variable</th>
<th>Median &lt; 14</th>
<th>Median &gt;/=14</th>
<th>Statistical Test Values</th>
<th>df</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(f)</td>
<td>(f)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60-60 years</td>
<td>13</td>
<td>16</td>
<td>5.875</td>
<td>2</td>
<td>0.053</td>
</tr>
<tr>
<td>70-79 years</td>
<td>15</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>80 years and above</td>
<td>3</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>18</td>
<td>10</td>
<td>3.348</td>
<td>1</td>
<td>0.07</td>
</tr>
<tr>
<td>Female</td>
<td>13</td>
<td>19</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>12</td>
<td>7</td>
<td>4.90</td>
<td>1</td>
<td>0.179</td>
</tr>
<tr>
<td>Married</td>
<td>13</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Widow/widower</td>
<td>5</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Divorced</td>
<td>1</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(p>0.05)

The Likelihood Ratio and Chi-square test was used to find the association between pretest scores of quality of sleep and selected demographic variables.

The obtained p values of Chi square and Likelihood Ratio test were >0.05. Hence there was no association between pretest sleep quality scores and selected demographic variables. Hence H3 was rejected and H03 was accepted.

**Discussion**

**Major findings of the study:**

**Section 1: Description of demographic characteristics:** The frequency and percentage distribution of demographic variables of elderly showed that, among the 60 subjects, 29(48.33%) belonged to the age group of 60-69 years.

- The present findings of the study supported by an another studies conducted by,

Prakash Dharam et al—regarding the prevalence and nature of insomnia among elderly population over 66 years of age. The results of the study showed that (32%) had insomnia, (89.45%) subjects were with chronic insomnia. The data suggested that insomnia was more prevalent among elderly people over 60 years of age.8

**Section 2: Effectiveness of warm foot bath on quality of sleep:** In the experimental group, the mean post test score of quality of sleep among elderly (11.73±3.9) was much less than of control group, (15.16±4.24). In experimental group the mean difference was (4.16) and it was more than the difference of control group (-2.26).

Also in experimental group, the calculated’’t’ value \(t_{(29)}=18.08\) was found to be greater than the table value \(t_{(29)}=2.09\) at <0.05 level of significance, indicate that warm footbath is effective in improving quality of sleep.

Philip Anju (2018)—supported study conducted a quasi experimental study among patients with cancer to assess the effect of warm foot bath on quality of sleep. Results showed that, mean value of quality of sleep in experimental and control group was 3.96±1.7 and 8.07±1.70 respectively, with the mean difference of 4.11. \(t\) value is 10.02 and \(p<0.001\) level of significance. The study found that warm foot bath was an effective intervention to improve the quality of sleep.9

**Section 3: Association between pretest scores of quality of sleep and selected demographic variables:** The obtained values of Chi square and Likelihood Ratio test were \(p>0.05\). \(H_{03}\) was accepted and \(H_3\) was rejected. Hence there was no association between pretest quality of sleep scores and selected demographic variables.

- The present findings of the study supported by an another study conducted by,

R Timalsina et al-(2017) conducted an analytical cross-sectional study to identify the factors associated with insomnia among elderly, there was no significant association of age, gender, marital status,educational status, current working status, financial dependency, disease and medicine use at present with insomnia. \(p>0.05\).10

**Conclusion**

The aim of the study was to assess the effectiveness of warm foot bath on quality of sleep among elderly.
Evaluative approach and quasi experimental, nonrandomized control group design were adopted for the study. Sixty subjects were selected by Non-probability purposive sampling technique. With my study i was able to improve the health and quality of sleep in elderly. So in conclusion we can say that the warm footbath is an effective treatment for sleeplessness in elderly population and it also helps to improve the quality of life without causing any side effects in comparison to medication.

**Conflict of Interest:** Nil

**Source of funding:** Self

**Ethical Clearance:** Taken from ethics committee of Yenepoya (Deemed to be university).

**List of abbreviations:**

- df : Degree of freedom
- $H_1,H_2,H_3$ : Research Hypothesis
- $H_{01}, H_{02}, H_{03}$ : Null hypothesis
- $p$ : Probability
- $r$ : Reliability
- SD : Standard deviation
- $\%$ : Percentage
- $\chi^2$ : Chi square

**References**

Selfie Taking Behavior among College Students: 
A Cross Sectional Study

Arijit Kundu1, Lipilekha Patnaik2, Sumitra Pattnaik2, Trilochan Sahu3

1PG Student, 2Professor, 3Professor & Head, Department of Community Medicine, Siksha ‘O’ Anusandhan Deemed to be University, Bhubaneswar, Dist.: Khordha State: Odisha

Abstract

Background: Clicking selfie and sharing in social media is increasing day by day as an obsessive compulsive desire, which needs urgent attention.

Objectives: To know the pattern of selfie taking and sharing of selfie in social networking sites and to correlate of selfie taking with self-esteem.

Method:

Study area: Colleges of one university in India.

A predesigned and pretested online questionnaire consisting of demographic characteristics, selfie related questions and Rosenberg self-esteem scale was used to collect data. Data were analyzed by using SPSS v20.

Results: Among 595 participants, 23.1% of the students clicked selfies daily. The places where selfies clicked were public places (47.1%) followed by home (23.4%) and college (19.5%). Boredom (24.4%) was the main reason to click selfies. Negative mental health issues were seen among 56% of the participants like unhappiness, sadness, feeling worthless, depressed etc, when they didn’t receive enough likes or comments in shared selfies. Among the students, 17.6% had selfitis and 20% had low self-esteem. No relation was seen between selfitis and low self-esteem.

Conclusion: Counselling emphasizing on self-motivation and self-control on unnecessary use of social media, giving quality time to family and friends may be initiated as intervention method.

Keywords: Selfitis, social media, mental health, self-esteem, selfie addiction.

Introduction

A selfie is a photograph that one has taken of oneself, typically with a smartphone or webcam and shared via social media (Oxford Dictionary, 2013). Oxford Dictionary named ‘selfie’ as its word of the year 2013. According to language research, the use of ‘selfie’ increased by a colossal 17,000% between 2012 and 2013, which marks a huge upward trend. Selfie is a self-objectification practice of promoting the self. Selfie addiction is new disorder of modern age. But no unique name was given to this disorder yet, and it has been not included in ICD 10. Many of the researcher called it selfitis, some researcher called it as selfie syndrome or selfie addiction etc. Selfitis is an obsessive compulsive desire to take photos of oneself and post them on social media as a way to make up for the lack of self-esteem and to fill a gap in intimacy,1 and has categorized it into three levels: borderline (up to three selfies per day, but not sharing on social media), acute (three selfies per day, and sharing them on social media), and chronic (at-least six selfies per day and sharing every selfie on social media)2.
According to American Psychiatric Association, selfitis is not included in DSM-5, but there are plenty of real mental disorders that need and deserve treatment. Whatever the term will be coined in future but it’s really a matter of concern for us to prevent students of being addicted to selfie. Selfie taking can be dangerous, it can cause a person injured physically or mentally.

Recent studies found that individuals with lower self-esteem were more prone to have Selfitis. This may be due to the fact that individuals with low self-esteem use social networking sites to develop social relationships with others without having face to face interactions.

Clicking selfie and sharing in social media is increasing day by day as an obsessive compulsive desire, which needs attention. So this study was conducted to know the pattern of selfie taking and sharing of selfie in social networking sites and to correlate of selfie taking with self-esteem.

**Method**

A cross sectional study was conducted from September to December 2017 by adapting convenient sampling method. The study strictly maintained anonymity and purely observational, so ethical permission was not required. An informed written consent was taken from students and those who gave consent for the research were included in this study. A google form was created which consisted of 2 parts. Part 1 includes the demographic characteristics and selfie related questions and part 2 consist of Rosenberg self-esteem scale. The link of the questionnaire was mailed to all the students of different colleges of the university. One person one response option was selected. A timeline was given for a month to send responses. A total of 595 responses were collected. Analysis was done by using SPSS version 20.0 licensed to the institution.

**Results**

A total of 595 students have participated in this study. Students from different colleges of the University had participated in this study consisting of medical undergraduates (49%), engineering (12%), pharmacy (10%), arts (9%), medical post graduate students (9%), law (7%) etc. Mean age was 21.28 ± 2.46 years (range-17 to 29 years). Among the participants, 48.1% were male and 51.9% were female.

It was observed that 23.1% of the students clicked selfies daily, 12.6% participants clicked three or more selfies per day. Among them, 22% liked to click group selfie, 17.3% liked to click own selfie & 60.7% liked to click both. Only 23.4% students don’t like to share selfies. 66% share selfies in social networking sites and 44.7% share selfies by messenger applications. 9 students share 3 or more selfies per day.

![Figure 1: Places where selfies clicked](image1)

Most commonly selfies were clicked in public places (47.1%), home (23.4%), college (19.5%), others like get-together, parties (10%). (Fig. 1)

It was seen that boredom (24.4%) was the main reason followed by to share lifestyle (22.6%), to keep memories (15%), to share in social media (14.9%), send to friends (12.5%), to get attention (5.1%), to see themselves (4.5%) were the reasons to click selfies.

![Figure 2: Feelings after sharing selfies](image2)
A total of 44.7% said that they get some sort of satisfaction after sharing selfies in social networking sites. Mixed feelings were seen among the study participants after sharing selfies in SNSs the findings. These were happiness (35.4%), excited (11%), comfortable (7.1%), cheerful (7%), satisfaction (5.2%), feeling confident (5.1%), anxiety (5.1%), depression (5%), appreciation (4%), insecurity (3.1%). 11% of them don’t feel anything after sharing selfies and only 1% don’t share selfies. (Fig. 2)

Negative feelings were seen among 56% on the participants which consists of unhappiness (19%), sadness (12%), worthless (7%), depression (5.7%), angry (4.7%), ashamed (4.6%), rejection (3%) and 44% felt nothing when they didn’t receive enough likes or comments in shared selfies. 8% of the participants said they would like to remove selfies from SNSs if didn’t get enough likes or comments. (Fig. 3)

In our study we have found that near one fourth (23.1%) of the study population clicked selfies daily and near one fifth (17.6%) of the students had Selfitis. Similar kind of result was seen in a study done by Era Dutta et al in Mumbai found that 13% of students very often felt addicted to selfie taking. Though exact prevalence of Selfitis among students is not known yet. Further studies are needed to find out the exact prevalence of Selfitis.

12.6% participants clicked three or more selfies per day. This result is similar to the study done by Era Dutta et al in Mumbai where it was seen that 16.5% of the students took four or more selfies per day.

We have found that 13.2% of the students had negative experience {anxiety (5.1%), depression (5%), insecurity (3.1%)} with posting selfies on social media. Similar kind of results were observed in the study done by Satish Sarosheet al in Indore, where 16% of people under study had a negative experience with posting selfies on social media.

Among the students, 105 (17.6%) had Selfitis. Among them 7.7% had acute selfitis, 82.7% had borderline selfitis, 9.6% had chronic selfitis. (Fig. 4)

In our study population 20% (n=59) had low self-esteem and no relation was found between selfitis and self-esteem.
Low self-esteem may contribute to externalizing behavior and delinquency, although some studies have found that there was positive correlation of low self-esteem with selfie addiction. In our study we dint find any association between those two variables.

Among the study population, 8% said they would like to remove selfies from SNSs if didn’t get enough likes or comments in those posted selfies. Similar finding was seen in the study done by Satish Sarosheet al in Indore, where it was seen 21% of people delete selfies if it does not get any likes. This indicates the self endorseement people seek in the form of likes on their selfies.

**Conclusion**

Proper counselling on unnecessary use of social media and mobile phones, giving qualitytime to family and friends, academic guidance and career counselling may be helpful for students to prevent selfie addiction. Behavioural counselling emphasizing on self-motivation and self-control is essential.

The study was limited to students of only one university. The response from the students was very less. This was the limitation of this study. A broad multicenter study will help to find out the exact burden of the selfie addiction among students.

**Conflict of Interest:** Nil

**Source of Funding:** Selffunded

**Ethical Clearance:** Ethical Clearance from the Institutional ethical committee, IMS & SUM Hospital was obtained.

**References**

A Study on Human Resource Development Climate Survey in Selected Public Sector Banks in Special Reference to Thiruvannamalai District

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¹Assistant Professor, ²Head, Department of Commerce, School of Management Studies & Commerce, VELS University, Chennai

Abstract

In the present scenario of globalization and liberalization of the economy, there is a need for efficient management of the human resources, particularly in the banking sector. The study depends mainly on primary data collected through a well-framed and structured questionnaire to obtain the well-considered opinions of the respondents. If the HRD climate is good, then the employees will contribute their maximum for the achievement of the organizational goals. The results of the present study show that the HRD climate in the public sector banks is at average level and there are lot of scopes for improvement in the HRD climate. The result also shows that there is no difference in the perception of the employees on the basis of their gender, qualification and designation but the perception of the employees differs on the basis of their age. The researcher has taken four Public Sector Banks from two taluks located in Thiruvannamalai District.

Keywords: Human Resources, Human Resource Development Climate, HRD Mechanisms.

Introduction

Management is concerned with the execution of organizational objectives by utilizing physical and monetary resources through the efforts of human resources.¹ The Human Resource Development (HRD) Departments have to play a more important role in shaping the workforce to face the challenges.² Human Resource Development (HRD) is concerned with the provision of learning and developing opportunities that support the success of business strategies and improvement of organizational, team and individual performance (Armstrong and Baron, 2002). Climate is an overall feeling that is conveyed by the physical layout, the way the human employees interact and the way members of the organization conduct themselves with outsiders.³

Objectives of the Study

- To study the type of HRD climate prevailing in some selected Public Sector Banks.
- To study the relationship between the HRD climate and work performance.
- To suggest ways and means of improving the HRD climate in Banks.

Hypotheses

- HRD Climate in Public Sector Banks is positive and optimistic.
- Factors of HRD Climate do not differ significantly.

Methodology: The methodology of the study is based on both primary as well as secondary data. The study depends mainly on primary data collected through a well-framed and structured questionnaire to obtain the well-considered opinions of the respondents. Principal Component Analysis, KMO and Bartlett’s test and Chi-Square test is adopted to analyse the responses from supervising staff and clerical staff of select Public Sector Banks in Cheyyar and Vandavasi taluks in Thiruvannamalai District.

Study Area: The study is confined to a few selected Public Sector Banks and for this purpose, the following 4 Public Sector Banks in Cheyyar and Vandavasi Taluks in Thiruvannamalai District were considered as the sample domain:
Table 1: Sample Domain

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Public Sector Banks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>State Bank of India (SBI)</td>
</tr>
<tr>
<td>2.</td>
<td>Indian Bank (IB)</td>
</tr>
<tr>
<td>3.</td>
<td>Indian Overseas Bank (IOB)</td>
</tr>
<tr>
<td>4.</td>
<td>Union Bank (UB)</td>
</tr>
</tbody>
</table>

Source: Secondary data

The researcher has taken four Public Sector Banks from two taluks located in Thiruvannamalai District. Out of 134 questionnaires distributed, only 106 responses were received. Out of which 6 incomplete questionnaires were rejected. 100 questionnaires were used for the present study.

Analysis of Data: The primary data collected from the managers of select PSBs are analyzed by using the following statistical tools (Statistical Package for Social Sciences – SPSS) to obtain torrent of results regarding the objectives of the study:

1. Percentage Analysis.
2. KMO and Bartlett’s test.
3. Factor Analysis by Principal Component Method will be used to identify the factors of HRD climate.

Limitations of the Study

- The study is limited to only Public Sector Banks. Private Sector Banks were not considered because HRD Climate in these banks may not be the same.
- The study was conducted in selected Public Sector Banks, which may not give the global picture of the situation.
- The study covers only two taluks located in Thiruvannamalai District. Due to time constraint, the study is restricted only to two taluks

Table 2: Name of the Bank

<table>
<thead>
<tr>
<th>Name of the Bank</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>SBI, Cheyyar</td>
<td>18.0</td>
</tr>
<tr>
<td>Indian Bank, Vakkadai</td>
<td>4.0</td>
</tr>
<tr>
<td>Indian Bank, Senkadu</td>
<td>4.0</td>
</tr>
<tr>
<td>Indian Bank, Perunkattur</td>
<td>4.0</td>
</tr>
<tr>
<td>Indian Bank, Cheyyar</td>
<td>20.0</td>
</tr>
<tr>
<td>Union Bank, Anakkavoor</td>
<td>5.0</td>
</tr>
<tr>
<td>IOB, Cheyyar</td>
<td>8.0</td>
</tr>
<tr>
<td>SBI, Alathoor</td>
<td>4.0</td>
</tr>
</tbody>
</table>

Source: Primary data

From the table 2, State Bank of India employees are almost covered for the data collection. Four branches of the State Bank have been taken for the study which ensures that the largest player of the country is utilized sufficiently for the study. Almost 43% of the respondents are working in State Bank of India. The next important player is Indian Bank, the respondents participated in the data collection form one percent greater than the State Bank employees’ i.e. 44%.

Table 3: Tests of Equality of Group Means

<table>
<thead>
<tr>
<th>Regression Factor Score</th>
<th>Wilks’ Lambda</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employees Enjoy their Work</td>
<td>.974</td>
<td>.410</td>
</tr>
<tr>
<td>Should be treated humanity</td>
<td>.888</td>
<td>1.953</td>
</tr>
<tr>
<td>Subordinate Development is important</td>
<td>.966</td>
<td>.552</td>
</tr>
<tr>
<td>Personnel Policies facilitate Employee Development</td>
<td>.952</td>
<td>.775</td>
</tr>
<tr>
<td>Top Management willing to invest Time &amp; Other Resources</td>
<td>.947</td>
<td>.863</td>
</tr>
<tr>
<td>Senior Officers/Executives Help</td>
<td>.950</td>
<td>.811</td>
</tr>
<tr>
<td>Competency Lacking Employees are helped</td>
<td>.844</td>
<td>2.867</td>
</tr>
<tr>
<td>Employee Behavior Can be Changed</td>
<td>.831</td>
<td>3.156</td>
</tr>
<tr>
<td>People are Helpful to Each Other</td>
<td>.942</td>
<td>.960</td>
</tr>
<tr>
<td>Very Informal and Don’t Hesitate to Discuss their Personal Problems</td>
<td>.948</td>
<td>.850</td>
</tr>
<tr>
<td>Psychological Climate is very conductive</td>
<td>.951</td>
<td>.799</td>
</tr>
<tr>
<td>Guides for Future Responsibilities/ Roles</td>
<td>.873</td>
<td>2.251</td>
</tr>
<tr>
<td>Makes Effort to Identify and Utilize the Potential</td>
<td>.972</td>
<td>.439</td>
</tr>
<tr>
<td>Promotion is Based on Suitability</td>
<td>.971</td>
<td>.457</td>
</tr>
</tbody>
</table>

Source: Primary data

From the table 3, it is very clear that the Wilks’ Lambda values are very near to 1, it means insignificant, therefore it is clear that the grouped means are appropriate with all other components. A 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 16.2.
H₀₁: The psychological climate in the organization is not conducive.

H₁₁: The psychological climate in the organization is conducive.

Based on the name of the bank, hypothesis is tested to know the Psychological Climate among the various banks, and it is revealed that there is conducive psychological climate in the organization. The minimum expected cell frequency is 16.2, but the expected frequency is less than 5, i.e. 0.000, therefore the null hypothesis is rejected.

**Table 4: Employees Enjoy their Work**

<table>
<thead>
<tr>
<th>Name of the Bank</th>
<th>Employees Enjoy their Work</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not at All True</td>
</tr>
<tr>
<td>SBI, Cheyyar</td>
<td>3</td>
</tr>
<tr>
<td>Indian Bank, Vakkadai</td>
<td>0</td>
</tr>
<tr>
<td>Indian Bank, Senkadu</td>
<td>0</td>
</tr>
<tr>
<td>Indian Bank, Perunkattur</td>
<td>0</td>
</tr>
<tr>
<td>Indian Bank, Cheyyar</td>
<td>0</td>
</tr>
<tr>
<td>Union Bank, Anakkavoor</td>
<td>0</td>
</tr>
<tr>
<td>IOB, Cheyyar</td>
<td>0</td>
</tr>
<tr>
<td>SBI, Alathoor</td>
<td>0</td>
</tr>
<tr>
<td>SBI, Korkai</td>
<td>0</td>
</tr>
<tr>
<td>SBI, Vandavasi</td>
<td>0</td>
</tr>
<tr>
<td>Indian Bank, Mamandur</td>
<td>0</td>
</tr>
<tr>
<td>Indian Bank, Vandavasi</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3</strong></td>
</tr>
</tbody>
</table>

Source: Primary data

After allotting the weight age to the factors it was cross tabulated with the weights as shown in the table 4, and it reveals that the employees enjoy their work. Based on the cross table hypothesis is framed below to test the significance level.

H₂₀: Employees do not enjoy their work in public sector banks.

H₂₁: Employees enjoy their work in public sector banks.

From the table 5 below of the chi-square tests, it is found that only 38.3% have less than 5, the expected count is .11 and the observed is .000, therefore the null hypothesis is rejected with the conclusion that the employees working in the public sector banks enjoy their work.

**Table 5: Chi-Square Tests**

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>df</th>
<th>Asymp. Sig. (2-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>994.761</td>
<td>44</td>
<td>.000</td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>929.761</td>
<td>44</td>
<td>.000</td>
</tr>
<tr>
<td>Linear-by-Linear Association</td>
<td>.157</td>
<td>1</td>
<td>.692</td>
</tr>
</tbody>
</table>

a 23 cells (38.3%) have expected count less than 5. The minimum expected count is .11

**Table 6: Opinion Statement of Employees**

<table>
<thead>
<tr>
<th>Statement</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employees enjoy their work</td>
<td>1</td>
<td>5</td>
<td>43</td>
<td>46</td>
<td>5</td>
<td>100</td>
</tr>
<tr>
<td>Should be Treated Humanly</td>
<td>1</td>
<td>8</td>
<td>8</td>
<td>55</td>
<td>28</td>
<td>100</td>
</tr>
<tr>
<td>Subordinate Development is Important</td>
<td>1</td>
<td>10</td>
<td>62</td>
<td>25</td>
<td>2</td>
<td>100</td>
</tr>
<tr>
<td>Personnel Policies Facilitate Employee Development</td>
<td>1</td>
<td>9</td>
<td>37</td>
<td>48</td>
<td>5</td>
<td>100</td>
</tr>
<tr>
<td>Top Management Willing to Invest Time &amp; Other Resources</td>
<td>5</td>
<td>31</td>
<td>51</td>
<td>13</td>
<td>-</td>
<td>100</td>
</tr>
</tbody>
</table>
From the table 6 exhibited that the different opinions of employees for the different statements. Early identification of human resource potential and development of their skill represent two major tasks of human resource development. This can only be achieved when conducive HRD Climate prevails. Thus on the whole, the researcher finds the existence of good HRD Climate in the organization according to the perceptions of employees sought through the scale constructed for measuring the same. The managers in general showed a favourable attitude towards HRD Policies and practices of the organization. They were satisfied with the developmental policies of the top management as well as contented with their work and the organization as a whole i.e. level of job satisfaction was also good.

**Suggestions**

- The management may take steps to bridge the communication gap among the employees.
- The employees may be encouraged to express their feelings without any fear.
- The management is to motivate the employees to know their strength and weakness with enthusiasm.
• Proper authority may be given to the employees to take suitable decisions within the notified banking policy.

• HR policies of the organization can be designed suitably to encourage the employees to contribute their best.

• Grievance Redressal measures may be taken to satisfy the employees in order to minimize their problems.

• Attention may be given to meet the basic requirements of the employees, so that the employees will concentrate on their work.

**Conclusion**

HRD climate plays a very important role in the success of any organization, because directly or indirectly it affects the performance of the employees.\(^4\) If the HRD climate is good, then the employees will contribute their maximum for the achievement of the organizational goals. The results of the present study show that the HRD climate in the public sector banks is at average level and there are lot of scopes for improvement in the HRD climate.\(^5\) The result also shows that there is no difference in the perception of the employees on the basis of their gender, qualification and designation but the perception of the employees differs on the basis of their age. The management can improve the HRD climate by introducing suitable changes in the HR policies and practices.\(^6\)

**Conflict of Interest:** Completed

**Source of Funding:** Self

**Ethical Clearance:** Nil

**References**


To Compare Tympanoplasty with Temporalis Fascia and Tragal Perichondrium in Patients with Chronic Suppurative Otitis Media

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Abstract

Background: Hearing is a sense that enables man to establish contact with his fellows via speech to experience life more fully. The present study was conducted to compare tympanoplasty with temporalis fascia and tragal perichondrium.

Materials and Method: The present study was conducted on 56 patients of chronic suppurative Otitis Media. Patients were divided into 2 groups. In group I, 28 patients were subjected to tympanoplasty with temporalis fascia while the in group II, 28 patients underwent with tragal perichondrium. In all patients, otomicroscopy was performed. Pure tone audiometry was done as per American speech and hearing association (ASHA).

Results: In group I, 28 patients were subjected to tympanoplasty with temporalis fascia while the in group II, 28 patients underwent with tragal perichondrium. 18 patients in group I and 17 in group II had <20 dB air bone gap, 10 in group I and 11 in group II had 21- 40 dB air bone gap. The difference was non-significant (P> 0.05). 22 patients in group I and 20 in group II had <20 dB air bone gap, 6 in group I and 8 in group II had 21- 40 dB air bone gap. The difference was non-significant (P> 0.05).

Conclusion: Both temporalis fascia and tragal perichondrium are excellent graft materials for closure of perforation of tympanic membrane and hearing improvement.

Keywords: Hearing, Tragal perichondrium, temporalis fascia.

Introduction

Hearing is a sense that enables man to establish contact with his fellows via speech to experience life more fully. Deafness in varying degrees of severity is a big impediment to the integration of a person into the social structure. The otologist in the past had not much to offer to hearing handicapped people with chronic middle ear disease.¹ With recent times the advent of the antibiotic era, the operating microscope and modern anesthetics techniques aimed at producing a dry, magnified operating field, have radically altered the outlook.²

The surgical repair of permanent perforations of the tympanic membrane was first described as a “myringoplasty” by Berthold in 1878. He placed a plaster against the tympanic membrane for three days to remove the epithelium, and then applied a thick skin graft.³ The concept of onlaymyringoplasty was introduced by Berthold in 1878 using a skin graft while underlay myringoplast was introduced by John J. Shea and Tabb H.G in 1960 using a vein graft. Permanent perforation of the tympanic membrane resulting as sequelae of chronic suppurative otitis media is a major cause of deafness. Stalwarts from past as far back as Hippocrates have asserted the same.⁴
Various autografts have been used for repair of the tympanic membrane perforation like full thickness skin graft, Pedicled skin grafts, split skin graft, vein graft, Fascia grafts and Perichondrium. The present study was conducted to compare tympanoplasty with temporalis fascia and tragal perichondrium.

Materials and Method

The present study was conducted in the department of Otorhinolaryngology, Krishna Institute of Medical sciences deemed to be university, Karad. It comprised of 56 patients of chronic suppurative Otitis Media. All were informed regarding the study and written consent was obtained. Ethical Clearance was obtained prior to the study.

General information such as name, age, gender etc. was recorded. Patients were divided into 2 groups. In group I, 28 patients were subjected to tympanoplasty with temporalis fascia while the in group II, 28 patients underwent with tragal perichondrium. In all patients, otomicroscopy was performed. Pure tone audiometry was done as per American speech and hearing association (ASHA). For all patients X-ray mastoid were taken. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

Results

Table I: Distribution of patients

<table>
<thead>
<tr>
<th>Groups</th>
<th>Group I (Tympanoplasty with temporalis fascia)</th>
<th>Group II (Tympanoplasty with tragal perichondrium)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>28</td>
<td>28</td>
</tr>
</tbody>
</table>

Table I shows that, in group I, 28 patients were subjected to tympanoplasty with temporalis fascia while the in group II, 28 patients underwent with tragal perichondrium.

Table II: Preoperative Hearing Levels in both groups

<table>
<thead>
<tr>
<th>Preoperative Air-Bone Gap</th>
<th>Group I</th>
<th>Group II</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;20</td>
<td>18</td>
<td>17</td>
<td>0.91</td>
</tr>
<tr>
<td>21-40</td>
<td>10</td>
<td>11</td>
<td>0.92</td>
</tr>
<tr>
<td>&gt;40</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

Table II shows that 18 patients in group I and 17 in group II had <20 dB air bone gap, 10 in group I and 11 in group II had 21-40 dB air bone gap. The difference was non-significant (P> 0.05).

Discussion

Permanent perforation of the tympanic membrane resulting as sequelae of chronic suppurative otitis media is a major cause of deafness. Controversies range about every step of the operation from the incision to the material used for packing. A great deal of experimental work is being done often with contradictory results. The first known attempt to close a perforation of tympanic membrane to improve hearing was made by Marcus Banzer in 1640 using prosthesis made of pig’s bladder. Since then various graft materials like pig’s bladder, Thiersch skin graft, Split-skin graft, Pedicle graft from ear canal skin, temporalis fascia graft, Vein graft, Sclera, Corneal graft, tympanic membrane homograft and perichondrium have been used for closure of the perforated tympanic membrane. Controversies range about every step of the operation from the incision to the material used for packing. A great deal of experimental work is being done often with contradictory results.

The present study was conducted to compare tympanoplasty with temporalis fascia and tragal perichondrium.

In this study, in group I, 28 patients were subjected to tympanoplasty with temporalis fascia while the in group II, 28 patients underwent with tragal perichondrium. Jyoti et al found that majority of the patients shows mild to moderate hearing loss. 47.5% of them had air-one gap up to 20 dB. 52.5% of them had air-bone gap 21-40 dB. None of them had air-bone gap above 40 dB. In the postoperative hearing analysis, 77.5% of the patients showed air-bone gap upto 20dB. 22.5% of the patients showed air-bone gap in the range of 21-40 dB. 80% of the patients operated with temporalis fascia...
showed air bone gap upto 20dB. 75% of the patients operated with tragal perichondrium showed air-bone gap upto 20dB. Mean improvement in hearing temporalis fascia is 09.5 dB. Mean improvement in hearing using tragal perichondrium is 09.0 dB. Mean improvement in hearing using tragal perichondrium is 09.0 dB.

We found that 18 patients in group I and 17 in group II had <20 dB air bone gap, 10 in group I and 11 in group II had 21- 40 dB air bone gap. Wullestein included 60 patients out of which 30 were subjected to myringoplasty with temporalis fascia and remaining 30 to myringoplasty with tragal perichondrium. The comparative study was done on following parameters- graft uptake, audiological outcome, donor site complications and any late complications such as reperforation, retraction, worsening of hearing and adhesions. The youngest patient in our group was 13 years while the oldest was 56 years old. The overall male: female ratio was 27:22. The patients who underwent temporalis fascia grafting, 86.73% had a gain of 15dB while 13.7% had a gain of >15 dB. of the patients underwent tragal perichondrium grafting 50% had a gain of 15 dB while 10% had a gain of >15dB. The graft uptake rate was 85.7% for both temporalis fascia as well as tragal perichondrium. 4% of the patients of the temporalis fascia group had seroma and 4% had persistent pain. Residual perforation was seen in 3 patients of temporalis fascia group and 4 patients of tragal perichondrium group. 1 case of each group showed canal stenosis.

We found that 22 patients in group I and 20 in group II had <20 dB air bone gap, 6 in group I and 8 in group II had 21- 40 dB air bone gap. Agazzi in their study of long term result of myringoplasty in adult and children and found the state of middle ear at the time of operation influences surgical outcome; wet ear have higher rate of reperforation.

**Conclusion**

Both temporalis fascia and tragal perichondrium are excellent graft materials for closure of perforation of tympanic membrane and hearing improvement.

**Conflict of Interest:** The authors declare that there is no conflict of interest regarding the publication of this paper.

**Source of Funding:** Self

**Ethical Clearance:** Ethical Clearance has been taken from Institutional Ethical Committee.

**References**

8. Guilford FR, Wright WK and Draper WL. Tympanic skin grafting and reconstruction of the middle ear sound conducting mechanism. Arch. Otolaryng. 1959; 69: 70.
Reducing Fertility Rate: A Threat Leader States

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¹Research Scholar, ²Professor, Mittal School of Business, Lovely Professional University, Phagwara

Abstract

The aim of the study is to analyze the situation of fertility rate in the districts of Punjab. The state is passing through the stage of demographic transition with which the major socio-economic and demographic variables are leaving a strong impact on the demographic dividend. The change in age structure along with the change in literacy, per capita income, female work participation and urbanization, the fertility rate has fallen in leader districts. The laggard districts in the state are still the evidence to high fertility rate. The rural-urban differentials are further widening this gap and changing the total composition of demographic dividend for the years to come. Keeping these factual situations in mind, the study concentrates on analyzing the differentials in the fertility rate in districts of the state, collectively effecting the working segment—the demographic dividend, which could ultimately form a sound platform for the policy makers of the state.

Keywords: Economic Development, Demographic transition, Population, fertility rate, Demographic dividend.

Introduction

Punjab is going through the stage of demographic transition which further is leading to a crucial change in the age structure and demographic dividend of the state. As fertility declines, the proportion of children in proportion to the population of working age decreases, resulting in a lower dependency ratio. This further leads to increase in living standards and the material needs which starts the wave of consumerism to the extent that even a child becomes a source of happiness like many consumer goods. With the rise in per capita capital investments in infrastructure and basic social overhead and the creation of jobs for the available increasing population of working age group, a state or a country can reap the benefits of increased production associated with the decreasing proportion of dependents till the window of the demographic dividend is open. This “demographic bonus” can thus contribute significantly to economic growth and poverty reduction and further will decrease to the proportion to a major fall in the labor force for the years to come. Fertility rate, on the other hand, if stands very low gives a challenge to development programs with very less replacement of the population ultimately leading to decrease in labor force.

The Study Area: Punjab, a name given to the state from Persian dialect means “Five Rivers”, a land of five rivers with the Education Index (0.265) Health Index (0.780063), Income index (0.678) and overall Human Development Index (0.140154) stands on the 6th rank in India. Enjoyed the Green Revolution which brought economic prosperity for the state in the decade of seventies, Punjab shows poor ranking on demographic variable especially gender variable. This is one of the major cause of an adverse environment regarding demographic variables. A very considerable regional diversity in terms of social, economic and demographic characteristics prevails in the state. All the three regions of Punjab had a long history of economic and political happenings. Not only that, there is a striking variations in level of education especially female education, female work participation, dependency ratio, fertility rate, mortality rate, level of employment, per capita income etc. among the various parts of the state, effecting the livelihood of the people. All these indicators have a tendency to further shift the major variables like migration, employment, production, urbanization patterns and overall economic development of the state.

Literature review: The size of the family and the number of children per woman has fallen substantially in many countries over the period, especially after 1960. This trend is broadly favorable for sustainable development. High fertility is associated with increased risk of poor maternal health and mortality. In most of
the cases, women who have several children find it more difficult to work outside the home, thus having fewer opportunities to improve their economic and social status and that of their families (1). With advances in the field of medicine and public health, there would be a further decline in the mortality rate. The higher the income, the higher the age at marriage. Higher age at marriage shortens the reproductive span which in turn, reduces the fertility rate (2). Duza and Baldwin also found that the fertility decline in Tunisia, Sri Lanka and Malaysia could be attributed to rising age at marriage as the result of enhanced educational and occupational opportunities (3).

William Sander studied the fertility behavior in United Nations for four periods and confirmed that economic factors, particularly the earning ability of women affect fertility, an increase in the earning ability of women results in an increase on the price of children thereby reducing fertility (4). Becker in his ‘demand model’ of fertility behavior viewed children as ‘consumer goods’ and as with other goods an increase in income resulted in an increase in the ‘quality’ and ‘quantity’ of children (5). Demographic factors like age at marriage, present family size, gender preference and socioeconomic factors like education, occupation, contraceptive practice, etc. were reported the determinants of desired family size (6). Bogue studied the reasons of fertility decline in Western Europe and explained that education had the powerful impact in explaining the fertility differentials. Female education shows a negative relation with fertility (7). Cleland and Rodriguez also found that the wife’s education had a slightly stronger influence on fertility than husband’s education. They also noted that in countries with low levels of development the impact of primary schooling was initially positive and only became negative among women who had completed a certain level of schooling. Only when primary school was completed did greater fertility control suppressed the loss of traditional birth spacing behavior associated with exposure to modern education (8). Bongaartshas taken these socioeconomic factors as indirect determinants though one or more of the proximate determinants (9). Income and education, being major players among the socio-economic factors. These studies contributed to variations in the level of fertility were essential for initiating planned efforts to control fertility (10).

Objectives:

1. To examine the variations in fertility rate in the districts of Punjab
2. To examine the relation of fertility rate with other variables like literacy rate, per capita income, urbanization etc.
3. To analyze the differentials in fertility rate leading to the formation of demographic dividend of Punjab.

Database and Methodology: The study is based on secondary data. It is confined to all the districts of the state. It is a comparative analysis conducted on the fertility levels of the districts of Punjab. The statistical tables, techniques like correlation is used. The disparity pattern in fertility is also explained through diagrams. The source of data collection is the Census of Punjab 2001 & 2011, Economic Survey of Government of India and Reports on Gender profile 2011 by National Women Commission, India.

Fertility rate in Punjab: Fertility rate has fallen below the level of replacement fertility rate in Punjab. The concept that is widely associated with TFR is replacement level fertility. A TFR of 2.1 replacement fertility since an average of two births is needed to “replace” a mother and father but only if the births survive to reproductive age. An extra 0.1 birth is added to offset the effects of premature death, Higher fertility in developing countries occurs for a number of reasons all of which work synergistically and to varying degrees depending on the country, religion, culture, and social norms. These reasons include but are not limited as lack of availability to affordable family planning, religious restrictions on the use of family planning, a desire for more children as labor supply and for security in old age, a desire for one or more children of a particular gender, female literacy, and female participation in the workforce.

The change in the fertility rate of Punjab from 1971-2010 taking into consideration two major economically active phases of Punjab; the post green revolution era and the post reform era. The urban areas of Punjab had achieved the level of replacement fertility rate of 2.1 in 1998 while the state had reached into that phase in 2005. The rural urban gap of Punjab was 1.1 in 1971 and this gap has reduced to 0.1 in 2011. Many of the districts in Punjab had practiced positively towards gender statistics so as to make the land more comfortable for women.
The state has observed a sharp fall in the fertility rate after reform period with changing age structure, increasing working force including women, per capita productive investments, rising standard of living with changing life styles and higher per capita incomes, urbanization and positively responding gender variables.

Table 1: District wise fertility rate in Punjab

<table>
<thead>
<tr>
<th>Dist</th>
<th>TFR</th>
<th>Rural</th>
<th>Urban</th>
<th>R-U Gap</th>
</tr>
</thead>
<tbody>
<tr>
<td>Punjab</td>
<td>1.71</td>
<td>1.78</td>
<td>1.58</td>
<td>0.20</td>
</tr>
<tr>
<td>Gurdaspur</td>
<td>1.66</td>
<td>1.74</td>
<td>1.48</td>
<td>0.26</td>
</tr>
<tr>
<td>Kapurthala</td>
<td>1.64</td>
<td>1.71</td>
<td>1.52</td>
<td>0.19</td>
</tr>
<tr>
<td>Jalandhar</td>
<td>1.56</td>
<td>1.66</td>
<td>1.48</td>
<td>0.18</td>
</tr>
<tr>
<td>Hoshiarpur</td>
<td>1.64</td>
<td>1.68</td>
<td>1.50</td>
<td>0.18</td>
</tr>
<tr>
<td>Shaheed Bhagat Singh Nagar</td>
<td>1.67</td>
<td>1.67</td>
<td>1.66</td>
<td>0.01</td>
</tr>
<tr>
<td>Fatehgarh Sahib</td>
<td>1.68</td>
<td>1.70</td>
<td>1.63</td>
<td>0.07</td>
</tr>
<tr>
<td>Ludhiana</td>
<td>1.63</td>
<td>1.71</td>
<td>1.58</td>
<td>0.12</td>
</tr>
<tr>
<td>Moga</td>
<td>1.73</td>
<td>1.76</td>
<td>1.64</td>
<td>0.12</td>
</tr>
<tr>
<td>Firozpur</td>
<td>1.91</td>
<td>1.99</td>
<td>1.73</td>
<td>0.26</td>
</tr>
<tr>
<td>Muktsar</td>
<td>1.79</td>
<td>1.81</td>
<td>1.76</td>
<td>0.05</td>
</tr>
<tr>
<td>Faridkot</td>
<td>1.77</td>
<td>1.80</td>
<td>1.73</td>
<td>0.07</td>
</tr>
<tr>
<td>Bathinda</td>
<td>1.71</td>
<td>1.75</td>
<td>1.64</td>
<td>0.11</td>
</tr>
<tr>
<td>Mansa</td>
<td>1.83</td>
<td>1.86</td>
<td>1.73</td>
<td>0.13</td>
</tr>
<tr>
<td>Patiala</td>
<td>1.70</td>
<td>1.83</td>
<td>1.52</td>
<td>0.31</td>
</tr>
<tr>
<td>Amritsar</td>
<td>1.70</td>
<td>1.90</td>
<td>1.54</td>
<td>0.36</td>
</tr>
<tr>
<td>Tarn Taran</td>
<td>1.85</td>
<td>1.87</td>
<td>1.74</td>
<td>0.13</td>
</tr>
<tr>
<td>Rupnagar</td>
<td>1.72</td>
<td>1.77</td>
<td>1.59</td>
<td>0.18</td>
</tr>
</tbody>
</table>

Punjab is not only the ‘Basket of India’ but also the supplier of labor force to foreign lands, working on all types of manual projects outside which had led to the increase in the level of income of an average family. The fertility rate is less in SAS Nagar, Jalandhar, Kapurthala and Ludhiana and high in Ferozepur, Amritsar, Muktsar and Tarn Taran. On the contrary the unequal difference in rural to urban gap lies maximum in Amritsar, Ferozepur, Rupnagar and Patiala which shows that the rural areas of these districts have more fertility rate. Table -1 shows a percentage change in rural and urban literacy from 2001-11. The urban literacy is more than the rural literacy due to the basic infrastructural facilities available in the towns and cities. The leaders in rural and urban female literacy are Hoshiarpur, Sahibzada Ajit Singh Nagar, Gurdaspur and laggards are Mansa, Muktsar, Ferozepur and Sangrur.

TarnTaran, Moga, Ferozepur and Mansa observed a high fertility rate while Jalandhar, Hoshiarpur and Ludhiana have the low rate. The districts with the lower fertility rate and urbanization index have a strong impact on family structures and family health.
Correlation with other variables: If we look at table no 2 we find five variables, linked to fertility rate. The very first variable is literacy rate which is strongly and inversely related to fertility rate. The other variable is per capita level of income which somehow not so strongly but inversely related to fertility rate. The fertility rate is higher in low as well as high income groups as Punjab is the land based economy with a preference to a baby boy who the social structure accepts as the real owner of land.

The third variable is urbanization which is leading to increase in bearing a child further leading to fall in fertility rate. The percentage of increasing young population and falling support ratio has a negative correlation with fertility rate.

Correlation with gender variables: The table 3 representing the gender variables especially the female literacy rate and the economically active rate of women has an inverse relation with fertility rate.

### Table 2- District wise analysis of fertility rate and other variables-2011

<table>
<thead>
<tr>
<th>District</th>
<th>Literacy rate-2011%</th>
<th>Per Capita income (in rupees)-2011</th>
<th>% Urbanization-2011</th>
<th>% Young population (15-64) 2011</th>
<th>% Support ratio 0-14 &amp; 65 &amp; above</th>
<th>Fertility Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gurdaspur</td>
<td>79.95</td>
<td>57081</td>
<td>28.5</td>
<td>67.10</td>
<td>49.10</td>
<td>1.66</td>
</tr>
<tr>
<td>Kapurthala</td>
<td>79.07</td>
<td>77955</td>
<td>34.9</td>
<td>67.70</td>
<td>47.70</td>
<td>1.64</td>
</tr>
<tr>
<td>Jalandhar</td>
<td>82.48</td>
<td>74349</td>
<td>53.18</td>
<td>69.20</td>
<td>44.40</td>
<td>1.56</td>
</tr>
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<td>Hoshiarpur</td>
<td>84.59</td>
<td>71658</td>
<td>21.15</td>
<td>67.30</td>
<td>48.70</td>
<td>1.64</td>
</tr>
<tr>
<td>SBS Nagar</td>
<td>79.78</td>
<td>94798</td>
<td>20.43</td>
<td>67.40</td>
<td>48.40</td>
<td>1.67</td>
</tr>
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<td>77342</td>
<td>30.87</td>
<td>68.70</td>
<td>45.50</td>
<td>1.68</td>
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<td>59.14</td>
<td>68.80</td>
<td>45.30</td>
<td>1.63</td>
</tr>
<tr>
<td>Moga</td>
<td>70.68</td>
<td>86103</td>
<td>22.55</td>
<td>66.30</td>
<td>50.80</td>
<td>1.73</td>
</tr>
<tr>
<td>Firozpur</td>
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<td>27.25</td>
<td>66.00</td>
<td>51.50</td>
<td>1.91</td>
</tr>
<tr>
<td>Muktsar</td>
<td>65.81</td>
<td>67003</td>
<td>27.99</td>
<td>66.80</td>
<td>49.70</td>
<td>1.79</td>
</tr>
<tr>
<td>Faridkot</td>
<td>69.55</td>
<td>67887</td>
<td>35.2</td>
<td>67.20</td>
<td>48.80</td>
<td>1.77</td>
</tr>
<tr>
<td>Bathinda</td>
<td>68.28</td>
<td>64715</td>
<td>35.99</td>
<td>68.60</td>
<td>45.90</td>
<td>1.71</td>
</tr>
<tr>
<td>Mansa</td>
<td>61.83</td>
<td>63803</td>
<td>21.25</td>
<td>65.90</td>
<td>51.70</td>
<td>1.83</td>
</tr>
<tr>
<td>Patiala</td>
<td>75.28</td>
<td>68441</td>
<td>40.27</td>
<td>68.20</td>
<td>46.60</td>
<td>1.70</td>
</tr>
<tr>
<td>Amritsar</td>
<td>76.27</td>
<td>56429</td>
<td>53.64</td>
<td>67.70</td>
<td>47.60</td>
<td>1.70</td>
</tr>
<tr>
<td>Tarn Taran</td>
<td>67.81</td>
<td>64127</td>
<td>12.63</td>
<td>64.60</td>
<td>54.80</td>
<td>1.85</td>
</tr>
<tr>
<td>Rupnagar</td>
<td>82.19</td>
<td>65998</td>
<td>26.02</td>
<td>67.50</td>
<td>48.10</td>
<td>1.72</td>
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<tr>
<td>SAS Nagar</td>
<td>83.80</td>
<td>74990</td>
<td>55.17</td>
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<tr>
<td>Sangrur</td>
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<td>1.79</td>
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<tr>
<td>Barnala</td>
<td>67.82</td>
<td>71605</td>
<td>31.97</td>
<td>67.40</td>
<td>48.40</td>
<td>1.77</td>
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<tr>
<td>Correlation (r)</td>
<td>-0.842</td>
<td>-.392</td>
<td>-0.57</td>
<td>-0.792</td>
<td>0.788</td>
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</table>

Data source Census of India-2001 and 2011

### Table 3: District wise analysis of fertility rate and other variables-2011

<table>
<thead>
<tr>
<th>District</th>
<th>Female Literacy rate-2011%</th>
<th>Female economically active -2011</th>
<th>Gender gap in literacy rate</th>
<th>Fertility Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gurdaspur</td>
<td>66.97</td>
<td>47.94</td>
<td>9.71</td>
<td>1.66</td>
</tr>
<tr>
<td>Kapurthala</td>
<td>66.94</td>
<td>48.36</td>
<td>8.52</td>
<td>1.64</td>
</tr>
<tr>
<td>Jalandhar</td>
<td>70.58</td>
<td>48.23</td>
<td>7.67</td>
<td>1.56</td>
</tr>
<tr>
<td>Hoshiarpur</td>
<td>72.25</td>
<td>50.11</td>
<td>8.44</td>
<td>1.64</td>
</tr>
<tr>
<td>SBS Nagar</td>
<td>66.65</td>
<td>49.57</td>
<td>11.48</td>
<td>1.67</td>
</tr>
<tr>
<td>Fatehgarh Sahib</td>
<td>67.06</td>
<td>46.92</td>
<td>8.53</td>
<td>1.68</td>
</tr>
</tbody>
</table>
The differentials of gender gap are also less in leader districts with a strong positive linkage while rural urban differential have negative correlation with fertility rate, it is because the low differential of rural and urban can lead to even growth.

**Conclusion**

The fertility rate is one of the key variables which acts as a driving force in a developing economy. It has an impact on the growth rate of population leading drastic fall in labor supply further leading to inter and intra-regional migrations. The district wise study clearly deducts a negative correlation of literacy rate, urbanization, gender gap in literacy rate, female work participation and young population on fertility rate and the growth of an economy. Jalandhar, Sahibzada Ajit Singh Nagar and Hoshiarpur, are the front liners in declining fertility rate esp. the urban line of the districts. On the other hand, Mansa, Muktsar and Tarn Taran lag behind in urbanization, literacy rate, female work participation, female education and ultimately facing a higher fertility rate. The regional imbalance in the state is observed among different districts which makes an unequal regional zone. The state is marching ahead in production and infrastructural sectors but needs to concentrate on the wave of the demographic dividend and enjoy the window of opportunity before it closes down. To conclude with the district analysis of Punjab in fertility rate, the differentials in leaders and laggard districts should be taken into consideration so as to evenly grow with this demographic wave.

**Ethical Clearance:** N.A.

**Source of Funding:** Self

**Conflict of Interest:** (If any then mention it otherwise write it as nil). ........ Nil

**References**


6. Asari VG, John C. Determinants of desired family size in Kerala. Demography India; 1990; 27; 369-381.


A Correlational Study on Knowledge and Practice of Fluid and Electrolyte Administration among Staff Nurses of Selected Hospitals at Mangaluru

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Abstract

Fluid balance monitoring is an essential part of caring critically ill patients. Human body cannot function properly when there is inadequate electrolyte and water in their cells. Increase or decrease of electrolyte which is present in the human body can lead to various disease conditions. Electrolyte balance is helpful to the human being to maintain their blood chemistry and muscle function.

Objective: Assessment on knowledge and practice of fluid and electrolyte administration among staff nurses.

Materials and Method: Knowledge questionnaire and observation checklist regarding fluid and electrolyte administration.

Result: The mean percentage of the knowledge scores and practice scores among staff nurses were 50.41% and 63% respectively. There was weak positive uphill correlation between knowledge and practice among staff nurses (r=.194).

Keywords: Fluid, electrolytes, staff nurse.

Introduction

Fluid is critical component recommended for a living creature. Without water human beings are not able to survive for a longer time. Both, fluids and electrolytes are playing a vital role for preserve good health. During disease conditions an average adult require about 2.5-3 litters of fluid to maintain the lose occur through different parts of the body. In severe case, oral rehydration is not much possible, in order to overcome fluids have to be replaced through intravenous route, it is called as infusion.¹

Body fluids, mainly water has to carry out several functions in human body. Transportation of oxygen, electrolyte and nutrients to the cells and control of body temperature are the vital activities executed by the water. Fluid balance monitoring is fundamental element of caring the critically ill patients. Ultimately, it is the process to maintaining balanced intake and output in order to continue the metabolic proceedings of the body. Fluid accumulation can deteriorate the patient condition, especially in critically ill conditions. Appropriate nursing intervention is necessary to avoid complications while administration of fluids.²

In critical care units, many of the procedures greatly influence the fluid and electrolyte status. A nurse working in intensive care unit must have thorough knowledge regarding the type of fluid, amount of fluid and the timings of fluids to be administered. Inadequate awareness about fluid administration accelerate poor patient outcome. It is estimated that 20 percentage of patients had poor documentation of fluid balance or unrecognized fluid imbalance which can be avoided by the proper intervention of nurses.³
Materials and Method:

Study setting and sample size: The research design selected for this study was descriptive correlative design. The study was carried out in Derlakatte and Kodiylbail, Mangaluru, Karnataka. In the present study, samples consist of 60 staff nurses who were selected by purposive sampling technique, based on inclusion criteria.

Tools and techniques: Questionnaire was used to assess the knowledge \([r=0.70]\) and observation checklist with 12 items \([r=0.80]\) are used for the study.

Data analysis: The data was collected after obtaining prior permission from the concerned authority to conduct the study. The participants were assured about the confidentiality of their responses. The data was analyzed in terms of objectives of the study using both descriptive and inferential statistics. The data obtained was plotted in the master sheet.

Results

Majority of the subjects (83.30%) were in the age group of 21-30 years, most of the subjects were (86.70%) females. 60% had BSc nursing qualification and 80% of the subjects had 1-5 years experience.

Majority of the subjects (55%) had average knowledge level and 73.3% are practicing good fluid and electrolyte administration [fig 1].

Area wise analyses of knowledge score show that majority (48.3%) of the subjects had average knowledge in the area of components of fluid. Regarding the area of electrolyte most of the subjects (58.3%) had average and Major portion of the subjects (53.3%) had average knowledge regarding complications of fluid and electrolyte imbalance.

Area wise analysis of practice shows that majority of the subjects (53.8%) had good practice regarding the area of before fluid administration. In the second area, during the administration of fluid most of the subjects (86.7%) had average practice. In case of third area, half of the samples (50.0%) had excellent practice.

There was no significant association between selected demographic variables with the knowledge and practice. There is a positive\([r=0.194]\) correlation between the knowledge score and practice score.

Discussion

Distribution of subjects according to their knowledge score: The present study many of the subjects (55%) had average knowledge and followed by 41.7% had good knowledge. The mean percentage of overall level of knowledge score was 50.41%. The study findings are supported by the study conducted by Aswathy, result showed that 50% of samples have 76-100%, 47.5% of samples have 51-75% and 2.5% have <50% knowledge score respectively.4

Distribution of the subjects according to their practice score: The present study revealed that majority
(73.3%) of the subjects had good practice, followed by 18.3% had average practice of fluid and electrolyte administration. The mean percentage of overall level of practice was 63%. The study findings are supported by the study conducted by Kanakalakshmi, result shows that majority of the nurses (62%) had moderately adequate and 23% had inadequate knowledge. Regarding the practice 42% followed moderately safe and 37% followed safe practice.5

Correlation between the knowledge and practice: The present study reveals that there is a positive\[r=0.194\] correlation between knowledge and practice. As the knowledge increases practice also increase. The study findings are supported by the study conducted by Aysegul Gunes et al. result revealed that the mean knowledge score of intravenous potassium administration was found 9.48±3.21, while the mean practice score was 10.85±2.04. Statistically positive relationship was found (r: 0.595; p< 0.05) between the knowledge and practice scores of staff nurses.6

Conclusion

Present study findings showed that most of the staff nurses had average knowledge and good practice in fluid and electrolyte administration. Educations and training can make the knowledge and practice excellent.

Financial support and sponsorship: Nil.

Conflicts of Interest: There are no conflicts of interest.

Ethical clearance: Ethical clearance obtained from ethics committee of Yenepoya (deemed to be university) protocol number 2017/078.

Reference

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Analysis of Pattern and Extent of Substance Abuse/Dependence: An Institutional Study

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Abstract

Drug addiction is a condition in which person become addicted to a particular drug and loses control over his mind and body. Addiction is caused specially by narcotic drugs i.e Pharmaceutical and Psychoactive drugs. In the present study data of 250 patients with socio-demographic profile has been analysed. There were 246 males and 4 females. Most patients belonged to the nuclear families (60%) and only 6% lived alone. Most of substance abuser were employed (84%). Out of employed patients, majority were self – employed(48%) while some patients worked in the private sector (30%) and only a small number of patients were employed in a govt. sector (6%). Most of the patients were living in the rural area (61%). Out of 250 patients 62% were married,35% unmarried and 3% divorced. Majority of age group of substance abusers of present study was between 20-35 yrs. Among all the patients dual/ multiple substance abuse/dependence cases were more (82 & 60) as compared to the single substance abuse/dependence. Among the single substance alcohol cases were more as compared to the heroin, opium,cannabis and injection and corex. In the dual/ multiple substance abuse/dependence the most common combination was of alcohol and tobacco. There is a need of medical education programs emphasizing hazard of various drug abuse. Various government and private organizations have to join hands to fight against alarming menace of drug abuse.

Keywords: Addiction, Alcohol dependence, Drug abuse, Illicit substance, licit substance.

Introduction

Drug addiction is a condition in which person become addicted to a particular drug and loses control over his mind and body. Addiction is caused specially by narcotic drugs i.e. Pharmaceutical and Psychoactive drugs. DSM-IV and DSM-V criteria used for substance abuse/dependence to diagnose the addiction of substance abuse/dependence when diagnosed the patient. DSM-5 is the latest guidelines of Diagnostic & Statistical Manual of Mental Disorders which was published in 2015 for diagnosing alcohol used disorders (AUDs) or substance abuse disorders¹.

Drug addiction includes both licit (alcohol, nicotine) and Illicit (cannabis, cocaine and opiates) substance addiction. The repeated drug consumption increases tolerance and dependence both physiologically and psychologically.

In whole world every country is facing the problem of drug addiction and drug trafficking. According to World Drug Report (2016), nearly 250 million people between age of 15–64 have used drug . A total of 12 million people inject drugs with 14% of living with HIV. The overall impact of drug use is increasing continuously². Male are 3 times more using the drugs as compare to the women. World Health Organization (WHO) statistics on the drugs reported that 190 million people in whole world consume drug.

Drug abuse is becoming a major health problem in developing country like India. The substance abuse/dependence in youth has shown alarming dimensions in India. 1 million heroin addicts are registered in India,

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according to a UN report and unofficially there may be more than five million. As per estimate prevalence of ever use of any drug is 63.7%. Cannabis, Heroin, and pharmaceutical drugs are the most frequently abused drugs. Frightening information is that of all alcohol, cannabis and opium abusers (21%), (3%) and (0.1%) are below the age of 18 yrs as per recent survey.

Injectable buprenorphine was the most commonly used opioids, followed by bhukhi/doda/opium and heroin. In Manipur and Nagaland PWID people aged between 18-24 years and older than 35 years have been reported to share needles/syringes and draw up drug from a common container.

In medical education an increase in substance abuse was observed. The reported prevalence of substance abuse was 20.43% among medical students. The most common reasons for substance use were relief from psychological stress like the changing of family background, community, new responsibilities and competition in the field of education as well as in employment and occasional celebration. So, to reduce these stress they starts doing experiments with many drugs like opium, heroin, cocaine etc which are easily available to them. Some other problems like child labor, street children and family histories of drug abuse are at higher risk. However more than 91.7% of students were aware of ill effects of these substances.

The scientific literature suggests that some drugs are more strongly associated with violence. These drugs include alcohol, PCP (phencyclidine), cocaine, amphetamines and barbiturates. Inversely, heroin and cannabis are generally associated with a weaker desire to use violence to resolve disputes.

However Heroin has high addiction potential and consumed in high quantity by abusers. From its abuse, addicts are also reported to be involved in illegal activities. There is a need of medical education programs emphasizing hazard of various drug abuse. Control of drug abuse include proper education of youth and proper treatment of addicts or group counseling.

Today, there is no part of world that is free from the curse of drug trafficking and drug addiction. Million of drugs addicts, all over the World, are leading miserable lives, between life and death. India too is caught in this vicious circle of drug abuse, and the numbers of drug addicts increasing day by day. Still there is lack of epidemiological data to combat the situation.

In the present study pattern and extent of licit and illicit drugs abuse/dependence in the patient of drug de-addiction centre, Pt. B.D.S. University of Health Sciences, Rohtak, Haryana has been analysed.

### Material and Method

Information was collected from OPD (Out Patient Department) as well as the wards of the Drug De-Addiction Centre, Pt. B. D. Sharma University of Health Sciences, Rohtak during the study period from March’2017 to March’2018. The study was conducted after getting approval from institutional human ethical committee. A specialized questionnaire including all the details of the patients and pattern of substance abuse / dependence socio-demographic was designed. The questionnaire was filled only after getting the verbal informed consent from the patient as well as from their relatives. The patients who voluntarily involved in giving his/her information were later interviewed. Data of 250 patients & 100 controls was collected during the study period.

Information regarding socio-demographics (age, sex, area to which person belongs, no. of siblings), history of patient (marital status, education, employment, family income, current living arrangement), family history of substance abuse /dependence, details of substance abuse /dependence (name, initial age of consumption, mode of consumption, frequency per day), HIV Screening, Involvement in any illegal activity & any previous treatment of drugs abuse / dependence was collected & analyzed statistically.

### Result

In the present study data of 250 patients with socio-demographic profile has been analysed (Table 1). There were 246 males and 4 females. Sixty percent & patients belonged to the nuclear families, 34% to joint families and 6% lived alone. Eighty four percent substance abuser were employed and 16% patients were unemployed. Out of employed patients 48% were self – employed and 30% patients worked in the private sector. However the data reported no significant p-value at 5% level when statistically analysed. Age group of patients of present study varied between 20-35 yrs. Majority of patients were educated Upto 8th (33%) and followed by 9th & 10th standard (29%) (Table-1).
Table 1: Socio-demographic profile of substance users, N=250 (N is the total no. of patients)

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Frequency</th>
<th>Percentage (%)</th>
<th>Mean ± S.D</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>246</td>
<td>98</td>
<td>125±121</td>
</tr>
<tr>
<td>Female</td>
<td>4</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td><strong>Domicile</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>152</td>
<td>61</td>
<td>125±27</td>
</tr>
<tr>
<td>Urban</td>
<td>98</td>
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</tr>
<tr>
<td><strong>Employment Status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployed</td>
<td>40</td>
<td>16</td>
<td>62.5±39.83</td>
</tr>
<tr>
<td>Self Employed</td>
<td>120</td>
<td>48</td>
<td></td>
</tr>
<tr>
<td>Private Sector</td>
<td>76</td>
<td>30</td>
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<tr>
<td>Govt. Sector</td>
<td>14</td>
<td>6</td>
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<td><strong>Marital Status</strong></td>
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<tr>
<td>Married</td>
<td>156</td>
<td>62</td>
<td>83.3±61.32</td>
</tr>
<tr>
<td>Unmarried</td>
<td>88</td>
<td>35</td>
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</tr>
<tr>
<td>Divorced</td>
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<td>3</td>
<td></td>
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<tr>
<td><strong>Current Living Arrangement</strong></td>
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<tr>
<td>Alone</td>
<td>15</td>
<td>6</td>
<td>83.3±55.12</td>
</tr>
<tr>
<td>Nuclear Family</td>
<td>150</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>Joint Family</td>
<td>85</td>
<td>34</td>
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</tr>
<tr>
<td><strong>Education Status</strong></td>
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<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>14</td>
<td>6</td>
<td>41.6±28.55</td>
</tr>
<tr>
<td>Upto 8th Standard</td>
<td>82</td>
<td>33</td>
<td></td>
</tr>
<tr>
<td>9th &amp; 10th</td>
<td>72</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>11th &amp; 12th</td>
<td>52</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>Graduation</td>
<td>20</td>
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<td></td>
</tr>
<tr>
<td>Post Graduation</td>
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<td>4</td>
<td></td>
</tr>
<tr>
<td><strong>Family History of Addiction</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>85</td>
<td>34</td>
<td>125±40</td>
</tr>
<tr>
<td>No</td>
<td>165</td>
<td>66</td>
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<tr>
<td><strong>Age when Substance Abuse Initiated</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Early (Below 20)</td>
<td>155</td>
<td>62</td>
<td>125±30</td>
</tr>
<tr>
<td>Later (Above 20)</td>
<td>95</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td><strong>Age</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Below 20 yrs</td>
<td>10</td>
<td>4</td>
<td>50±40</td>
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<tr>
<td>20-35 yrs</td>
<td>122</td>
<td>49</td>
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<td>36-45 yrs</td>
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<td>25</td>
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<tr>
<td>46-55 yrs</td>
<td>36</td>
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</tr>
<tr>
<td>Above 55 yrs</td>
<td>20</td>
<td>8</td>
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</table>

Table 2: Distribution pattern of substance abusers

<table>
<thead>
<tr>
<th>Substance</th>
<th>No. of substance abusers</th>
<th>Percentage (%)</th>
<th>Mean ± S.D</th>
</tr>
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<tbody>
<tr>
<td>Alcohol</td>
<td>30</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Tobacco</td>
<td>12</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Alcohol + Tobacco</td>
<td>82</td>
<td>33</td>
<td></td>
</tr>
<tr>
<td>Cannabis (Bhang, Charas/ Hashish, Ganja)</td>
<td>12</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Heroin (Smack, Brown Sugar)</td>
<td>20</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Opium (Afeem, Bukkhi, Doda)</td>
<td>18</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Injection (Avil, Brufin, Norphine, Fortwin, Alprex)</td>
<td>10</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Corex</td>
<td>4</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Sedative (Tablet), [Termadol, Clonazepam]</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Dual/Multiple Substance User (Opium, Cannabis, Heroin, Tablets, Injections, Stimulants etc.)</td>
<td>60</td>
<td>24</td>
<td></td>
</tr>
</tbody>
</table>

Among all the patients dual/multiple substance abuse/dependence cases were more (82 & 60) as compared to the single substance abuse/dependence. Among the single substance alcohol cases (30) were more common as compared to the heroin, opium, cannabis, injection and corex were. In the dual/multiple substance abuse/dependence the most common combination was of alcohol and tobacco (Table 2)

Fig 1: Marital status of substance users
There were 61% patients with rural habitat and rest of belonged to urban area (Fig 2). Out of 250 patients 62% were married, 35% unmarried and 3% divorced (Fig. 1).

Discussion

Licit and Illicit drugs abuse/dependence is continuously increasing in Indian subcontinent and becoming a major threat to public health. People of rural and urban areas, along with sociodemographic factors. National Household Survey of Drug Abuse (NHSDA) in India and the United Nations Office of Drugs and Crime (UNODC) has undertaken with the objective of evaluating extent of use of various drugs of abuse in India.

Present study reported that dual/ multiple substance abuse/ dependence was more (33% & 24%) as compared to the single substance abuse/ dependence. Among the single substance alcohol (12%) was more common as compared to the heroin (8%), Opium (7%), Cannabis (5%), Injection (4%) and Corex (2%). In the dual/multiple substance abuse/dependence the most common combination was of alcohol and tobacco.

As per available literature the prevalence of ever use of any drug was 63.7%. Tobacco was the most commonly used psychoactive substance. Prevalence of ever use of alcohol was 19.6%, followed by cannabis (3.8%), opium (0.6%) and heroin (0.2%). Tobacco and alcohol outnumbered illicit drug users in terms of extent of their use.

Present findings showed that the Prevalence of licit or illicit drugs consumption is less in females (2%) as compared to male (98%). It was observed that 49% of patient belong to age group (20-35 yrs). Most of patients (94%) were educated. There were 60% cases of Nuclear families. As per available recent report prevalence of substance abuse was more among joint families.

Many studies have been carried to know the prevalence of substance abuse in India. Acc. to survey 78% people said that user makes their first contact with drug through their friends. Among the states Punjab, Haryana and Chandigarh have highest takers of Heroin, opium and opioid in the country. In U.T. of Chandigarh prevalence of substance dependence was estimated to be 4.65%. Dependence on opioids, and sedative hypnotics were found to be 1.53% and 0.52% respectively. Prevalence of Injectable opioids was calculated to be 0.91%. Injectable buprenorphine was the most commonly used opioids, followed by bhukhi/doda/opium and heroin. Increasing trends of Heroine among population is shattering the youth of Punjab. There were 8% cases of heroine takers.

Easy availability and social acceptability of smoking to some extent and Use of substance like cannabis, opium, sedative, injection, heroin, was also reported in the studied group. Prevalence of drug addiction was quite high.

Studies done in India and in other countries have revealed higher prevalence and pattern of substance use among medical students and other college students as well as in common people. A higher proportion of young people were found to be using any of the substances when one or both of their parents were working or in government profession.

In the present study it was found that more males than the females used at least one substance of abuse. Most of them did so despite knowing the ill effects and legal consequences of such use. Some of the study participants had made attempts to quit in the past but failed to maintain due to lack of will power. Stress, relationship, peer pressure were the main factors leading to basic drugs use.

Conclusion

It is well known that substance abuse did not spare any part of the world, it has spread its roots in rural as well as in urban areas of country. Substance abuse has physical, mental & social health impact on human beings. Now, its alarming time, various Government and Private organizations have to join hands to fight against the menace of drug abuse. There is a need to focus on preventive measures which may be in the form of education, legislation, campaigning, advertisement on television as well as in the newspapers. The ultimate goal is to reduce the magnitude of substance abuse, no matter
what strategy to be followed. Strategy must include the early identification of the user & to provide the effective treatment as soon as possible.

Conflict of Interest: The authors declare that they have no conflict of interest.

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4. Laha S. Substance use and abuse in India-A comparative study with other countries. IJAHMS. 2016; 02:1-17.
Health Seeking Behavior among the Mothers of Under Five Children with Upper Respiratory Tract Infection

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Abstract

Background of the study: In India acute respiratory tract infections is one of the leading causes of morbidity and mortality in young children.¹ In most developing and developed countries, it is observed that the health of the children strongly depends on their parental health care seeking behavior. Mainly health seeking behavior depends on parental knowledge, understanding of children illnesses and availability of health care facilities. Poverty and transportation are the key factors for health care seeking behavior.²

Statement of the problem: Health seeking behavior among the mothers of under five children with upper respiratory tract infection.

Objective: To assess health seeking behavior among the mothers of under five children with upper respiratory tract infection.

Keywords: Upper respiratory tract infection, under five children, health seeking behavior.

Introduction

One of the major causes of child mortality and morbidity rate is acute respiratory tract infection. Control of respiratory tract infections is a major problem in developed and developing countries. Due to acute respiratory tract infection (ARI) the proportion of death in the community is much higher and most of the children die at home, many of those infections taking their natural course without specific treatment.³

In India acute respiratory tract infections is one of the leading causes of morbidity and mortality in young children. In acute respiratory tract infection, (ARTI) children usually have symptoms like loss of appetite, difficulty in breathing, nasal blockage and also sucking difficulty in breastfed babies.¹ In most developing and developed countries, it is observed that the health of the children strongly depends on their parental health care seeking behavior. Mainly health seeking behavior depends on parental knowledge, understanding of children illnesses and availability of health care facilities. Poverty and transportation are the key factors for health care seeking behavior.²

Materials and Method

Research approach: Quantitative Research approach was selected for this study.

Research Design: The research design selected for the study was a Non-experimental Cross-sectional Indescriptive research design was adopted for the study.

Research Variables: Health seeking behavior, Upper respiratory tract vision.

Demographic Variables: Age of the mother, Educational status of the mother, Monthly family income, Area of Living.

Setting of the study: The study setting is pediatric outpatient departments in selected secondary care hospitals of Udupi district, Karnataka. The descriptive cross sectional survey design was used for this study.

Population: Mothers of under five children with upper respiratory tract infections who are attending Pediatric OPDs of Dr.TMA Pai hospital, Udupi district.
Sample and sampling technique: Total 154 mothers of under five were selected by using convenience sampling technique.

Table 1: Frequency and Percentage distribution of mothers based on usage of home remedies. n=154

<table>
<thead>
<tr>
<th>Home remedies</th>
<th>Frequency f</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>What home remedy you will use to manage your child’s cough</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not responded</td>
<td>19</td>
<td>12.3</td>
</tr>
<tr>
<td>Ginger and turmeric mixture</td>
<td>67</td>
<td>43.5</td>
</tr>
<tr>
<td>Warm salt water with ginger</td>
<td>61</td>
<td>39.6</td>
</tr>
<tr>
<td>Tulsi kashaya</td>
<td>7</td>
<td>4.5</td>
</tr>
<tr>
<td>What home remedy will you use when your child is having runing nose</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not responded</td>
<td>8</td>
<td>5.1</td>
</tr>
<tr>
<td>Steam inhalation</td>
<td>18</td>
<td>11.6</td>
</tr>
<tr>
<td>Ginger with turmeric powder</td>
<td>71</td>
<td>46.1</td>
</tr>
<tr>
<td>Not practicing</td>
<td>57</td>
<td>37.0</td>
</tr>
<tr>
<td>What home remedy you will prefer to manage your child’s Sore throat</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not responded</td>
<td>10</td>
<td>6.4</td>
</tr>
<tr>
<td>Ginger with warm salt water</td>
<td>33</td>
<td>21.4</td>
</tr>
<tr>
<td>Warm salt water gargle</td>
<td>62</td>
<td>40.2</td>
</tr>
<tr>
<td>Not practicing</td>
<td>49</td>
<td>31.8</td>
</tr>
<tr>
<td>What measures you will use when your child is having fever</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not responded</td>
<td>8</td>
<td>5.1</td>
</tr>
<tr>
<td>Take syrup from medical store</td>
<td>3</td>
<td>1.9</td>
</tr>
<tr>
<td>Consult the doctor</td>
<td>133</td>
<td>86.3</td>
</tr>
<tr>
<td>Tepid sponge</td>
<td>10</td>
<td>6.4</td>
</tr>
</tbody>
</table>

Results

Results of the study have shown that that among 154 mothers majority 136 (88.3%) of the sample took their child to hospital during illness. Majority, 118 (76.6%) of the sample reported that distance to the hospital is the main barrier for them in seeking medical advice. Majority 134 (87.0%) of the sample were consulting multi super specialty hospital during child’s illness, most 92 (59.7%) of the mother took independent decision to take the child to hospital. Majority, 134 (87.0%) of the mothers were considering severe cough as the main symptom of respiratory tract infection.

Discussion

Among 154 mothers majority 136 (88.3%) of the sample took their child to hospital during illness. Majority, 118 (76.6%) of the sample reported that distance to the hospital is the main barrier for them in seeking medical advice. Majority 134 (87.0%) of the sample were consulting multi super specialty hospital during child’s illness, most 92 (59.7%) of the mother took independent decision to take the child to hospital. Majority, 134 (87.0%) of the mothers were considering severe cough as the main symptom of respiratory tract infection.

Majority 67 (43.5%) of the sample were using ginger and turmeric mixture to manage cough of the child at home and 71 (46.1) sample were using ginger with the turmeric powder to manage child’s running nose. Most 133 (86.3%) of the sample were consulting the doctor when child had fever.

Conclusion:

Mothers with graduation and above, middle class officials and those who were subscribing to news paper had better health seeking behavior than other mothers. The findings highlight that, the nurses and health care providers can play a significant role to educate the mothers’ regarding importance of seeking medical care and mode of transmission, early identification, management and prevention of URTI in under five children.

Conflict of Interest: There is no conflict.

Source of Funding: Self

Ethical Clearance:

References

Prevalence of Depression among Elderly in the Urban Field Practice Area of Rajarajeswari Medical College and Hospital: A Cross Sectional Study

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Abstract

One of the important determinants of Mental health is age, old age not challenges physically but also with Challenges affecting the mental and social wellbeing. The current prevalence of depression with the light of evidences from the community based studies is 36%, of which 86.1% of the elderly population had medical co morbidities. This cross-sectional study was conducted in Channasandra, urban field practice area of Rajarajeswari medical college and hospital. The sample size was estimated to be 92.16 which was rounded off to 100. The study was carried out using GDS – 15, geriatric depression scale. From the above study, the prevalence of the depression among the elderly was found to be 38 (38%). of which 24 (63.1%) were suffering from moderate depression and 14 (36.8%) were suffering from severe depression. In the current study, it was found that depression was seen more among 30(78.9%) of the depressive subjects with medical co-morbidities, when compared with 42(67.7%) of the non-depressive subjects having co-morbidities. From the above study, prevalence of depression among the elderly was found to be 38% which influenced by illiteracy, medium standard of living.

Keywords: Mental health, Social wellbeing, Depression, Elderly.

Introduction

India; second most populous country in the world. In India, according to Population Census 2011 there are nearly 104 million elderly persons (aged 60 years or above) in India; 53 million females and 51 million males. Both the share and size of elderly population is increasing over time. From 5.6% in 1961 the proportion has increased to 8.6% in 2011. For males it was marginally lower at8.2%, while for females it was 9.0%. As regards rural and urban areas, 71% of elderly population resides in rural areas while 29% is in urban areas.¹

One of the important determinant of Mental health is age, old age not challenges physically but also with Challenges affecting the mental and social wellbeing.

As the age advances there will be normal aging of the brain, which results in deteriorating physical health and cerebral pathology, the overall Prevalence of mental and behavioral disorders tends to increase with age. ² The current prevalence of depression with the light of evidences from the community based studies is 36%, of which 86.1% of the elderly population had medical co-morbidities.³

Depression is a common problem among elderly. Among them, it is a cause of disability, social deprivation, and loneliness. Often it goes unrecognized because elderly attribute its symptoms to the aging process. Depression in elderly leads to increased use of health services by elderly thereby putting pressure on the already burdened health-care system. ⁴

In India, the research on the elderly and their psychological problems is scarce; as Majority of Depressive disorders remain undiagnosed and untreated because of a wrong belief that it is a part of ageing and a social stigma.³ Hence this study was conducted using GDS-15 scale with an objective of assessing the
prevalence of depression among the elderly and to find out the determinants responsible for it.

**Methodology**

This cross-sectional study was conducted in channasandra, urban field practice area of Rajarajeswari medical college and hospital; after getting approval from Institutional Ethical Committee. The sample size was estimated using the formula \( n = \frac{4pq}{L^2} \). The prevalence of depression, “\( p \)” among elderly persons was taken as 36%. 

With precision of 10%, using the above mentioned statistical formula which considers 95% confidence limits, the sample size was estimated to be 92.16 which was rounded off to 100.

All the elderly population in channasandra that is the urban field area of Rajarajeswari medical college was enlisted by house to house survey, which was 492. of the 492 elderly population who were enlisted 216 were males and 276 were females. All the subjects were enlisted by alphabetic order of their names. Using the random table number, the subjects were recruited to the study until the desired sample size is met. of the 100 selected study subjects, 40 were males and 60 were females.

The study was carried out using GDS – 15, geriatric depression scale. Each of the study subjects were interviewed separately. Information regarding the socio-demographic characteristics, financial status, and comorbid conditions were collected using a pretested structured proforma and data was entered into MS excel sheet and was analyzed using SPSS software version 21.

**Results**

From the above study, the prevalence of the depression among the elderly was found to be 38 (38%), of which 24 (63.1%) were suffering from moderate depression and 14 (36.8%) were suffering from severe depression.

The socio-demographic characteristics and depression of the study subjects revealed that 11(28.9%) were aged above 70 years. Among 38 study subjects suffering from depression, 21(55.2%) were females and 17(44.7%) were males. In the present study 22(57.8%) of the subjects with depression were illiterate. When the depressive study subjects were classified according to the Standard of Living Index (SLI) it was noted that 21(55.2%) of the subjects belonged to medium SLI, which was found to be statistical significant (\( p=0.002^{*} \)). From the study it was noted that depression was more among married subjects, 23(60.5%); and also it was found that depression was more among the subjects who were from nuclear families, 20(52.6%); however it was not statistically significant [Table 1].

From Table 2, it’s noted that depression is found among 30(72%) of the financially dependent study subjects compared to depression among 8(21%) of the financially independent study subjects. Depression was found to more among 18(60%) of the subjects who were not receiving any financial assistance compare to 12(40%) of the subjects who were receiving financial assistance; which is statistically significant.

<table>
<thead>
<tr>
<th>Socio-Demographic Profile</th>
<th>Number of Study Subjects (n=100)</th>
<th>Depression (n=38)</th>
<th>Z score</th>
<th>CI</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lower limit</td>
<td>Upper limit</td>
</tr>
<tr>
<td>Age in Years</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60 - 69</td>
<td>68(68%)</td>
<td>27(71.1%)</td>
<td>1.49</td>
<td>-0.48</td>
<td>0.97</td>
</tr>
<tr>
<td>&gt;70</td>
<td>32(32%)</td>
<td>17(44.7%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>40(40%)</td>
<td>21(55.2%)</td>
<td>1.84</td>
<td>0.32</td>
<td>0.07</td>
</tr>
<tr>
<td>Female</td>
<td>60(60%)</td>
<td>17(44.8%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education Status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>68(68%)</td>
<td>22(57.8%)</td>
<td>0.96</td>
<td>0.16</td>
<td>0.34</td>
</tr>
<tr>
<td>Literate</td>
<td>32(32%)</td>
<td>16(42.2%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard of Living Index</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>26(26%)</td>
<td>17(44.8%)</td>
<td>4.61</td>
<td>0.23</td>
<td>0.71</td>
</tr>
<tr>
<td>Medium</td>
<td>74(74%)</td>
<td>21(55.2%)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
In the current study, it was found that depression was seen more among 30(78.9%) of the depressive subjects with medical co-morbidities, when compared with 42(67.7%) of the non-depressive subjects having co-morbidities [Table 3].

When the relationship between insomnia and anorexia and depression was studied; it was noted that insomnia was more among 28(73.6%) of the depressive subjects compared to 14(22.5%) of the non-depressive subjects. Anorexia was also more among 30(78.9%) of the depressive subjects compared to 12(19.3%) of the non-depressive subjects, which was found to be statistically significant [Table 4].

**Discussion**

In the present study, the prevalence of depression among the study subjects was found to be 38%, when compared to the 10%-20% of the prevalence depending on the cultural variations, as estimated by WHO. 5

In the study done by Sanjay TV et al., in Bangalore; a very similar prevalence rate of depression among elderly was noted. In that study the prevalence of depression
was found to be 36% among the elderly study subjects.\(^3\) which was very similar to the prevalence of 32.4% found by Nair et al., in the study conducted at Dharwad.\(^6\)

In this study it was found that depression was more among the subjects belonging to medium SLI and illiterates, which was very similar to results found in the study done by Jain RK et al., in Mumbai city.\(^7\) It was also evident in the study done Pracheth R et al., \(^8\) this was mostly due to majority of the subjects were migrated from the rural areas to the urban areas, which had impact on their SLI.

In the study, it was noted that depression was significantly associated with the subjects who were financially dependent than compared to the subjects who were financially independent,

Which is also confirmed in the study done by Gupta et al., where in depression was less seen among the subjects receiving pension.\(^9\)

In our study, it was found that the depression among the study subjects who had medical co-morbidities. In the study done Kaneko Y et al., and Wong SY et al., co-morbidities were identified as important risk factors for depression\(^10, 11\).

Depression was found to be significantly associated with insomnia among 28(73.6%) of the study subjects in our study which was statistically significant, a very similar result was found in the study done by Grover S et al., \(^2\)

In the study done by Bharatwaz RS et al., depression was significantly associated with insomnia.\(^12\)

It was significantly found that the anorexia was more commonly associated with depression, which was found to be statistically significant. As per the DSM – IV criteria it is noted that the anorexia is the third most common symptom associated with depression and insomnia is the fourth commonest symptom to be associated with depression.\(^13\)

**Conclusions**

From the above study, prevalence of depression among the elderly was found to be 38% which influenced by illiteracy, medium standard of living. It was also seen that depression was more among the financially dependent study subjects. It’s also confirmed from our study that depression is commonly associated with medical co-morbidities, insomnia and anorexia. Prevalence of depression is increasing and there is a need for further research on this topic.

**Conflict of Interest:** None

**Source of Funding:** Self

**References**


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Abstract

Breast cancer is dreadful and life threatening disease. The causative agent of breast cancer is still under research. Breast cancer affects one in eight women. The statistics shows that 6 percent of women in India die due to breast cancer. Breast cancer is the second important cause of death. Generally breast cancer is a malignant tumour that begins in the cells of the breast and eventually it spreads to the surrounding tissues. The disease can be treated if it is detected early. As stages increases, the chance of curing decreases. There are various imaging techniques that play a vital role in detecting breast cancer. This survey is an attempt to showcase various breast cancer detection techniques based on image processing technique.

Keywords: Breast cancer, malignant tumour, mammography, medical imaging.

Introduction

Breast cancer is one of the most common diseases among women and that lead to causes death under the age group of 15-54. The world health organization’s international agency for research on breast cancer estimates more than 150,000 women die due to breast cancer each year in world wide. Since breast cancer is leading disease in world detection at the right time is crucial. In the recent times, microwave imaging (MI) techniques are highly recommended in the context of safe and low-cost alternative mammographic approach for breast cancer diagnosis at a premature state. In order to develop the microwave imaging techniques lot of analysis has been made and implemented in laboratory. This literature is mainly focused on various techniques that are used to detect and treat this disease in early diagnosis: radiometry, radiography, digital mammography, endocrine therapy, space time beam forming, thermography, near-field microwave imaging, ultra-sound technique, tomography, microwave breast imaging system and microwave radar imaging.

Radiometry: Radiometry technique finds a major application in the early detection and diagnosis of breast cancer is shown in Figure 1.

![Flow graph of radiometry](http://www.resltd.ru/eng/radiometry/momtext.htm)

**Figure 1: Flow graph of radiometry**

Microwave radiometry method is suggested for the detection of breast cancer at an earlier stage. It is suitable for detection of all kinds of stagnant and growing tumours. The working of the microwave radiometry is based on the screening and it is referred as the process of mammography wherein a passive, non-invasive, non-

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ionizing procedure to determine thermal distribution rather than mass. Radiometry is a technique for measuring electromagnetic energy in the form of thermal radiation in clinical thermography to measure the natural emission from the human body. Directly an antenna contact shall be matched to the tissue to obtain maximum radiated power coupling to the transmitter or receiver and if an mismatching occurs then it is identified the antenna is a non-contact and must be removed from the target of the relative permittivity becomes more significant results in a spectacular reduction in the surface emission of the radiometry or continuing to be noteworthy reflection in case of hyperthermia.

Radiotherapy: Radiography is an imaging technique using X-ray (shown in Figure 2), gamma rays or other likely radiations to view the internal parts of an object. The limitation is in the imaging of dense breast type which accounts for a large percentage of missed carcinomas in case of mammography. Other imaging strategies such as the ultra sonogram, transilluminating thermography, computed tomography, magnetic resonance imaging and radio-nuclide images to name a few for breast cancer detection.

Digital Mammography: Digital mammography is nothing but another sophisticated imaging technique in which the X-ray film is replaced by solid-state device oriented detectors that convert incident X-rays into electrical signals. Digital mammography has great potential for improved radiographic imaging of dense breasts in the detection process. More over the adaptive thresholding process is carried over the breast area with an intention on classifying the fat and potential tumor or parenchyma tissues. This is a familiar methodology and has been accomplished in medical image processing.

Endocrine Therapy: Endocrine therapy (shown in Figure 3) adds, blocks or removes cancer cells from the infected area. One third of the breast cancer patients would undergo endocrine therapy. The receptor is a 66kDa intra-nuclear protein comprises of six functional areas and trigger transcription factor. ER status also make available of predictive information. Tumours missing ER and oestrogen receptor usually produce quicker than tumours having both ER and PgR.

Microwave Breast Imaging: Some of the specific fields like detection of unseen objects and non-destructive test of structures use the imaging technique by adopting the electromagnetic waves.
is shown in Figure 4. This technique is solely dependent on electric parameters which survive among the normal and tumor breast tissue inside the microwave spectrum. By using the signals received from the breast, the breast image is again reconstructed. When the frequency increases simultaneously the resolution becomes higher and hence tissue loss increases. In terms of these conditions an ultra-wideband signal is suitable. To have the maximum disclosure to the human body the SAR (specific absorption rate) value is fixed to attain safety standards. The specific absorption rate provides the amount of power to be utilized in the tissue per volume. The microwave breast cancer imaging method should use the same frequency band to prevent the patient from health hazardous exposure. It is indicated that it is possible to detect even very small size tumor with low cost and also can acquire images rapidly when compared to other imaging techniques.

**Ultrasound Imaging Techniques**

Ultrasound imaging is commonly used to treat and diagnosis the breast cancer detection. This technology includes ultrasound elastography contrast-enhanced ultrasound, 3-D ultrasound automatic breast ultrasound and computer-aided detection of ultrasound. Ultrasound is very safe and yield pictures of the breast tissues using sound waves and also ultrasound which are directly placed into skin. A sound wave recovers computes and transmits with high frequency. Sound waves are the only source to create new images which can be used as follows: Ultrasound is used to diagnose breast deformity and Doppler ultrasound is used to approach blood supply in the breast [6]. It depicts the growing interest to employ ultrasound images to detect cancer. Breast Ultrasound imaging is far better than mammography in the following facts: (i) Ultrasound do not produce any radiation; it is more safe and convenient for patients. (ii) Ultrasound is obviously sensitive towards detection of abnormal tissues. (iii) High rate of false positives present in the mammography which leads to unwanted biopsies.

**Space Time Beam-Forming:** In this new technology numerous receiving antennas are utilized[7]. Vigorous and clear images are predicted because the speckled reaction from the tumour adds more contrast. A three dimensional image of retransmitted power is calculated by figure out the output power distribution. The tumour can be predicted because large amount of speculation happens around it. The technique of microwave imaging via space time beam-forming is projected for sensing early stage breast cancer. An ultra wide band is persistently passed on the signal that falls on the nearest exterior of the breast. The beam former concentrates on the retransmitted signal and facilitate on frequency dependent transmission effects. The dielectric property makes the contrast between normal and malignant tissues. The outcome of these method exhibits different numerical breast phantoms dependent particularly on FDTD models of the breast.

**Thermography:** A highly specific technique is used to predict the temperature changes on the surface of the skin [8]. Digital infrared thermal imaging (DITI) is utilized for viewing of breast cancer which also encloses an infrared thermal camera to capture the picture of various temperatures in breast area is shown in Figure 5.

<table>
<thead>
<tr>
<th>Image Zone</th>
<th>Mn</th>
<th>Delta T(Min)</th>
<th>Max</th>
<th>Delta T(Max)</th>
<th>Avg</th>
<th>Delta T(Avg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left 1</td>
<td>29.67</td>
<td>2.99</td>
<td>30.59</td>
<td>2.91</td>
<td>30.25</td>
<td>3.04</td>
</tr>
<tr>
<td>Left 2</td>
<td>26.77</td>
<td>2.88</td>
<td>27.68</td>
<td>2.91</td>
<td>27.21</td>
<td>2.86</td>
</tr>
<tr>
<td>Left 3</td>
<td>29.58</td>
<td>2.28</td>
<td>30.35</td>
<td>1.74</td>
<td>29.97</td>
<td>2.26</td>
</tr>
</tbody>
</table>

[Figure 5: Thermography](http://patricialuccardi.com/thermography/)]

The thermography has ultimate benefits as it is non-penetrating and non-contact procedure which avoids the contraction of breast. As it does not engross the radiation, it can remain ensure the safeness even if exposed to long period of time. The outcomes are influenced by hormonal imbalances. It is a test that uses an infrared camera to detect the breast cancer. The abnormal thermogram carriers with it a high risk of cancers. It is also used to access the more rapidly growing meoplasms. Microwave thermography depicts positive effects in monitoring radiation treatment. Knowing that a malignant tissue has a higher conductivity than the surrounding tissue, this method is based upon tissue specific transmission of electrical low level currents due to tissue specific conductivity and permittivity[9].

**Near Field Microwave Imaging:** Balanced antipodal antenna is proposed to work as a sensor and it provides the signal to detect the breast cancer. Non-ionizing electromagnetic waves are used. It has the ability to send short electromagnetic pulses into the near-field without distortion low loss antenna directional
manner. It outlines the main features of active, passive and hybrid signal under investigation for breast cancer detection. Its main focus is on active microwave signal is particular microwave tomography and con-focal microwave imaging \cite{10}. Near field microwave imaging technology is to explore the original structure of the body. Microwave imaging is purely radar based which explode the way of operating by sending a short time pulse of microwaves using one or two antennas \cite{11, 12}. There is a huge reduction in the size of the antenna.

**Microwave Radar Imaging:** Ultra-wide band (UWB) radar imaging technique assists to restructure the backscattered power distribution within the breast. Microwave radar imaging reorganizes the view of the image by accepting the replicated wave from objects. It is caused by measuring the dissimilarity present between the electrical dielectric possessions of malignant and normal breast tissues \cite{13}. A reflection happens when the microwaves broadcast the breast with tumor. There are two important technologies made available till now they are Tomography and UWB radar system. The processing of UWB radar is mainly based on UWB pulses. Ad-hoc IC’s are required to compete with UWB in the time-domain \cite{14}.

**Tomography:** Tomography is one of the method of imaging by sections or sectoring, through the use of any kind of penetrating wave \cite{15}. A coherent microwave signal is transmitted any one antenna. Electromagnetic approaches such as electrical impedance tomography and microwave imaging have been investigated in image accuracy for temperature monitoring. Tomography scan combines a series of X-ray images taken from different angles around our body is shown in Figure 6.

A multi-static UWB radar measurement system has been developed and carries out clinical trials to detect the breast cancer. The desired result of the system depicts a clear boundary and it is segregated from the fibro-glandular tissue.

**Conclusion**

In this survey paper, different techniques of detecting breast cancer by using mammographic imaging has been studied and discussed. Breast cancer is the second leading cause of death in women, so it is necessary to make research on the techniques to detect breast cancer. Early detection of breast cancer can increase the rate of survival.

**Conflict of Interest:** The authors in this manuscript have no conflict of interest.

**Source of Funding:** There is no funding for this research work; everything has done on my own expenses.

**Ethical Clearance:** This manuscript has maintained below 10% plagiarism and ethical clearance has maintained.

**References**


![Figure 6: Courtesy of Dr. Wendie Berg – 2-D view of tomography of breast cancer](image-url)


A Study of the Engineering Maintenance Services of a Tertiary Care Hospital

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Abstract

The engineering maintenance service is required in every hospital. It is more required as the hospital starts getting older. The study emphasis on the engineering maintenance service that is presently being carried on in the hospital and changes are recommended based on the study. The study has been done with the help of interviews and prospective study of the engineering maintenance happening in the hospital.

A new hospital may not require much of maintenance but as the hospital becomes older maintenance becomes an important part of the hospital. The hospital building is a highly complex unit and is subjected to rigorous demands as most of it is operational both day and night. Patient care is directly or indirectly dependent upon the performance of the hospital building, its utilities & services. Proper maintenance of the hospital building, its utilities & services is of paramount importance to the welfare of a patient and a major concern of the hospital administration.

Keywords: Maintenance services, Preventive maintenance, operating cost.

Introduction

Engineering Service utilization management is the evaluation of the mechanical, electrical, plumbing & other equipment necessity, appropriateness and efficiency of the use in the healthcare services or procedures. The investment on these equipment is said to be a good, only if it shows a utilization coefficient of 50% or above.

The purpose of this article is to find how good the equipment is utilized in hospital. These equipment in hospital constitutes nearly the 50% of the total investment. Keeping this in view, it is essential to ensure maximum service availability with minimum downtime. With the adaption of the proper maintenance technique and management system, one can utilize resources optimally and reduce the breakdown and related maintenance workload.

Hospitals have undergone a quantum change in concept and care provisioning from ancient days to present era. The information explosion and technological advances have revolutionized the medical care. The sophistication in the medical field has led to the development of specialized care centre in an attempt to provide high quality care. Modern medical technology has contributed immensely in improving the quality of healthcare and state of health profile of nations. The advancements has been mainly due to improved diagnostics facility, sophisticated equipments and spectacular progress in development in surgical procedures.

Medical equipment contributes to almost 40-50% cost in tertiary care hospital set up. The medical equipment though cutting edge technology at time of purchase poses a threat of inevitable obsolescence within 6-7 years of installation. This problem is compounded by fact that most of such equipments are imported and many few local reputed manufacturers exist in India. This leads to putting higher costs and further to lesser competitive edge and low utilization rate resulting in undesired operating margins.

The availability and utilization of various healthcare
equipment at all levels in the health system for effective and efficient delivery, was also emphasized in the Alma-Ata declaration at the international conference on primary health care in 1978, which was later included in to the strategy of health for all by 2000 AD.

Aim: To study the Engineering maintenance services and suggest recommendations for changes if any.

Objective: To do a prospective study and an interview with the staff to determine the shortcomings and suggest changes.

Scope:

- The study would include the engineering department as a whole.
- The staff of the maintenance team would be interviewed.

Review of literature: Buildings are required to provide a conducive and safe environment for various human activities. The extent to which buildings provide the required environment for the required activity is a measure of the functionality of the building. Hospitals are the most complex of building types. Each hospital is comprised of a wide range of services and functional units, such as diagnostic and treatment functions, hospitality functions, and the fundamental inpatient care or bed-related functions.

Nous Hospital Consultants regarded a hospital as not a mere building, but a complex social institution, composed of many groups representing a wide variety of interests and diverse needs that utilize the services of various medical, paramedical and support personnel to render all needed health care to the patients in its custody. It employs a wide variety of modern technologies and engineering services to support the process of healthcare using numerous biological, pharmaceutical, chemical and bio-chemical substances. It handles the dynamics of life and death situations during the process of rendering healthcare. A hospital building as a healing indoor environment needed in healthcare to prevent infection control. Ulrich described a hospital building to be a healthcare environment that should measurably improve patient outcomes, reduce or eliminate environmental stressors, provide positive distractions, enable social support and give a sense of control. The goal of every health institution is to provide patient care, and produce medical and health manpower. In furtherance of this goal, staff with expertise of the highest skill are motivated in an environment that is clean, conducive and patient friendly. Hospital buildings are places where care and cure should be available to the public, but due to lack of maintenance public hospital buildings have become a place where people working in the built environment and patients have allergic-like reactions to unspecified stimuli: reactions like dizziness, nausea, irritation of mucous membrane, eye and/or nasopharyngeal irritation and sensitivity to bad odour from human waste, poor toilet facilities, and insufficient cleaning method.

Maintenance works are complex in nature and therefore are carried out by directly employed labour while some are carried out by contractors. Accordingly, the mode of execution of maintenance works is a matter of policy. It is stipulates that in reaching a decision, the maintenance manager should compare the costs and services provided by the contractors with his own directly employed labour force, taking into account the availability of labour and the type and location of the building to be maintained, in accordance with this notion, contended that the choice should be made depending on which offers the greater advantage in terms of cost, quality and convenience.

The reasons for using in-house personnel to deliver maintenance services. Using in-house staff will give a better control of service levels. Estates Good Practice, in their research, showed that the unique nature of an institution’s estates, its location, availability of craftsmen and the preference of the estate director will all feature in the choice between direct or contract workers. According to them, the success of the operation will rely on management, adequate supervision and quality control.

The Chartered Institute of Building reiterated that the sizes, types and number of buildings to be maintained will invariably determine the source of manpower either in service or outsourcing.

Iyagba stated that outsourcing holds the promise of flexibility and profitability, but there may be disadvantages that are not at all obvious. Another major attraction, as noted by the author, is that it allows the business to focus on its core business and competencies, leaving peripheral and support functions to be serviced by outside experts.

Shohet, in his examination of the proportion of maintenance works performed by outsourcing versus in-
house provision in hospital buildings, reaffirmed that the choice of either method depends on the occupancy rate. This conclusion differs from that of previous studies on the subject. At standard or low occupancy levels, there is indeed an advantage as well as savings in the employment of a manpower composition in which the majority of the maintenance workers are external personnel.

**Methodology:** In order to understand the current concepts and latest techniques in engineering maintenance, updated information was obtained from various national and international journals and documentation’s from the worldwide web. The study was conducted in II phases.

**Phase I: Interview and discussion:** A review of available documentation followed by detailed discussions & informal interviews were held with the key officials, Engineers and other staff of the Engineering Services Department in order to appraise the organizational structure, staffing pattern and the nature of various tasks and responsibilities assigned to different functionaries of the Engineering Services Department.

**Phase II: Prospective study**

1. **Observation study:** In order to understand the maintenance methodology followed by the Engineering Services Department, various tasks and procedures were physically observed. The routine maintenance activities along with method of tackling various engineering breakdowns were ascertained by first hand observations at the Complaint offices and various maintenance sites.

2. The initial prospective study was carried out for three months, i.e., from 21st May, 2016 to 18th August, 2016 during which complaint registers at the offices of the various sub divisions of the Civil, Electrical and Air-conditioning divisions, of the Engineering Services Department, responsible for the maintenance of the Main Hospital were studied. All complaints received during this period were reviewed and grouped according to the type and nature of main maintenance breakdown and the maintenance methodology adopted thereafter.

**Observation and analysis:** The hospital has a list of complaints regarding maintenance that are registered by various staff working in the hospital. The register only records the complaint it doesn’t record what initiatives have been taken or the time taken to resolve the problem. Through direct observation the recordings were made.

The problems in the hospital were a great challenge, some of the problems were not solved until the last day of the study. The reason for delays were noted down in the interview. The main reason quoted by majority of the workers was delay in taking decisions and allocating funds for the issue.

The study done has observed that the maintenance done in the hospital has lot of room for improvement. The delays in attending the problems can be reduced with an efficient system. The management should look into the delays and try to ascertain as to why the delay is taking place and should try for reforms.

The management of the hospital can take steps and streamline the process of the maintenance service that is currently being provided in the hospital. The visibly delay in attending the problem affects the patient satisfaction and leads to the patient not getting the service expected from the hospital.

**Recommendations:**

**Complaint communication & registration:**

- A standard format for complaint communication needs to be developed and introduced which should indicate details like the ward, time and to whatever extent possible give information of the exact nature of the complaint.
- Standard complaint registers specific to each engineering wing need to be developed and introduced which should have a prescribed format of registration of complaints with a correlation to the engineering specialty.
- All complaints received by the Engineering maintenance staff must be recorded in the prescribed monthly complaint register. Telephonic complaints should invariably be followed on a prescribed written format.
- Wherever possible the complaint slip should be signed by the complainant with necessary remarks like satisfactory works done not done should be obtained from the complainant. The same should be returned to the inquiry clerk who in turn should write it down in the complaint book.
Maintenance Information System

- A ‘maintenance Information System’, must be evolved. Details of day-to-day complaints, special repair complaints and periodical repairs may be compiled on a monthly basis and circulated to respective sections of the Engineering Services and Hospital Administration.

- The Engineering Services Department must explore the feasibility of introduction of a Computerized Maintenance Management System.

Preventive Maintenance: There is a strong need to bring about a change in the maintenance methodology being followed at the hospital from breakdown maintenance in the current system to a system of preventive maintenance.

- There is an urgent need of creating a multi-specialty preventive maintenance system, which could comprise of team of engineers and various categories of maintenance staff from the various specialties of the engineering services.

Training in Hospital Engineering

- In keeping pace with the rapid technological advances in the field of hospital engineering is a need for developing a separate cadre of hospital engineers. They should be formally trained to provide solutions to the multi-dimensional engineering problems peculiar to hospitals.

- Training programs, workshops for the engineers and other technical staff must introduced for continued education in their respective field of specialization and updating their knowledge about the recent advancements in the field of hospital engineering and maintenance techniques and strategies.

Conclusion

The hospital maintenance department forms an integral part of the hospital. The maintenance service provided by the hospital shows how well the hospital responds to the requirements of the patient. This would in turn tell us about how the hospital cares about the patient. The maintenance services in the hospital needs to work on the recommendation given. The recommendation if acted upon would turn the hospital into a quality hospital. The services would improve and it would help in improving patient satisfaction.

Conflict of Interest: There is no conflict of interest.

Source of Funding: The study is not funded by any agency.

The study was done as a part of Summer Internship of MBA, and there was no direct intervention with patient care & hence no Ethical Issues were involved.

References


Effect of SAQ Training on Vital Capacity and Peak Expiratory Flow Rate among School Students of Rural Area

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Abstract

The aim of the present study was to find out the effect of SAQ training on vital capacity and peak expiratory flow rate among the school students of rural area. To achieve the purpose of the study 40 boy students of 12 to 16 years aged group were randomly selected from the rural area. Tentulmuri Mohammad Muslim MSK in Tentulmuri, Kharagpur-II Block, Paschim Medinipur District, in West Bengal, West Bengal state in India was selected as rural area of the study. The participant’s were divided into two groups SAQ group and Control group, where was 20 participants in each group. SAQ group underwent SAQ training programme for 16 weeks duration,three alternative days in a week. The selected variables vital capacity and peak expiratory flow rate was measured by wet spirometer and Wrights peak flow meter. Before and after 16 weeks of experimental training the pre test and post test data was collected and pair t test was used to analyze the date. The data was calculated by Microsoft Office Excel 2007 software. The level of significant was set at 0.05. The finding were the vital capacity and peak expiratory flow rate significantly improved after 16 weeks experimental training programme.

Keywords: SAQ Training, Vital Capacity, Peak Expiratory Flow Rate, School Student, Rural Area.

Introduction

The metabolic activities within the cells of human body conduct by the atmospheric oxygen. The atmospheric oxygen enters in human body by the proper respiratory functioning. The increasing of lungs capacity means the development of the functional activity of respiration likes reduce the tidal volume and increase the inspiratory capacity and reserve volume, functional residual capacity, expiratory reserve volume, residual volume vital capacity and also total lungs capacity.¹ The current society is fully dependent on science and technology, so it is extreme challenge of human being to maintain their health and fitness. In this concept, the physical exercise is the main key to free from this suffers.² Whereas the regular physical exercise help to strengthen respiratory capacity.³-⁶ The obesity is one of the major problems in modern society. The previous studies find regular physical exercise also effective on increase pulmonary function of healthy adults.⁷,⁸

The term SAQ is derived from the first letters of both of the transitional Speed, agility and Quickness. SAQ exercises modern training system produces integrated effects of many physical capacities of any athletes within a single training programme.⁹-¹⁴ Thesaq training was significant to improve dynamic balance ability when it was conducted among the children of 7-11 years old.¹⁵ The key of SAQ training is quick and rapid body movement in preselected direction. When these exercise method was applied upon sports persons of several ages, it was bring the extreme physiological benefit.¹⁶-²¹ Some researcher were classified the saq drill exercise in without equipments and with equipments and their findings was the both method were significant to increase the physiological variables to the subjects.²² These exercise method also useful to develop physical capacity of adapted children.²²
Statement of the Problem: The aim of the study was to find out the effect of SAQ training on vital capacity and peak expiatory flow rate among the school students of rural area.

Objective of the Study:

1. To find out the effect of SAQ training on vital capacity among the school students of rural area.
2. To find out the effect of SAQ training on peak expiatory flow rate among the school students of rural area.

Hypothesis: There will be significant different of SAQ training on vital capacity and peak expiatory flow rate among the school students of rural area.

Method

Subjects: The aim of the study was to find out the effect of SAQ training on vital capacity and peak expiatory flow rate among the school students of rural area. To achieve the aim of the study total 40 participants were randomly selected from a rural area high school. Tentulmuri Mahammad Muslim MSK in Tentulmuri, Kharagpur-II Block, Paschim Medinipur District, in West Bengal, West Bengal in India was selected the rural area a school of the present study. The participant’s age were ranged from 12 to 16 years.

Design of the study: Pre test and post test control group designed as applied in this study. The all participants were assigned into two groups SAQ group and Control Group. Where 20 subjects in each groups. The SAQ group was underwent an experimental SAQ training programme for 16 weeks and control group did not underwent any special training programme during experimental period.

Variables and Measurement

Vital Capacity: Vital Capacity was measured by Wet Spirometer. The spirometer was six liter container, filled with water upto one inch from the top and was counter balanced by a chain, which passed over free running pulley. The spirometer was placed on a table. The participant took deep breathed as possible, then he placed the mouth piece in between his lips and breathed out gradually and consistently until the most extreme volume of air was ousted, without taking in another breath. During breath out there was confirm that the exhaled air not escape through the nose and other sides. Dial of spirometer was followed to record the data, within three appropriate trails highest score was recorded in ml.

Peak Expiatory Flow Rate: Peak Expiatory Flow Rate was measured by Wrights Peak Flow Meter. The participant was held the instrument in his hands and took deep breathed as possible. Then he placed the mouth piece in between his lips and breathed out forcefully without taking in another breath. During breath out there was confirm that the exhaled air not escape throw the nose and other sides. Within three appropriate trails highest score was recorded.

Training Schedule

Table 1: (SAQ Training Schedule for 16 weeks)

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>SAQ Drills</th>
<th>Duration</th>
<th>Rest Between Each Drill</th>
<th>Total Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Warm-Up</td>
<td>10 Minutes</td>
<td>1 Minutes</td>
<td>60 Minutes</td>
</tr>
<tr>
<td>1</td>
<td>Leader Drill (Straight Run Quick Steps)</td>
<td>3 Minutes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Leader Drill (Two Foot Run)</td>
<td>3 Minutes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Lateral Run Drill</td>
<td>3 Minutes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>L Drill</td>
<td>3 Minutes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>T Drill</td>
<td>3 Minutes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>M Drill</td>
<td>3 Minutes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Slalom Weave Drill</td>
<td>3 Minutes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Run Shuffle Shuffle Run Drill</td>
<td>3 Minutes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Box or Four Cones Drill</td>
<td>3 Minutes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>5-10-5 Pro Agility Drill</td>
<td>3 Minutes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Cool Down</td>
<td>10 Minutes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
SAQ training schedule was 16 weeks duration, three alternative days in per weeks. Every training session was 60 minutes duration, was conducted at play ground of respective school.

Statistical Procedure: The pair t test was applied to analyze the data and level of significant was set at 0.05 levels. The Microsoft Office Excel 2007 software was used to calculate the data.

Result

Table 2: Represented the descriptive statistic of SAQ group

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>Pre Test</th>
<th>Post Test</th>
<th>Mean Difference</th>
<th>T value</th>
</tr>
</thead>
<tbody>
<tr>
<td>VC</td>
<td>20</td>
<td>Mean 2525</td>
<td>Mean 2730</td>
<td>205</td>
<td>5.11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SD 506.66</td>
<td>SD 540.07</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>S.Err 113.29</td>
<td>S.Err 120.76</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PEFR</td>
<td></td>
<td>Mean 244.5</td>
<td>Mean 259.75</td>
<td>15.25</td>
<td>6.89</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SD 39.03</td>
<td>SD 37.95</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>S.Err 8.72</td>
<td>S.Err 8.48</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Abbreviations: VC = Vital Capacity, PEFR = Peak Expiratory Flow Rate, SD = Standard Deviation, S.Err = Standard Error

The result of vital capacity of SAQ training group, the pre test was 2525 ± 506.66 and post test was 2730 ± 540.07. The mean different was shown as 205 and obtained t value was 5.11. The result of peak expiratory flow rate of SAQ group, pre test was 244.5 ± 39.03 and post test was 259.75 ± 37.95. The mean different was 15.25 and obtained t value was 6.89.

Table 3: Represented the descriptive statistic of control group

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>Pre Test</th>
<th>Post Test</th>
<th>Mean Difference</th>
<th>T value</th>
</tr>
</thead>
<tbody>
<tr>
<td>VC</td>
<td>20</td>
<td>Mean 2425</td>
<td>Mean 2435</td>
<td>10</td>
<td>1.46</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SD 525.03</td>
<td>SD 525.43</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>S.Err 117.40</td>
<td>S.Err 117.49</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PEFR</td>
<td></td>
<td>Mean 241</td>
<td>Mean 244</td>
<td>3</td>
<td>1.55</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SD 60.51</td>
<td>SD 56.68</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>S.Err 13.53</td>
<td>S.Err 12.96</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Abbreviations: VC = Vital Capacity, PEFR = Peak Expiratory Flow Rate, SD = Standard Deviation, S.Err = Standard Error

The result of vital capacity of control group, pre test was 2425 ± 525 and post test was 2435 ± 525.43. The mean different was shown as 10 and obtained t value was 146. The result of peak expiratory flow rate of pre test was 241 ± 60.51 and post test was 244 ± 56.68. The mean different was 3 and obtained t value was 1.55.

Discussion

The present study shows that the selected 16 weeks SAQ training programme significantly improved the vital capacity and peak flow rate among the rural area school students. It has no doubt that the saq training is not a low intensity exercise. The quick and rapid body movement is required to find its better benefits. The several studies of saq training were conducted on the athlete’s to improve their physical ability and neuromuscular ability. The present study was conducted on school students of rural area. Our study same as the previous studies that analyzed the effects on physiological variables due to saq training programme among the athletes.

Findings:

1. After 16 weeks SAQ training programme vital capacity among the school students of rural area was significantly increased.

2. After 16 weeks SAQ training programme peak expiatory flow rate among the school students of rural area was significantly increased.
Conclusion

As per result of the study, it was conclude that the SAQ training was significant to improve the vital capacity and peak expiratory flow rate among the school students of rural area.

Ethical Clearance: The study was ethically approved by the Departmental Academic Integrated Panel of Department of Physical Education of Swami Vivekanand Subharti University, Meerut. The University also approves the present study under the code of practice Governing the ethical conduct of research. The letter of ethical approbation of this study also uploaded in another file.

Conflict of Interest: Nil

Source of Funding: Self (The study was done by self funded)

Reference


19. Karthikeyan J. Effect of saq training on selected physiological parameters among college men


A Study of Knowledge and Awareness Regarding Pulmonary Tuberculosis in Patients Under Treatment for Tuberculosis in Tuberculosis Unit Ambala City (Haryana)

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1Post Graduate Student, 2Professor, 3Assistant Professor, 4Professor and Head, Maharishi Markandeshwar Institute of Medical Sciences And Research, Mullana (Ambala), 5Tutor, Maharishi Makandeshwar Medical College and Hospital, Kumarhatti, Solan

Abstract

Background: In 2015, out of the total annual estimated incidence of 9.6 million cases of tuberculosis worldwide, about 2.2 million were from India alone. Every day in India, more than 6000 persons develop tuberculosis and about 600 die of it i.e. on estimation 2 deaths are occurring every five minutes.

Objectives: To determine the level of awareness of tuberculosis patients regarding various aspects of tuberculosis.

Methodology: A cross sectional study was carried out on 340 tuberculosis patients registered during the study period of one year under RTNTCP DOTS regimen using a self-designed pretested, semi-structured proforma. Questionnaire contained information regarding socio-demographic profile of TB patients and knowledge about disease and its treatment.

Results: 50.3% of patients knew that TB is caused by germs/infection. 43.5% knew that TB spreads via air. 94.7% were aware of cough with expectoration as a symptom, while only 32.4% were aware about all the symptoms of TB. 64.7% knew that TB can be prevented by covering the mouth while coughing and 94.7% knew that TB is curable. 81.8% knew the duration of treatment to be 6-8 months. While 64.1% knew the consequences of not completing their complete course.

Conclusion: Awareness about tuberculosis was good in some aspects like symptoms but in some areas like regularity of treatment inadequate knowledge was present. Some myths like cure of tuberculosis by alternate medicine were also present.

Keywords: Awareness, Tuberculosis, socio-demographic profile.

Introduction

Tuberculosis was among the top ten causes of death for 2015. Worldwide in 2015, about 10.4 million people were estimated to be having tuberculosis out of which about 1.2 million were HIV positive. Also, worldwide about 1.4 million people died from tuberculosis in 2015. 1 About 9 million people become infected with tuberculosis each year and out of these about 3 million are either not diagnosed or officially not treated. These “missed” cases are especially important taking into account that tuberculosis is an airborne disease and each undiagnosed and untreated patient can infect as many as 15 persons per year.2

Various surveys in India from year 2000 to 2015, still show India to be the tuberculosis capital of the world. India accounts for 23% of the total number of tuberculosis cases globally. In 2015, out of the total

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annual estimated incidence of 9.6 million cases of tuberculosis worldwide, about 2.2 million were from India alone.\textsuperscript{3} The incidence rate of tuberculosis in India is 167 cases per 1 lakh and prevalence rate is 195 cases per 1 lakh population.\textsuperscript{4} Everyday in India, more than 6000 persons develop tuberculosis and about 600 die of it i.e. on an estimation 2 deaths are occurring every five minutes.\textsuperscript{5}

Increased knowledge about tuberculosis is hypothesized to help patients in continuing treatment and completing the regimen. In this context the present study is conceptualized with the objective of finding knowledge of tuberculosis patients about various aspects of tuberculosis.

**Material and Method**

**Study Area:** The study was conducted in the Tuberculosis Unit (TU) Ambala city. There are 11 peripheral health institutions (PHIs) and 30 subcentres including 13 designated microscopy centers.

**Study Population:** A cohort of tuberculosis patients who registered for treatment during October 2015 to July 2016 formed the study population.

**Inclusion Criteria:** All patients (CAT- I and CAT-II) aged more than 15 years who registered in the Tuberculosis Unit Ambala city from October 2015 to July 2016.

**Exclusion Criteria:** Patients age equal to or less than 15 years.

**Study Period:** October 2015 to September 2016.

**Study Design:** Cross sectional study

**Study Tools:**

**Questionnaire:** The Questionnaire was a self designed pretested semi-structured proforma. The Questionnaire contained 2 sections:-

**Section 1** contained questions related to the socio-demographic profile of the patients. There were questions regarding name, age and sex of the patients. Age was asked in completed years. Qualification of the subject was categorized into illiterate, primary, middle, high, secondary, and graduate. Marital status, Type of family, Residence whether rented or own house, Religion, Occupation type whether employed, unemployed, student or housewife and Average per capita income was ascertained.

**Section 2** contained questions related to knowledge about tuberculosis. Questions related to cause of tuberculosis whether by germs/infection, eating unhealthy food, hereditary or by person infected with tuberculosis. The method of spread of tuberculosis is by air, contaminated water/food, sharing clothes with infected person was also asked. Knowledge about the various signs and symptoms of tuberculosis was also asked. This section also included questions on method of prevention of tuberculosis and whether a cure was available for the disease. How long do tuberculosis patients need to take drugs and what happens if drugs were taken irregularly was ascertained.

**Study Strategy:** 363 patients registered for treatment during the study period. Out of these 340 patients fulfilled the inclusion criteria. The patients were informed about the purpose of the study and invited to participate. A written consent was taken from patients and they were interviewed using a self designed, pretested, semi-structured questionnaire. A minimum of 15 minutes was spent on each patient.

**Data Analysis:** Data was entered in MS Excel software version 2007 and compiled and analyzed using Statistical Program for Social Sciences (SPSS) version 22. Percentages were calculated for the various socio-demographic and awareness parameters.

**Ethics Consideration:** The present study did not impose any financial burden on the participants. Informed and written consent was taken from the participants before conducting the study.

**Results**

The total number of males in the study was 227(66.8%) while the females were 113(33.2%). The mean age was found to be 40.84 yrs ± 17.12. Maximum (28.8%) patients were educated upto middle school level followed by 22.1% who were educated upto high school level. One half of the tuberculosis patients were living in nuclear family while the other half were in joint family. According to religion, majority of patients (81.8%) were Hindu. Majority of the patients (64.7%) were employed. Majority of patients i.e. 74.7% were married.

Table 1 elucidates that maximum number of patients (50.3%) believed germs/Infection to be the primary cause of tuberculosis. Eating unhealthy food
was considered the cause by 14.7% and 2.6% believed it be hereditary. Others included smoking and alcohol as the cause of tuberculosis. Maximum number of patients (43.5%) believed air to be the main method of spread of tuberculosis. 15.9% believed that it spread by contaminated water/food, while 3.8% thought it spreads by sharing clothes with infected person. 1.8% thought there were other causes of spread of tuberculosis. 94.7% of the patients answered cough with expectoration as the most common symptom of tuberculosis. Out of all the patients, only 110 i.e. 32.4% answered all of these as the symptoms of tuberculosis.

Table 1 Knowledge about causes, spread and symptoms of Tuberculosis in study participants

<table>
<thead>
<tr>
<th>Causes of TB</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germs/Infection</td>
<td>171</td>
<td>50.3</td>
</tr>
<tr>
<td>Eating unhealthy food</td>
<td>50</td>
<td>14.7</td>
</tr>
<tr>
<td>From person infected with TB</td>
<td>97</td>
<td>28.5</td>
</tr>
<tr>
<td>Hereditary</td>
<td>9</td>
<td>2.6</td>
</tr>
<tr>
<td>Others</td>
<td>13</td>
<td>3.8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TB spreads by</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>By air</td>
<td>148</td>
<td>43.5</td>
</tr>
<tr>
<td>By contaminated water/food</td>
<td>54</td>
<td>15.9</td>
</tr>
<tr>
<td>Sharing clothes towels with infected person</td>
<td>13</td>
<td>3.8</td>
</tr>
<tr>
<td>Others</td>
<td>6</td>
<td>1.8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Response (Yes)</th>
<th>Response (No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cough with expectoration</td>
<td>322(94.7%)</td>
<td>18(5.3%)</td>
</tr>
<tr>
<td>Fever</td>
<td>294(86.5%)</td>
<td>46(13.5%)</td>
</tr>
<tr>
<td>Loss of appetite</td>
<td>187(55%)</td>
<td>153(45%)</td>
</tr>
<tr>
<td>Loss of Weight</td>
<td>182(53.5%)</td>
<td>158(46.5%)</td>
</tr>
<tr>
<td>All of the above</td>
<td>110(32.4%)</td>
<td>230(67.6%)</td>
</tr>
</tbody>
</table>

Table 2 shows that regarding prevention, 64.7% (maximum) knew that tuberculosis could be prevented by covering the mouth with cloth while coughing. Majority (94.7%) of patients believed tuberculosis to be curable while only 0.9% believed otherwise. Majority (81.8%) knew correctly that the drugs have to be taken for 6 to 8 months. Maximum (64.1%) number of the patients believed that tuberculosis will not be cured if they take drugs irregularly or don’t complete their treatment. 28.5% believed that tuberculosis can be cured by alternative medicines, while 4.7% thought it would take longer time to cure if they took medicines irregularly. 2.6% were of the view that god will cure their ailment if they don’t complete their course.

Table 2: Knowledge about Prevention, Curability, Duration and Regularity of treatment in tuberculosis patients

<table>
<thead>
<tr>
<th>Prevention</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covering the mouth with cloth while coughing.</td>
<td>220</td>
<td>64.7</td>
</tr>
<tr>
<td>Not sharing clothes or towels with other persons.</td>
<td>84</td>
<td>24.7</td>
</tr>
<tr>
<td>By killing mosquitoes/houseflies</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Don’t know</td>
<td>36</td>
<td>10.6</td>
</tr>
</tbody>
</table>

**Is TB Curable?**

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>322</td>
<td>94.7</td>
</tr>
<tr>
<td>No</td>
<td>3</td>
<td>9.9</td>
</tr>
<tr>
<td>Don’t know</td>
<td>15</td>
<td>4.4</td>
</tr>
<tr>
<td>Total</td>
<td>340</td>
<td>100.0</td>
</tr>
</tbody>
</table>

**How long do TB patients need to take drugs (duration)?**

<table>
<thead>
<tr>
<th>Duration</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 months</td>
<td>27</td>
<td>7.9</td>
</tr>
<tr>
<td>6-8 months</td>
<td>278</td>
<td>81.8</td>
</tr>
<tr>
<td>10 months</td>
<td>28</td>
<td>8.2</td>
</tr>
<tr>
<td>12 months</td>
<td>7</td>
<td>2.1</td>
</tr>
</tbody>
</table>

**What happens if they take drugs irregularly or don’t complete course?**

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>TB can be cured by alternative medicine</td>
<td>97</td>
<td>28.5</td>
</tr>
<tr>
<td>God will cure my ailment</td>
<td>9</td>
<td>2.6</td>
</tr>
<tr>
<td>TB cannot be cured</td>
<td>218</td>
<td>64.1</td>
</tr>
<tr>
<td>TB will be cured but will take longer time</td>
<td>16</td>
<td>4.7</td>
</tr>
</tbody>
</table>

**Discussion**

In the present study, it was observed that 50.3% of tuberculosis patients knew the cause of tuberculosis to be germs/ infections, 28.5% were of the view that it is caused from the person infected with TB, 14.7% thought eating unhealthy food to be the cause, 2.6% believed it to be a hereditary disease and 3.8% had other reasons. Similarly, in a study conducted by Dolma KG et al14, reported that 43.6% patients knew the cause of tuberculosis to be germs. Khalil S et al15 in their study at Aligarh reported that 66.7% of TB patients knew the cause to be germs, 5% thought the disease was hereditary and 18% thought it to be caused by alcohol, smoking and poor diet.

In the present study, it was observed that 43.5% of tuberculosis patients knew that TB spreads via air, 35% thought that it spreads via contact with tuberculosis patients, 15.9% thought that it spreads through contaminated food and water and 3.8% thought it spreads through sharing of clothes with infected person.
Similarly, in a study by Das R et al\textsuperscript{16} it was observed that 53% of tuberculosis patients knew that it spreads via air and 17% thought that it spreads by physical contact. Patil AR et al\textsuperscript{10} in their study observed that 30% of TB patients knew it to be spreading by air and 39.6% believed that it spreads by sharing food/clothes with TB patients. In a study by Khalil S et al\textsuperscript{15}, it was observed that 31.7% of TB patients knew that it spreads via air (coughing), 50% thought it spreads by contact and 16.7% thought it to be spreading due to eating unhealthy food.

In the present study, it was observed that 94.7% of tuberculosis patients knew cough with expectoration to be a symptom of TB, 86.5% knew fever to be a symptom, 55% knew about loss of appetite and 53.5% about loss of weight. Only 32.4% knew that all the above were symptoms of tuberculosis. Similarly in a study conducted by Mondal et al\textsuperscript{17} in Rajshahi, it was observed that 97.9% TB patients knew cough was a symptom, 71% knew about fever, 57% about weight loss and 51% about loss of appetite. Esmael et al\textsuperscript{18} in their study reported that 97% TB patients knew cough to be a symptom. Similarly, Khalil S et al\textsuperscript{15} in their study reported that 86.4% patients knew cough was a symptom, 50.5% knew about fever, and 70% knew about weight loss as a symptom.

In the present study, it was found that 64.7% of TB patients knew that disease could be prevented by covering the mouth while coughing. Similarly, in a study done by Patil AR et al\textsuperscript{10} in Maharashtra, found that 65.6% of TB patients knew that Tuberculosis could be prevented by covering their mouth while coughing. Karampudi et al\textsuperscript{19} did a study in Vijaywada and observed that 74% of TB patients knew that it could be prevented by covering their mouth while coughing.

In the present study, it was found that 94.7% of TB patients believed that the disease was curable. Similar findings were seen in a study done by Paramasivan et al\textsuperscript{20} in Kerala which reported that 96% of TB patients knew it to be curable. Study by Das R et al\textsuperscript{16} in Tripura also showed that 95% of TB patients knew that tuberculosis was curable.

In the present study, it was observed that 81.8% of TB patients knew the duration of treatment to be 6 to 8 months, 7.9% thought it was 3 months, 8.2% knew it was 10 months and 2.1% thought it was 12 months. Similarly, in a study by Pramanik D et al\textsuperscript{21} in West Bengal reported that 66% of TB patients knew the duration to be 6 months, 11% knew it be for $\geq$ 8 months and 8% didn’t know about it. Similarly, Karampudi SN et al\textsuperscript{19} reported in their study that 70% of tuberculosis patients knew that treatment duration was 6 to 9 months.

**Conclusion**

Knowledge regarding cough as a symptom was high however, knowledge about cause, spread and prevention was poor. Also, most patients were aware about correct duration of treatment. However, a third of the patients were not aware of the consequences of not completing the treatment. This indicates a need for more intensive education activities focusing on regularity of treatment.

**Conflict of Interest:** None

**Source of Fund:** Self

**References**

7. Khalil S, Ahmad E, Khan Z, Perwin N. A study of knowledge and awareness regarding pulmonary tuberculosis in patients under treatment for


Effectiveness of Active Release Technique Versus Myofascial Release Technique on Patients with Plantar Fasciitis: A Comparative Study

Arul Pragassame S.1, Mohandas Kurup V.K.2, R. Santhose Kumar3

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Abstract

Background: Plantar fasciitis is one of the most common causes of heel pain. The pain and discomfort associated with this disorder affect physical mobility and function dramatically. There are various conservative treatment strategies known to enhance symptoms of the condition including ice, heat, taping, electrical modalities, night splints, orthotics, stretching and strengthening. In addition, there are a number of soft tissue techniques such as Myofascial Release Technique (MFR) and Active Release Technique (ART) that may be effective in Plantar Fasciitis.

Objective: To find out and compare the effectiveness of Active Release Technique versus Myofascial Release Technique on pain and functional performance in patients with plantar fasciitis.

Methodology: Thirty patients who met the selection criteria were chosen for the study after receiving their informed consent. Participants were assigned randomly into two groups (Group A and Group B). Group A received the ART, whereas Group B received the MFR technique. Both groups jointly received ultrasound therapy and plantar fascia stretching exercise. The assessment of Numerical Pain Rating Scale (NPRS) and Patient Specific Functional Scale (PSFS) is made before and after the six day treatment schedule.

Result: Statistically significant improvements in NPRS (Z=3.44, P=0.001) and PSFS (t=10.2, P=0.001) were observed in group A patients. Statistically significant improvements in NPRS (Z=3.44, P=0.001) and PSFS (t=9.4, P=0.001) were noted in group B patients. When comparing group A and group B, NPRS (Z=2.59, P=0.009) showed significant differences between two groups and PSFS (t=1.92, P=0.06) was insignificant.

Conclusion: The study concluded that both the Active release technique and the Myofascial release technique are effective in reducing pain and improving functional performance in patients with plantar fasciitis. However, the pain reduction in the Active release technique group is significantly higher than in the Myofacial release technique group, but the functional performance shows similar effects in both groups.

Keywords: Active release technique, Myofascial release technique, plantar fasciitis, Ultrasound therapy, plantar fascia stretching exercise.

Introduction

Plantar Fasciitis is an extremely painful condition caused by inflammation and swelling of the plantar fascia, a dense band of tissue that runs across the bottom of the foot, starting at the back of the heel. It is often caused by overuse, poor natural mechanics, overweight of the body, sports or unsuitable footwear. One of the most prevalent causes of foot pain is plantar fasciitis accounting for 11% to 15% of all foot conditions. The incidence of plantar fasciitis peaks in people between 40 and 60 years of age with no gender bias.

Some of the sports that can predispose an individual include running, ballet dancing, aerobics, improper
Forty one patients were selected with Plantar Fasciitis, specified period using a convenient sampling method. The sample size was chosen during the Research Committee approved the study (PMR/University, Tamil Nadu, India. The Departmental and Rehabilitation (PMR), RMMCH, Annamalai 2018 in the outpatient Department of Physical Medicine undertaken during September, October and November programs. Treatment of ultrasound therapy and stretching exercise patients with plantar fasciitis, along with conventional and myofascial technique will provide better results in out and compare whether the Active release technique restricted fascial layers sustained pressure applied either directly or indirectly to pain, and enhance function. MFR usually includes slow, complex that is designed to respond to ideal length, reduce strength and flexibility to the foot completely.

People with plantar fasciitis frequently complain about pain in the foot arch and heel. The pain may be severe when the foot is first pressurized in the morning or after sitting or standing for long time. Usually, the plantar fascia becomes stretched after walking about ten to twelve steps and the pain gradually diminishes. Physiotherapy treatment options for plantar fasciitis includes plantar fascia stretching, orthosis/night splint, tapping, cryotherapy, ultrasound, contrast bath, iontophoresis, laser, phonophoresis, microwave diathermy. Also in some cases, massaging of the inflamed location severs is a temporary relief.

ART is a very effective and new non-invasive hands-on technique, a patented movement-based massage technique to solve soft tissue issues in the body, including the fascia, muscles, nerves and ligaments. It is designed to identify and treat adhesions of scar tissue that interfere with the normal function of the body. It enables the therapist to: break-up restrictive adhesions, restore normal muscle and nerve sliding and restoring strength and flexibility to the foot completely.

MFR is a low load, long-term stretch to the myofascial complex that is designed to respond to ideal length, reduce pain, and enhance function. MFR usually includes slow, sustained pressure applied either directly or indirectly to restricted fascial layers. The aim of the study is to find out and compare whether the Active release technique and myofascial technique will provide better results in patients with plantar fasciitis, along with conventional treatment of ultrasound therapy and stretching exercise programs.

Materials and Method

The present study was a comparative study undertaken during September, October and November 2018 in the outpatient Department of Physical Medicine and Rehabilitation (PMR), RMMCH, Annamalai University, Tamil Nadu, India. The Departmental Research Committee approved the study (PMR/DRC-6/2018). The sample size was chosen during the specified period using a convenient sampling method. Forty one patients were selected with Plantar Fasciitis, 11 of them were excluded and therefore the study sample was 30 patients. The inclusion criteria for the study were (1) Clinically diagnosed cases of plantar fasciitis (2) Unilateral involvement (3) Both male and female (4) Age between 25-65 years (5) Those who are willing to take 6 consecutive days of treatment. The primary exclusion criteria were (1) History of recent fractures, any ankle/foot surgeries and pathologies (2) Subjects with fixed deformities of foot/ankle and knee joint (3) Subjects with impaired circulation in the lower extremities, peripheral neuropathies, etc. (4) Neurological disorders leading to impaired balance and coordination (5) Injection of corticosteroids in the heel before 3 months.

Study Procedure: Patients were informed of the purpose, study method and informed consent obtained individually for participation after screening for selection criteria. Demographical information were collected. Subjects were assigned randomly into two groups. Group A (N=15) received the ART, whereas Group B (N=15) received the MFR. Both groups jointly received ultrasound therapy and plantar fascia stretching exercises. The pain intensity measured with the NPRS and functional status by PSFS. The above assessment was conducted on the first visit with the patient before the start of treatment and again on the final day of treatment at the end of the 6th day. Evaluation of pre-and post-treatment was compared and analyzed statistically.

Outcome Measures

Numerical Pain Rating Scale: The NPRS is a subjective measure for individuals to rate their pain at an eleven-point numerical scale. The scale consists of 0 (no pain at all) to 10 (worst imaginable pain). Patients were asked to mark a point on the line corresponding to their perceived quantity of pain during the assessment.

Patient Specific Functional Scale: The PSFS is a self-reported, designed to evaluate functional changes, mainly in patients with musculoskeletal disorders. The PSFS enables patients to report their functional status as a clinical outcome measure at the baseline and at a follow-up session to determine if a significant change in functional status has occurred.

Treatment procedure: The treatment procedure was given for six days a week. The frequency was one session a day. All participants were received ultrasound therapy (8 minutes) prior to soft tissue mobilization and were instructed to perform the plantar fascia stretch as a home program. Hold for 30 seconds and repeat 3 times, twice a day.
**Active Release Technique**\(^7,12\): Each session of the ART is a combination of examination and treatment. The patient is in the long sitting position. The therapist utilizes her hands to assess muscles or fascia texture, tightness and motion. Abnormal tissues are treated precisely by combining direct tension with very particular patient movements. The therapist will first start by shortening the affected limb muscle or fascia and then apply very specific hand pressure as we stretch the tissue is lengthened (patient moves muscle through movement). Treatment duration is 15 minutes per session, which is 6 days a week.

![Figure 1: Applying ART by using the finger pad in the plantar fascia](image)

**Myofascial Release Technique**\(^13\): MFR is a technique for soft tissue mobilization. The patient is asked to lie prone with his feet out of the couch. He provides a pillow for assistance and patient comfort under his feet. The treatment area is cleaned and properly dried. The therapist assesses the painful region. Sustained mild pressure is provided, using the thumb, in the line with the plantar fascia fibers from calcaneum to the toes. Pressure is kept for 90 seconds with 1 minute of rest interval. The treatment duration is 15 minutes per session, which is 6 days a week.

![Figure 2: Applying MFR by using knuckle in the plantar fascia](image)

**Data Analysis and Results**

Statistical analysis of the study was carried out using the “Statistical Package for Social Sciences” (SPSS-21). Wilcoxon matched pair test compared the pre and post comparison of NPRS, whereas Mann-Whitney ‘U’ test was performed between group NPRS comparison. The pre–post comparison of PSFS was performed by paired sample ‘t’ test as the variable was continuous. The comparison between two groups was performed through an independent sample ‘t’ test. The level of significance \(\alpha=0.05\). The data were submitted in a tabular format.

The mean study population age was 40.07 years with the corresponding standard deviation of 12.53 in Group A, while it was 38.07 (11.66) years for Group B. The other baseline characters of group A and group B are shown in Table-1.

**Table:1 Baseline Characteristics of the Group A and Group B**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Group A (ART)</th>
<th>Group B (MFR)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>40.07 (Mean)</td>
<td>38.07 (Mean)</td>
<td>0.10</td>
</tr>
<tr>
<td>Sex</td>
<td>N (Mean)</td>
<td>N (Mean)</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>7 (46.7)</td>
<td>8 (53.3)</td>
<td>0.12</td>
</tr>
<tr>
<td>Female</td>
<td>8 (53.3)</td>
<td>7 (46.7)</td>
<td></td>
</tr>
<tr>
<td>Side of Involvement</td>
<td>N (Mean)</td>
<td>N (Mean)</td>
<td>0.12</td>
</tr>
<tr>
<td>Right</td>
<td>7 (46.7)</td>
<td>7 (46.7)</td>
<td></td>
</tr>
<tr>
<td>Left</td>
<td>8 (53.3)</td>
<td>8 (53.3)</td>
<td></td>
</tr>
</tbody>
</table>

N: Number; SD: Standard deviation; %: Percentage.

The mean NPRS was 6.94±1.44 group ‘A’ and was reduced to 2.67±1.68 after treatment. The difference in the reduction was statistically significant \((z=3.44, p=0.001)\). Similarly, NPRS was significantly reduced following treatment in group ‘B’ (Pre M=6.47±1.77, Post M=3.47±1.96). The mean degree of improvement.
in Group ‘A’ was 4.27±1.28 while in Group was ‘B’ 3.0±1.13. The comparison between groups shows that there was a significant difference in NPRS improvement (Z=2.59, P=0.009). Hence, the improvement of Group ‘A’ in decrease pain following treatment was significantly higher than in Group ‘B’.

<table>
<thead>
<tr>
<th>NPRS</th>
<th>Group A</th>
<th>Group B</th>
<th>Pre post difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PRE</td>
<td>POST</td>
<td>PRE</td>
</tr>
<tr>
<td>Mean</td>
<td>6.94</td>
<td>1.44</td>
<td>6.47</td>
</tr>
<tr>
<td>S.D</td>
<td>2.67</td>
<td>1.68</td>
<td>3.47</td>
</tr>
<tr>
<td>Z</td>
<td>3.44</td>
<td>3.44</td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>0.001</td>
<td>0.001</td>
<td></td>
</tr>
</tbody>
</table>

Z: Mann Whitney U test statistics; M=Mean.

There was a significant difference in PSFS after treatment in Group ‘A’ (t=10.2, p=0.001). The magnitude of improvement was M=2.64±1.00. Similarly, there was significant improvement in PSFS after treatment in Group ‘B’ (t=9.4, p=0.001). The magnitude of improvement was M=2.10±0.87. Between group comparison shows that, the difference in the improvement was statistically insignificant (t=1.92, p=0.06>0.05).

Table 3: PSFS Comparison Group A and Group B

<table>
<thead>
<tr>
<th>NPRS</th>
<th>Group A</th>
<th>Group B</th>
<th>Pre post difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PRE</td>
<td>POST</td>
<td>PRE</td>
</tr>
<tr>
<td>Mean</td>
<td>3.98</td>
<td>1.52</td>
<td>4.29</td>
</tr>
<tr>
<td>S.D</td>
<td>6.62</td>
<td>1.36</td>
<td>6.39</td>
</tr>
<tr>
<td>‘t’</td>
<td>10.2</td>
<td>9.4</td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>0.001</td>
<td>0.001</td>
<td></td>
</tr>
</tbody>
</table>

Discussion

The study was detailed and tailored to compare, after 6 days of treatment, which treatment was best for both groups. In this study, gender was almost equal in the two groups. This is consistent with the study by Riddle, DL, et al that suggests, plantar fasciitis is more likely to happen in people with obesity, who spend most of the day on their feet, or who have restricted ankle flexion. It affects both active and sedentary adults of all ages.

ART is effective in decreasing pain and improving functional performance. ART views plantar fasciitis as a severe restriction of soft tissue that inhibits biomechanical movements. These constraints restrict the translation of tissues and influence the biomechanics of the entire body. ART to restore the free and unimpeded movement of all soft tissues and to restore optimum texture, resilience and soft tissue function.

ART can exert the stretching effect and release the restriction of scar tissue, increase blood circulation, range of motion and foot becomes less tender. Patients can actually stand comfortably on their feet. It has been hypothesized that ART can exert its effect by releasing restrictions on adhesions and scar tissue. James W. George et al evaluates the effects of ART on hamstring flexibility. Twenty male participants were received ART for 4 consecutive days. The results showed that the active release method increases the flexibility of hamstring.

The results of the study, consistent with the other study conducted by Andrew L. Miners et al 2011, described the subjective pain and functional improvements of a patient with chronic Achilles tendinopathy following a specific treatment plan. They found that a specific protocol of soft tissue mobilization using Graston Technique, ART and exercises, appeared to facilitate a rapid and complete recovery from chronic Achilles tendinopathy.

MFR has been shown to boost the proliferation of fibroblast, resulting in collagen synthesis that can
encourage healing of plantar fasciitis by replacing degenerative tissue with stronger and more functional tissue. Hence this technique is proposed to act as a catalyst in the resolution of plantar fasciitis.8

This stress and movement cause minor damage to normal tissues, leading to the release of inflammatory chemicals such as histamine and bradykinin. These chemicals will affect the local circulation and the nocicpetors18. It has been hypothesized that MFR can exert through lengthens and softens the fascia. Sumankuhar et al19, determined the effectiveness of myofascial release in the treatment of plantar fasciitis and found that MFR techniques are significant changes in pain reduction and improvement of functional activity.

From the perspective of the previous study, there is only one study available which investigated the comparative effects of ART and MFR techniques. The resulting outcome supports the hypothesis of the Kage V7. They investigated the effect of ART and MFR on subjects with plantar fasciitis and found that the ART and MFR together with conventional treatment are more effective in reducing pain and improving functional ability in patients with plantar fasciitis.

**Limitation and Recommendation:** The small sample size affects the validity of outcomes, therefore care should be taken to generalize these outcomes to a broader population. This study can be extended by separating patients by age and sex, and can be conducted to determine the long effect of ART and MFR.

**Conclusion**

The study concluded that both the Active release technique and the Myofascial release technique are effective in reducing pain and improving functional performance in patients with plantar fasciitis. However, the pain reduction in the Active release technique group is significantly higher than in the Myofacial release technique group, but the functional performance shows similar effects in both groups.

**Ethical Clearance:** Taken from Departmental Research Committee (PMR/DRC-6/2018).

**Source of Funding:** Self

**Conflict of Interest:** Nil.

**References**


Patient Expectation Survey: An Adjunct to Successful Delivery and Reception of Health Care Services

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Abstract

Objective: To know the expectation of a consumer population group of a dental hospital, and the preferences of patients while availing hospital services.

Methodology: A cross-sectional, pilot patient expectation survey (PES) was conducted using closed ended questionnaire among a Malaysian dental student population (N=317), studying in India, not yet exposed the clinical phase of dentistry, and not having referred to a dental hospital OPD. Results were statistically analysed for descriptive analysis.

Results: This study identifies expectations of study population when visiting a dental hospital, which may or may not be anticipated by the dentists, thus emphasising the importance of market research by way of PES. The results indicate significance of sensitizing clinician to patient expectations, to ensure success of private practice and institutional programmes.

Conclusion: It would be beneficial to use a PES to plan the same and sensitize physicians about expectations of patients, to ensure a higher chance of patient satisfaction. PES is a cost-effective method leading to evidence-based and rational use of scarce resources. Implementation of results of PES can become an essential motivation for patients to seek routine check-ups and treatment.

Keywords: PES, Patient satisfaction, healthcare market, health programmes.

Introduction

A paradigm shift is taking place in the healthcare market. Other than clinical excellence, healthcare providers now recognise the presence of other factors which play a role in determining their success or failure. The need for market research is becoming significant in the healthcare market. It helps an organization to keep abreast with consumer taste and preferences. However, the majority of hospital administrators do not invest in marketing research or track the effectiveness of their own institution’s advertising.¹

One of the most widely used method of market research in hospital has been patient expectation surveys from in-patients, out-patients or ‘potential costumers’. In this study, patient expectation survey has been conducted on the first year Malaysian dental/medical students, with knowledge that these students are most likely to avail the dental facility provided by their university considering them the ‘potential customers’ for the university health services.

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¹0.5958/0976-5506.2019.02851.1
This study is an attempt to reinforce the importance of knowing the customers’ mind so that the resources available to the health care providers are best utilized, be it a corporate hospital or a private clinic.

**Methodology:** A cross-sectional, pilot patient expectation survey was conducted including 317 Malaysian dental and medical student population, studying in India, not yet exposed the clinical phase. A closed ended structured questionnaire was prepared according to the objectives of the study. We utilized online survey to collect responses in order to reach a wider population and respondent’s convenience.

The students who had already availed the dental hospital facility were excluded. In this case, the group would reflect a general expectation of a population having only a basic awareness or knowledge of dentistry.

Ethical Clearance for the study was obtained. Objectives of the study were briefly explained to the subjects and the confidentiality of the data was assured. Informed consent was obtained from all the participants.

Statistical analysis of the data was done using Statistical Package for Social Sciences (SPSS) version 13. Descriptive analysis was done to find the frequencies of the demographic variables and the various attributes that were questioned to the study participants. The questionnaire used is given below.

**Results**

Majority of the participants expected a waiting time of 10 – 20 minutes before being called in the consultation room and about 33 percent expected their doctor to spend about 5 – 10 minutes consulting their problems. (Figure 1 and Figure 2). Once with the doctor in the consultation room, majority of study participants expected their doctors to be polite and preferred only one nurse other than doctor and themselves. In the waiting area, majority (about 69 percent) of the participants expected sufficient seating capacity with high sanitation standards. (Table 1) More than 80 percent expected their doctors to listen to them and have a thorough discussion on the problem. About 67 percent expected their doctors to answer their questions and 68 percent did not expect their doctors to suggest a confirmatory investigation procedure. Another 58 percent expected a session on dental health / health education during their visits by the doctor (Figure 3). In addition, more than 75 percent did not expect their doctor to be a specialist as long as they are treated for their problems and they get well (Table 1).

![Figure 1: Waiting Time in Doctors Clinic](image-url)
Figure 2: Consultation time with doctor in percentage

Table 1: Some attributes expected by patients from their doctors

<table>
<thead>
<tr>
<th>Attributes</th>
<th>%, (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Attitude and behavior of the doctor</strong></td>
<td></td>
</tr>
<tr>
<td>I expect my doctor to be Polite</td>
<td>83.91 (266)</td>
</tr>
<tr>
<td>Attitude of doctor doesn’t matter</td>
<td>12.6 (40)</td>
</tr>
<tr>
<td>Its ok if the doctor is rude and uncaring</td>
<td>3.4 (11)</td>
</tr>
<tr>
<td><strong>How many personnel do you expect in consultation room</strong></td>
<td></td>
</tr>
<tr>
<td>Doctor and me (patient)</td>
<td>28.07 (89)</td>
</tr>
<tr>
<td>Doctor, patient and Nurse</td>
<td>59.93 (190)</td>
</tr>
<tr>
<td>Doctor, Patient, Nurse and other patients</td>
<td>12 (56)</td>
</tr>
<tr>
<td><strong>Facilities for patients in waiting room/area</strong></td>
<td></td>
</tr>
<tr>
<td>Standing Space (drinking water, toilet)</td>
<td>12.9 (41)</td>
</tr>
<tr>
<td>Sufficient seating with high sanitation</td>
<td>69.4 (220)</td>
</tr>
<tr>
<td>These are not important</td>
<td>17.6 (56)</td>
</tr>
<tr>
<td><strong>Doctors Qualification</strong></td>
<td></td>
</tr>
<tr>
<td>Specialist only</td>
<td>17.3 (55)</td>
</tr>
<tr>
<td>May not be specialist (as long as I am treated)</td>
<td>76 (241)</td>
</tr>
<tr>
<td>Degree doesn’t matter</td>
<td>6.6 (21)</td>
</tr>
</tbody>
</table>
Discussion

Patient Expectation Survey (PES) is one of the Market Research tools helpful in addressing decisions related to the delivery of hospital services. This could be an initial marketing activity of an upcoming hospital or could also be an on-going process for improvement, or in response to a certain problem being faced by the hospital.

Relation between patient expectation and patient satisfaction: Zemencuk et al\(^2\) have concluded that unmet expectations of the patients are associated with patient dissatisfaction.

Bedi et al\(^3\) explain this relationship using Expectancy-Disconfirmation Paradigm Model. They explain that if patients are viewed as consumers, a consumer model such as Expectancy- Disconfirmation model from marketing theories can be applied to healthcare provision. In this model, the assumption is that patients have expectations when they visit a hospital. These expectations arise from prior experience or word-of-mouth communication, third party information or cultural milieu. The degree to which these expectations are fulfilled can be measured and there is a relationship. The higher the perceived fulfilment of expectation is higher is the satisfaction. When fulfilment is lower than expectation, the lesser is the satisfaction. When expectations are low, they are easily fulfilled and satisfaction level is kept high and vice versa.

Disconfirmation of pre-consumption expectations is the key influence on consumer satisfaction.\(^4\)

- Positive disconfirmation: performances exceed expectations
- Negative disconfirmation: expectations are not met

Linder et al\(^5\) examined determinants of patient satisfaction and found that patient expectations were most important in determining patient satisfaction.

The economics of patient satisfaction: Basinsky et al\(^6\) suggest that the focus on quality has intensified because of the concern that health care is costly, may sometimes be dispensed inappropriately and inequitably. Friar B\(^7\) has suggested that just a 1% increase in satisfaction can produce up to a 3% increase in market capitalization.

The present study reveals that the expected waiting time is more and consultation time less. This is contrary to the usual belief. Most patients were found to expect dentists to listen to their problems and answer their questions. Management should sensitize doctors about patient expectations, which if heeded to, can improve the situation without any additional input in terms of resources.
58% of patients expected dentists to give them health education. This needs to be communicated to the doctors, as to how important it may be to patients and how it can positively affect patients’ psyche, resulting in higher satisfaction and better compliance to advise of doctor.

Nowadays, modern medicine is increasingly relying upon investigations and public have come to judge services by investigations asked for. In the present study 68% patients expect doctors to request investigations. Here doctors cannot be expected to order investigations just as patients expect, rather this information can be communicated to the doctor who in turn, can explain to patients why investigations are/ are not required. This will ease the anxiety of patients and result in better compliance with advice and result in improved satisfaction.

84% of patients expect doctors to be polite. If doctors are not perceived to be polite this can be a significant dissatisfied. Doctors especially in biggerset ups need to be counselled and sensitized on this account.

Nowadays public is highly discerning and they expect hospitals to provide clean and hygienic environment with adequate civic amenities. In our study 69% of patients were shown to expect sufficient seating arrangements with drinking water and toilets with high sanitation level. As our hospitals/ clinics often lack these, patients feel dissatisfied. Health care professionals need to take regular measures to upgrade facilities and match expectations.

Specialist care has become a norm in contemporary health care world. However, in our study 76% patients do not prefer a specialist as long as they are getting a good treatment.

Privacy and confidentiality are important to patients and they would certainly prefer not to have any third person in the consultation room. Almost 60% of the patients want only doctor and nurse to be present during consultation. One could recommend that whosoever is present with the physician in the consultation room, should try to contribute and support the consultation process. This may result in more acceptability of the concerned person during the consultation process. We recommend more work in this area, since it is identified as a source of dissatisfaction for the patients. It appears that the cost of care is not a major issue for the patients. The reason may be that they are getting service of similar quality at a higher cost outside. This issue needs further research. Additionally, the present study indicates the expectation of a Malaysian population group. These results cannot be generalized. Patient expectation depends upon a milieu of cultural, social and personal factors and hence each locale requires a separate PES.

Conclusion: This study identifies the various expectations from general public when they visit a dental hospital. This may or may not be anticipated by the dentists. It is always important to be in touch with what the target population expects, right through the trivial details, even using open ended questions. Sometimes it could be very small issues, which may not even require financial aid that may lead to satisfaction or dissatisfaction of patients. Moreover, the knowledge of the expectations of target population may also help the hospital direct its marketing strategy. Patient expectation survey can be considered as a pro-active marketing activity designed to have a better chance at achieving patient satisfaction. It would be beneficial to use a patient expectation survey to plan outpatient services and sensitize physicians about expectations of patients, to ensure a higher chance of patient satisfaction. Such an approach has also been found to be a cost-effective method for reaching large markets. Patient expectation surveys will lead to a evidence-based and rational use of scarce resources. However, it would be best to use such a patient expectation survey in conjunction with a patient satisfaction survey to complete the ‘before’ and ‘after’ picture. It can reasonably be concluded that in the current competitive healthcare scenario, patient satisfaction surveys in respect of a particular service can be an important market information and research tool in the hands of contemporary hospital administrators.

Conflict of Interest: There were no conflicts of interest.

Source of Funding: Self

Ethical Clearance: Kusturba Hospital (KH)

References


A Feasibility Study of Skill Transfer to Female Health Worker in Screening of Cervical Cancer and Breast Cancer

Radhika Joshi¹, Asha K. Pratinidhi², Vaishali Vhawal¹, Pandurang Chougule³, Sujata Kanetkar⁴, Sunita Tata⁵, Satish Kakade²

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Abstract

Screening is possible for cancer of cervix and breast which are the first two commonest cancers in women. Trained nurses know how to carry out vaginal examination hence there is a possibility of training them VIA, VILI and taking of PAP smears. Theoretically CBE can be taught to them so that any woman coming to the PHC for any reason can be screened for these two cancer sites. A study was therefore planned to find out feasibility of skill transfer of screening of cancer cervix and cancer breast. Thirty nine nurses were from KIMS and 8 from randomly selected 4 PHCs. After orientation in first session 12 hands on training sessions were taken. Two nurses were trained at a time. The technique and the lesions were demonstrated with the A. V. aids. After first three hands on training sessions, the trainee nurses were instructed to undertake screening on their own between two hands on training sessions. All suspected cases were called again on weekly training days for confirmation of findings of nursing staff. A theory and practical examination were undertaken at the end of the training. Thirty eight out of 39 nurses attended all the training sessions and could master the skill of screening the women for cancer cervix by VIA, VILI and could take PAP smear by the spatula as well as CBE. Nurses scored more than 50% marks with min. 57% and max. 78%. Difficulties encountered in the training like obtaining acetic acid and Lugol’s iodine at PHCs needs to be addressed. It is possible to do skill transfer for VIA, VILI and taking of PAP smears as well as CBE to nurses by 12 hands on training sessions. If nurses are trained in this way they can start opportunistic screening of the women visiting PHCs regularly in the PHCs in rural area and hospitals in urban area.

Keywords: Cervix Cancer, Breast Cancer, Clinical Breast Examination.

Introduction

Cancer of breast and cervix rank first and second and are very important public health problems in women above 30 years of age. Together they are responsible for more than 80% morbidity due to female cancers in India and the case fatality rate is very high due to late diagnosis of the disease[¹, ²]. Screening for both cervical cancer[³] and breast cancer[⁴] is possible by Visual Inspection after application of Acetic Acid (VIA), Visual Inspection after application of Lugol’s Iodine (VILI), Pap smear, HPV testing and Clinical Breast Examination (CBE), mammography and ultrasonography respectively. About 70% population in India is still residing in rural areas where all screening facilities are not readily available. Auxiliary Nurse Midwives (ANMs) are posted in the Primary Health Centre (PHCs) and are routinely conducting normal deliveries. Thus theoretically nurses working in hospitals and ANMs working at PHCs can be taught the skill of VIA, VILI and taking of Pap smear. They can also be taught the CBE of Women.

Nursing students are taught vaginal examination and conduction of normal labor. Since facilities for mammography, ultrasonography and HPV testing are not available in all hospitals and also in rural areas, VIA/VILI, Pap smear and CBE are the only possible alternatives for screening of cancer cervix and cancer breast.

These screening procedures can be made available to the rural women with the skill transfer to the ANMs for early diagnosis and better prognosis due to that.
A project was therefore undertaken at Krishna Institute of Medical Sciences “Deemed to be University” (KIMSDU) to find out feasibility of skill transfer of screening of cancer cervix by VIA, VILI and PAP smear and screening of breast cancer by CBE.

**Material and Method**

The training of nurses was undertaken from November 2014 to October 2015. Out of 38 nurses, 19 were GNMs, 17 were ANMs and 2 were BSc nursing category, 31 were working at Krishna Hospital (KH) Karad and 8 were from randomly selected four PHCs from Karad Taluka. Qualified staff members from Department of Surgery and Department of Obstetrics and Gynecology taught the nurses in clinical examination of breast and visual inspection after application of 5% acetic acid and visual inspection after application of Lugol’s iodine as well as taking pap smears. After orientation and theoretical training for one day the nurses were given hands on training once a week for 12 weeks. The training sessions were arranged in KH for those nurses working in KH and at PHCs for those who were working at PHCs. The hands on training sessions were undertaken for two trainee nurses at a time, once in a week. During first three hands on training sessions the trainees were demonstrated the standard procedures of VIA, VILI, taking PAP smears\(^5\) and CBE\(^6\) and shown the lesions. A careful and detailed CBE included inspection of both breasts in three position namely; I) with arm raised over the head, II) partial sitting and leaning forward, and III) sitting with hands pressed on the waist; followed by palpation of breast and auxillary lymph nodes. After maintaining privacy, the patients were undressed to the waist examined in good light and facing the examiner. The lesions of both cervix and breast were shown with help of audio visual aids and the features distinguishing positive lesions from negative lesions were explained.

The trainees were given the hand outs and images of various lesions. During fourth training session, the nurses were made to carry out screening procedures for Ca breast and Ca cervix and the teachers corrected if there were any problems and ensured that the trainees had mastered the screening procedures and learnt the commonly seen lesions on the cervix and commonly encountered presentations of cancer breast. The trainees were now encouraged to carry out screening of breast cancer and cervical cancer on their own during the interval of two hands on training sessions and call all women having positive screening test on the day of hands on training for confirmation of their findings by the specialist. The theory and practical examinations were held at the end of the training for all nurses.

Informed consent of all women screened and all nurses participating in the study was obtained and Institutional Ethics Committee (IEC) clearance was taken before commencement of the project work. After theory and practical examinations, marks were given by the examiners appointed from gynecology and surgery specialty. The project was financially supported from intramural funds of KIMSDU.

**Results**

It was observed that all 38 out of 39 nurses regularly attended the training sessions and were keenly interested in learning the CBE and VIA, VILI and taking of PAP smears. It required some motivation to start screening women on their own after initial four sessions. But once started they did it nicely. On an average 10 to 15 women were screened by the trainees in between two training sessions.

For the theory examination, all the nurses got passing marks above 50%. The mean score was 69.5 ± 5.1 and minimum of 57 and maximum of 78. The performance of nurses from hospitals and PHCs was comparable.

Some students were eager and confident to learn but some were not confident. We convinced them that it is not difficult and motivated them to learn. There was some variation in the learning ability of the trainees.

During training sessions on CBE, it was observed that some nurses learnt the technique of CBE fast. Those who had problem with learning CBE were shy; less confident and less motivated. With repeated sessions and convincing them that they can do it, it was possible to transfer the skill of CBE to them. At the end of four sessions, all the nurses were comfortable and acquired the skill of inspection in all the three positions and palpation of breast as well as axillary lymph nodes. It was generally seen that the nurses were able to expose cervix well using Cusco’s speculum, apply 5% acetic acid, and inspect the cervix for the white patches showing abnormal areas. Then they could apply Lugol’s Iodine and do visual inspection for mohogyony brown stain taken up by the normal tissue against which the unstained area of affected region could be seen as pale yellow or saffron yellow areas. It was observed that it was difficult for the nurses to work alone but in pairs they were able...
to carry out the screening very effectively as the helper would hand over the material and do documentation.

**Discussion**

Cocron review\(^7\) on Self Breast Examination (SBE) has revealed that SBE has no impact on cancer mortality. There can be poor compliance with follow up and increased number of biopsies performed on benign lesions so at present screening by SBE is not recommended. Clinical Breast Examination (CBE) needs careful attention to technique and thoroughness. No trials are available for comparing CBE alone to no screening but Canadian National Breast Screening study-2 (CNBSS-2) included randomized screening of 39405 women aged 50 to 59 years into two groups. Group one was CBE alone and the second group was CBE with mammography. No mortality advantage was seen when mammography was added to an annual standardized 10- to 15- minute breast examination implying that careful, detailed, annual CBE may be as effective as a mammography screening programme. Clinicians who spend 3 minutes per breast and use proper technique have better sensitivity and specificity than those who do not. The American college of Obstetricians and Gynecologist recommended both SBE and CBE.

VIA and VILI are simple and efficient screening tests have low cost and high sensitivity in comparison to Pap smear. Hence, VIA and VILI can be used as an alternative screening modalities for cervical cancer in low resource setting like India\(^8-9\). The sensitivity of cytology increased significantly when combined with VIA or VILI\(^3\).

**Opportunistic Screening:** National Program for Prevention and Control of Cancer, Diabetes, CVD and Stroke (NPCDCS) \(^10\) has two components first relates to cancer and second relates to the rest of the diseases. There is now emphasis on optimization of scarce resources and provision of seamless services to the end customer and also ensuring long term sustain ability of the interventions. Screening by the ANMs at PHCs for the rural population and nurses working at hospital for urban population is feasible and should be included in the programme. Referral of suspected cases to appropriate institutions for further case management can be considered as a sustainable long term intervention for down staging of cancer there by improving the prognosis and healthy survival of patient.

Any patient attending OPD at a hospital or at a PHC for some complaint not related to cancer cervix or breast like relative accompanying patient, visitors coming to meet the in patient person, mother bringing their children for some complaints, can be screened. All women above 30 can be offered organized opportunistic screening.

It is possible to do skill transfer for VIA and VILI as well as CBE to nurses by 12 hands on training sessions. If nurses are trained in this way they can start screening the women visiting PHCs regularly as opportunistic screening in the PHCs in rural area and hospitals in urban area.

There is a possibility of all medical colleges developing hands on training course for screening of carcinoma cervix and carcinoma breast at district level. By including these screening procedures as a curricular activity of training for ANMs, GNMs and B. Sc nursing students, all nursing students graduating now onwards will be able to undertake screening tests of VIA, VILI, taking of PAP smears and CBE for screening the women for cancer cervix and cancer breast.

Government of India – is now giving emphasis on NCDs including cancers. The treatment is supported for the poor under Rajiv Gandhi Yojana. By the time the diagnosis is made it is often too late. So down staging of both important sites of cancers namely carcinoma cervix and carcinoma breast is possible by opportunistic screening\(^11,12\) in all small and big hospital for the urban population and in PHCs for the rural population if specific skill transfer programme is undertaken for already trained nurses.

It is thus possible to have screening of cancer cervix and breast as a routine activity on fixed days of week in rural and urban areas just like ANC or immunization.

**Ethical Clearance:** The study was approved by Institutional Ethics Committee of Krishna Institute of Medical Sciences “Deemed to be University”, Karad dated on 17.01.2014

**Source of Funding:** Intramural funds of Krishna Institute of Medical Sciences “Deemed to be University”, Karad

**Conflict of Interest:** Nil
References


Immediate Effect of Post Deep Neck Flexors Endurance Test on Neck Reposition Accuracy in Smartphone Addictors

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Abstract

Background: Neck reposition accuracy is the ability of the person to return to the specific starting point after a particular neck movement. Neck reposition accuracy error is a common issue in modern society but the sources of its development can be divers.

According to many researchers, along lasting neck reposition related errors disorganise different nerve conduction leading to muscle tone abnormalities around the neck and occiput, hence affecting the proprioceptive sensibility in the neck and cervical spine at large as well as eliciting associated musculoskeletal complaints.

The purpose of this study was to evaluate the immediate effect of Deep Neck Flexors endurance test on neck reposition accuracy.

Method and Procedures: A total of 30 subjects, age group 18-30 years and smart phone users at SRM Institute of science and technology, SRM College of physiotherapy, Kattankulathur.

Smart phone addiction scale (SAS) was used to assess the smartphone usage level, along with isometric neck endurance test, to assess immediate effects on the repositioning of the neck accuracy. Additionally a special gyro motion sensor device was used to assess the accuracy of neck repositioning before and after exercise/Test.

Outcome measures: SAS (Smartphone addiction scale) and gyroscope special device.

Results & Conclusion: Results showed a significant difference in head reposition errors after performing the endurance test with a P value less than .001 (p<.001) and a negative correlation between holding time during the test (Deep Neck flexors endurance test)

Keywords: Neck reposition accuracy; Neck Proprioception; Deep neck flexors endurance test.

Introduction

Neck neuromusculoskeletal disorders in the modern society is increasingly affecting individuals in different age groups, but the sources of its enlargement can be numerous and to various degrees which can mostly lead to different serious conditions.¹

Kim et, al (2015), introduced that the modern society is developing musculoskeletal disorders due to computers and smartphone usage. The prolonged usage of smart phone usage and computers are associated with weakness of muscles and Forward head posture. The authors continues positing that the deep neck muscles plays a crucial role in maintaining the neck in neutral posture and that are affected easily by the slouched posture.¹³

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The use of electronic movement and sensors is increasing worldwide in the field of medicine. This can be explained by the fact that some devices are being designed to sense human movement in research and fall prevention programs in elderly. However, few studies have attempted to do research on their role in quantifying vital statistics. 10, 11

According to numerous researchers, long-lasting neck pain interrupts afferent nerve conduction prolonging the abnormal muscle tone of the neck and the occiput, shoulder girdle and the neck, hence unfavourably impacting the proprioceptive sensibility in the cervical spine and pain which can be acute, sub-acute or chronic or functionally disabling, depending on the duration. Different manipulative therapies and other techniques have been shown to improve function and independency to the patient.1-3

It was frequently noted by researchers in the past years that different neck structures dysfunctioning including sub occipital, deep neck flexors and mechanoreceptors have proven to impact proprioception in various patients.4

According to Revel et al. introduced the method of evaluating the ability of repositioning to the original starting position which he stated that it is dependent to cervical cephalic kinaesthetic sensibility.6,5

Proprioceptive sensibility along with the vestibular apparatus governs the information that lead the head to move and reposition accurately in relation to the trunk.7

But in a recent study by Pinsault et al. stated that vestibular is not responsible for head repositioning test hence supporting his test as cervical proprioceptive acuity. Where he finally noted that impaired cervical kinaesthetic sensibility is linked to various complaints that mostly lead to devastating problems including degenerative conditions, chronic pains, instability and disability.8

Although neck pain and instability can lead to a proprioceptive dysfunction, there is no consensus and a concrete literature to find out which standardized test for cephalic repositioning accuracy as well as homogenous results. It is with this regard that Strimpacos et al. concluded in his study that researchers have not yet come up with a reliable tests and measures as well as conclusive literature. [9]

**Purpose of the Study:** This study intended to assess the immediate effect of post deep neck flexors isometrics endurance test on neck reposition accuracy in smartphone addictors. The main aim was to compare the strength of deep neck flexors keeping in mind the normal value differences in relation to gender differences. The test was based on the current evidence suggesting its immediate impact while relating it to smartphone addictors.

**Materials and Method**

Study setting was at SRM College of Physiotherapy for a duration of four weeks. The findings were reported in both pre and post testing along with the number of seconds and the ability to maintain the position during the test, and then compared the Smartphone Addiction Scale scores and the duration of smartphone usage per day and in years.

As the study aimed to assess effectiveness of deep neck flexors endurance test, a special electronic device that detect the change of movement (gyroscope) was used to assess the initial position of the head then the subjects were instructed to perform the movement in sagittal movements of the head. In other words, the subject was instructed to fully flex the head and bring it back to the previous position.

The next step was to perform the deep neck flexors endurance test while observing the smooth performance of the subject during the test in relation to the duration of holding the chin tuck while counting the seconds spent without changing the position.

The normal duration for men is 39 seconds while for females it is 29 seconds. During the test the subject was instructed that he/she should do chin tuck and lift the head at least one inch off the couch and hold as maximum as possible.

The test was stopped when the subject was unable to hold the head in chin tuck in a given seconds in relation to gender differences, or when the subject was releasing the head towards the couch or else opening of the neck folds due to chin tuck.

Neck reposition then was reassessed by instructing again the subject to do the neck flexion to neutral position in sagittal plane movement. The device assessed the difference in error to bring back the neck to its original position.
Results

Table 1: Demonstrate the findings Pre and Post-test measurements in degrees of repositioning error

<table>
<thead>
<tr>
<th>Variables</th>
<th>Number</th>
<th>Mean</th>
<th>SD</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test Errors</td>
<td>30</td>
<td>11.5</td>
<td>5.36</td>
<td>.000</td>
</tr>
<tr>
<td>Post-test Errors</td>
<td>30</td>
<td>7.5</td>
<td>3.85</td>
<td></td>
</tr>
</tbody>
</table>

The findings from this study reported the improved accuracy after exercises from 11.5±5.36° to 7.5 to 3.85° (Table 1) meaning that there was a visible reduced error in neck repositioning after performing deep neck isometrics endurance exercises by using paired samples test, with a confidence interval of 95%.

Discussion

Based on the findings of this study, the effects of isometrics neck endurance exercises were reported as immediate effects among smart phone addicts. The neck repositioning was improved immediately after exercises and it statistically shown a significant difference.

Similar study was done in South Korea, assessing exercises in smart phone addicts with musculoskeletal complaints and showed that shoulder retraction and protraction exercises resulted in improvement regarding pain and disability. Same findings also were reported by Vijay and colleagues in 2016, where the deep neck muscles endurance exercises improved forward head-neck posture.[14]

In a study by Kim Eun-Young et al 2015, also reported an improvement of Neck disability Index of their subjects. while comparing the deep neck flexors static exercises with McKenzie cervical exercises although they came up with no significant change while comparing the outcomes in both groups. Therefore this study aimed to evaluate the influence of only deep neck flexors on neck neuromusculoskeletal disorders.[12]

Another study done by Falla D et. al, reported that deep neck chin tuck targeted exercises for strengthening has led to strength improvement.
Conclusion

The authors concluded that isometric endurance exercises had immediate effects on neck repositioning accuracy among young smartphone addicts. However, as the results did not show a statistical significance the findings should not be generalized in other population unless proved by big well controlled studies such as RCTs and systematic reviews.

Limitations of the Study: One of the limitations of the present study is that only a cross-sectional study was used, assessing effects of neck endurance exercise test. This cross-sectional study was done with the aim to check whether there would be an immediate impact of deep neck endurance exercises among young smartphone addicts.

The other limitation of the study is that the findings couldn’t be able to confirm with confidence the effects because exercises effects may take more sessions to have a significant impact.

The authors encourage more advanced study designs like RCTs; by implementing and assessing long term effects of this exercise test in the form of treatment in all smartphone users. This was assessed only once in smartphone addicts and normally the muscle adaptation to exercises require repetition for days to weeks of training, which suggest a comparative study to ascertain this conclusion; furthermore, the electronic device used in this study (gyro sensor) has been rarely used in medical studies therefore we recommend further studies for its reliability to confirm its ability to sense various human movements.

Recommendations: Further RCTs with follow up among smartphone abusers are recommended to confirm or ascertain with our findings. Prevention and health awareness programs in the university are needed to address this global health concern about smartphone addiction and inform the targeted population on the impact of smartphone not merely on the health also on the academic performance of those students involved.

Conflict of Interest: The Authors declare that there is no any conflict of interest in this study.

Ethical Clearance: Taken from SRM College of Physiotherapy Ethical committee.

Source of Funding: Self.

Reference:
10. Zeng H and Zhao Y. Sensing Movement: Microsensors for Body Motion Measurement. Laboratory for Biomedical Microsystems, Department of Biomedical Engineering, The Ohio State University, Sensors 2011, 11, 638-660; doi:10.3390/s110100638.


Gender Dynamics in Morality of Alcohol Addict and Non-Addict Young Indian College Students

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Abstract

Background: Alcohol consumption has been associated with gender roles and symbolizes masculinity. With a paradigm shift in values and morality in the modern times, its consumption and resultant adverse consequences on health, growth, productivity, is on a steep rise not only among males but also among young females, which is a great cause of concern. Values are imbibed early in life, though, not visible, shape or style of life and modus-operandi. Some research evidences of the association of decline in morality and rising incidence of addiction among youth and its adverse socio-cultural and politico-legal consequences worldwide inspired this investigation.

Methodology: It is an ex-post facto study of 200 young college male and female students in the age group of 18-24 years.

Result: Study shows an inverse association of addiction and morality (t= - 2.646) and no gender difference in morality overall (t=.372). Further, gender wise analysis reveals a significant association of morality with addiction among male addicts (t=-3.940), but has not proved significant among young female. The significant interconnected (F=6.981) of gender and addiction in morality indicates gender dynamics in addiction and morality hypothesis.

Conclusion: India being the youngest country, with a maximum population of youth in the world by 2020, emerges as the ambassador of promoting world peace and harmony. Rising alcohol addiction and its association with low morality among Indian male youth may block it. This study suggests a need to identify its pathways to block addiction and low morality and restoring world peace and harmony.

Keywords: Morality, Substance Addiction, Gender, Young.

Introduction

Youth are the future of the nation. They shape the state and status of any country. They are the drivers of any developmental trend and activity in society and major determinants of the extent of growth and development in any given society. India is the youngest country in the world, approximately 40 per cent of the Indian population is in the age range of 13 to 35.¹ But, this demographic dividend, if not used properly, may result in demographic disaster in India.² Alcohol addiction among youth has taken the shape of the epidemic in states like Punjab, Haryana and establishing its jaws in Rajasthan and other states as well in India. Such a scenario exist worldwide. The picture is grim if we look at the world trade and statistics on the substance addiction scenario with a turnover of around $500 billion, it is the third largest business in the world, next to petroleum and arms trade. About 190 million people all over the world consume one drug or the other.³

Alcohol addiction can damage relationships, cause poor academic performance, problems with the law and
reduced overall morality.\textsuperscript{4} Alcohol dependent youth encounter difficulty in working, experience more guilt and feeling of inadequacy and dissatisfaction when they fail to meet their standards. Youth are the Ambassador of world peace and harmony and propeller of development of a country. If they are engulfed by alcohol addiction and resultant dip in the morality the future looks dismay. Owing to the severe adverse effects of alcohol addiction, it remains one of the biggest cause of concern of the new millennium.\textsuperscript{6}

Drinking behaviour has been an important way to symbolize, and regulate gender roles, by making it a symbol of masculinity which promotes alcohol consumption among male population as compared to female, however, this practice is at a steep rize among young females also.\textsuperscript{7,8} Alcohol consumption has now been associated as a symbol of modernity, social status, power (in terms of gender equality) apart from other common socio-cultural influences among young and old both.\textsuperscript{13} This may indicate a paradigm shift in values in the modern times.\textsuperscript{9} Morality is one of the core values which include principles concerning right and wrong or good and bad behavior which may differ from person to person depending on their environment, and their belief system.\textsuperscript{10} It can be instrumental in a rise or fall of not only nations but the human race.\textsuperscript{11}

Though, some studies\textsuperscript{12} rule out faulty values as a cause of addiction, other demonstrate an association of low morality with alcohol addiction\textsuperscript{12} makes the situation look grim. Therefore, its pertinent to study the gender dynamics of morality and alcohol addiction.

**Objective:** Studying gender differences in morality of addict and non-addict, college going Indian students youth.

**Material and Method**

Study design: Present study is an expost facto investigation using contrast group comparison design. The study was conducted over a short period of three months from (August to October 2017) at four private colleges of Jaipur city. This is not an intervention based research and no clinical trials on samples were conducted.

**Participants:** The study used purposive nonprobability sampling technique to select a sample of 200 college going young Indian males and females (100= Addiction and 100= non Addiction) who was attending college regularly and were regular/frequent drinkers/ non-drinkers in the age range of 18-24 years. Alcohol addicts were identified by the peer referrals. Informed consent of the participants was obtained before conducting this study and those consented to participate were included in the study. The refusal/ dropout rate of participants for different reasons was 15%.

Reason for choosing this sample for the present study: It is painful to accept that the universities and the colleges (the educational institutions) are becoming the central places for the availability, trading, experimentation, peer pressure and succumbing to alcohol and drug behavior. As youth is said to be the most vulnerable stage, who is struggling between urge of independence and lack of direction, is exposed to all kinds of temptations (risky behaviour, adventures, peer pressure etc.) are more vulnerable to fall prey to substance addiction and its consequences. The college sample, therefore, becomes the fertile grounds for this study.

Inclusion criteria:

- Young Female College going students registered as regular students who were alcohol addiction.
- Young Male College going students registered as regular students who were alcohol addiction.

Exclusion criteria

- Students who are registered as a part-time/distance education.
- Occasional drinkers.
- Students who were clinically diagnosed with some mental or physical ailment for which they were taking medical or psychiatric treatment.

Hypothesis of the Study

1. There is no significant difference in the morality of addicted and non-addicted young college students.
2. There is no significant gender difference in the morality of college students.
3. There is no significant difference of morality in addicted and non-addicted young male college students.
4. There is no significant difference in the morality of addiction and non-addiction young female college students.
5. There is no significant interaction effect of gender and addiction in morality of young college students.

**Procedure:** The present study uses the subscale of the **morality** of self-reported multi-dimensional assessment of the personality questionnaire (MAP-A) by “Sanjay Vohra”). A complete enumeration of students was done and those present at the time of study visits and giving signed consent were included in the study. Statistical Package for Social Sciences, Version 22 for Windows (SPSS 22) was used to analyze the quantitative data.

**FINDINGS OF THE PRESENT STUDY**

### Table 1: Mean, SD comparison of morality among addiction and non-addiction young males and female college students.

<table>
<thead>
<tr>
<th>Addiction Non Addict</th>
<th>Male/ Female</th>
<th>Mean Morality Score</th>
<th>Std. Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Addict</td>
<td>Male</td>
<td>1.37</td>
<td>1.455</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>1.84</td>
<td>1.573</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>1.60</td>
<td>1.524</td>
<td>100</td>
</tr>
<tr>
<td>Non Addict</td>
<td>Male</td>
<td>2.48</td>
<td>1.374</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>1.84</td>
<td>1.503</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>2.16</td>
<td>1.468</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>Male</td>
<td>1.92</td>
<td>1.514</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>1.84</td>
<td>1.530</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>1.88</td>
<td>1.519</td>
<td>200</td>
</tr>
</tbody>
</table>

### Table 2 t-value, level of significance of morality among addict and non- addict male and female college students.

<table>
<thead>
<tr>
<th>Addiction Non Addict</th>
<th>‘t’</th>
<th>“df”</th>
<th>‘p’</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypothesis- I</td>
<td>-2.646</td>
<td>198</td>
<td>.009</td>
</tr>
<tr>
<td>Hypothesis- II</td>
<td>.372</td>
<td>198</td>
<td>.711</td>
</tr>
<tr>
<td>Hypothesis- III</td>
<td>-3.940</td>
<td>98</td>
<td>.000</td>
</tr>
<tr>
<td>Hypothesis- IV</td>
<td>.000</td>
<td>98</td>
<td>1.000</td>
</tr>
</tbody>
</table>

### Table 3 Interaction effect of gender and addiction in morality among young college students

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of Squares</th>
<th>“df”</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Model</td>
<td>31.305</td>
<td>3</td>
<td>10.435</td>
<td>4.781</td>
<td>.003</td>
</tr>
<tr>
<td>Intercept</td>
<td>708.485</td>
<td>1</td>
<td>708.485</td>
<td>324.586</td>
<td>.000</td>
</tr>
<tr>
<td>ADNDT</td>
<td>15.418</td>
<td>1</td>
<td>15.418</td>
<td>7.064</td>
<td>.009</td>
</tr>
<tr>
<td>MF</td>
<td>.386</td>
<td>1</td>
<td>.386</td>
<td>.177</td>
<td>.674</td>
</tr>
<tr>
<td>ADNDT * MF</td>
<td>15.237</td>
<td>1</td>
<td>15.237</td>
<td>6.981</td>
<td>.009</td>
</tr>
</tbody>
</table>

**Discussion**

Alcohol addiction is a major cause as well as an effect of many problems in our society and morality, though intangible, but deep rooted is associated with it. Attempting to know the underlying causes and pathways of the development of these problems is a pertinent route of investigation. [Table.1] shows the descriptive statistics (mean and SD) for comparison of morality among addiction and non-addiction young males and female college students. Significant difference in morality between the addict and non-addict, college students (t = -2.646, df=198, p=.09) [Table.2] of the present study does not confirm the first hypothesis and reveals a significant association between low morality and alcohol consumption. Insignificant difference in the scores of morality, of male and female college students. (t = .372, df=198, p=.711)[Table.2] confirms the second null hypothesis. Studying morality only among young males, significantly low morality scores of addict males in comparison to non-addict young males does not confirm the third null hypothesis (t = -3.940, df=98, p=.000). [Table.2], whereas, insignificant difference in morality of addict and non-addict female (t = .000, df=98, p=1.000) confirms the forth null hypothesis. Further, [Table.3] reveals a significant interaction effect (F=6.981, df=1, p=.009) of gender and addiction on morality which does not confirm the fifth hypothesis of the present study.

Present study reveals that among young females, alcohol addiction is not associated with morality but it is significantly associated in addicted male population scoring significantly low on morality. It is interesting to note that non addict males score significantly higher on morality than non-addict females, but addicts males score significantly lower on scale of morality than addict.
females. It reveals that morality seems to follow different pathways among male and female addicts. These results confirm the argument that young female revert to alcohol for social affiliation, assertion of parity in social norms and competing for masculinity (compensation for femininity and inferiority according to Aderian school of thought,\textsuperscript{14} whereas, among young males it is associated with compromising with morality. Therefore, understanding the association of addiction and morality and how it is going to affect them, gender dynamics need to be considered. The society puts greater burden of morality on female alcohol addicts than male alcohol addicts. The present study refutes the common sense notion that low moral values are encouraging female college students to alcohol addiction. Although, the value deterioration and effacement of values in modern times is universal among both among males and females, and there is a steep rise in female alcohol addiction in recent past, however, such paradigm shift in value of morality is not associated with alcohol addiction in female as the case with the male population. Modern women find drinking alcohol morally and ethically correct. An increased autonomy and exposure to wider professional opportunities among women are growing and consuming alcohol seem to enhance as an expression of power and freedom without realizing how and when they become habitual drinkers. In western societies gender differences in drinking behaviour are already shrinking.\textsuperscript{15} However, ruling out low morality as a cause of rising incidences of alcohol addiction among women raises the concern of disturbing social order, run the risk of losing a powerful social weapon of moral responsibility as a check against drinking practices and deterrent factor in recovery from addiction among young female.\textsuperscript{16} Spiritual and religious practices and social and moral values serve as the guidance yardsticks for people themselves, their children and society as a whole.\textsuperscript{17} Specially, in India, this burden is greater for women owing to greater responsibility she bears in home making and raising their children.

Alcohol addiction being epidemic among male college students and is associated with the morality, it reflects that morality in addicted youth male is also at a point of decline. Looking at the broader scenario, youth is heading towards a double damage of suffering the disadvantages of alcohol addiction, which may reduce their will power and power of critical thinking\textsuperscript{18} and lowered morality may tempt them to take wrong decisions and indulge in immoral practices which would be harmful to their personal and professional life and would be damaging to the image of the nation. It is to be further ascertaining the direction of the association of alcohol and morality (if addiction lowers morality or low morality promotes alcohol addiction among male college students\textsuperscript{7}). We need to look for other factors responsible for rising incidences of alcohol addiction among female young college students than morality because it does not explain their alcohol addiction behavior.

**Conclusion:**

The present study suggests different gender dynamics to understand alcohol addiction and morality. Steep rise of alcohol addiction and decline morality among male Indian youth suggests that India with a maximum population of youth in the world by 2020, shall incur maximum threat and losses and bears vital responsibility in restoring peace and harmony in the world.

**Conflict of Interest:** The authors declare no conflict of interests.

**Ethical Clearance:** This is not an intervention based research and no clinical trials on samples were conducted. Informed consent was taken from the participants.

**Source of Funding:** Self

**References:**


Role of Ultrasound in the Characterization of Thyroid Nodule in Correlation with Fine Needle Aspiration Cytology

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Abstract

Nodular thyroid disease are a very common clinical finding, with an estimated prevalence on the basis of palpation that ranges from 3% to 7%. High resolution Ultrasonography (USG) is the most sensitive test to detect thyroid lesions. USG can identify thyroid nodules that have been missed on physical examination, isotope scanning and other imaging techniques. Fine Needle Aspiration Cytology (FNAC) is the gold standard diagnostic investigation for the thyroid nodules. USG of thyroid gland was performed in 70 patients with clinically detected thyroid nodule, in our study, over a period of 18 months, using USG with Color Doppler in GE VOLUMON S6 PRO and PHILIPS Affinity 30 with linear array transducer of 7-9 megahertz frequency. Ultrasonographic findings relevant to benign and malignant thyroid nodules were recorded and compared with fine needle aspiration cytology reports. Out of total 70 cases 64 cases (91%) were diagnosed as benign and 6 cases (9%) as malignant on Ultrasonogram (USG). Whereas in FNAC, 63 cases (90%) were diagnosed as benign and 7 cases (10%) as malignant. In this study, it was found that sensitivity for detecting thyroid malignancy on USG is 85.7%. The positive predictive value for detecting thyroid malignancy on ultrasound is 100%.

Keywords: Nodular thyroid; USG, FNAC, Sensitivity; Positive predictive value.

Introduction

The thyroid gland is unique and largest among all endocrine glands. Nodular thyroid disease is a very common clinical finding, with an estimated prevalence on the basis of palpation is 3% to 7%.¹ In a large population study (in Framingham, Massachusetts), clinically apparent thyroid nodules were present in 6.4% of women and 1.5% of men.² During the past two decades, due to the widespread use of ultrasonography (USG) for evaluation of thyroid and neck disease there is significant increase in the prevalence of clinically non-palpable thyroid nodules, calculated to be 20% to 76% in the general population. This caused an epidemic of thyroid nodules and the prevalence is same as that of autopsy data in 50% patients with no previous history of thyroid disease.³ ⁵ Thyroid nodules are more common in elderly persons and in women than in men. Malignant thyroid lesions constitute approximately 5% of all thyroid nodules, independent of their size.⁶⁻⁷ There is considerable dilemma over whether clinically undetectable thyroid lesions should be assessed by fine needle aspiration cytology (FNA).⁷ ⁸ The dilemma is due to uncertainty about the occurrence of malignancy in small thyroid lesions and also due to uncertain natural course of thyroid microcarcinomas.⁹⁻¹⁴ High-resolution USG has maximum sensitivity to detect thyroid lesions. USG can detect thyroid nodules which are missed on physical examination, isotope scanning and other imaging techniques.¹⁵ Characterization of thyroid nodules into benign and malignant nodules by USG, helps in taking decision whether to go for FNAC and also to plan further management of the patients accordingly. In this study, we have tried to find out the efficacy of USG in the evaluation of thyroid nodules.

Aims and Objectives of the Study:

1. To study the gray scale ultrasonographic features in patients presenting with thyroid nodules of different pathology.
2. To study the accuracy of gray scale and color doppler ultrasonographic features in differentiating benign from malignant thyroid nodule.

3. Correlation of ultrasonography with that of FNAC findings in differentiating benign from malignant thyroid nodules.

**Materials and Method**

Cross sectional study was done from September 2017 to May 2019 and based on inclusion and exclusion criteria, total 70 patients clinically suspected to have thyroid lesions, were undergone Ultrasonography (USG) in the Department of Radio diagnosis KIMS & PBM Hospital, Bhubaneswar, Odisha. All the patients were undergone fine needle aspiration for confirmation of ultrasound findings and establishment of final diagnosis after taking consent from them. Slides were sent to the Department of Pathology, KIMS & PBM Hospital for cytological analysis. Any history of receiving radioactive iodine in the past, any history of thyroid surgery in the past and swelling in the neck other than thyroid gland were excluded in this study. USG machine used was GE Voluson S6 with a 10 MHz linear probe. Mode of USG is B mode gray scale real time ultrasound and color doppler.

**Results**

Maximum number of 30 cases were found in the age group 31 – 40 and minimum of 3 cases were in age group 11 –20. Maximum number of cases were found to be females i.e. 49 patients(70%) and minimum number were male i.e. 21 patients (30%).

Most of the patients i.e. 42 (60%) cases showed a single nodule, 27.1% cases multiple nodules and 12.9% cases diffuse pattern. Maximum number of malignant nodules 5 out of 7 nodules (71.4%) were single.

**Table-1: Distribution of nodules according to echogenicity**

<table>
<thead>
<tr>
<th>Echogenicity</th>
<th>No of cases</th>
<th>Benign (n=63 and%)</th>
<th>Malignant (n=7 and%)</th>
<th>Percentage of total cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isoechoic</td>
<td>20</td>
<td>20 (31.8%)</td>
<td>0</td>
<td>28.6</td>
</tr>
<tr>
<td>Hyperechoic</td>
<td>06</td>
<td>06(9.5%)</td>
<td>0</td>
<td>08.6</td>
</tr>
<tr>
<td>Hypoechoic</td>
<td>22</td>
<td>16 (25.4%)</td>
<td>06 (85.7%)</td>
<td>31.4</td>
</tr>
<tr>
<td>Heterogeneous</td>
<td>13</td>
<td>12 (19.1%)</td>
<td>01 (14.3%)</td>
<td>18.6</td>
</tr>
<tr>
<td>Anechoic cyst</td>
<td>05</td>
<td>05 (7.9%)</td>
<td>0</td>
<td>7.1</td>
</tr>
<tr>
<td>Heterogeneous with cystic changes</td>
<td>04</td>
<td>04(6.3%)</td>
<td>0</td>
<td>5.7</td>
</tr>
<tr>
<td>Total</td>
<td>70</td>
<td>63</td>
<td>07</td>
<td>100</td>
</tr>
</tbody>
</table>

22 cases (31.4%), showed hypoechoic nodules and in 4 cases (5.7%) heterogeneous with cystic changes. 6 out of 7 (85.7%) malignant cases nodules were hypo echoic. [Table-1]

10 out of 70(14.3%) cases showed calcifications. Micro calcification was seen in 6 (8.6%) patients and macro calcification in 4 (5.7%) patients. All the thyroid nodules with microcalcifications were malignant.

**Table 2: Distribution of nodules according to halo**

<table>
<thead>
<tr>
<th>Halo</th>
<th>No of cases</th>
<th>Benign (n=63 and%)</th>
<th>Malignant (n=7 and%)</th>
<th>Percentage of total cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thin halo</td>
<td>31</td>
<td>31 (49.2%)</td>
<td>0</td>
<td>44.3</td>
</tr>
<tr>
<td>Thick incomplete halo</td>
<td>13</td>
<td>09 (14.3%)</td>
<td>04 (57.1%)</td>
<td>18.6</td>
</tr>
<tr>
<td>Absent</td>
<td>26</td>
<td>23 (36.5%)</td>
<td>03 (42.9%)</td>
<td>37.1</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>63</td>
<td>07</td>
<td>100</td>
</tr>
</tbody>
</table>

31 cases (44.3%) showed thin halo and all are benign. 13 cases (18.6%) nodules showed thick incomplete halo. All malignant nodules showed thick incomplete halo or no halo. [Table-2]
Out of 63 FNAC proven benign nodules, 61 nodules (96.8%) showed well defined margins and out of 7 malignant nodules, 6 nodules (85.7%) showed poorly defined margins. [Table-3]

Out of 7 malignant cases, 6 cases (85.7%) are associated with lymphadenopathy. No associated lymphadenopathy was noted in all the benign nodules and one of the malignant nodule.

Peripheral vascularity was observed in 79.3%, followed by spoke wheel pattern in 15.9% of benign nodules. Internal vascularity was observed in 71.4% of malignant nodules. So, malignant nodules predominantly show internal vascularity. [Table-4]

Most common diagnosis was Colloid goiter (61.4%) and least common diagnosis was Hashimoto’s thyroiditis (2.8%) on USG. Maximum number of cases on FNAC were also found to be colloid goiter (68.6%) followed by multinodular goiter (17.2%) and Hashimoto’s thyroiditis (2.9%). [Table-5]

### Table 3: Distribution of nodules Margins & FNAC correlation

<table>
<thead>
<tr>
<th>Margin</th>
<th>No cases</th>
<th>BENIGN (n=63 and%)</th>
<th>MALIGNANT (n=7 and%)</th>
<th>Percentage of total cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well defined</td>
<td>62</td>
<td>61 (96.8%)</td>
<td>01 (14.3%)</td>
<td>88.6%</td>
</tr>
<tr>
<td>Poorly defined</td>
<td>08</td>
<td>02 (3.2%)</td>
<td>06 (85.7%)</td>
<td>11.4%</td>
</tr>
<tr>
<td>Total</td>
<td>70</td>
<td>63</td>
<td>07</td>
<td>100</td>
</tr>
</tbody>
</table>

### Table 4: Distribution of nodules according to vascularity

<table>
<thead>
<tr>
<th>Vascularity Pattern</th>
<th>No of cases</th>
<th>BENIGN (n=63 and%)</th>
<th>MALIGNANT (n=7 and%)</th>
<th>Percentage of total cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peripheral flow</td>
<td>50</td>
<td>50 (79.3%)</td>
<td>00</td>
<td>71.4</td>
</tr>
<tr>
<td>Internal flow</td>
<td>08</td>
<td>03 (4.8%)</td>
<td>05 (71.4%)</td>
<td>11.4</td>
</tr>
<tr>
<td>Spoke wheel pattern</td>
<td>11</td>
<td>10 (15.9%)</td>
<td>01 (14.3%)</td>
<td>15.7</td>
</tr>
<tr>
<td>Peripheral and internal flow</td>
<td>01</td>
<td>00</td>
<td>01 (14.3%)</td>
<td>1.5</td>
</tr>
<tr>
<td>TOTAL</td>
<td>70</td>
<td>63</td>
<td>07</td>
<td>100</td>
</tr>
</tbody>
</table>

### Table 5: Distribution of cases on basis of USG and FNAC diagnosis.

<table>
<thead>
<tr>
<th>USG Diagnosis</th>
<th>Percentage of total cases (%)</th>
<th>FNAC Findings</th>
<th>Percentage of total cases (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colloid Goiter</td>
<td>43 (61.4)</td>
<td>Colloid goiter</td>
<td>49 (68.6)</td>
</tr>
<tr>
<td>Multi nodular goiter</td>
<td>12 (17.2)</td>
<td>Multi nodular goiter</td>
<td>12 (17.2)</td>
</tr>
<tr>
<td>Hashimoto’s thyroiditis</td>
<td>02 (2.8)</td>
<td>Hashimoto’s Thyroiditis</td>
<td>02 (2.9)</td>
</tr>
<tr>
<td>Diffuse Hypertrophy</td>
<td>04 (5.8)</td>
<td>Papillary Ca</td>
<td>04 (5.7)</td>
</tr>
<tr>
<td>Nodule with degenerative changes</td>
<td>03 (4.3)</td>
<td>Anaplastic Ca</td>
<td>01 (1.4)</td>
</tr>
<tr>
<td>Carcinoma</td>
<td>06 (8.5)</td>
<td>Medullary Ca</td>
<td>02 (1.4)</td>
</tr>
<tr>
<td>TOTAL</td>
<td>70 (100)</td>
<td></td>
<td>70 (100)</td>
</tr>
</tbody>
</table>

### Table 6: Correlation between USG and FNAC findings

<table>
<thead>
<tr>
<th>Lesion</th>
<th>USG Diagnosis</th>
<th>Percentage</th>
<th>FNAC Diagnosis</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benign</td>
<td>64</td>
<td>91.4</td>
<td>63</td>
<td>90</td>
</tr>
<tr>
<td>Malignant</td>
<td>06</td>
<td>8.6</td>
<td>07</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>70</td>
<td>100</td>
<td>70</td>
<td>100</td>
</tr>
</tbody>
</table>
Out of total 70 cases, 64 (91%) were diagnosed as benign and 6 cases (9%) as malignant by ultrasonography (USG). On the basis of FNAC, 63 cases (90%) were diagnosed as benign and 7 cases (10%) as malignant.

**Discussion**

**Age and sex distribution:** In present study, out of 70 patients with various thyroid disorders maximum number of cases were found from 3rd to 5th decades i.e. 42 cases (approximately 70%) and females constitute about 70% of total cases. According to Kapur et al, maximum number of solitary thyroid nodules were found in 3rd, 4th and 5th decade. According to Belfiore et al, 84.8% were females and 14.2% were males.

**Nodularity:** In our study, 60% cases were having single thyroid nodule and 27.1% cases were with multiple thyroid nodules. Malignant lesions (5/7) were mostly seen in single thyroid nodules. Diffuse thyroid involvement were found in 12.9% cases and all of them were found to benign. In a study done by C Capelli et al a total of 6135 nodules were obtained of which 4495 patients had solitary nodules (73.2%) and 1231 patients (20%) had multiple nodules.

**Echogenicity:** In present study, 31.4% cases were having hypoechoic nodules. Out of this, 8.6% cases were having malignant lesions and 22.8% cases were having benign lesions. This shows that hypoechoic nodules are suspicious for malignancy. 26 cases (37.1%) showed iso to hyperechoic nodules and 5 cases (7.1%) showed anechoic cysts where no malignancy seen. This suggests that iso to hyperechoic and purely anechoic nodules are benign. Solbiati et al found 62% hypoechoic nodules were malignant in his study.

**Margins:** In present study, 88.6% cases were showing well defined, regular margins of thyroid nodules. Out of this, 87.1% cases were benign lesions and 1.5% cases were malignant lesions. 11.4% cases showed irregular margins of thyroid nodules, out of which 2.8% were benign and 8.6% were malignant lesions. This shows that irregular margin of a nodule favors malignant nature of lesions. Solbiati et al found
that 82% thyroid nodules with regular margins were benign and 55% thyroid nodules with irregular margins were malignant.\textsuperscript{19}

**Calcifications**

In present study, all the cases showing macro calcifications were benign and all the cases showing micro calcifications were malignant. So our study shows significant associations of micro calcifications with malignancy.

**Peripheral halo:** In our study, malignant nodules showed thick incomplete halo and no halos where as benign nodules showed predominantly thin halo. According to Hoang JKe\textsuperscript{20}t al, a thin, well-defined peripheral halo represents displaced blood vessels around the lesion and is considered highly suggestive of a benign nodule\textsuperscript{20}. Solbiati et al found halo in 36% of thyroid nodules and more in benign than in malignant (86% versus 14%).\textsuperscript{19}

**Vascularity:** In our study, 95.2% of benign nodules show predominantly peripheral and spoke wheel pattern of vascularity. 71.4% malignant nodules showed internal vascularity. One malignant case showed peripheral with internal vascularity and other one showed spoke wheel pattern of vascularity. Fobbe et al found that 80-90% of benign nodules showing peripheral vascularity where as 70% to 90% of malignant nodules showing internal vascularity with or without a peripheral component.\textsuperscript{21}

**Lymphadenopathy:** In our study, lymphadenopathy was seen in 6 malignant cases (85.7%). Presence of Lymphadenopathy with thyroid nodule is highly suggestive of malignant nature of thyroid nodule. Gorman et al found metastatic cervical lymph nodes with US in 80% of patients with medullary carcinoma of thyroid.\textsuperscript{22}

**Benign lesions:** In our study, colloid goiter was found to be the most common (77.8%) benign lesion followed by multinodular goiter (19%). Similarly, according to Goellner and Gharib, colloid goiter (40%) is the most common histologic diagnosis followed by follicular adenoma (18%) and adenomatous goiter in about 11% cases with a 16% malignancy rate.\textsuperscript{23}

**Malignant lesions:** In our study, out of 7 malignant nodules, maximum number of 4 cases (57.1%) were papillary carcinoma, According to Raj Gopal SK et al.percentage of papillary carcinoma was 60-65%.\textsuperscript{24}

**Diagnostic Accuracy of USG:** Sensitivity and positive predictive value for detecting thyroid malignancy on USG were found to be 85.7% and 100% respectively.

**Limitations:** In our study the number of malignant cases were less. Most of the diagnosis was made on the basis of cytology instead of histology. In cases of multiple nodules, only the dominant nodule was evaluated in our study.

**Conclusion**

Now-a-day’s high resolution USG is the first line imaging modality in patients with thyroid pathology because of its high sensitivity and specificity in the evaluation of thyroid nodules, diffuse thyroid diseases and in differentiating benign and malignant thyroid nodules. FNAC or histopathological examination is the gold standard investigation for the final diagnosis. However, the knowledge of the specific USG features may be helpful to target suspicious nodules and to avoid unnecessary intervention in the benign nodules. The most useful USG features of malignant nodules in this study were solitary nodule, peripheral thick incomplete halo or absence of halo, predominant solid composition, hypoechogenicity, poorly defined margins, internal vascularity, presence of microcalcifications and associated lymphadenopathy.

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**Source of Funding:** Nil

**Ethical Clearance:** The ethical clearance is approved by Institutional Ethical Committee, KIMS Hospital, Bhubaneswar (KIIT/KIMS/IEC/18/2019)

**References**

A Study of Impact of Voice of Customers for Admissions Department of a Quaternary Care Hospital

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2SIHS, S B Road, Pune

Abstract

Most executives recognize that customer experience is important to their businesses. To compete on customer experience, companies need to consistently deliver a better experience. To do that, they need to understand the experience of customers they are managing today. This is why voice-of-the-customer (VoC) programs is such a priority for so many businesses; the ability to listen to your customers is crucial to your ability to compete on customer experience. VoC programs are the only way to systematically listen to the customers, we use this information to take action, and monitor performance over time.1

From patient experience, an admission to a bed as an inpatient in an acute hospital is a major event, independent of this admission being an emergency or from a waiting list. When patients need an emergency admission, it is important to be admitted quickly and to an appropriate bed, avoiding unnecessary waiting times in the emergency room. On the other hand, if patients are being admitted from a waiting list for elective surgery, it is important to minimize the number of occasions that admissions are cancelled as a result of there being no bed available. 2

When patients have positive hospital experiences, they share their satisfaction with relatives, friends and neighbors. The exchange of positive patient experiences helps hospitals build good reputations. If a hospital overlooks patient feedback, it becomes vulnerable to price wars and loses its customers to competitors.

Admission department plays a vital role in the hospitals. It serves as the first point of contact for the patients and their attendants. Hence, a sober image of this department is necessary. It is a place where both the patients and the staff have to exhibit patience and understanding.

Keywords: Impact of Voice of Customer, Quaternary care Hospital, Admission Department.

Introduction

Health administrators and physician increasingly incorporate patients perspectives into healthcare; patient satisfaction has become a significant outcome.3,4 Because health care organizations operate in evermore competitive markets, patient satisfaction with services is a crucial factor in determining a health care organization’s competitive advantage and survival.5 Patient satisfaction also has become an increasingly important component of quality assessment.

Donabedian8 has urged for including patients perspectives as a key component of quality assessment since the early 1970s. The rise of consumerism has contributed to increase patients demand for information and involvement9. The shift toward continuous quality improvement that gained momentum in 1990s places meeting patient expectations at the core of medicine’s mission.10 Increasing lypatients at is faction measures are also being used to evaluate physician performance and determine physician compensation in academic and private practice settings.

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Contact No. : 9423212709
Hospitals that are committed to providing excellent health care outcomes, including patient satisfaction, establish multiple programs and initiatives to achieve these goals. Measuring performance is essential to assessing the effects of continuous efforts to improve quality of care and ensuring the pursuit of excellence in hospitals. Increasingly, patient satisfaction is acknowledged as a key organizational performance measure. In addition to providing a unique perspective on the performance of a hospital, patient satisfaction is considered as a predictor of a patient’s willingness to follow treatment, to return for service, or to recommend a service to others. In the US, the Centers for Medicare and Medicaid Services (CMS) has identified patient experience of care as an important determinant of the performance payments to be made to acute hospitals. Thus, from fiscal year 2013 at least 0.3% of hospitals Medicare revenue (30% of the 1% withholds from participating hospital.

Diagnosis-Related Group payments) will be determined by their performance on these experience/satisfaction measures.

The world’s economy has largely become a service-oriented one, and service quality, regardless of the service being rendered, is a central issue for any kind of business. This is the reason why most organizations seek to satisfy the users (clients, customers, patients) of its products or services. Patient satisfaction forms one of the most important dimensions of quality of healthcare.

Customers are the most important stakeholders and their views on every aspect of the health care environment will have to be understood so that measures can be taken to satisfy them during their future encounters with the health care environment.

A critical challenge for health services in developing countries is to find ways to make them more client-oriented. Indifferent treatment of patients, unofficial payments to providers, lack of patient privacy, and inadequate provision of medicines and supplies are common, yet are rarely acknowledged by traditional quality assessment method. Assessing patient perspectives gives users a voice, which, if given systematic attention, offers the potential to make services more responsive to peoples’ need and expectation, important elements of making health systems more effective. Studies have shown that health care utilization, a long-standing concern for many developing countries, is sensitive to user perceptions of quality. For these reasons, patient perceptions of health services are now an important part of quality assessment in health care.

**Aim:** To study and analyze the Voice of the Customer for the Admissions Department of a Quaternary Care Hospital.

**Objectives:**

- To find out the major issues faced by the patients during the visit.
- To identify the key areas of the department providing dissatisfactory and poor services to the patients.
- To provide measures/recommendations for improved quality services.

**Scope:**

- Present study was conducted for the duration of 45 days.

**Review of Literature**

The hospitalization process has three main stages: an admission, an inpatient period and a final stage with the discharge process. An inefficient bed management in any of the three stages of the hospitalization can cause a mismatch between demand and capacity. It has been proved that when bed demand exceeds capacity, patient admissions and scheduled surgical procedures can be delayed or cancelled. Traditionally, it has been assumed that the variability in the demand comes from the emergency patient. Interventions focused primarily on emergency departments have had limited success. However, repeated case studies have shown that elective admissions are often the major cause of variation as they are more unpredictable than the emergency admissions. In addition, the greatest variation is typically in the number of discharges and, therefore, efforts to reduce variation should start with the discharge process and not in the admission process. Then, to have information about planned discharges 24-h in advance would allow a higher planning and an optimal bed assignment. Moreover, the discharge process should start at the point of admission in the case of planned admissions, as in some cases the estimated length of stay without a medical complication is known. Discharge planning allows for a better and quicker bed assignment in hospitals and the development of nurses and other staff working in discharge coordinator roles. In this sense, it has been proved that multidisciplinary teams can
improve the delivery of health services and patient care. All admissions and discharges of the hospital should be centrally managed and planned, as single-department solutions may create or worsen bottlenecks in other areas.

During the hospitalization process, patient flow is a strategic aim for the healthcare enterprise. Hospitals can combine process management with information technology to redesign patient flow for maximum efficiency and clinical outcomes. Information is the foundation of any patient flow initiative. Patient flow is built upon the capture, integration and sharing of information, both within and across the different departments and staff.

**Fish Bone Diagram:** An Ishikawa diagram basically helps in understanding the cause and effect relationship for solving a problem. It is a very helpful tool as it gives a pictorial representation of what is the cause of a problem or a phenomenon, what factors have a high/low impact to those problem/phenomena and how can the situation be resolved. The Ishikawa is drawn like a fishbone and helps a person to see the causes and effects in a particular relationship. The Ishikawa diagram looks like a fishbone, and is popularly known as the Fishbone Diagram. Ideally, an Ishikawa diagram has an oval/rectangular box at the right hand side. This box is labeled with the problem to be studied/effect. There is a horizontal line (which can be visualized as the back bone) and a number of bones (read causes) stemming out of it. There is a label for each one of these, and these are on the lefthand side of the diagram. Each cause may have several contributing causes and these are marked by smaller lines.

When utilizing a team approach to problem solving, there are often many opinions as to the problem’s root cause. One way to capture these different ideas and stimulate the team’s brainstorming on root causes is the cause and effect diagram, commonly called a fishbone diagram.

The cause and effect diagram is used to explore all the potential or real causes (or inputs) that result in a single effect (or output). Causes are arranged according to their level of importance or detail, resulting in a depiction of relationships and hierarchy of events. This can help you search for root causes, identify areas where there may be problems, and compare the relative importance of different causes.

The fishbone will help to visually display the many potential causes for a specific problem or effect. It is particularly useful in a group setting and for situations in which little quantitative data is available for analysis. The fishbone has an ancillary benefit as well. Because people by nature often like to get right to determining what to do about a problem, this can help bring out a more thorough exploration of the issues behind the problem - which will lead to a more robust solution.

The rest of the fishbone then consists of one line drawn across the page, attached to the problem statement, and several lines, or ‘bones,’ coming out vertically from the main line.

**hy-Why Analysis:** A Why-Why Diagram is a Tree Diagram where each child statement is determined simply by asking ‘why’ the parent occurs, as below. It is thus very similar in use to a Cause-Effect Diagram, and techniques may be borrowed from Cause-Effect Diagram usage. Its simplicity can make it useful in less formal situations.

The Why-Why and How-How Diagrams together make a very simple toolset for finding causes of and solutions to problems.
Methodology:

Type of study: Descriptive study

Place of study: Chennai

Time Frame: The study was conducted over a period of one and a half months i.e. 10th May to 25th June 2017.

Study variables: Voice of Customers, Types of patients

Population for the study: In patients during the study period

Exclusions: Transit patients during the study period

Study Procedure: Data was collected from Inpatients through the feedback form which is predesigned by the hospital.

Data Analysis Tools: MICROSOFT EXCEL 8.0 Software.

Fish Bone Diagram (Root Cause Analysis) Why-Why Analysis

Observation and Results

Table 1: Responses for the feedback form

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Questions</th>
<th>Ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Rating 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Extremely Satisfied</td>
</tr>
<tr>
<td>1</td>
<td>Taking into account of all healthcare experiences that you have encountered, how satisfied are you with the Hospital?</td>
<td>43%</td>
</tr>
<tr>
<td></td>
<td>Will you continue to choose the Hospital for your future health needs?</td>
<td>Definitely Will</td>
</tr>
<tr>
<td>---</td>
<td>---------------------------------------------------------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>2</td>
<td>Will you continue to choose the Hospital for your future health needs?</td>
<td>68%</td>
</tr>
<tr>
<td>3</td>
<td>Would you recommend the Hospital to a friend or family member?</td>
<td>70%</td>
</tr>
<tr>
<td></td>
<td>How organized was the admission process?</td>
<td>44%</td>
</tr>
<tr>
<td>4</td>
<td>How would you like to rate our associates on meeting your personal preferences?</td>
<td>46%</td>
</tr>
<tr>
<td>5</td>
<td>Overall Service Experience at the Hospital</td>
<td>48%</td>
</tr>
<tr>
<td>6</td>
<td>How organized was the admission process?</td>
<td>44%</td>
</tr>
<tr>
<td>7</td>
<td>Would you recommend the Hospital to a friend or family member?</td>
<td>70%</td>
</tr>
<tr>
<td>8</td>
<td>Cleanliness and Hygiene of the Room and Bathroom.</td>
<td>56%</td>
</tr>
<tr>
<td>9</td>
<td>Comfort of Air Conditioning in your room</td>
<td>49%</td>
</tr>
<tr>
<td>10</td>
<td>Peace and Quiet in the Room</td>
<td>46%</td>
</tr>
<tr>
<td>11</td>
<td>Promptness in responding to the call bell</td>
<td>57%</td>
</tr>
<tr>
<td>12</td>
<td>How well was pain managed?</td>
<td>52%</td>
</tr>
<tr>
<td>13</td>
<td>How well was pain managed?</td>
<td>52%</td>
</tr>
<tr>
<td>14</td>
<td>The overall quality of food service</td>
<td>45%</td>
</tr>
<tr>
<td>15</td>
<td>Timeliness of Service</td>
<td>48%</td>
</tr>
<tr>
<td>16</td>
<td>How organized was the admission process?</td>
<td>44%</td>
</tr>
<tr>
<td>17</td>
<td>Explanation given by the doctor regarding your treatment</td>
<td>70%</td>
</tr>
<tr>
<td>18</td>
<td>How organized was the admission process?</td>
<td>44%</td>
</tr>
<tr>
<td>19</td>
<td>How organized was the admission process?</td>
<td>44%</td>
</tr>
<tr>
<td>20</td>
<td>How well was pain managed?</td>
<td>52%</td>
</tr>
<tr>
<td>21</td>
<td>The overall quality of food service</td>
<td>45%</td>
</tr>
<tr>
<td>22</td>
<td>How well was pain managed?</td>
<td>52%</td>
</tr>
<tr>
<td>23</td>
<td>The overall quality of food service</td>
<td>45%</td>
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<tr>
<td>24</td>
<td>How well was pain managed?</td>
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</tr>
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<td>25</td>
<td>How organized was the admission process?</td>
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<td>26</td>
<td>How well was pain managed?</td>
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</tr>
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<td>27</td>
<td>The overall quality of food service</td>
<td>45%</td>
</tr>
<tr>
<td>28</td>
<td>How well was pain managed?</td>
<td>52%</td>
</tr>
<tr>
<td>29</td>
<td>How well was pain managed?</td>
<td>52%</td>
</tr>
<tr>
<td>30</td>
<td>How well was pain managed?</td>
<td>52%</td>
</tr>
<tr>
<td>31</td>
<td>How well was pain managed?</td>
<td>52%</td>
</tr>
<tr>
<td>32</td>
<td>How well was pain managed?</td>
<td>52%</td>
</tr>
</tbody>
</table>

**Figure 2: Responses for the feedback form**
From the above figure, some inferences can be made such as:

- Majority of the patients were satisfied with the services and the overall experience at the hospital.
- The highest satisfaction has been recorded with respect to the doctors explanation of treatment to the patients followed by courtesy and compassion exhibited by doctors as well as nursing staff.
- The highest dissatisfaction has been recorded with respect to waiting time and discharge speed followed by communication and handling of queries.

The above feedback was obtained from 3 different avenues namely, in-patient, front line and post discharge. In-patient feedback referred to feedback obtained from the patients during their stay at the hospital. Front line feedback referred to feedback obtained by Guest Relation Officers during their interaction with the patients. Post Discharge feedback referred to feedback obtained after the discharge of the patients. It can be noted here that most of the feedback obtained is through Post Discharge followed by In-Patient and Front line feedback.

From the above figure, it can be inferred that a maximum of compliments are recorded through feedback obtained from patients during their stay at the hospital. This is followed by suggestions and finally complaints.
From the above figure, it can be inferred that a maximum of complaints are recorded through feedback obtained by the Guest Relation Officers in their interaction with the In-Patients. This is followed by suggestions and finally compliments.

**Figure 5: Stratification of Post Discharge Feedback**

From the above figure, it can be inferred that a maximum of compliments have been recorded through feedback obtained from patients after their discharge. This is followed by complaints and finally suggestions.

**Figure 6: % of patients from each area for admission**

A maximum of patients come for planned admissions (IP), followed by admission through the Emergency Department and Day care. 3% patients come under the transit category which has been excluded for this study. A maximum of patients get admitted after being referred by the Emergency Medical Officer closely followed by Cardiologist, Ortho and General Surgeon. The other departments also contribute towards admission rates of the hospital.
**Discussion:**

The study shows results where majority of the patients have a higher satisfaction rate with the overall experience while still having a few complaints which have been recorded in 3 different avenues, namely, In-Patient feedback, Front Line feedback and Post Discharge feedback. Most of the feedback obtained is through Post Discharge followed by In-Patient and Front line feedback.

A maximum of compliments were recorded through feedback obtained from patients during their stay at the hospital while a maximum of complaints were recorded through feedback obtained by the Guest Relation Officers in their interaction with the In-Patients.

The study also shows that a majority of patients come for planned admissions (IP), followed by admission through the Emergency Department and Day care. Similarly, a maximum of patients get admitted after being referred by the Emergency Medical Officer closely followed by Cardiologist, Ortho and General Surgeon.

The leading causes for dissatisfaction of patients have been identified as:

- Courtesy and compassion of admission staff
- Accuracy of information provided by admission staff
- Adherence to time for bed allocation
- Response to queries by admission staff
- Waiting time for admission

**Recommendations:**

- The Staff of the hospital should possess a pleasant attitude towards the patients at all times in order to overcome & achieve 100% response of the patients as a part of the quality assurance program of the hospital. A mere smile on their face can go a long way in making a patient feel comfortable.
- Lack of coordination is what brings miscommunication to the forefront. This can be handled by having group meetings everyday where various scenarios are spoken about and virtually handled as a training session.
- Training sessions to all the staff handling admissions is necessary. Their performance and knowledge needs to be regularly reviewed to minimize incidences of patients being misguided by the uninformed staff.
- Allocation of the bed can be difficult during times of full occupancy which is the case usually with hospitals. Yet, this issue can be handled by speeding up the discharge process which was found to be the major cause for delay of patients vacating beds.
• Planning ensured an early and certain discharge as well as a better bed assignment because there was information about which beds would be available. Therefore, the number of patient outliers in the hospital significantly diminished. A limitation of planning discharge was that not all of them were effectively real the following day. However, the importance of the planning was precisely to avoid improvisation of all the staff that participated in the discharge: physician, nurse, house officer, sanitary transport, families and patients and others. In fact, discharge process should start in the admission point, as it is the mismatch between demand and supply of beds that promotes delays and bottlenecks in the system.

Conclusion

When patients have positive hospital experiences, they share their satisfaction with relatives, friends and neighbors. The exchange of positive patient experiences helps hospitals builds good reputations. If a hospital overlooks patient feedback, it becomes vulnerable to price wars and loses its customers to competitors.

Admission department plays a vital role in the hospitals. It serves as the first point of contact for the patients and their attendants. Hence, a sober image of this department is necessary. It is a place where both the patients and the staff have to exhibit patience and understanding. A proper location of admission department, friendly staff and concise information about the admission process and charges is what is expected by the patient when it comes to a department of admission.

Ethical Clearance: The study was done as a part of Summer Internship of MBA, and there was no direct intervention with patient care & hence no Ethical Issues were involved.

Source of Funding: The study is not funded by any agency.

Conflict of Interest: Nill

References


Effect of Combination of Active Stretching and Deep Breathing Exercise for Pectoral Group of Muscle Tightness in Breast Feeding Mother

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Abstract

Objective: To determine the effects of active stretching along with deep breathing exercise for pectoral group of muscle tightness in breast feeding mother.

Method: A total of 60 subjects were screened as per inclusion and exclusion criteria and they were briefed about study and intervention. Informed consent was taken from the subjects. Subjects were selected on the basis of simple sampling method. The subjects which had pectorals muscle tightness was taken in the study. Pre and post treatment muscle length test measurement, chest measurement and respiratory rates was taken into consideration.

Conclusion: Various recent approaches are used in the treatment of subjects who are suffering from muscle tightness because of poor posture, but this study concluded that combine effect of active stretching with deep breathing exercise was effective in decreasing the muscle tightness and shallow breathing and increase chest measurement. It is proved from this study that combination of active stretching and deep breathing exercise has significant effect on pectoral muscle group tightness.

Keywords: Pectoral Muscle group, tightness, breast feeding mothers, chest measurements, muscle length test, chest measurement.

Introduction

Human beings have upright erect posture or bipedal posture¹. Posture is attitude assumed by the body either with support during muscular inactivity, or by means of the co-ordinate action of man muscles working to maintain the stability or to form an essential basis which is being adapted constantly to the movement which is super imposed upon it².

Poor posture is defined as when posture is inefficient, that is, when it fails to serve the purpose for which it was designed, or if an unnecessary amount of muscular effort is use to maintain it². There are different anatomical features that lead to incorrect posture they are as follows:

- Laxity of ligamentous structures.
- Musculoskeletal tightness
- Muscle tonus
- Joint position and mobility

Muscle imbalance and muscle shortness also leads to incorrect posture. Excessive use of arm in front of the body and the necessity to lean forward which is occupational demand, this tensions usually occur in muscles round shoulder girdle and in next extensors². The ability to relax is an important factor in reeducation, as some degree of useless and unnecessary tension is nearly always associated with poor posture².

As it is advantage to baby while breast feeding if mother is in forward lean position so this is adapts to bad posture for mother².

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Stretching helps in relaxing the muscle which helps in further correcting posture and reducing pain caused by altered posture\(^4\); and Deep breathing exercises also helps in improving our respiratory functions and caused due to improper posture and further helps in relaxation\(^4\).

The first step of breathing awareness is the recognition of the relationship of body movement to the flow of air while breathing\(^5\).

**Method**

- **Type of Study**: Experimental study
- **Study Design**: pre and post test
- **Sampling Method**: simple random sampling
- **Sample size**: 60
- **Study Duration**: 3 months
- **Place of study**: Krishna Hospital, Physiotherapy Outpatient Department

**Materials**

- Consent form
- Data collection sheet
- Paper
- Pen
- Inch tape
- Stop watch

**Outcome measures:**

- Muscle length test
- Chest measurements
- Respiratory rate

**Procedure:** This study was an experimental study. Study designed as a pre-test and post-test. Subjects selects for this study from Krishna hospital, Karad. The purpose of the study was explained to the patients. 60 patients were selected for the study on the basis of inclusion and exclusion criteria. Demographic and baseline assessments of the subjects were done on the first day. After the baseline assessments therapy was started on next day. Duration of therapy was 6 days. The values were assessed before and after treatment. The difference between the pre and post values were assessed and compared by student paired and unpaired t test.

**Interventions:**

- Warm up exercise:
- Joint rotation (10 min)
- Free shoulder exercise (2 min)
- Free elbow exercise (2 min)
- Free neck exercise (2 min)
- Free trunk exercise (4 min)
- Specific exercise:
  - Deep breathing exercise along with active stretching exercises: take deep breath in by nose, let the lung fulfill with air along with do active stretch; once the muscle get stretch, maintain that stretch and slowly exhale from mouth.
  - Type of stretching which is including in the therapy:
    - Wall stretch – stand against the outer corner of a room or in doorway. Bend your elbow a 99-degree angle so your upper arm is parallel to the floor at shoulder height. Place your forearm against the corner of the wall gently press your forearm on the wall and feel the stretch in pectoral muscle, hold the position 15 to 20 seconds and repeat 10 times, (10 times × 2 set)
    - Elbow wrap stretch – sit cross on the floor. bring your arm behind your back and clap each hand around the opposite elbow or forearm. Hold for 20 to 30 seconds focus on lifting your collarbone and squeezing your shoulder blades together. Repeat for 10 times (10 times × 2 set)
    - Camel pose – kneel on the floor with your knees hip width apart and your hand at your waist. Your toes can’t be tucked or the top of your feet can be flat against the floor; slowly reach back keep your hands on your lower back, push your elbow back; keeping your chest lifted, shoulders back, and core engaged, slowly push your hip forward, making sure to keep your chin down, if that still feel ok you can slowly release your head backward.

**Cool down:**

- Upper limb stretches
- Biceps stretch
- Triceps stretch
- Trapezius stretch

**Precautions:**

- Avoid excessive stretch which is very painful
- Always listen to your body
- During practicing breathing exercise concentrate on stretch
Results and Statistics

(1) Muscle length test:

Table no 1 - Comparison of pre and post muscle length test pectoralis major and pectoralis minor within the group.

<table>
<thead>
<tr>
<th>Muscle group</th>
<th>Mean ± SD</th>
<th>P value</th>
<th>t value</th>
<th>Interference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre- treatment</td>
<td>Post- treatment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pectoralis major</td>
<td>8.465±0.7843</td>
<td>6.653±0.6951</td>
<td>&lt;0.0001</td>
<td>36.291</td>
</tr>
<tr>
<td>Pectoralis minor</td>
<td>6.506±0.6128</td>
<td>4.771±0.5456</td>
<td>&lt;0.0001</td>
<td>27.792</td>
</tr>
</tbody>
</table>

In the present study pre-interventional mean score for pectoralis major was 8.465±0.7843 and for pectoralis minor was 6.506±0.6128; whereas post interventional mean score was for pectoralis major 6.653±0.6951 and for pectoralis minor was 4.771±0.5456 respectively.

Inter group analysis of muscle length test of pectoralis major and pectoralis minor score was done using paired ‘t’ test; p value of pectoralis major and minor was <0.0001; t value of pectoralis major was 36.291 and for pectoralis minor was 27.792. Inter group analysis of muscle length test for pectoralis major as shown statistically extremely significant and muscle length test for pectoralis minor as shown statistically extremely significant.

(2) Chest measurement:

Table no 2 - Comparison between pre and post chest measurement at the upper thoracic level within the group

<table>
<thead>
<tr>
<th></th>
<th>Mean ± SD</th>
<th>P value</th>
<th>t value</th>
<th>Interference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre-treatment</td>
<td>Post treatment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>At upper thoracic</td>
<td>1.553±0.2273</td>
<td>3.208±0.4311</td>
<td>&lt;0.0001</td>
<td>37.994</td>
</tr>
</tbody>
</table>

In the present study pre-interventional mean score for chest measurement was 1.553±0.2273; whereas post interventional mean score was 3.208±0.4311 respectively.

Inter group analysis of chest measurement score was done using paired ‘t’ test; p value of chest measurement was <0.0001; t value of chest measurement was 37.994. Inter group analysis of chest measurement as shown statistically extremely significant.

(3) Respiratory rate:

Table no 3 - Comparison of pre and post respiratory rate within the group

<table>
<thead>
<tr>
<th></th>
<th>Mean ± SD</th>
<th>P value</th>
<th>t value</th>
<th>Interference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
<td>Post</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respiratory rate</td>
<td>21.733±1.364</td>
<td>15.467±1.770</td>
<td>&lt;0.0001</td>
<td>28.962</td>
</tr>
</tbody>
</table>

In the present study pre-interventional mean score for respiratory rate was 21.733±1.364; whereas post interventional mean score was 15.467±1.770 respectively. Inter group analysis of respiratory rate score was done using paired ‘t’ test; p value of respiratory rate was <0.0001; t value of respiratory rate was 28.962. Inter group analysis of respiratory rate as shown statistically extremely significant.

Discussion

A woman’s body undergoes profound changes during and after pregnancy; the rounded shoulders and arched lower back increases because of bad posture adaptation. After delivery body needs to be kept in a correct posture during all activity to help the body or joint position to realign; the postpartum period is the
time when the woman has not totally recovered from the stress and strain place on her body. While breast feeding slouching over the baby can increase pectoral muscle tightness1,3.

Active stretching which was carried out independently by the patient after instruction and supervision by therapist; it is designed to improve the mobility of soft tissues and consequently increase ROM and flexibility4. Intensity of stretch was low intensity; duration of stretch 20 to 30 sec per stretch; mode of stretching was selfstretching.

Proper breathing control is important for successful stretch; breathing helps to relax the body, increase blood flow throughout the body. During the session patient took slow deep breath along with active stretch of pectoral muscle group, and slowly exhaled by mouth but stretch was maintained for 20 to 30 sec.

In this study, 60 subjects were assessed for eligibility, out of which 60 completed the study. Pre- treatment outcome measure for pectoral muscle group tightness was muscle length test, chest measurements, respiratory rate.

Inter group statistical analysis revealed statistically extremely significant. Pre and post value of muscle length test was took. This was done by using paired t test, for pectoralis major mean±SD was 8.465± 0.7843, p value (<0.0001), t value (36.291); for pectoralis minor mean±SD was 6.506± 0.6128, p value (<0.0001), t value (27.792).

Inter group analysis of chest measurement score was done by using paired t test. Statistical analysis showed extremely significant difference. Mean±SD was 1.557± 0.2273, p value (<0.0001), t value (37.994).

Inter group analysis of chest respiratory rate was done by using paired t test. Statistical analysis showed extremely significant difference. Mean±SD was 21.733 ± 1.364, p value (<0.0001), t value (28.962).

In study has shown clinically significant changes in muscle length test, chest measurements, respiratory rate. These findings suggest that combination of active stretching and deep breathing exercise is effective for pectoral muscle group tightness in breastfeeding mother.

An exercise has been effective with patient with pectoral region tightness. Regular practice of stretching and breathing exercise in combination is very helpful to decrease the muscle tightness.

**Conclusion**

Various recent approaches are used in the treatment of subjects who are suffering from muscle tightness because of poor posture, but this study concluded that combine effect of active stretching with deep breathing exercise was effective in decreasing the muscle tightness and shallow breathing and increase chest measurement. It is proved from this study that combination of active stretching and deep breathing exercisehas significant effect on pectoral muscle group tightness.

**Conflict on Interest:** There were no conflicts on interest in this study.

**Funding:** This study was fund by Krishna Institute of Medical Sciences Deemed to be University, Karad.

**Ethical Clearance:** The study was approved by the institutional ethics committee of KIMS DU. The trail was registered with Clinical Registry of India with no: CTRI/2018/01/011545.

**References**

To Determine Spectrum of MRI Imaging in Vertebral Artery Dissection: A Radiological Study

P R Shaha¹, Manisha Luhana²

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Abstract

**Background:** Vertebral artery dissection is a potential cause of posterior circulation ischemia that requires high-spatial-resolution imaging. The present study was conducted to determine spectrum of MRI imaging in vertebral artery dissection.

**Materials and Method:** The present study was conducted on 64 cases of vertebral artery dissection of both genders. All participants were imaged by 1.5 T super conducting magnetic resonance imager. The site of dissection was classified as V1 (prevertebral segment), V2 (intertransverse segment), V3 (atlantoaxial segment) and V4 (intradural/intracranial segment) using standard method of classification.

**Results:** Out of 64 patients, males were 34 and females were 30. Dizziness was present in 34, gait instability in 38, headache in 42 and altered mental status in 50. The difference was non-significant (P > 0.05). V1 was seen in 1, V2 in 7, V3 in 36 and V4 in 20. The difference was significant (P > 0.05). Posterior circulation infarct was present in 25, cerebellar infarction in 11, cerebellar and medullary infarct in 9, occipital infarct in 12, subarachnoid hemorrhage in 2 and solitary lateral medullary infarct in 5.

**Conclusion:** Most common MRI finding was posterior circulation infarct, cerebellar infarction, cerebellar and medullary infarct, occipital infarct, subarachnoid hemorrhage, solitary lateral medullary infarct.

**Keywords:** Cerebellar infarction, MRI, Vertebral artery dissection.

Introduction

Vertebral artery dissection (VAD) accounts for 0.4 to 2.5% of all strokes in the general population, however, in young populations it comprises a substantial chunk (5-20%) of stroke patients. The diagnostic armamentarium for VAD includes both invasive and non-invasive modalities with the conventional angiography considered as the gold standard technique for its diagnosis.¹

Vertebral artery dissection is a potential cause of posterior circulation ischemia that requires high-spatial-resolution imaging for the definitive diagnosis. Digital subtraction angiography (DSA) remains the gold standard for assessment of the vertebrobasilar arteries, with excellent spatial and temporal resolution. However, risks associated with conventional angiography include vascular injury, intracerebral complications, contrast medium nephrotoxicity and exposure to ionizing radiation.²

The diagnosis of VAD may go unnoticed or may get inordinately delayed owing to lack of high level of suspicion on part of physicians and for want of availability of comprehensive diagnostic modalities.³ Three-dimensional (3D) time-of-flight (TOF) MRA is important as a non-invasive examination to diagnose blood flow in the brain.⁴ TOF MRA mainly reflects the blood flow within the artery, representing the inner contour of the artery. Intramural dissecting haematoma shows a typical evolution of signal intensity related to
the paramagnetic effects of the products of hemoglobin breakdown and is frequently isointense to surrounding structures. Therefore, the diagnostic performance of TOF in the detection of vertebral artery dissection is poor. The present study was conducted to determine spectrum of MRI imaging in vertebral artery dissection.

Materials and Method

The present study was conducted in the department of Radiodiagnosis. It comprised of 64 cases of vertebral artery dissection of both genders. Ethical Clearance was obtained prior to the study.

General data such as name, age, gender etc. was recorded. Patients were examined clinically and MRI was done in all patients. All participants were imaged by 1.5 T super conducting magnetic resonance imager (Magnetom Avanto, Siemens Medical System). Presence of mural hematoma together with diminished lumen of the vessel or complete occlusion was diagnosed as VAD. The site of dissection was classified as V1 (prevertebral segment), V2 (intertransverse segment), V3 (atlantoaxial segment) and V4 (intradural/intracranial segment) using standard method of classification. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

Results

Table I: Distribution of patients

<table>
<thead>
<tr>
<th>Gender</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>34</td>
<td>30</td>
</tr>
</tbody>
</table>

Table I shows that out of 64 patients, males were 34 and females were 30.

Table II: Clinical presentation in patients

<table>
<thead>
<tr>
<th>Features</th>
<th>Number</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dizziness</td>
<td>34</td>
<td>0.52</td>
</tr>
<tr>
<td>Gait instability</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td>Headache</td>
<td>42</td>
<td></td>
</tr>
<tr>
<td>Altered mental status</td>
<td>50</td>
<td></td>
</tr>
</tbody>
</table>

Table II shows that dizziness was present in 34, gait instability in 38, headache in 42 and altered mental status in 50. The difference was non-significant (P> 0.05).

Discussion

With advances in non-invasive imaging vertebral artery dissection is now more commonly diagnosed as a cause of vertebro-basilar stroke in younger population. Vertebral artery dissections commonly involve intima as well as media with intramural hematoma usually located between the media and internal elastic lamina. The precipitating event can be an intimal tear that allows blood to seep from the lumen into the media or a hemorrhage from the vasa vasorum within the media.

True fast MR imaging with steady-state precession (true- FISP) is a coherent steady-state technique that uses a fully balanced gradient waveform to recycle transverse magnetization. True FISP is extremely rapid relative to black-blood T1WI and T2 WI and fat-suppressed T1WI. True FISP offers a high signal-to-noise ratio and imaging efficiency; true FISP provides reliable examination of blood vessels without the need for intravenous administration of contrast medium. However, true FISP is not suitable for the imaging of fast flow velocity.

<table>
<thead>
<tr>
<th>Dissection</th>
<th>Number</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>V1</td>
<td>1</td>
<td>0.01</td>
</tr>
<tr>
<td>V2</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>V3</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>V4</td>
<td>20</td>
<td></td>
</tr>
</tbody>
</table>

Table III: Type of dissection

Table III, graph III shows that VI was seen in 1, V2 in 7, V3 in 36 and V4 in 20. The difference was significant (P> 0.05).

<table>
<thead>
<tr>
<th>MRI findings</th>
<th>Number</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Posterior circulation infarct</td>
<td>25</td>
<td>0.01</td>
</tr>
<tr>
<td>Cerebellar infarction</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Cerebellar and medullary infarct</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Occipital infarct</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Subarachnoid hemorrhage</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Solitary lateral medullary infarct</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

Table IV: MRI findings in patients

Table IV shows that posterior circulation infarct was present in 25, cerebellar infarction in 11, cerebellar and medullary infarct in 9, occipital infarct in 12, subarachnoid hemorrhage in 2 and solitary lateral medullary infarct in 5.
because the reduction of signal intensity on true FISP is remarkable with a flow velocity of 50–100 cm/s, which corresponds to arterial flow velocity. Therefore, true FISP is not suitable for visualizing the inner contour of the artery but can provide information regarding the outer surface appearance of the intracranial arterial wall. The present study was conducted to determine spectrum of MRI imaging in vertebral artery dissection.

In this study, out of 64 patients, males were 34 and females were 30. Dizziness was present in 34, gait instability in 38, headache in 42 and altered mental status in 50. Auer et al conducted a study in which fifty patients were studied: 17 had VAD and 33 had vertebral artery hypoplasia. Fusion images of the vertebral artery were reconstructed using a workstation. A receiver operating characteristic (ROC) analysis was conducted with a continuous rating scale from 1 to 100 to compare observer performance in VAD detection. Five radiologists participated in the observer performance test, and their performances with TOF images were compared with those using fused images. The observers found that the mean areas under the best-fit ROC curve for TOF images alone and fused TOF images were 0.66±0.05 and 0.93±0.04, which were significantly different.

We found that VI was seen in 1, V2 in 7, V3 in 36 and V4 in 20. Posterior circulation infarct was present in 25, cerebellar infarction in 11, cerebellar and medullary infarct in 9, occipital infarct in 12, subarachnoid hemorrhage in 2 and solitary lateral medullary infarct in 5.

Wessels et al found that of the total 17 patients imaged with age range of 23-59 years (mean age 38 years), 11 were males and 6 were females. V3 was the commonest site of dissection (n=10) followed by V4 (n=4) and V2 (n=3). The most common pattern of dissection was steno-occlusive (n=15), whereas 2 patients had aneurysmal type of dissection. T1W images revealed intra-arterial thrombus in all the 17 patients. T2W revealed absent flow in vertebral artery in 5 patients. 3D TOF MRA revealed narrowed lumen in 10 patients and complete occlusion in 5 patients. One patient revealed intimal flap on 3D TOF MRA.

Conclusion

Authors found that most common MRI finding was posterior circulation infarct, cerebellar infarction, cerebellar and medullary infarct, occipital infarct, subarachnoid hemorrhage, solitary lateral medullary infarct.

Conflict of Interest: The authors declare that there is no conflict of interest regarding the publication of this paper.

Source of Funding: Self

Ethical Clearance: Ethical Clearance has been taken from Institutional Ethical Committee

References


A Study to Assess the Iodine Level in the Salt and Salt Preservation Practices among Homemakers of Selected Households at Mangaluru

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Abstract

Background: Salt iodization is an accepted fact worldwide to correct the deficiency of iodine. It is a long chain of transport of iodized salt from the manufacturing site to the consumer’s home. During the process, it is said that around one quarter to half proportion of fortified iodine can lose.

Objectives: The descriptive study assessed the iodine level in the salt and salt preservation practices among homemakers.

Materials and Method: Iodine Spot Testing Kit was used to assess the iodine level in the salt and an observational checklist (9 items) and a self-reported rating scale (6 items) on the salt preservation practices was used to collect data from homemakers.

Results: 32 (31.06%) of salt samples were moderately iodized with iodine level of 7-14 ppm. Most of the households, 62 (60.2%) were practicing inappropriate salt preservation practices. There is a significant association of salt preservation practice scores with age (χ² = 16.45, p = 0.001), education (χ² = 44.57, p = 0.001) and experience in managing the kitchen (χ² = 38.53, p = 0.001).

Conclusion: IEC activities can play a great role to improve the knowledge of homemakers regarding appropriate salt preservation practices.

Keywords: Iodine, salt preservation practices and iodine in salt.

Introduction

Iodine is an essential trace element for life and is the heaviest element commonly needed by living organisms. A decreased production of T3 and T4 and an enlargement of the thyroid tissue to obtain more iodine occur due to the deficiency of iodine, causing the disease known as goitre and many other disorders such as impaired mental function, hypothyroidism, cretinism and retarded physical development.[¹] Salt iodization is accepted as the effective and viable long-term public health measure for the prevention and control of Iodine Deficiency Disorder (IDD).[²]

Nearly one-third of the world’s population lives in areas of iodine insufficiency. In areas where the iodine intake is <50µg, goitre is usually endemic, and when the daily intake falls <25µg, congenital hypothyroidism is seen. The existence of goitre in areas of severe iodine insufficiency can be as high as 80%. To provide 150µg/day of iodine, WHO recommends that iodine concentration in salt should be within the range of 20 to 40 mg per kg of salt at the point of production.[³]

When all salt used in manufactured food is iodized, the lower limit 20 mg is recommended. Adequately iodized...
salt is a salt sample which has ≥15ppm of iodine, at the household level.[4]

Iodine deficiency disorders form the major trace element deficiencies of public health significance in India; several surveys have indicated that no state in the country is free from IDD and nearly two-thirds of children and women of the age group of 15-45 years across the country are estimated to be suffering from IDD.[5]

Earlier iodine deficiency disorders were seen in Himalayan and hilly regions only, but now a day most of the people in the world especially Indian women are suffering from thyroid problems, despite of using iodized salt. This may be because of some faulty practices in preservation of salt. This has motivated the investigator to assess iodine level of salt and salt preservation practices at household level, so that appropriate interventions could be undertaken to reduce the prevalence of iodine deficiency disorders.

Materials and Method

Study setting and sample size: The research design selected for this study was descriptive correlative design. The study was carried out in Kumpala area, Kotekar post, Mangaluru, Karnataka. In the present study, samples consist of 103 homemakers who were selected by convenience sampling technique, based on inclusion criteria.

Tools and techniques: Iodine Spot Testing Kit was used to assess the iodine level in the salt \( r=0.84 \) and an observational checklist with 9 items \( r=0.80 \) and a self-reported rating scale with 6 items \( r=0.75 \) on the salt preservation practices was used to collect data from homemakers.

Data analysis: The data was collected after obtaining prior permission from the concerned authority to conduct the study. The participants were assured about the confidentiality of their responses. The data was analyzed in terms of objectives of the study using both descriptive and inferential statistics. The data obtained was plotted in the master sheet.

Results: Majority of the subjects, 62 (60.2%) were between the age group of 31-40 years with the mean age of 35 ± 0.63. Most of the homemakers, 76 (73.8%) belongs to Hindu religion and 80 (77.6%) were residing in nuclear family structure. Most of the homemakers, 83 (80.6%) were having below 5 years of experience in managing kitchen with the mean experience of 3.5 ± 0.47. Half of the homemakers, 52 (50.5%) were spending less than 3 hours per day in the kitchen [Table 1].

Most of the salt samples, 71 (68.93%) were adequately iodized with iodine level ≥ 15ppm and 32 (31.06%) of salt samples were moderately iodized with iodine level of below 7-14 ppm [Table 2].

Most of the households, 62 (60.2%) were practicing inappropriate salt preservation practices [Table 3, Fig. 1].

There was a significant association of salt preservation practice scores with age \( \chi^2 = 16.45, p = 0.001 \), education \( \chi^2 = 44.57, p = 0.001 \) and experience in managing the kitchen \( \chi^2 = 38.53, p = 0.001 \).

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Baseline Characteristics</th>
<th>F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Age (in years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1.</td>
<td>21-30</td>
<td>21</td>
<td>20.4</td>
</tr>
<tr>
<td>1.2.</td>
<td>31-40</td>
<td>62</td>
<td>60.2</td>
</tr>
<tr>
<td>1.3.</td>
<td>41-50</td>
<td>20</td>
<td>19.4</td>
</tr>
<tr>
<td>2.</td>
<td>Religion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1.</td>
<td>Hindu</td>
<td>76</td>
<td>73.8</td>
</tr>
<tr>
<td>2.2.</td>
<td>Muslim</td>
<td>27</td>
<td>26.2</td>
</tr>
<tr>
<td>3.</td>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.1.</td>
<td>Second PU</td>
<td>20</td>
<td>19.4</td>
</tr>
<tr>
<td>3.2.</td>
<td>Undergraduates</td>
<td>63</td>
<td>61.2</td>
</tr>
<tr>
<td>3.3.</td>
<td>Postgraduates</td>
<td>20</td>
<td>19.4</td>
</tr>
<tr>
<td>4.</td>
<td>Type of family</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.1.</td>
<td>Nuclear</td>
<td>80</td>
<td>77.6</td>
</tr>
<tr>
<td>4.2.</td>
<td>Joint</td>
<td>23</td>
<td>22.4</td>
</tr>
<tr>
<td>5.</td>
<td>Employment status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.1.</td>
<td>Unemployed</td>
<td>51</td>
<td>49.5</td>
</tr>
<tr>
<td>5.2.</td>
<td>Employed outside home</td>
<td>52</td>
<td>50.5</td>
</tr>
<tr>
<td>6.</td>
<td>Experience in managing the kitchen</td>
<td>83</td>
<td>80.6</td>
</tr>
<tr>
<td>6.2.</td>
<td>6-10 years</td>
<td>20</td>
<td>19.4</td>
</tr>
<tr>
<td>7.</td>
<td>Type of salt used for cooking</td>
<td>103</td>
<td>100</td>
</tr>
<tr>
<td>7.1.</td>
<td>Iodized</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Form of salt used</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.1.</td>
<td>Powdered salt</td>
<td>103</td>
<td>100</td>
</tr>
<tr>
<td>9.</td>
<td>Amount of time spent in the kitchen</td>
<td>52</td>
<td>50.5</td>
</tr>
<tr>
<td>9.2.</td>
<td>&gt; 3 hours per day</td>
<td>51</td>
<td>49.5</td>
</tr>
</tbody>
</table>

[Mean age = 35 ± 0.63 years, Mean experience in managing the kitchen = 3.5 ± 0.47 years, Mean amount of time spent in the kitchen = 2.5 ± 0.52 hours]
Table 2: Frequency and percentage distributors of households according to level of iodine in the salt. 

<table>
<thead>
<tr>
<th>Type of salt</th>
<th>Iodine level (ppm)</th>
<th>Number of households</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Powdered</td>
<td>0-6</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>7-14</td>
<td>32</td>
<td>31.06</td>
</tr>
<tr>
<td></td>
<td>15-30</td>
<td>71</td>
<td>68.93</td>
</tr>
<tr>
<td></td>
<td>&gt; 30</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 3: Frequency and percentage of salt storing practices. n = 103

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Items</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Storing the salt container:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.1. In a dry place</td>
<td>44</td>
<td>42.7</td>
</tr>
<tr>
<td></td>
<td>1.2. In a wet place</td>
<td>10</td>
<td>9.7</td>
</tr>
<tr>
<td></td>
<td>1.3. Near to stove</td>
<td>49</td>
<td>47.6</td>
</tr>
<tr>
<td>2</td>
<td>Storing salt in container:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.1. Glass</td>
<td>22</td>
<td>21.4</td>
</tr>
<tr>
<td></td>
<td>2.2. Plastic</td>
<td>71</td>
<td>68.9</td>
</tr>
<tr>
<td></td>
<td>2.2. Metal</td>
<td>7</td>
<td>6.8</td>
</tr>
<tr>
<td></td>
<td>2.4. Salt packet itself</td>
<td>3</td>
<td>2.9</td>
</tr>
<tr>
<td>3</td>
<td>Keeping the storage container:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.1. Open</td>
<td>3</td>
<td>2.9</td>
</tr>
<tr>
<td></td>
<td>3.2. Tightly closed</td>
<td>83</td>
<td>80.6</td>
</tr>
<tr>
<td></td>
<td>3.3. Loosely closed</td>
<td>17</td>
<td>16.5</td>
</tr>
<tr>
<td>4</td>
<td>Amount of salt packets stored at home:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4.1. One or less than one</td>
<td>72</td>
<td>69.9</td>
</tr>
<tr>
<td></td>
<td>4.2. Two or more</td>
<td>31</td>
<td>30.1</td>
</tr>
<tr>
<td>5</td>
<td>Color of the stored salt:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5.1. White</td>
<td>103</td>
<td>100</td>
</tr>
<tr>
<td>6</td>
<td>Placement of the spoon:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6.1. Inside the container</td>
<td>84</td>
<td>81.6</td>
</tr>
<tr>
<td></td>
<td>6.2. Outside the container</td>
<td>19</td>
<td>18.4</td>
</tr>
<tr>
<td>7</td>
<td>Quality of salt in the container:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7.1. Dry and clear white</td>
<td>100</td>
<td>97.1</td>
</tr>
<tr>
<td></td>
<td>7.2. Moist and with impurities</td>
<td>3</td>
<td>2.9</td>
</tr>
<tr>
<td>8</td>
<td>Condition of the salt container:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8.1. Without breakages and cuts</td>
<td>76</td>
<td>73.8</td>
</tr>
<tr>
<td></td>
<td>8.2. With breakages and cuts</td>
<td>27</td>
<td>26.2</td>
</tr>
</tbody>
</table>

Fig. 1: Description on utilization of salt during cooking process

Discussion

Section I: Description of baseline characteristics of homemakers: The present study revealed that majority of the subjects, 62 (60%) was between the age group of 31-40 with the mean age of 35 ± 0.63 years. More than half of the subjects, 63 (60%) were under graduates and 52 (50%) were working women. The study findings are supported by the studies conducted by Gidey B, et.al in North Ethiopia and Gebrearegaw H, et.al in Gondar Town, Northwest Ethiopia where the results showed that the mean age of the participants was 38 years, 55.9% of the subjects were unemployed housewives and 23% had at least secondary school level in education.\[6\],\[7\]

Section II: Description of iodine content in the salt: The present study showed that 32 (31.06%) of salt samples were moderately iodized with iodine level of 7-14 ppm. The study findings are in accordance with another study conducted among 6-12 years school children in Gulbarga city of Karnataka where the results have showed that among the salt samples collected from retail shops and households, only 44.62% samples were adequately iodized.\[8\]

Section III: Description of salt preservation practices among homemakers:

Most of the homemakers, 71 (68.9%) were storing salt in plastic container, 7 (6.8%) in a metal container and 3 (2.9%) in salt packet itself. Seventeen homemakers, 17 (16.5%) were keeping the lid of container loosely closed and 3 (2.9%) were keeping it open. Most of the homemakers 50 (49.6%) were adding salt at the early beginning of the cooking and 22 (21.2%) in between
cooking. The study conducted in 2014 by Rashmi S, et al in Kanpur, India has also revealed that 99% of households were storing salt in kitchen itself and less than half proportion of the respondents (47%) were storing salt in glass jars followed by masaladan (23%).[9]

Section IV: Association between salt preservation practice scores and selected baseline characteristics: The present study revealed that there is a significant association of salt preservation practice scores with age ($\chi^2 = 16.45$, $p = 0.001$), education ($\chi^2 = 44.57$, $p = 0.001$) and experience in managing the kitchen ($\chi^2 = 38.53$, $p = 0.001$). The study findings are in accordance with a study conducted by Ebrahim S. in 2012 Basra City, South Iraq, where the results revealed that education and experience are significantly associated with level of iodine in the salt and salt preservation practices.[10]

Conclusion

Present study findings showed that most of the homemakers were practicing inappropriate salt preservation practices which affect the iodine level in the salt. Hence, IEC activities can play a great role to improve the knowledge of homemakers regarding appropriate salt preservation practices.

Financial Support and Sponsorship: Nil.

Conflict of Interest: There are no conflicts of interest.

Ethical Clearance:

References


An Analysis of Agricultural Development in Tamilnadu with Special Reference to Madurai District

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¹Assistant Professor, ²Associate Professor, Department of Economics, VELS Institute of Science, Technology and Advanced Studies, Chennai

Abstract
The developmental plans in India have stressed the need for a revolutionary change in agriculture which can be brought about by the introduction of new and HYV of improved seeds, application of suitable doses of fertilizers and extensive use of pesticides. The ‘Green Revolution’ as it is otherwise called, has led to a large increase in production of food grains after 1966-67. The Community Development Projects (each covering 100 villages) were started in 1952. The main objective was to mobilize rural dwellers for labour-intensive agricultural productivity projects supported by certain land reforms, new village co-operatives in which the State would be a partner and national extension services. In the Second Five Year Plan, only 20 per cent of total outlay went to agriculture, which is lower than the percentage allotted in the First Five Year Plan. The literates and illiterates were 17.95 lakhs and 7.67 lakhs respectively in 2001. The population is spread over the entire district with 11.27 lakhs and 14.35 lakhs living in the rural and urban areas respectively. Government should encourage the farmers to start co-operative societies in the study area in order to develop a direct link between the wholesalers/retailers, processors and exporters to cut down the marketing cost incurred for lengthy channel. The Government should initiate action to improve market information system and market intelligence.

Keywords: Agriculture Development, Community Development, Revenue Divisions.

Introduction
The developmental plans in India have stressed the need for a revolutionary change in agriculture which can be brought about by the introduction of new and HYV of improved seeds, application of suitable doses of fertilizers and extensive use of pesticides. The ‘Green Revolution’ as it is otherwise called, has led to a large increase in production of food grains after 1966-67. The revolution has brought about self sufficiency in food grains in agriculture, reduced our dependence on foreign countries for food grains and generated progress in agriculture. The revolutionary change has attempted to break the chain of the vicious circle of poverty in Indian agriculture and paved the way for success mainly in the production of food grains. The review of agricultural development in India since Independence will show the telling impact of the new agricultural strategy. Indian agriculture during the 19th Century was almost of subsistence type. Production of food grains was mainly for consumption purposes and there has been very little rise in output. Indian agriculture is rich in resources but low in productivity. With 2.5 per cent of the world surface area, the country cultivates 163 million hectares, which is approximately 12 per cent of the world arable area. Comparatively in the world scene, Indian rice productivity is just 40 per cent of the Chinese yields, approximately one-third of the Korean yields and around 55 per cent of Indonesian yields. Agricultural development has received priority after independence in our five year plans. Efforts were made to overcome the technical constraints, institutional drawbacks, poor extension services, etc. In the First Five Year Plan, agriculture received top priority.¹ The agricultural development programmes included the Extensive Cultivation and the Community Development Programme. The Community Development Projects (each covering 100 villages) were started in 1952. The main objective was to mobilize rural dwellers for labour-intensive agricultural productivity projects supported by certain land reforms, new village co-operatives in which the State would be a partner and national extension services. In the Second Five Year
Plan, only 20 per cent of total outlay went to agriculture, which is lower than the percentage allotted in the First Five Year Plan. The approach to development was based on the selectivity of area and concentration of efforts and it was pursued in the Third Five Year Plan also. Institutional support to development was initiated. Inspite of the efforts made by the government, the chronic food shortage could not be wiped out. The Ford Foundation team visited India during January to April 1959 to suggest measures to overcome food shortages. The team submitted their report ‘India’s Food Crisis and Steps to meet it’. The team had found that there were no insurmountable obstacles to increase production. The team recommended intensive agricultural development through selected areas in the country, which have vast potential for improvement. Based on Ford Foundation’s recommendations the Intensive Agricultural District Programme (IADP) also known as the “Package Programme” was initiated in the year 1960-61. Seven districts were chosen initially for implementation of this programme. Thus there has been a conscious effort to increase agricultural productivity. The IADP with improved seeds, improved farm tools, fertilizers and pesticides demonstrated the most effective way to increase agricultural production by the application of scientific knowledge how which could be extended to areas with basic inputs. The seven districts in which the programme was implemented, made considerable progress and then it was extended to 15 districts comprising the first group of 7 districts selected in 1960-61 and the second group of eight districts in 1962-63. In 1964-65, 114 districts were chosen for Intensive Agricultural Area Programme (IAAP) which was intensive agricultural development of a selected area.

The “New Strategy” for agricultural development initiated in 1966 called for an effective implementation of IADP and IAAP with the use of High Yielding Varieties. The HYVP assumed crucial importance in the agricultural development strategy. The HYV strategy aims to increase productivity of crops per acre through multiple cropping. The Fourth Plan put the New Strategy as follows: (i) to apply scientific techniques and knowledge of agricultural production at all stages, particularly in the fields, (ii) to select a few areas with assured rainfall and irrigation for concentrated application of a package of practices based on improved varieties of seeds, responsive to heavy doses of fertilizers and availability of inputs and to fix special targets of production of food grains. The first dwarf varieties of wheat were introduced in India by the scientists at the Indian Agricultural Research Institute (IARI), New Delhi in 1962-63 with the co-operation of Dr. Norman Borlaug. The Central Rice Research Institute at Cuttack and Rice Project Directorate at Hyderabad helped to introduce the new high yielding varieties of rice and new farm practices. There are at present 120 rice research stations in the country. The IARI is paying attention to the improvement of nutritional quality of major food grains such as wheat, rice, millet, maize, sorghum and so on. The area under HYVP which was 1.89 million hectares in 1966-67 had increased to 9.2 million hectares on the eve of Fourth Five Year Plan. In 1989-90, the area under HYVP increased to 26.53 million hectares which accounted for 31.6 per cent of the gross cropped area. The area under rice increased from 30 million hectares in 1950-51 to 56 million hectares in 1989-90, the production of rice stood at 20 million tonnes and 59 million tonnes respectively. There has been a tremendous increase in yield from 668 kg. per hectare to 1425 kg. per hectare over the period.

The Sixth Plan’s objectives include speedy implementation of land reforms, spread of new technology to more farmers and regions, using agriculture as a catalyst of income and employment generation in rural areas and promoting scientific, land-water use patterns based on consideration of ecology, energy conservation and employment generation. An overall view of recent trends in area under High Yielding Varieties shows that the annual rate of growth between 1980-81 and 1987-88 was 3.5 per cent. Agricultural production which suffered a setback during 1991-92 due to irregular monsoon in 1991 was expected to record a relatively high growth rate in 1992-93. Foodgrains production was targeted at 183 million tonnes during 1992-93.

The Tenth Five Year Plan (2002-2007) envisages an overall GDP growth rate of 8 per cent per annum. The National Agricultural Policy has envisaged:

- Growth that is based on efficient use of resources and conserves our soil, water and bio-diversity;
- Growth with equity, i.e., growth which is widespread across regions and benefits all farmers;
Growth that is demand-driven and caters to domestic markets as well as maximizes benefits from exports; and

Growth that is sustainable technologically, environmentally and economically;

Growth rate is excess of 4 per cent. The strategy to achieve the desired growth rate, exceeding 4 per cent, in the sector during the Tenth Plan, would be a regionally differentiated one based on agro-climatic conditions and land and water resources of different regions.

Table 1: Villages and Number of Selected Farmers

<table>
<thead>
<tr>
<th>S. No.</th>
<th>I. Madurai East</th>
<th>Total</th>
<th>Male</th>
<th>Total</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Chinnamangalam</td>
<td>321.42</td>
<td>14</td>
<td>342.33</td>
<td>16</td>
</tr>
<tr>
<td>2.</td>
<td>Kadakinaru</td>
<td>278.12</td>
<td>12</td>
<td>267.16</td>
<td>12</td>
</tr>
<tr>
<td>3.</td>
<td>Kallandri</td>
<td>213.16</td>
<td>9</td>
<td>182.36</td>
<td>8</td>
</tr>
<tr>
<td>4.</td>
<td>Mathur</td>
<td>178.28</td>
<td>8</td>
<td>163.74</td>
<td>8</td>
</tr>
<tr>
<td>5.</td>
<td>Valliyakundram</td>
<td>143.16</td>
<td>6</td>
<td>136.32</td>
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</tr>
<tr>
<td>6.</td>
<td>Sakkudi</td>
<td>138.72</td>
<td>6</td>
<td>127.36</td>
<td>6</td>
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<tr>
<td>7.</td>
<td>Arumbanoor</td>
<td>102.63</td>
<td>4</td>
<td>94.34</td>
<td>4</td>
</tr>
<tr>
<td>8.</td>
<td>Narasasingam</td>
<td>98.43</td>
<td>4</td>
<td>78.36</td>
<td>4</td>
</tr>
<tr>
<td>9.</td>
<td>Othakadai</td>
<td>96.73</td>
<td>4</td>
<td>71.32</td>
<td>3</td>
</tr>
<tr>
<td>10.</td>
<td>Puduthamaraipatti</td>
<td>78.36</td>
<td>3</td>
<td>69.42</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>II. Madurai West</th>
</tr>
</thead>
<tbody>
<tr>
<td>11. Kulumangalam</td>
</tr>
<tr>
<td>12. Thiruppalai</td>
</tr>
<tr>
<td>13. Paravai</td>
</tr>
<tr>
<td>14. Kodimangalam</td>
</tr>
<tr>
<td>15. Chinnapatti</td>
</tr>
<tr>
<td>16. Karuvanur</td>
</tr>
<tr>
<td>17. Kavanur</td>
</tr>
<tr>
<td>18. Chatrapatti</td>
</tr>
<tr>
<td>19. Veerapandi</td>
</tr>
<tr>
<td>20. Patchikulam</td>
</tr>
</tbody>
</table>

| Total | 3451.73 | 150 | 3226.07 | 150 |


Table 2: Number of Revenue Divisions, Taluks and Community Development Blocks

<table>
<thead>
<tr>
<th>Revenue Divisions</th>
<th>Taluks</th>
<th>Community Development Blocks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Madurai</td>
<td>1. Madurai North</td>
<td>1. Alanganallur</td>
</tr>
<tr>
<td>2. Usilampatti</td>
<td>2. Madurai South</td>
<td>2. Chellampatti</td>
</tr>
<tr>
<td></td>
<td>4. Peraiyur</td>
<td>4. T. Kallupatti</td>
</tr>
<tr>
<td></td>
<td>5. Thirumangalam</td>
<td>5. Kottampatti</td>
</tr>
<tr>
<td></td>
<td>7. Vadipatti</td>
<td>7. Madurai West</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total</th>
<th>1. Alanganallur</th>
<th>1. Madurai North</th>
<th>1. Madurai East</th>
</tr>
</thead>
</table>

Source: District Gazette, Madurai District, No. 5, March 5, 2012-13.

Population of the District: According to the 2001 Census, the total population of the district was about 25.78 lakhs comprising 13.03 lakhs of males and 12.74 lakhs of females and with a density of 689 persons per sq.km. The density of Madurai district is higher than the densities of the State and the Nation. The proportion of women to men is 964 to 1000 in the Madurai district compared to the ratio of 978 to 1000 for the state. The literacy rate is 78.65 per cent. The literates and illiterates were 17.95 lakhs and 7.67 lakhs respectively in 2001. The population is spread over the entire district with 11.27 lakhs and 14.35 lakhs living in the rural and urban areas respectively. The birth rate is 20.6 per 1000 and the mortality rate is 8.4 per 1000, thus resulting in a natural growth rate of 12.2 per 1000.

Table 3: Block-Wise Distribution of Area and Population (2012-13)

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of the Block</th>
<th>Total Geographical Area (in hectares)</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Men</td>
<td>Women</td>
</tr>
<tr>
<td>1.</td>
<td>Alanganallur</td>
<td>20245</td>
<td>48683</td>
</tr>
<tr>
<td>2.</td>
<td>Chellampatti</td>
<td>21007</td>
<td>43516</td>
</tr>
<tr>
<td>3.</td>
<td>Kallikudi</td>
<td>25682</td>
<td>33661</td>
</tr>
<tr>
<td>4.</td>
<td>T. Kallupatti</td>
<td>26532</td>
<td>40373</td>
</tr>
<tr>
<td>5.</td>
<td>Kottampatti</td>
<td>32900</td>
<td>49261</td>
</tr>
<tr>
<td>6.</td>
<td>Madurai East</td>
<td>24265</td>
<td>61958</td>
</tr>
<tr>
<td>Sl No.</td>
<td>Name of the Block</td>
<td>Total Geographical Area (in hectares)</td>
<td>Population</td>
</tr>
<tr>
<td>-------</td>
<td>------------------------</td>
<td>---------------------------------------</td>
<td>-------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Men</td>
</tr>
<tr>
<td>7.</td>
<td>Madurai West</td>
<td>16182</td>
<td>64637</td>
</tr>
<tr>
<td>8.</td>
<td>Melur</td>
<td>39818</td>
<td>57665</td>
</tr>
<tr>
<td>9.</td>
<td>Sedapatti</td>
<td>54903</td>
<td>53624</td>
</tr>
<tr>
<td>10.</td>
<td>Thirumangalam</td>
<td>30834</td>
<td>42108</td>
</tr>
<tr>
<td>11.</td>
<td>Tirupparankundrum</td>
<td>29162</td>
<td>103307</td>
</tr>
<tr>
<td>12.</td>
<td>Usilampatti</td>
<td>35522</td>
<td>46662</td>
</tr>
<tr>
<td>13.</td>
<td>Vadapatti</td>
<td>17760</td>
<td>55273</td>
</tr>
</tbody>
</table>

Source: Annual Credit Plan, Lead Bank (Canara Bank), Madurai, 2008.

In Madurai district, Sedapatti block has the largest area of the total geographical area in the district. In terms of population, Thirupparankundram block has largest and Kallikudi block has smallest population in Madurai district.

Irrigation: Irrigation is one of the most fundamental inputs as it helps to relieve agriculture which hitherto was a gamble in monsoon and events like severe famine and semi-famine conditions. Moreover optimum utilization of land and resources can be obtained only with assured water supply and multiple cropping could be undertaken only with better irrigation. Irrigation helps in ‘increasing production per unit of land, particularly when used in appropriate combination with other inputs’. It is a proven fact that output per acre is higher in irrigated lands than in dry lands in India.9

Fertilizer: Intensive use of land leads to depletion of nutrients in the soil which has to be replenished with the use of manures and fertilizers to increase soil productivity. Mellor estimated that 53 per cent of the incremental food grains production in India during 1973-74 was attributable to fertilizer use and its contribution was expected to increase to 79 per cent during 1983-84. A Food and Agriculture Organisation (FAO) annual study has described the importance of fertilizer use as a spearhead of agricultural development. Because wherever efforts are made to raise agricultural efficiency and production for expanding populations, more fertilizers and manures have been invariably needed. The Intensive Agricultural District Programme (IADP) and High Yield Variety Programme (HYVP) increased the importance of fertilizers to compensate for the nutritional loss. The use of fertilizers has increased from 1.20 million tonnes in 1966-67 to 5.4 million tonnes in 1988-89.10

Mechanization: Farm mechanization is another essential input for increased agricultural productivity. Assured irrigation at appropriate time and quantity, uniform application of fertilizers, seed-bed preparation of a good quality and early harvesting and threshing to sow the next crop with well adapted machinery and implements can only lead to timely farm operations of satisfactory quality. Much-headway is made in this direction in States like Punjab, Haryana, Uttar Pradesh, Andhra Pradesh and Tamil Nadu. Economists differ as to the possible loss and gain of farm mechanization. On the one hand it is opined that “Mechanization therefore contributes to meeting these peak power needs with better land preparation and higher cropping intensity leading to substantially bigger harvests which in turn require more labour during post-harvest slack periods for threshing, storage, transport and even quadruple the number of field operations”.11

Conclusion

In the light of this study, this section presents details of agriculture. The economy of Madurai district is basically agrarian in character and a vast majority of its population is dependent upon agriculture for income and employment either directly or indirectly. The agricultural sector not only generates employment but also fulfills the food requirements of the growing population.12 The main crops cultivated in Madurai district are paddy, maize, cumbu, ragi, cotton, sugarcane and groundnut. of these crops, paddy and sugarcane are grown under irrigated conditions and the remaining crops are cultivated in irrigated and unirrigated conditions in Madurai district. The farmers in the study area were of the opinion that they could not achieve the maximum yield due to severity of diseases and pest attacks. It is suggested that the farmers should be educated properly to apply the pesticides at the prescribed level and this may be done through the agricultural department officer attached to the panchayat unions. The marketing cost
constitutes a major portion of the consumer price. Hence, Government should encourage the farmers to start co-operative societies in the study area in order to develop a direct link between the wholesalers/retailers, processors and exporters to cut down the marketing cost incurred for lengthy channel. The Government should initiate action to improve market information system and market intelligence. Existing techniques disseminating marketing information should be reviewed. Visual media like television can be used for providing market information to farmers of rural areas. Modern devices such as computers may be employed wherever necessary to make a meaningful estimate of marketable surplus and daily average price.

**Ethical Clearance:** Completed

**Source of Funding:** Self

**Conflict of Interest:** Nil

**References**

A Study on Problems Faced by Sipcot Industrial Labours in Reference to Cuddalore District

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Abstract

Welfare measures are having positive and significant effect on productivity of the organization. The welfare facilities will directly influence employee productivity. We are in the track of changing face due to various factors such as liberalization, privatization, globalization and also the recent global economic. So every organization is expected to meet the challenges by reshaping their labour welfare measures. It is found that better working conditions and welfare facilities are made available inside industrial units. However, it is suggested to take the following initiatives for further improvement. Maintenance of the parks and gardens needs to be improved. Safety training must be given periodically and the employees who are unaware of safety aspects must be identified and trained. Training for handling of the safety equipment must be given periodically for the employees.

Keywords: Labours problems, Industrial Units in SIPCOT.

Introduction

Labour plays a very important role in the industrial production of the country. The human resource managers are really concerned with the management of people at work. It is necessary to secure the corporation of labour force, in order to increase production and profit. The corporation of labour force is possible when they are fully satisfied with their employer and the working conditions of the job. In the past, industrialist and the employers believed that their only duty to their workers was to pay them satisfactory wages and salaries. Until recently, the labour force has been viewed as servant and the management as masters. In today’s context, the situation is totally different with the introduction of the concept on human resource management. Psychological researchers convinced them that the workers required something more important. In addition to providing monetary benefits, human treatment given to workers plays a very important role in seeking their cooperation. Human has unique significance in every organization because it makes possible the effective use of human resources along with material resource. Labour or workers welfare activities benefit not only the workers but also the management in the form of greater industrial efficiency.¹ The human resource managers realize that the welfare activities pay a good dividend in the long run, because they contribute a lot to the health, efficiency and moral of the workers.

Statement of the Problem: The researcher has identified the following problems of the study. Industrial units in SIPCOT were facing a number of problems such as poor infrastructural facilities, bad shape of roads, inadequate supply of water, short supply of raw material and power. Because of those problems a large number of units had been either closed or were at the stage of closure. Lack of proper attention to their location, uneconomic land development, delay in allotment of land, lack of housing facilities, lack of coordination among different government department and so on are the other problems.² They must be motivated to change their habits and their way of living since the present day problems require alteration of their behavior which are detrimental to health like pollution, unsafe drinking water, cigarette smoking, consumption of alcoholic liquor and the like. Hence, it is the responsibility of the employer to promote environmental health and thereby prevent diseases.

Objectives of the Study:

1. To find out the problems faced by the workers of select industrial units in SIPCOT, Cuddalore.
2. To suggest measures to improve the standard of labour welfare measures in the select industrial units in SIPCOT, Cuddalore.

**Hypotheses**

**Ho1:** “There is no association between problems of the workers and nature of industrial units in SIPCOT”.

**Methodology:** The present study has adopted the field survey method. A sincere effort has been made in the study to prove and analyze the Effectiveness of Labour Welfare Measures among the Selected Groups of Industrial Units in SIPCOT, Cuddalore. The present study is based on survey method; both primary and secondary data are used. All the objectives of the study are achieved by the data collection, analysis and interpretation of both primary and secondary data.

**Sampling Design:** The study is confined to three categories of industrial unit’s namely chemical industry, textile industry and pharmaceutical industry. From each category 200 workers were selected by adopting convenient sampling technique.

**Tools Used for the Study:** The collected data have been consolidated, tabulated and analyzed by using relevant statistical tools like Percentage analysis, Descriptive analysis, One Way ANOVA, t-test, Correlation analysis and Reliability test for Cronbach’s alpha and Kruskal-Wallis Test. The SPSS 20.0 package was utilized for analyzing the data. The interpretation of the study is done by using tables, graphs and charts to give meaningful results. For analyzing the data collected during the investigation, the following statistical values were used according to the relevance of its application.

**Level of Problems Faced by the Workers in the Sipcot Industrial Units:**

**Physiological Problems:** The term ‘Physiological’ would be a positive and dynamic concept. In common parlance, health would imply absence of disease. The World Health Organization has defined heath a state of complete physical mental and social well-being and not merely the absence of disease or illness or infirmity. By providing a better healthy working condition employee efficiency and productivity could be increased and the problems of absenteeism also minimized.³

Kruskal-Wallis Test has been applied to analyse the significant association between employee health problems and nature of industry in the SIPCOT industrial units and the following null hypothesis has formulated.

**Ho1:** “There is no association between problems of the workers and nature of the industrial units in SIPCOT”.

**Ho1 (i):** “There is no association between physiological problems of the workers and nature of the industrial units in SIPCOT”.

**Table 1: Kruskal-Wallis Test for Physiological Problems of the Workers and Nature of Company**

<table>
<thead>
<tr>
<th>Workers Health Problems and Nature of Company</th>
<th>N</th>
<th>Mean Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headaches and cold</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemical Company</td>
<td>200</td>
<td>302.56</td>
</tr>
<tr>
<td>Textile Company</td>
<td>200</td>
<td>331.23</td>
</tr>
<tr>
<td>Pharmaceuticals Company</td>
<td>200</td>
<td>267.71</td>
</tr>
<tr>
<td>Total</td>
<td>600</td>
<td></td>
</tr>
<tr>
<td>Diabetics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemical Company</td>
<td>200</td>
<td>299.85</td>
</tr>
<tr>
<td>Textile Company</td>
<td>200</td>
<td>284.18</td>
</tr>
<tr>
<td>Pharmaceuticals Company</td>
<td>200</td>
<td>317.48</td>
</tr>
<tr>
<td>Total</td>
<td>600</td>
<td></td>
</tr>
<tr>
<td>Itching of skin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemical Company</td>
<td>200</td>
<td>315.74</td>
</tr>
<tr>
<td>Textile Company</td>
<td>200</td>
<td>291.67</td>
</tr>
<tr>
<td>Pharmaceuticals Company</td>
<td>200</td>
<td>294.09</td>
</tr>
<tr>
<td>Total</td>
<td>600</td>
<td></td>
</tr>
<tr>
<td>Urinal infection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemical Company</td>
<td>200</td>
<td>294.81</td>
</tr>
<tr>
<td>Textile Company</td>
<td>200</td>
<td>319.21</td>
</tr>
<tr>
<td>Pharmaceuticals Company</td>
<td>200</td>
<td>287.48</td>
</tr>
<tr>
<td>Total</td>
<td>600</td>
<td></td>
</tr>
<tr>
<td>Body pain and back pain</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemical Company</td>
<td>200</td>
<td>309.75</td>
</tr>
<tr>
<td>Textile Company</td>
<td>200</td>
<td>271.27</td>
</tr>
<tr>
<td>Pharmaceuticals Company</td>
<td>200</td>
<td>320.48</td>
</tr>
<tr>
<td>Total</td>
<td>600</td>
<td></td>
</tr>
<tr>
<td>Eye problem</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemical Company</td>
<td>200</td>
<td>335.95</td>
</tr>
<tr>
<td>Textile Company</td>
<td>200</td>
<td>268.70</td>
</tr>
<tr>
<td>Pharmaceuticals Company</td>
<td>200</td>
<td>296.86</td>
</tr>
<tr>
<td>Total</td>
<td>600</td>
<td></td>
</tr>
<tr>
<td>Blood pressure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemical Company</td>
<td>200</td>
<td>325.93</td>
</tr>
<tr>
<td>Textile Company</td>
<td>200</td>
<td>308.11</td>
</tr>
<tr>
<td>Pharmaceuticals Company</td>
<td>200</td>
<td>267.47</td>
</tr>
<tr>
<td>Total</td>
<td>600</td>
<td></td>
</tr>
</tbody>
</table>

Source: Computed from Primary data

It is clear from the Table: 1 that the urinal infection and headache and cold scored highest mean rank in the textile Industrial Units whereas body pain and back pain scored the highest mean rank in the pharmaceuticals industrial units. The highest mean score of itching of skin, eye problem and blood pressure is in the chemical industrial units. This highest mean rank indicates the level of problems in the respective industrial units.
The calculated chi-square values of headache and cold (25.782), urinal infection (7.666), body pain and back pain (17.576), eye problem (19.844) and blood pressure (17.844) are significant at five per cent level. The value indicates that there is a significant association between physiological problems and nature of industrial units in SIPCOT. Hence, the stated hypothesis “There is no association between physiological problems and nature of industry in SIPCOT industrial units” is rejected. However, the calculated chi-square values of diabetics (5.564) and itching of skin (3.251) are not significant. The value indicates that there is no association between physiological problems and nature of industry in the SIPCOT industrial units. Hence, the stated hypothesis “There is no association between physiological problems and nature of industry in the SIPCOT industrial units” is accepted.

**Psychological Problems:** The psychological well-being of the workforce is an important indicator of healthy industrial operations. Psychological problems are associated with pain and other health outcomes. It also results in occupational injury, absence, and recovery. The psychological problems decrease the ability of the workers. Kruskal-Wallis Test has been applied to analyse the significant association between workers’ psychological problems and nature of companies in the SIPCOT industrial units and the following null hypothesis has formulated.

\[ Ho1 \ (ii): \text{There is no association between psychological problems of the workers and nature of industrial units in SIPCOT}. \]
It is clear from the Table: 3 that the depression and frustration variables scored highest mean rank among the workers in the chemical industrial units, whereas angry in the work spot scored highest mean score among the workers in the pharmaceuticals Industrial Units. The workers are lonely has the highest mean rank among the workers in the textile industrial units. This shows that the workers in the respective industrial units have more psychological problems than the other nature of the industry.

Table 4: Test Statistics\textsuperscript{a, b}

<table>
<thead>
<tr>
<th>Depression</th>
<th>Frustration</th>
<th>Forgetfulness</th>
<th>Angry in work spot</th>
<th>Fee lonely</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-Square</td>
<td>32.857</td>
<td>24.946</td>
<td>3.607</td>
<td>8.307</td>
</tr>
<tr>
<td>Df</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Asymp. Sig.</td>
<td>0.001*</td>
<td>0.001*</td>
<td>0.165</td>
<td>0.016*</td>
</tr>
</tbody>
</table>

\textsuperscript{a} Kruskal Wallis Test, \textsuperscript{b} Grouping Variable: Nature of Company

The calculated chi-square values of depression (32.857), frustration (24.946), angry in work spot (8.307) and free lonely (23.028) are significant at five per cent level. The value indicates that there is a significant association between psychological problems and nature of industrial units in SIPCOT. Hence, the stated hypothesis “There is no significant association between psychological problems and nature of industrial units in SIPCOT” is rejected. However, the calculated chi-square value of forgetfulness (3.607) is not significant. The value indicates that there is no significant association between psychological problems and nature of industrial units in SIPCOT. Hence, the stated hypothesis “There is no significant association between psychological problems and nature of industrial units in SIPCOT” is accepted.

Common Problems

The problems which are not included in the other types of problems are in the common problems. In the present study, the common problems among the respondents have been measured with the help of problems. Kruskal-Wallis Test has been applied to analyse the significant association between workers’ common problems and nature of companies in the SIPCOT industrial units and the following null hypothesis has formulated.\textsuperscript{5}

\textbf{Ho1 (iii):} “There is no association between common problems of the workers and nature of industrial units in SIPCOT”.

Table 5: Kruskal-Wallis Test for Common Problems of the Workers and Nature of Company

<table>
<thead>
<tr>
<th>Workers Health Problems after Joining the Job</th>
<th>N</th>
<th>Mean Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work injuries and illness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemical Company</td>
<td>200</td>
<td>349.14</td>
</tr>
<tr>
<td>Textile Company</td>
<td>200</td>
<td>358.42</td>
</tr>
<tr>
<td>Pharmaceuticals Company</td>
<td>200</td>
<td>293.94</td>
</tr>
<tr>
<td>Total</td>
<td>600</td>
<td></td>
</tr>
</tbody>
</table>
It is clear from the Table: 5 that the work injuries, illness, poor supervision and inadequate training have scored the highest mean score among the workers in the chemical industrial units. Whereas heavy work load has scored highest mean score among the workers in the pharmaceuticals Industrial Units. This shows the level of common problems among the workers the Industrial Units.

### Table 6: Test Statistics\(a, b\)

<table>
<thead>
<tr>
<th></th>
<th>Work injuries and illness</th>
<th>Heavy work load</th>
<th>Poor supervision and inadequate training</th>
<th>Pressures at work place</th>
<th>Risky nature of job</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-Square</td>
<td>37.305</td>
<td>8.028</td>
<td>27.863</td>
<td>2.114</td>
<td>0.958</td>
</tr>
<tr>
<td>df</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Asymp. Sig.</td>
<td>0.001*</td>
<td>0.018*</td>
<td>0.001*</td>
<td>0.347</td>
<td>0.619</td>
</tr>
</tbody>
</table>

*a. Kruskal Wallis Test, b. Grouping Variable: Nature of Company*

The calculated chi-square values 37.305, 8.028 and 27.863 to the above respective variables are significant at five per cent level. The value indicate that there is a significant association between common problems and nature of industrial units in SIPCOT. Hence, the stated hypothesis “There is no significant association between common problems and nature of industrial units in SIPCOT” is rejected. However, the calculated chi-square values of pressure at work place (2.114) and risky nature of job (0.958) are not significant.\(^b\) The value indicates that there is no significant association between common problems and nature of industrial units in SIPCOT. Hence, the stated hypothesis “There is no significant association between common problems and nature of industrial units in SIPCOT” is accepted.

### Suggestions of the Study:

- The industrial units have to improve the hygienic condition in the canteen and also to increase the nutrition food to the workers. The management should provide subsidized food in Canteen to the all workers.
- The workers state that there exists quality of first aid which has to be enhanced in the critical places. It is also suggested that considerable attention should be given for first aid appliances with quality of drugs and necessary medicines.
A safety committee has to be constituted in the SIPCOT industrial units to educate the workers about their responsibility during the hazardous situations. In order to render quality safety service, the members of the safety committee should undergo first aid training.

Adequate safety equipment and provisions shall be provided to maintain industrial peace and harmony.

The workers like to have appropriate, clean and adequate latrines and urinals at the workplace.

**Conclusion**

Welfare measures have positive and significant effect on the productivity of the organisation. The welfare facilities directly influence employee productivity. Once this relationship is established, high employee productivity may lead to high satisfaction. The analysis revealed positive response from almost all the workers. It is found that better working conditions and welfare facilities are made available inside industrial units. However, it is suggested to take the following initiatives for further improvement. Maintenance of parks and gardens needs to be improved. Safety training must be given periodically and the workers who are unaware of safety aspects must be identified and trained. Training for handling of the safety equipment must be given periodically for the workers.

**Conflict of Interest:** Completed

**Source of Funding:** Self

**Ethical Clearance:** Nil

**References**

Reducing Fertility Rate: A Threat to Leader States

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Abstract

The aim of the study is to analyze the situation of fertility rate in the districts of Punjab. The state is passing through the stage of demographic transition with which the major socio-economic and demographic variables are leaving a strong impact on the demographic dividend. The change in age structure along with the change in literacy, per capita income, female work participation and urbanization, the fertility rate has fallen in leader districts. The laggard districts in the state are still the evidence to high fertility rate. The rural-urban differentials are further widening this gap and changing the total composition of demographic dividend for the years to come. Keeping these factual situations in mind, the study concentrates on analyzing the differentials in the fertility rate in districts of the state, collectively effecting the working segment—the demographic dividend, which could ultimately form a sound platform for the policy makers of the state.

Keywords: Economic Development, Demographic transition, Population, fertility rate, Demographic dividend.

Introduction

Punjab is going through the stage of demographic transition which further is leading to a crucial change in the age structure and demographic dividend of the state. As fertility declines, the proportion of children in proportion to the population of working age decreases, resulting in a lower dependency ratio. This further leads to increase in living standards and the material needs which starts the wave of consumerism to the extent that even a child becomes a source of happiness like many consumer goods. With the rise in per capita capital investments in infrastructure and basic social overhead and the creation of jobs for the available increasing population of working age group, a state or a country can reap the benefits of increased production associated with the decreasing proportion of dependents till the window of the demographic dividend is open. This “demographic bonus” can thus contribute significantly to economic growth and poverty reduction and further will decrease to the proportion to a major fall in the labor force for the years to come. Fertility rate, on the other hand, if stands very low gives a challenge to development programs with very less replacement of the population ultimately leading to decrease in labor force.

The Study Area: Punjab, a name given to the state from Persian dialect means “Five Rivers”, a land of five rivers with the Education Index (0.265) Health Index (0.780063), Income index (0.678) and overall Human Development Index (0.140154) stands on the 6th rank in India. Enjoyed the Green Revolution which brought economic prosperity for the state in the decade of seventies, Punjab shows poor ranking on demographic variable especially gender variable. This is one of the major cause of an adverse environment regarding demographic variables. A very considerable regional diversity in terms of social, economic and demographic characteristics prevails in the state. All the three regions of Punjab had a long history of economic and political happenings. Not only that, there is a striking variations in level of education especially female education, female work participation, dependency ratio, fertility rate, mortality rate, level of employment, per capita income etc. among the various parts of the state, effecting the livelihood of the people. All these indicators have a tendency to further shift the major variables like migration, employment, production, urbanization patterns and overall economic development of the state.

Literature review: The size of the family and the number of children per woman has fallen substantially in many countries over the period, especially after 1960. This trend is broadly favorable for sustainable development. High fertility is associated with increased risk of poor maternal health and mortality. In most of
the cases, women who have several children find it more difficult to work outside the home, thus having fewer opportunities to improve their economic and social status and that of their families (1). With advances in the field of medicine and public health, there would be a further decline in the mortality rate. The higher the income, the higher the age at marriage. Higher age at marriage shortens the reproductive span which in turn, reduces the fertility rate (2). Duza and Baldwin also found that the fertility decline in Tunisia, Sri Lanka and Malaysia could be attributed to rising age at marriage as the result of enhanced educational and occupational opportunities (3).

William Sander studied the fertility behavior in United Nations for four periods and confirmed that economic factors, particularly the earning ability of women affect fertility, an increase in the earning ability of women results in an increase on the price of children thereby reducing fertility (4). Becker in his ‘demand model’ of fertility behavior viewed children as ‘consumer goods’ and as with other goods an increase in income resulted in an increase in the ‘quality’ and ‘quantity’ of children (5). Demographic factors like age at marriage, present family size, gender preference and socioeconomic factors like education, occupation, contraceptive practice, etc. were reported the determinants of desired family size (6). Bogue studied the reasons of fertility decline in Western Europe and explained that education had the powerful impact in explaining the fertility differentials. Female education shows a negative relation with fertility (7). Cleland and Rodriguez also found that the wife’s education had a slightly stronger influence on fertility than husband’s education. They also noted that in countries with low levels of development the impact of primary schooling was initially positive and only became negative among women who had completed a certain level of schooling. Only when primary school was completed did greater fertility control suppressed the loss of traditional birth spacing behavior associated with exposure to modern education (8). Bongaartshas taken these socioeconomic factors as indirect determinants though one or more of the proximate determinants (9). Income and education, being major players among the socio-economic factors. These studies contributed to variations in the level of fertility were essential for initiating planned efforts to control fertility (10).

**Objectives:**

1. To examine the variations in fertility rate in the districts of Punjab
2. To examine the relation of fertility rate with other variables like literacy rate, per capita income, urbanization etc.
3. To analyze the differentials in fertility rate leading to the formation of demographic dividend of Punjab.

**Database and Methodology:** The study is based on secondary data. It is confined to all the districts of the state. It is a comparative analysis conducted on the fertility levels of the districts of Punjab. The statistical tables, techniques like correlation is used. The disparity pattern in fertility is also explained through diagrams. The source of data collection is the Census of Punjab 2001 & 2011, Economic Survey of Government of India and Reports on Gender profile 2011 by National Women Commission, India.

**Fertility rate in Punjab:** Fertility rate has fallen below the level of replacement fertility rate in Punjab. The concept that is widely associated with TFR is replacement level fertility. A TFR of 2.1 replacement fertility since an average of two births is needed to “replace” a mother and father but only if the births survive to reproductive age. An extra 0.1 birth is added to offset the effects of premature death, Higher fertility in developing countries occurs for a number of reasons all of which work synergistically and to varying degrees depending on the country, religion, culture, and social norms. These reasons include but are not limited as lack of availability to affordable family planning, religious restrictions on the use of family planning, a desire for more children as labor supply and for security in old age, a desire for one or more children of a particular gender, female literacy, and female participation in the workforce.

The change in the fertility rate of Punjab from 1971-2010 taking into consideration two major economically active phases of Punjab; the post green revolution era and the post reform era. The urban areas of Punjab had achieved the level of replacement fertility rate of 2.1 in 1998 while the state had reached into that phase in 2005. The rural urban gap of Punjab was 1.1 in 1971 and this gap has reduced to 0.1 in 2011. Many of the districts in Punjab had practiced positively towards gender statistics so as to make the land more comfortable for women.
The state has observed a sharp fall in the fertility rate after reform period with changing age structure, increasing working force including women, per capita productive investments, rising standard of living with changing life styles and higher per capita incomes, urbanization and positively responding gender variables.

Table 1: District wise fertility rate in Punjab

<table>
<thead>
<tr>
<th>Dist</th>
<th>TFR</th>
<th>Rural</th>
<th>Urban</th>
<th>R-U Gap</th>
</tr>
</thead>
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<tr>
<td>Punjab</td>
<td>1.71</td>
<td>1.78</td>
<td>1.58</td>
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<td>1.74</td>
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<td>0.26</td>
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<td>1.71</td>
<td>1.52</td>
<td>0.19</td>
</tr>
<tr>
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<td>1.56</td>
<td>1.66</td>
<td>1.48</td>
<td>0.18</td>
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<tr>
<td>Hoshiarpur</td>
<td>1.64</td>
<td>1.68</td>
<td>1.50</td>
<td>0.18</td>
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</tr>
<tr>
<td>Moga</td>
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<td>1.76</td>
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</tr>
<tr>
<td>Firozpur</td>
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</tr>
<tr>
<td>Faridkot</td>
<td>1.77</td>
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<td>1.73</td>
<td>0.07</td>
</tr>
<tr>
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<td>Mansa</td>
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<td>1.86</td>
<td>1.73</td>
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<tr>
<td>Patiala</td>
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<td>1.83</td>
<td>1.52</td>
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<tr>
<td>Amritsar</td>
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<td>1.90</td>
<td>1.54</td>
<td>0.36</td>
</tr>
<tr>
<td>Tarn Taran</td>
<td>1.85</td>
<td>1.87</td>
<td>1.74</td>
<td>0.13</td>
</tr>
<tr>
<td>Rupnagar</td>
<td>1.72</td>
<td>1.77</td>
<td>1.59</td>
<td>0.18</td>
</tr>
</tbody>
</table>

Data source: Census of India-2001, 2011

Punjab is not only the ‘Basket of India’ but also the supplier of labor force to foreign lands, working on all types of manual projects outside which had led to the increase in the level of income of an average family. The fertility rate is less in SAS Nagar, Jalandhar, Kapurthala and Ludhiana and high in Ferozepur, Amritsar, Muktsar and Tarn Taran. On the contrary the unequal difference in rural to urban gap lies maximum in Amritsar, Ferozepur, Rupnagar and Patiala which shows that the rural areas of these districts have more fertility rate. Table -1 shows a percentage change in rural and urban literacy from 2001-11. The urban literacy is more than the rural literacy due to the basic infrastructural facilities available in the towns and cities. The leaders in rural and urban female literacy are Hoshiarpur, Sahibzada Ajit Singh Nagar, Gurdaspur and laggards are Mansa, Muktsar, Ferozepur and Sangrur.

Tarn Taran, Moga, Ferozepur and Mansa observed a high fertility rate while Jalandhar, Hoshiarpur and Ludhiana have the low rate. The districts with the lower fertility rate and urbanization index have a strong impact on family structures and family health.
Table 2- District wise analysis of fertility rate and other variables-2011

<table>
<thead>
<tr>
<th>District</th>
<th>Literacy rate- 2011%</th>
<th>Per Capita income (in rupees)-2011</th>
<th>% Urbanization-2011</th>
<th>% Young population (15-64) 2011</th>
<th>% Support ratio 0-14 &amp; 65 &amp; above</th>
<th>Fertility Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gurdaspur</td>
<td>79.95</td>
<td>57081</td>
<td>28.5</td>
<td>67.10</td>
<td>49.10</td>
<td>1.66</td>
</tr>
<tr>
<td>Kapurthala</td>
<td>79.07</td>
<td>77955</td>
<td>34.9</td>
<td>67.70</td>
<td>47.70</td>
<td>1.64</td>
</tr>
<tr>
<td>Jalandhar</td>
<td>82.48</td>
<td>74349</td>
<td>53.18</td>
<td>69.20</td>
<td>44.40</td>
<td>1.56</td>
</tr>
<tr>
<td>Hoshiarpur</td>
<td>84.59</td>
<td>71658</td>
<td>21.15</td>
<td>67.30</td>
<td>48.70</td>
<td>1.64</td>
</tr>
<tr>
<td>SBS Nagar</td>
<td>79.78</td>
<td>94798</td>
<td>20.43</td>
<td>67.40</td>
<td>48.40</td>
<td>1.67</td>
</tr>
<tr>
<td>Fatehgarh Sahib</td>
<td>79.35</td>
<td>77342</td>
<td>30.87</td>
<td>68.70</td>
<td>45.50</td>
<td>1.68</td>
</tr>
<tr>
<td>Ludhiana</td>
<td>82.20</td>
<td>79754</td>
<td>59.14</td>
<td>68.80</td>
<td>45.30</td>
<td>1.63</td>
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<tr>
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<td>50.80</td>
<td>1.73</td>
</tr>
<tr>
<td>Firozpur</td>
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<td>62529</td>
<td>27.25</td>
<td>66.00</td>
<td>51.50</td>
<td>1.91</td>
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<tr>
<td>Muktsar</td>
<td>65.81</td>
<td>67003</td>
<td>27.99</td>
<td>66.80</td>
<td>49.70</td>
<td>1.79</td>
</tr>
<tr>
<td>Faridkot</td>
<td>69.55</td>
<td>67887</td>
<td>35.2</td>
<td>67.20</td>
<td>48.80</td>
<td>1.77</td>
</tr>
<tr>
<td>Bathinda</td>
<td>68.28</td>
<td>64715</td>
<td>35.99</td>
<td>68.60</td>
<td>45.90</td>
<td>1.71</td>
</tr>
<tr>
<td>Mantsa</td>
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<td>63803</td>
<td>21.25</td>
<td>65.90</td>
<td>51.70</td>
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<td>Patiala</td>
<td>75.28</td>
<td>68441</td>
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<td>1.70</td>
</tr>
<tr>
<td>Amritsar</td>
<td>76.27</td>
<td>56429</td>
<td>53.64</td>
<td>67.70</td>
<td>47.60</td>
<td>1.70</td>
</tr>
<tr>
<td>Tarn Taran</td>
<td>67.81</td>
<td>64127</td>
<td>12.63</td>
<td>64.60</td>
<td>54.80</td>
<td>1.85</td>
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<tr>
<td>Rupnagar</td>
<td>82.19</td>
<td>65998</td>
<td>26.02</td>
<td>67.50</td>
<td>48.10</td>
<td>1.72</td>
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<tr>
<td>SAS Nagar</td>
<td>83.80</td>
<td>74990</td>
<td>55.17</td>
<td>68.30</td>
<td>46.40</td>
<td>1.62</td>
</tr>
<tr>
<td>Sangrur</td>
<td>67.99</td>
<td>71495</td>
<td>31.24</td>
<td>67.10</td>
<td>48.90</td>
<td>1.79</td>
</tr>
<tr>
<td>Barnala</td>
<td>67.82</td>
<td>71605</td>
<td>31.97</td>
<td>67.40</td>
<td>48.40</td>
<td>1.77</td>
</tr>
<tr>
<td>Correlation (r)</td>
<td>-0.842</td>
<td>-.392</td>
<td>-0.57</td>
<td>-0.792</td>
<td>0.788</td>
<td></td>
</tr>
</tbody>
</table>

Data source Census of India-2001and 2011

**Correlation with other variables:** If we look at table no 2 we find five variables, linked to fertility rate. The very first variable is literacy rate which is strongly and inversely related to fertility rate. The other variable is per capita level of income which somehow not so strongly but inversely related to fertility rate. The fertility rate is higher in low as well as high income groups as Punjab is the land based economy with a preference to a baby boy who the social structure accepts as the real owner of land.

The third variable is urbanization which is leading to increase in bearing a child further leading to fall in fertility rate. The percentage of increasing young population and falling support ratio has a negative correlation with fertility rate.

**Correlation with gender variables:** The table 3 representing the gender variables especially the female literacy rate and the economically active rate of women has an inverse relation with fertility rate.

Table 3: District wise analysis of fertility rate and other variables-2011

<table>
<thead>
<tr>
<th>District</th>
<th>Female Literacy rate-2011%</th>
<th>Female economically active -2011</th>
<th>Gender gap in literacy rate</th>
<th>Fertility Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gurdaspur</td>
<td>66.97</td>
<td>47.94</td>
<td>9.71</td>
<td>1.66</td>
</tr>
<tr>
<td>Kapurthala</td>
<td>66.94</td>
<td>48.36</td>
<td>8.52</td>
<td>1.64</td>
</tr>
<tr>
<td>Jalandhar</td>
<td>70.58</td>
<td>48.23</td>
<td>7.67</td>
<td>1.56</td>
</tr>
<tr>
<td>Hoshiarpur</td>
<td>72.25</td>
<td>50.11</td>
<td>8.44</td>
<td>1.64</td>
</tr>
<tr>
<td>SBS Nagar</td>
<td>66.65</td>
<td>49.57</td>
<td>11.48</td>
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<tr>
<td>Fatehgarh Sahib</td>
<td>67.06</td>
<td>46.92</td>
<td>8.53</td>
<td>1.68</td>
</tr>
</tbody>
</table>
The differentials of gender gap are also less in leader districts with a strong positive linkage while rural urban differential have negative correlation with fertility rate, it is because the low differential of rural and urban can lead to even growth.

**Conclusion**

The fertility rate is one of the key variables which acts as a driving force in a developing economy. It has an impact on the growth rate of population leading drastic fall in labor supply further leading to inter and intra-regional migrations. The district wise study clearly deducts a negative correlation of literacy rate, urbanization, gender gap in literacy rate, female work participation and young population on fertility rate and the growth of an economy. Jalandhar, Sahibzada Ajit Singh Nagar and Hoshiarpur, are the front liners in declining fertility rate esp. the urban line of the districts. On the other hand, Mansa, Muktsar and Tarn Taran lag behind in urbanization, literacy rate, female work participation, female education and ultimately facing a higher fertility rate. The regional imbalance in the state is observed among different districts which makes an unequal regional zone. The state is marching ahead in production and infrastructural sectors but needs to concentrate on the wave of the demographic dividend and enjoy the window of opportunity before it closes down. To conclude with the district analysis of Punjab in fertility rate, the differentials in leaders and laggard districts should be taken into consideration so as to evenly grow with this demographic wave.

**Ethical Clearance:** N.A.

**Source of Funding:** Self

**Conflict of Interest:** (If any then mention it otherwise write it as nil). ........ Nil

**References**

6. Asari VG, John C. Determinants of desired family size in Kerala. Demography India; 1990; 27; 369-381.


A Qualitative Study to Assess Selected Psychosocial Experiences of Clients Admitted in Step Down Wards at Selected Hospitals Hyderabad, A.P.

Beulah Jasmine Rao

Beulah Jasmine Rao, Assistant Professor, Department of Medical Surgical Nursing, School of Nursing Science and Research, Sharda University, Greater Noida

Abstract

Background of the Study: One of the most upsetting situations one could ever experience in one’s life is a sudden phone call that summons you to the hospital where a loved one has been admitted to the intensive care unit. In addition to high level of worry and upset, one finds themselves in a strange environment of scary machines, unfamiliar devices. People with life threatening injuries and illnesses need critical care, critical care involves close constant attention by a team of specially trained health professionals; it usually takes place in an intensive care unit (ICU) or trauma center. Problems that might need critical care treatment include complications from surgery, accidents, infections, and severe breathing problems.¹

Problem statement: A Qualitative Study To Assess Selected Psychosocial Experiences of Clients Admitted In Step Down Wards At Selected Hospitals Hyderabad, A.P.

Objectives:

• To assess psychosocial experiences of patients admitted in step down wards.
• To analyze psychosocial problems according to their intensity.

Keywords: Psychosocial problems, psycho social experiences, depression, anxiety, step down wards.

Introduction

One of the most upsetting situations one could ever experience in one’s life is a sudden phone call that summons you to the hospital where a loved one has been admitted to the intensive care unit. In addition to high level of worry and upset, one finds themselves in a strange environment of scary machines, unfamiliar devices. People with life threatening injuries and illnesses need critical care, critical care involves close constant attention by a team of specially trained health professionals; it usually takes place in an intensive care unit (ICU) or trauma center. Problems that might need critical care treatment include complications from surgery, accidents, infections, and severe breathing problems.²

Monitors, intravenous (IV) tubes, feeding tubes, catheters, ventilators and other equipment are common in critical care units. These can sustain life but can also increase the risk of infection, while patients recover, and communication with health care providers and family members is an important part of making end-of-life-decisions. Intensive care unit is a very intense area and can create a great deal of tension and stress for patients and families, even though the ICU can be a frightening place and constitute a terrible time for family and the client who worry about the well being of their loved one, it is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is 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also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of healing, because ICU is also a place of
the ICU was unexpected, most patients will not be aware of their condition until late in their ICU stay and some of them only after discharge to the ward, however during the ICU stay they continue to have an emotional life, in a mixture of dreams, delusions and emotional experiences related to real events.  

Although various degrees of anxiety or depression that might delay and impair their recovery have been critically described in illness survivors, little is known about this and other neuropsychological sequel of critical illness, cognitive impairment and memory disturbances are those more frequently known and also it leads to post traumatic stress disorder (PTSD), these all depend on the previous health state more and on the existence of co-morbidities and on the aggressiveness suffered during the critical illness period.

Not only these but neuropsychological and psychosocial sequel depend on the aggressiveness and also on the ability of patients to deal with the memories they retain due to their stay from that period, these memories may be of two types, factual memories and delusional memories which includes nightmares, hallucinations, paranoid delusional memories and dreams.

Material and Method

Research approach: In the present study the “Qualitative approach was used to assess the selected psychosocial experiences of clients admitted in step down wards at selected hospitals, Hyderabad, A.P.”

Research Design: The research design is concerned with the overall frame work for conducting the Study. Descriptive design with narrative analysis was adopted for the present Study.

Variables: A variable is an attribute to a person or object that varies that it takes on different values.  

Back Ground Variable: In the study the back ground variables are Age, Gender, Occupation, Educational status, Income, Religion, Marital status, History of chronic/severe illness, Previous exposure of hospitalization, and Stay in the hospital, & clients with the history of major surgery.

Setting: Based on the setting and availability of the sample, the present study was conducted at MNR Hospitals, Sangareddy, and Andhrapradesh.

Population: Population is the entire aggregation of cases that meet a designed set of criteria Politand Hungler (1999).

The population in this study is termed as accessible population.

Target Population: It refers to the elements, people, objects to which the investigator wants to generalize the research findings. In the present study the target population of the study was clients in step down wards.

Accessible Population: Accessible population refers to the aggregate of cases which confirm to the designed criteria and which is accessible to the researcher as a pool of subjects or objects. In the present study the population consists of clients admitted in step down wards at selected hospitals, Hyderabad, A.P.”

Sample and Sample Size: The sample will be clients admitted in step down wards at selected hospitals, Hyderabad, A.P.” and the sample size of the present study is 50.

Sampling Technique: Non probability convenience sampling technique was adopted for the present study.

Criteria for Selecting the Sample

Inclusion Criteria:
- Clients who has stable condition
- Clients who are able to communicate
- Clients who are willing to participate
- Clients who are admitted in step down units for not less than 5 days.
- Clients who are able to understand Telugu & English.

Exclusion Criteria: Clients who are in highly unstable condition.

Findings:

Results

The present study selected to assess the selected psychosocial experiences among clients admitted in step down wards was effective in classifying the psychosocial problems among which Major psychosocial problem was Depression, Moderate psycho social problem was Anxiety, and pain, psychosis and sleep disturbances were
considered as mild psycho social problems when tested using two tailed test and the Total estimated maximum score was 2500 and out of which depression constitutes for 1786 score, anxiety constitutes for score of 1575, whereas pain score is 1364, and sleep disturbances and psychosis scores were 1263 and 503 respectively. Hence descriptively and inferentially the study is reliable at 0.01 level of significance.

**Conclusion**

The present study attempted to evaluate the selected psychosocial experiences showed significant statistics to categorize Depression as major, Anxiety as moderate and Pain as mild psycho social experiences among clients admitted in step down wards using Karl Pearson co-efficient and cron Bach formula. Hence it is concluded that the nurses and the health care providers must identify psycho social problems and device method which makes the client environment less stressful thereby ensuring provision of quality nursing care to all the clients during their stay in the hospital. It is concluded that the data generated by qualitative interviews could be important to nurses & clinicians working in step down wards & ICU in improving the psychological status and psychosocial recovery of the clients. It is concluded that this study gives a reassurance when proper education is provided to the clients in step down wards during their stay in terms of an important service. It is concluded that there are several aspects of care that deserves further examination by service providers where they are leading factors for psycho social maladjustment for the clients admitted I step down wards.

**Conflict of Interest:** There is no conflict.

**Source of Funding:** Self

**Ethical Clearance:** Ethical Clearance has taken from Institutional ethical committee.

**References:**

Cost Analysis of Intra Operative Anaesthesia Services in Tertiary Care Hospital

C. Lakshmi Venkatesh1, Aileen J.2, Narendranath V3

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Abstract

Anaesthesia services was gradually skyed high mainly because of patient population, with the increasing patient population, severe financial burden associate with care accelerate throughout the universe. At present, hospitals will provide many services under single shelf. Large service organization will consider the high number of personnel which comprises of capital intensive nature of business. Various complexities will be necessitating for hospital management which will include robust costing system. This paper investigates and compares the how much cost incurred for twelve combinations of seven anaesthetic agents in intra operative services at Tertiary care Hospital. So the study consider and compare the twelve combinations of seven anaesthetic drugs (Propofol, Thiopentone, Isoflurane, Sevoflurane, Vecuronium, Atracurium, Cis-atracurium) which Anaesthesiologists usually prefer. From the study we found that hospital can save the 91.2% of Propofol yearly expenditure by replace with Thiopentone as an induction agent. At same consumption rate hospital can exclude the 77% of yearly expenditure of Sevoflurane with replacing the Isoflurane for intra-operative maintenance. Hospital can cut down the 63% of cis-atracurium yearly expenditure by replacing the relaxant Vecuronium. The study concluded that Thiopentone, plus Vecuronium plus Isoflurane highly preferred combination by Anaesthesiologists among all eleven combinations. This was mainly due to the fact that these combinations costs were very lower compared to other drugs and these combinations influenced the patients to recover from the surgery at very fast which in turn decrement the discharge time availed by the patients which sky-high hospitals to take care more number of patients at hospitals. Hence the hospitals can maintain efficiency at intra operative services, and the cost of drugs included in total surgery cost of patients. In addition to the overhead information assist the top management while making a strategic plan and decision-making activities while preferring drugs. As a result Changes in combination of drugs affect the entire process of intra operative services at Tertiary care hospitals can be precisely revealed.

Keywords: Cost analysis, Cost effective analysis, Anesthesia services, Intraoperative anaesthesia costing, Intraoperative anaesthetic agents.

Introduction

Health care center which is otherwise known as clinics which has a group of general medical professionals and nurses whose intention is to provide health care services to the people. The primary importance is to provide incessant and comprehensive care to the patients. In health care center, there are some of the patients who need instant service who admit in Intensive Care Unit (ICU). The patients who are at ICU face unconsciousness situation have been induce or maintain anaesthesia services for surgical treatment when they will be at operating room. An anaesthesia service includes General Anaesthesia (GA), Spinal Anaesthesia (SA) and Sedation or local anaesthesia for monitoring patients for managing anaesthesia caution. Anaesthesiologists role is to judge the present situation and provide pain relief as per the current status. Perioperative anaesthesia services comprises of making and keeping patients to be very much comfortable before, during and after surgery, monitoring body functions, address during
surgery and manage emergence of pain during surgery. Hence, the hospitals starts utilizing resources in modern era which will be procuring equipment for operation theatres, anesthesiologists, ICU, cath lab and pathology lab which will constitute doctor times will accelerate the cost incurred for availing the services. Therefore, patients constitute as a primary element for hospital treatment cost. It will be essential for health care center to get a program to control the expenses, while at precisely the same time they will offer top quality service to the patients. costing comprises of activities like classifying, recording and allocation of expenses for the purpose of acquiring services and presented the data in table or graph format which assist the management to make decision accordingly. Health care services can develop a costing system for anaesthesia services on the basis of cost data, statement and reports preparation can assist the management in making strategic plan to meet hospital needs. The primary purpose will be assembling the information regarding anaesthesia combination of medicines which Anesthesiologists prefer and analyzed in a way which can only help in strategizing, control and decision making regarding the anaesthesia services. The main objective of using cost analysis is to benefit the cost of services, investigate the cost of every activity associate with hospital services, reduce the cost and control the cost involved in it. Hence the researcher makes a standardized care in a changing health care system, to investigate the cost associate with the preoperative anesthesia services without compromising quality.

Literature Review: The aim of the conducted study was that ascertaining interventions that anaesthesiologists generate in decreasing the total costs involved in Post-operative anaesthesia care unit (PACU). The author considered samples as patients who underwent ambulatory surgery at Tertiary care center. Findings of the study revealed that using drugs like Propofol reduce PACU costs at the same time it increases early discharge of patients at hospitals. Hence, it concludes that major factor of PACU cost is distribution of admission but anaesthesiologists have a small control over it.

Revealed that intention of various health care services was on high profits. To accelerate the costs, finding out the actual cost involved in providing proportion of anaesthesia and how much it was actually cost was taken into account. Cost to charge ratio applied for all departments which revealed an outcome as differentiation identified among all departments. It further stated that there was a disparity of charges among patients in health care services. Hence, there is no relationship among cost and charges of services at hospital.

Stated that author made an investigation in computerized database which was maintained at operation theatre. The author estimated the costs incurred at General Anaesthesia especially for varicose vein and inguinal hernia surgery. He considered the anaesthetic drugs, procedure, and usage of drugs and so on. It was identified that merely twenty five percent of cost included drugs and disposables cost of anaesthetic. Further it stated that when comparing anaesthetic service with regional anaesthesia, 5 min longer to provide service whereas 10 min shorter for regional anaesthesia especially for varicose vein surgery. Finally it concluded that staff costs depended on time spent for patients and then provision of a field block and sedation for inguinal hernia repair costs cheaper than regional anaesthesia.

Stated the author investigated the cost effectiveness of General Anaesthesia techniques for hip replacement surgery and then how to reduce the cost also investigated. The author investigated approaches for induction and maintenance. The findings stated that price tag on I.V strategy higher than inhaling the drugs at the same time maximum cost was belong to anaesthesiologist. At last it concluded that reduction in cost determined by means of considering the total price of GA procedure.

The primary focus was on investigating three method of General Anaesthesia in Gynecology department. While underwent Gynecological procedure, General Anaesthesia grouped into three groups as group I, V and C among sixty patients. Findings revealed that decrement cost at group I, post-operative nausea and vomiting accelerate at group C, shivering and requirement of analgesics were high at group V. Hence, it concluded that right combination of isoflurane and fentanyl or TIVA (Total Intravenous Anaesthesia) or both can offer services in a satisfactory manner.

Materials and Method

The present time driven activity based costing study was conducted in a tertiary care hospital, Bangalore. After getting prior approval from the hospital Ethical committee, the researcher proceeded with investigation which paved the way for them to know about anaesthesiologists and their utilization of combination of drugs.
The patients were randomly selected among who fall under ASA (American Society of Anaesthesiologists) grade I and ASA Grade II. Samples collected based on the availability of the Anaesthesiologist and General anaesthesia cases. Drugs included for induction (Propofol, Thiopentone,), Relaxant (Vecuronium, Atracurium, Cisatracurium), Inhalation (Isoflurane, Sevoflurane). Based on above drugs, Anaesthesiologists had a different combination of utilization of drugs taken into account for intra operative services at Tertiary hospital. This includes

- Propofol+Isoflurane+Atracurium,
- Propofol+Sevoflurane+Atracurium,
- Thiopentone+Isoflurane+Atracurium,
- Thiopentone+Sevoflurane+Atracurium,
- Propofol+Isoflurane+Vecuronium,
- Propofol+Sevoflurane+Vecuronium,
- Thiopentone+Isoflurane+Vecuronium,
- Thiopentone+Sevoflurane+Vecuronium,
- Propofol+Isoflurane+Cis-atracurium,
- Propofol+Isoflurane+Cis-atracurium,
- Thiopentone+Isoflurane+Cis-atracurium,
- Thiopentone+Sevoflurane+Cis-atracurium

The researcher also made an effort to know the anaesthesiologists perception on Induction, Inhalational and Relaxation drugs. For this researcher collected anaesthesiologists perception among one tertiary care hospital anaesthesiologists through a validated structured questionnaire.

**Measuring Tools:** Below were the statistical tools used to test the various combinations of drugs and Anaesthesiologists preference included

- Kruskal Wallis test
- Cronbach Alpha
- Tukey HSD

**Results and Discussion**

**Kruskal Wallis Test:** This method is used to check the relationship of two or more variables. We here have taken different combination of cost and average quantity consumption and checking the relationship between them

**Kruskal Wallis test results**

<table>
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<th>H-ties</th>
<th>df</th>
<th>p-value</th>
<th>alpha</th>
<th>sig</th>
</tr>
</thead>
<tbody>
<tr>
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<td>7.600327</td>
<td>11</td>
<td>0.0045</td>
<td>0.05</td>
<td>0.000</td>
</tr>
</tbody>
</table>

A Kruskal-Wallis H test showed that there was a statistically significant difference in anaesthesia drugs \( p = 0.004 \) which was lower than 0.05 hence null rejected and alternate accepted, with a lowest mean score for Thiopentone plus isoflurane plus Vecuronium 385.333.

Thiopentone+Isoflurane+Vecuronium are best because it had a mean value of 172.33 and \( p \) value as 0.02, compared to all combinations this is most reliable.

From the study we found that hospital can save the 91.2% of Propofol yearly expenditure by replace with Thiopentone as an induction agent. At same consumption rate hospital can exclude the 77% of yearly expenditure of Sevoflurane with replacing the Isoflurane for intra-operative maintenance. Hospital can cut down the 63% of cis-atracurium yearly expenditure by replacing the relaxant Vecuronium.

So, Thiopentone induction, Isoflurane inhalation anaesthesia and Vecuronium muscle relaxation saves the hospital more money compared to the other induction, inhalational relaxant drugs. The study concluded that Thiopentone, plus Vecuronium plus Isoflurane highly preferred combination by Anaesthesiologists among all eleven combinations.

**Survey among anaesthesiologists on Thiopentone and Isoflurane usage:**

**Figure: Number of anaesthetists preferred Thiopentone and Isoflurane**
In the above graph among twelve anaesthesiologists, three anaesthesiologists are strongly agreeing and five anaesthetists are agreeing for thiopentone induction and three anaesthesiologists are dis-agree and one anaesthesiologist is strongly disagreeing the thiopentone induction.

Six anaesthetists are strongly agreeing and six anaesthetists are agreeing the isoflurane maintenance among twelve anaesthetists.

**Discussion**

With the help of cost analysis, it identified that hospital can save the 91.2% of propofol yearly expenditure by replacing with thiopentone as an induction agent. Propofol induction cost is high compared to the thiopentone induction. According to the study intravenous anaesthesia is costlier than inhalational anaesthesia. At same consumption rate hospital can exclude the 77% of yearly expenditure of sevoflurane with replacing the sevoflurane for intra-operative maintenance. Sevoflurane is very costlier than the isoflurane. The price of sevoflurane is almost double than the isoflurane (9).

Hospital can cut down the 63% of cis-atracurium yearly expenditure by replacing the relaxant vecuronium. Cis-atracurium price is slightly high compared with other relaxants. Hence from the above, it revealed that drugs cost least were thiopentone, isoflurane and vecuronium which will benefit anaesthesiologists and also hospital. Anaesthesiologists had a perception to utilize the drugs which had a rapid recovery of patients from operating room at the same time which had a low cost in nature. Finally, their preference was on thiopentone, isoflurane and vecuronium.

According to the study done in 1995 patients who underwent laparoscopic gynecologic surgery inhaled propofol saved cost of drugs, surgery cost and anaesthesia cost and recovery time whereas drugs like thiopentone induction cost lower and speedy recovery was not possible. Hence the author recommended propofol drug. Tukey HSD reveals that drugs including induction and extubation of anaesthesiologists whereas excluding induction and extubation have higher in using thiopentone plus isoflurane plus vecuronium among anaesthesiologists.

As per the study, it revealed that propofol usage at PACU, made the patients to recover soon at hospital. The present study depicted that highest number of anaesthesiologists stated 20% of drug cost was included at total surgery cost.

According to the study (2014), comparison made between various combinations of drugs like ketamine, midazolam and propofol and finally revealed that these combinations cost higher in group 3 (500 mg of propofol) whereas lower in group 1 (200 mg of propofol). The present study depicted that high number of anaesthesiologists preferred propofol induction due to its faster recovery.

Using Excel sheet to code the data then it adopted percentage method to reveal the results of how the perception of anaesthetist in providing services at hospital. Cronbach alpha implemented in assessing how reliable the questions are framed in investigating the anaesthesiologist perception at hospital. Then Tukey HSD used to make a comparison between groups and identify which is best.

In this study we included only two induction drugs, two inhalational agents and three relaxants with twelve possible combinations. We included only direct costs of the drugs; we excluded indirect cost and anaesthetists charges. Opinion Survey is limited for study conducted hospital.

Hospital should adopt the thiopentone + isoflurane + vecuronium combination for anaesthesia practice, so hospital can save the money.

**Conclusion**

The researcher made an effort to investigate how much cost incurred for the anaesthesia agents in intraoperative anaesthesia services and to recommend the drugs which benefit the hospital in terms of consumption and cost. From the study among all drugs, thiopentone for induction, isoflurane for inhalation and vecuronium for relaxation recommended. These drugs costs very lower compared to other cost and at the same time effect derived from the drugs really good. Hence above combination accelerate the hospital efficiency for intra-operative services.

**Conflict of Interest:** The authors declare that they have no competing interests.

**Source of Funding:** Self-Funded

**Ethical Clearance:** Taken from RUAS research committee.
References


Prediction of Heart Diseases Using Hayes Process Macro Serial Mediation Model 6

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Professor, Chitkara University Institute of Engineering and Technology, Chitkara University, Punjab, India

Abstract

Heart diseases are among one of the most common reasons of fatalities in the modern world due to a variety of lifestyle and environmental factors. This study deals with the prediction of heart diseases in a population based on the relation between age and the maximum heart rate of a set of individuals. This relationship is also assessed with the introduction of two mediators namely resting blood pressure and cholesterol. The dataset for the study is the Cleveland dataset which is used by machine learning researchers. The data was subject to serial mediation Model 6 test based on Andrew Hayes PROCESS data analysis technique. The model test results have been presented and interpreted in light of the model test results.

Keywords: Heart diseases; Age; Maximum Heart Rate; Cholesterol; Resting Blood Pressure; PROCESS technique; Mediation.

Introduction

Data mining techniques are increasingly being practiced in almost every area which is based on finding knowledge from existing data to use it to strengthen the decision making of an organization. Almost every field, now days, is exploiting the advantage of data mining and machine learning algorithms to make the best use of the huge amount to data getting collected over the years in order to make appropriate strategies for the organization. Data Mining is a multidisciplinary approach which involves the statisticians, business analysts and data scientists to have a 360 degree view of the data and then draw some meaningful conclusions out of it by applying different techniques such as clustering, classification, prediction, and association analysis etc.

Healthcare is the backbone of every country. Healthcare covers detailed process of the diagnosis, treatment and prevention of disease, injury and other physical and mental impairments in humans. Healthcare, as an industry, is showing tremendous growth globally and due to increasing digitization of health services, the healthcare industry has become a very significant source of data. The organizations around the globe can grow only when its people are happy and healthy, however, with the growing age of people, health needs become critical and require more and immediate attention. Therefore, a well managed healthcare system is the need of every organization to prevent its people from any health hazard, which will not only increase the efficiency of people but will also contribute to the growth of organizations and the nation. Healthcare programs are generating a lot of data about patients, symptoms, diseases, diagnosis, and treatment which is a waste if cannot be carefully analyzed in time. Healthcare organizations can use this data and can apply data mining functionalities to make predictions about the diseases, their symptoms, causes, and treatment and also can device the policies that can be offered. Thus, application of data mining has huge potential in healthcare segment provided that healthcare professionals develop their competency in the field. Healthcare is an important societal issue wherein the application of data mining and machine learning algorithms can greatly and directly impact the lives of people. Medical field, like other areas has been collecting a huge volume of data related to patient’s health record, their symptoms and the probability of a particular disease and the possible prescriptions. A lot of machine learning algorithms, such as classification through decision tree, SVM, Bayesian method, neural networks; regression; clustering; and association rule mining have already been explored in this area to identify patterns and making predictions in medical data. Researchers are using various machine learning tools and successfully making the descriptive and predictive models which can be deployed to effectively manage the healthcare segment with better accuracy and low error rate. These
tools not only include the techniques of modeling and making right predictions but also have the processes to handle various inconsistencies and prepare the data ready to be used for analysis.

**Review of Literature:** Previous studies\(^3\) outlined the importance of data mining in healthcare to strategize this domain by not only designing more effective recommendation systems, policies and profiles of the patients diagnosed with certain diseases, but also helps in identification and detection of diseases. The author reviewed the previous work in healthcare and the use of various tools and technique of data mining in this sector to optimize the cost and to improve the decision making. Another study summarized the review of data mining functions and techniques in healthcare and concluded that no one method in this sector is sufficient enough to address the issues in this sector and therefore, a hybrid approach should be followed to have better accuracy and improved predictions in medical diagnosis.\(^4\)

One study\(^5\) noticed the need of data mining in heart diseases because of the growing rate of patients and the death rate due to this ailment. The study attempted to draw meaningful knowledge out of the huge and complex data pertaining to the heart diseases by using various data mining classification algorithms. The experiment was conducted to compare the performance of difference classification algorithms and judged that Naïve Bayes method gives maximum accuracy. Various data mining classification and prediction techniques were applied such as decision tree, neural networks, SVM, and logistics regression for predictive modeling on approximately 120000 instances to uncover the survivability of prostate cancer. Author concluded the study mentioning that accuracy of SVM algorithm is giving maximum accuracy in the given data. Author also discussed several issues in data understanding and data preparation that should be carefully considered for improved results of predictive modeling.\(^6\)

In a Heart Disease Prediction Model using SVM-Decision Trees-Logistic Regression (SDL) the authors proposed a framework including a union of regression, SVM, and decision tree in order to correctly anticipate the heart disease. The author followed rule-based approach to collate the validity of different mentioned data mining algorithms to improve the effectiveness of the predictive model.\(^7\) Five different data mining algorithms were compared to study whether the customer will clear his debts or not? The study was conducted on large data samples and the results indicate that the neural network, regression and mixed approach for modeling are more accurate in prediction, however, in terms of interpretation of the results, decision tree and regression are the best as in decision tree, rules are generated which can easily be understood and in regression analysis, the significance of the attributes can be easily observed, however, the other schemes such as neural networks and memory-based reasoning, the interpretation of the analysis is complicated.\(^8\)

A previous study\(^9\) identified the need of controlling hospital infections using data mining for public health supervision. The author then used the association rule mining approach and developed a unique system to achieve the objective. Author came up with some interesting rules that can really benefit the hospital system in controlling the infection.

Thus, in view of the extant literature, previous research highlights the importance of healthcare \(^12\) and the role played by data analytics in better prediction of diseases.

Keeping in consideration previous research, the aim of this study is to predict the likelihood of heart diseases in a population based on the relation between age and the maximum heart rate of a set of individuals. This relationship further assessed with the introduction of two mediators namely resting blood pressure and cholesterol. Specifically, the following sequential equation is tested:

\[
X \rightarrow M_1 \rightarrow M_2 \rightarrow Y
\]

**Method and Tools**

The dataset was procured from the open access Kaggle database. The dataset is called the Cleveland database which is popular with machine learning researchers and consists of 14 attributes. This study used four attributes namely:

- Age
- Serum cholestoral in mg/dl
- Resting blood pressure
- Maximum heart rate achieved

Only the complete data (pertaining to the four select attributes) consisting of 324 elements (respondents) was selected from the entire dataset consisting of 456 elements (respondents).
The PROCESS Macro SPSS was the tool applied to the research model based on the dataset. PROCESS technique was developed by Hayes. PROCESS is a “macro” that can be installed in SPSS or SAS software and it can perform all the mediation, moderation and relationship testing same as (SEM) Structural Equation Modeling. Although, the developer of the PROCESS macro pin point certain benefits over SEM. The first benefit is ease of use as PROCESS requires less coding and it can generate same results as render by SEM. Another, advantage of PROCESS is that it estimates each equation of the regression model separately whereas in SEM all the equations are calculated simultaneously using iteration through maximum likelihood estimation method. In the current study, the researchers have used model 6 (two mediators) (Hayes, 2013). In this model, we have one independent variable one dependent variable and two mediators between the relationship describing independent and dependent variable (i.e. \( X \rightarrow M_1 \rightarrow M_2 \rightarrow Y \)). Where, \( X \) is the independent variable (Age of the respondent), \( M_1 \) is the first mediator (Cholesterol level of the respondents), \( M_2 \) is the second mediator (resting blood pressure) and \( Y \) is the dependent variable (maximum heart rate of the respondent). In such a model we can test the direct relationship between input and output variables and at the same time we can test the indirect relationship between these variables. Here we can test the mediating effect of cholesterol level of the respondents on the relationship between age of the respondents and maximum heart rate of the respondent. Also we can test the mediating effect of blood pressure reading of the respondents on the relationship between age of the respondents and maximum heart rate of the respondent. We can also test whether there is a serial mediation effect of blood pressure reading of the respondents and cholesterol level of the respondents on the relationship between age of the respondents and maximum heart rate of the respondent.

### Table 1: Regression Weights: (Group number 1 - Default model)

<table>
<thead>
<tr>
<th></th>
<th>Estimate</th>
<th>S.E.</th>
<th>C.R.</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resting BP</td>
<td>&lt;--- Age</td>
<td>.458</td>
<td>.111</td>
<td>4.120 ***</td>
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<tr>
<td>Maximum Heart Rate</td>
<td>&lt;--- Age</td>
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<td>.145</td>
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<tr>
<td>Maximum Heart Rate</td>
<td>&lt;--- Resting BP</td>
<td>-.061</td>
<td>.071</td>
<td>-.860 .390</td>
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</table>

*** Significant at 95% confidence level.

### Table 2: Standardized Regression Weights: (Group number 1 - Default model)

<table>
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<tr>
<th></th>
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</thead>
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<tr>
<td>Resting BP</td>
<td>&lt;--- Age</td>
</tr>
<tr>
<td>Maximum Heart Rate</td>
<td>&lt;--- Age</td>
</tr>
<tr>
<td>Maximum Heart Rate</td>
<td>&lt;--- Resting BP</td>
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</table>
Table 3: Regression Weights: (Group number 1 - Default model)

<table>
<thead>
<tr>
<th>Estimate</th>
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<th>C.R.</th>
<th>P</th>
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</thead>
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<tr>
<td>Cholesterol</td>
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<td>.426</td>
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<td>.425</td>
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<tr>
<td>Maximum Heart Rate</td>
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<td>Maximum Heart Rate</td>
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<td>.062</td>
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</table>

*** significant at 95% confidence level; * significant at 90% confidence level.

Table 4: Standardized Regression Weights: (Group number 1 - Default model)

<table>
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<tr>
<td>Cholesterol</td>
</tr>
<tr>
<td>Maximum Heart Rate</td>
</tr>
<tr>
<td>Maximum Heart Rate</td>
</tr>
</tbody>
</table>

Run MATRIX procedure:

************** *PROCESS* Procedure for *SPSS* Release 2.16.1 **************

Written by Andrew F. Hayes, Ph.D.  www.afhayes.com

Model = 6
Y = max. heart rate
X = age
M0 = cholesterol
M1 = resting blood pressure

Sample size (N): 324

------------------------------------------------------------------------
Outcome: cholesterol

Model Summary

<table>
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<tr>
<th>R</th>
<th>R-sq</th>
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<th>F</th>
<th>df1</th>
<th>df2</th>
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Model coeff
coeff constant 105.7069 6.5160 16.3227 10.0000 92.6874 118.5263
cholesterol .0455
Age -.4527

------------------------------------------------------------------------
Outcome: resting BP

Model Summary

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<td>9.1422</td>
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</table>

Model coeff
coeff constant 110.5706 11.1364 19.0101 10.0000 189.7943 233.6139
cholesterol -.0334
resting BP -.0524
Age -.1219

------------------------------------------------------------------------
Outcome: resting blood pressure

Model Summary

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<td>27.3658</td>
<td>3.0000</td>
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</table>

Model coeff
coeff constant 211.7041 11.1364 19.0101 10.0000 189.7943 233.6139
cholesterol -.0334
resting BP -.0524
Age -.1219

********************************************** DIRECT AND INDIRECT EFFECTS **********************************************
**Interpretation:** An observation of figure 2, table 1 and table 2 shows that age is significantly and positively related to resting BP, which means that an increase in age leads to increase in resting BP. Similarly, age is significantly negatively related to maximum heart rate, which means that an increase in age leads to a reduction in heart rate. No significant relationship was discovered between resting BP and Maximum heart rate.

An observation of figure 3, table 3 and table 4 shows that there is no significant relationship between age and cholesterol. However, there is a significant negative relationship between (at 90% confidence level) between cholesterol and maximum heart rate. This implies that an increase in cholesterol leads to reduction in maximum heart rate.

The outcome of the PROCESS procedure is based on the relationships hypothesised as per figure-1.

For the outcome variable cholesterol age is not a significant predictor of cholesterol. For the outcome variable resting blood pressure, age is a significant predictor of resting BP but cholesterol is not a significant predictor of resting BP. For the outcome variable maximum heart rate, age is a significant predictor (inverse relationship), cholesterol is a significant predictor at 90% confidence level (inverse relationship) while resting BP has no significant predictive power of maximum heart rate.

Observing the output of the direct and indirect effects, the direct effect of X -> Y is age has a significant effect on maximum heart rate.

For indirect effects, there is no evidence of any mediation effect of M₁ or M₂ on the relationship between X and Y.

**Conclusion**

The study is based on the Cleveland heart diseases dataset which, in this study, was subject to direct tests between two variables namely age and maximum heart rate and the indirect test between these two variables where cholesterol (M 1) and resting blood pressure (M 2) were themediating variables. The mediation model (indirect) was not significant whereas the direct relationship between age (X) and maximum heart rate (Y) was significant. Age is also significantly related with resting blood pressure (direct relationship). A significant relationship was also discovered between cholesterol and maximum heart rate. However, no significant relationship was found between (1) resting blood pressure and maximum heart rate and (2) between age and cholesterol. The model testing was done using PROCESS Model 6 serial mediation technique.

**Availability of Data and Materials:** The data generated during the research are available from the corresponding author on reasonable request.

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**Acknowledgements:** Not Applicable
**Competing Interests Statement:** I declare that we have no significant competing financial, professional, or personal interests that might have influenced the performance or presentation of the work described in this manuscript.

**Ethical Clearance:** No human or living subjects involved and dataset is open source. Not under the purview of institutional ethical committee.

**References**


Effectiveness of Information Booklet on Knowledge Regarding Methicillin-Resistant Staphylococcus Aureus (MRSA) among Staff Nurses

Anuja Varghese¹, Gireesh G.R.², Janet Prima Miranda³, Shashikumarjawadagi⁴

¹Post Graduate Student, ²Associate Professor, Department of Medical Surgical Nursing, ³Associate Professor, Department of Obstetrics and Gynecology, ⁴Professor, Department of Medical Surgical Nursing, Yenepoya Nursing College, Yenepoya (Deemed to be University), Mangalore

Abstract

Staphylococci are ordinary microorganisms found mostly on the skin and nose of 20 to 30% of healthy adults. They are generally harmless, however are harmful if they enter the blood system. They penetrate skin defenses and cause staphylococcal infections. Staphylococcus Aureus is the most common types of staphylococcus that causes staphylococcal infections. MRSA is a type of staphylococcus bacteria that is resistant to antibiotics called beta-lactams antibiotics and other more common antibiotics, for example, penicillin and oxacillin. MRSA causes infections in different parts of the body. It is important to get care for MRSA infections as soon as possible. If left untreated, MRSA can quickly spread throughout the body and cause life-threatening problems. Health care workers who come into contact with MRSA patients should maintain high standards of hygiene and take extra care while treating those patients.

Keywords: Information booklet, Methicillin-resistant Staphylococcus aureus, Staff Nurses.

Introduction

Antibiotics are type of antimicrobial drug which are also called as antibacterials, that prevents growth of bacterial infections. Antibiotic is the one which kill and reduce the growth of bacteria.¹

Though antibiotics are used to prevent the bacterial infection, some of these bacteria can continue to live. These existing bacteria have the capacity to fight back against the antibiotics. If the bacteria continue to resist the antibiotics, it will no more prevent and kill the bacteria. So this indicates that the bacteria are stronger. It can easily increase its number and will cause infection to others. By this, many antibiotics are unable to resist the MRSA.

In recent years the resistance against the antibiotics increased because, people are not consuming prescribed amount of antibiotics. They just skip it and because of this the bacteria continues to live and develop a resistance. These negligence give space for bacteria to grow and it leads the bacteria to fight against the antibiotics which is used to prevent the bacteria.²

Staphylococcus aureus is a gram-positive bacterium normally seen on the skin and mucous membranes in most of the grownups and it seems to be less danger. Even though, S. Aureus can cause illness, numerous antibiotics namely cephalosporins, tetracycline can treat this bacteria.³

MRSA is a kind of a bacteria which resist a number of antibiotics, that used to treat this bacteria. From this it is clear that, MRSA infection cannot be treated or cured easily like any other bacterial infections.⁴

MRSA can cause severe problems like pneumonia and surgical site infections. If not treated properly it will cause sepsis and death. MRSA is commonly spread by direct contact with the infected person. Nurses in the hospital should have proper knowledge about MRSA.
The aim of this research is to prepare nurses with the latest information on the diagnosis, treatment and management of MRSA infection to help them improve the care of the patients and protect themselves.

**Materials and Method**

An evaluative approach with pre-experimental one group pre-test post-test design was used for this study. Staff nurses were selected by non-probability purposive sampling technique based on inclusion and exclusion criteria. 

**Inclusion criteria**

- Completed General Nursing and Midwifery or B.Sc Nursing or Post Basic B.Sc Nursing.
- Available during time of data collection.

**Exclusion criteria:**

- Post Graduate Nurses, ANM’s
- Infection control team nurses, sister in charges, floor supervisors, Nursing Superintendent, Assistant Nursing Superintendent.
- Who have already undergone in service programmes on MRSA

Ethical clearance was obtained from Yenepoya Ethics committee. Data was collected by demographic proforma and structured knowledge questionnaire. Reliability of the tool was obtained by split half method (r = 0.81), which indicates tool was reliable. The purpose of study was explained and consent was obtained from the study participants. Pre-test of knowledge taken on day-1 followed by distribution of information booklet and post-test conducted on day-5 to assess effectiveness of information booklet by using same structured knowledge questionnaire.

**Results**

Results of the study data was analyzed based on the objectives and hypothesis using descriptive and inferential statistics.

**Hypothesis:** Hypotheses were tested at 0.05 level of significance.

**H$_1$:** Mean post-test knowledge scores will be significantly higher than the mean pre-test knowledge scores.

**H$_2$:** There will be significant association between pre-test knowledge scores and selected demographic variable.

**Section 1: Description of demographic characteristics**

**Table 1: Distribution of demographic characteristics in terms of frequency and percentage. N=75**

<table>
<thead>
<tr>
<th>Demographic characteristics</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age in years</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21-30</td>
<td>41</td>
<td>54.7</td>
</tr>
<tr>
<td>31-40</td>
<td>31</td>
<td>41.3</td>
</tr>
<tr>
<td>≥ 41</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>28</td>
<td>37.3</td>
</tr>
<tr>
<td>Female</td>
<td>47</td>
<td>62.7</td>
</tr>
<tr>
<td><strong>Educational qualification</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diploma in Nursing</td>
<td>29</td>
<td>38.7</td>
</tr>
<tr>
<td>Basic Bsc Nursing</td>
<td>38</td>
<td>50.7</td>
</tr>
<tr>
<td>P.B.Bsc.Nursing</td>
<td>8</td>
<td>10.7</td>
</tr>
<tr>
<td><strong>Professional clinical working experience</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 6 months</td>
<td>17</td>
<td>22.7</td>
</tr>
<tr>
<td>6 months – 1 year</td>
<td>27</td>
<td>36</td>
</tr>
<tr>
<td>&gt; 1 year</td>
<td>31</td>
<td>41.3</td>
</tr>
<tr>
<td><strong>Area of work</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical wards</td>
<td>16</td>
<td>21.3</td>
</tr>
<tr>
<td>Surgical wards</td>
<td>22</td>
<td>29.3</td>
</tr>
<tr>
<td>Casualty</td>
<td>2</td>
<td>2.7</td>
</tr>
<tr>
<td>ICUs</td>
<td>18</td>
<td>24</td>
</tr>
<tr>
<td>OT</td>
<td>5</td>
<td>6.7</td>
</tr>
<tr>
<td>OPDs</td>
<td>9</td>
<td>12</td>
</tr>
<tr>
<td>Psychiatry ward</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

Data in the table 1 shows that nearly half of the subjects (54.7%) belonged to the age group 21-30 years. Most of the subjects (62.7%) were female. Half of the subjects (50.7%) were qualified with BSc nursing. Most of the nurses (41.3%) had experience more than one year. Most of the nurses (29.3%, 24%) were working in surgical wards and ICU respectively.

**Section 2: Assessment of level of knowledge**

**Table 2: Frequency and percentage distribution according to level of knowledge N=75**

<table>
<thead>
<tr>
<th>Level of Knowledge</th>
<th>Scores</th>
<th>Score percentage</th>
<th>Pre-test</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
<td>F</td>
<td>%</td>
</tr>
<tr>
<td>Poor</td>
<td>0-12</td>
<td>0-50</td>
<td>32</td>
<td>42.7</td>
</tr>
<tr>
<td>Good</td>
<td>13-18</td>
<td>51-75</td>
<td>37</td>
<td>49.3</td>
</tr>
<tr>
<td>Very good</td>
<td>19-24</td>
<td>76-100</td>
<td>6</td>
<td>8</td>
</tr>
</tbody>
</table>
Data in the table 2 shows that, in pre-test nearly half (49.3%) of the subjects had good knowledge, and only few (8%) of them had very good knowledge. In post-test, majority (65.3%) of the subjects had good knowledge and only few (20%) of them had poor knowledge.

Section 3: Effectiveness of information booklet

**H₀₁:** There will be no significant difference between mean pre-test and post-test knowledge scores of staff nurses.

### Table 3: Effectiveness of information booklet N=75

<table>
<thead>
<tr>
<th></th>
<th>Maximum score</th>
<th>Respondents knowledge</th>
<th>df</th>
<th>Paired 't' test</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean Difference</td>
<td>Mean %</td>
<td></td>
</tr>
<tr>
<td>Pre-test</td>
<td>11.74</td>
<td>4.61</td>
<td>3.43</td>
<td>48.91</td>
<td>74</td>
</tr>
<tr>
<td>Post-test</td>
<td>15.17</td>
<td>4.07</td>
<td>63.20</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

[* indicates significance]

Data in the table 3 depicts that, mean knowledge scores of staff nurses regarding MRSA in post-test was found higher (15.17±4.07) when compared with pre-test mean knowledge score (11.74±4.61). The mean difference between knowledge scores was 3.43.

The obtained p value is <0.05. It indicates that there was a significant difference between mean pre-test and post-test level of knowledge. Hence H₁ was accepted and H₀ is rejected and concluded that the information booklet enhanced the knowledge of staff nurses regarding MRSA.

### Table 4: Paired ‘t’ test to find effectiveness of information booklet in each area. N=75

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Area</th>
<th>Maximum score</th>
<th>Respondents knowledge level</th>
<th>Mean</th>
<th>SD</th>
<th>Mean %</th>
<th>Mean</th>
<th>SD</th>
<th>Mean %</th>
<th>Mean Difference</th>
<th>Paired ‘t’ test</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>General knowledge</td>
<td>10</td>
<td>Pre-test</td>
<td>3.32+1.95</td>
<td>33.2</td>
<td>4.70+1.95</td>
<td>47</td>
<td>1.38</td>
<td>1.38</td>
<td>-9.139</td>
<td>&lt;0.001*</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Types and causes</td>
<td>5</td>
<td>Post-test</td>
<td>3.46+1.11</td>
<td>69.2</td>
<td>4.28+1.07</td>
<td>85.6</td>
<td>0.82</td>
<td>0.82</td>
<td>-7.493</td>
<td>&lt;0.001*</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Clinical features and</td>
<td>9</td>
<td></td>
<td>4.97+2.37</td>
<td>55.22</td>
<td>6.08+2.15</td>
<td>67.55</td>
<td>1.11</td>
<td>1.11</td>
<td>-10.906</td>
<td>&lt;0.001*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>management</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

[* indicates significance]

Data in the table 4 depicts that the mean difference is higher regarding general knowledge (1.38) followed by clinical features and management (1.11) and types and causes (0.82). The study result indicates that least effectiveness in the knowledge score was found regarding types and causes (area II) and highest effectiveness was found regarding general knowledge (area I).

The findings of the study revealed that post-test knowledge score was significantly higher in all the areas than pre-test knowledge score which shows the effectiveness of information booklet.

Section 4: Association between mean pre-test knowledge scores and selected demographic variables.

**H₀₂:** There will be no significant association between pre-test knowledge scores and selected demographic variables.
Table 5: Chi-square test to find out association between mean pre-test knowledge score and selected demographic variables. N=75

<table>
<thead>
<tr>
<th>Demographic variables</th>
<th>Median ≤ 13</th>
<th>Median &gt; 13</th>
<th>Statistical test</th>
<th>df</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in years</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21-30</td>
<td>28</td>
<td>13</td>
<td>2.102</td>
<td>2</td>
<td>0.350</td>
</tr>
<tr>
<td>31-40</td>
<td>16</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥ 41</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>19</td>
<td>9</td>
<td>0.802</td>
<td>1</td>
<td>0.371</td>
</tr>
<tr>
<td>Female</td>
<td>27</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educational qualification</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diploma in Nursing</td>
<td>20</td>
<td>9</td>
<td>2.590</td>
<td>2</td>
<td>0.274</td>
</tr>
<tr>
<td>Basic Bsc Nursing</td>
<td>20</td>
<td>18</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P.B.Bsc. Nursing</td>
<td>6</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

M= Median (13) p > 0.05

Data in the above table shows that, there was no association found between pre-test knowledge scores and selected demographic variables such as age in years, gender and educational qualification, since the obtained p value was > 0.05.

Chi-square test was used to find the association between pre-test knowledge scores and selected demographic variables.

The obtained p value was >0.05. There was no significant association between pre-test knowledge scores and selected demographic variables. Hence $H_2$ was rejected and $H_{02}$ is accepted.

Discussion

Major findings of the study

Section 1: Description of demographic characteristics

In the present study, nearly half of the subjects (54.7%) belonged to the age group of 21-30 years followed by subjects (41.3%) in the age group of 31-40 years. Most of the subjects (62.7%) were females. Majority of the subjects (50.7%) were qualified with Basic Bsc Nursing, followed by subjects (38.7%) qualified with Diploma in Nursing. Most of the nurses (41.3%) had above 1 year of professional clinical working experience. Majority of the subjects (29.3%, 24%) were working in the surgical wards and ICU respectively.

Above study finding is supported by study conducted by Ellen A. Sussin Mississippi to determine nurses knowledge of MRSA, their attitude towards MRSA patients, and how well they comply with MRSA protocols. 46 nurses participated in the study in which 9 were males and 37 were females. 86.96% of the respondents had 0-5 years of experience, 2.17% had 6-10 years of experience, 4.35% had 11-15 years, 2.17% had 16-20 years, and 4.35% had above 20 years. 45.65% worked in acute care, 4.35% worked in outpatient care, 39.13% worked in inpatient care, 2.17% worked in home health, and 8.70% selected “other” to describe their work setting.

Section 2: Assessment of level of knowledge among staff nurses regarding MRSA

In the present study, during pre-test nearly half (49.3%) of subjects had good knowledge, followed by subjects (42.7%) had poor knowledge and only few (8%) of them had very good knowledge. In post-test, majority (65.3%) of the subjects had good knowledge and only few (20%) of them had poor knowledge. The finding of the study has revealed that there is an urgent need to educate the staff nurses on MRSA.

Above study finding is supported by study conducted by Adriana Maria da Silva et al to evaluate the knowledge of a nursing team from a public hospital in Brazil regarding MRSA. A total of 318 professionals from different units participated in the study. Results showed that 43.7% of the professionals from nursing team did not know basis of the Staphylococcus aureus resistance to methicillin. According to the analysis, the nursing teams knowledge and perception of MRSA susceptibility was limited.

Section 3: Effectiveness of the information booklet on knowledge regarding MRSA

In the present study, the knowledge scores of staff nurses regarding MRSA showed that, post-test
mean knowledge score was higher (15.17±4.07) when compared with pre-test mean knowledge score (11.74±4.61). It was also evident from the paired ‘t’ test (p value is < 0.001; P < 0.05). The results of the study indicates the effectiveness of information booklet in enhancing knowledge score of staff nurses on MRSA by using interventional measures in the form of information booklet.

Above study finding is supported by study conducted by Tintu Chacko et al – in Mangalore among primiparamothers to evaluate the effectiveness of information booklet on knowledge regarding importance of birth spacing. 60 samples were selected for the study. By using descriptive and inferential statistics the data were analysed. The result revealed that 81.7% of primipara mothers had poor knowledge score with a score range of 0-12, 11(18.3%) had average knowledge score with a score range of 13-25 and none of them had good knowledge score with a score range of 26-37. In pre-test the mean knowledge score was 7.96 and in post-test the mean knowledge score was 31.15. A significant difference was seen between pre-test and post-test knowledge scores (t=28.945, P<0.05). The study also showed that, demographic variables such as educational status, income and previous knowledge were significantly associated with knowledge scores. The study concluded that, information booklet was an effective educational intervention to enrich the knowledge of primipara mothers.

Section 4: Association between mean pre-test knowledge scores and selected demographic variables.

The Chi-square (χ²) computed in the present study showed that there was no significant association between pre-test knowledge scores and selected demographic variables such as age in years, gender and educational qualification, since the obtained p value was > 0.05.

Above study finding is supported by study conducted by Philomena Fernandes et al - in Mangalore among staff nurses to evaluate the effectiveness of an information booklet on knowledge regarding prevention and management of perineal tear during normal delivery. 40 staff nurses were selected for the study. The collected data were analysed using inferential and descriptive statistics. It is evident from the study that, there was a significant difference between pre-test and post-test knowledge scores(t=23.09, p<0.05). The study concluded that the information booklet was effective in increasing staff nurses knowledge regarding prevention and management of perineal tear during labour and there was no significant association between the knowledge score and demographic variables (p>0.05). 

**Conclusion**

The main aim of the study was to assess the knowledge of staff nurses on MRSA and teach them about it. Teaching was given through the information booklet which helped the staff nurses to gain knowledge on MRSA. The finding indicates that there was lack of knowledge among staff nurses regarding MRSA and information through various means like information booklet is an important source for improving the knowledge. With my study I was able to improve the knowledge of staff nurses. So in conclusion we can say that the information booklet is an effective method for improving the knowledge.

**Conflict of Interest:** Nil

**Source of Funding:** Self

**Ethical Clearance:** Taken from ethics committee of Yenepoya (Deemed to be university)

**List of abbreviations:**

| df     | Degree of freedom 
| H₁, H₂, H₃ | Research Hypothesis  
| H₀₁, H₀₂, H₀₃ | Null hypothesis  
| MRSA | Methicillin-resistant Staphylococcus aureus 
| p     | Probability  
| r     | Reliability  
| SD    | Standard deviation  
| %     | Percentage  
| χ²    | Chi square  

**References**


Maternal and Perinatal Outcome in Patients with Meconium Stained Liquor in First Stage of Labour: A Retrospective Study

Tanu Bhati¹, Sunil Takiar², Kalpna Kulshrestha³, Sukla Debbarma⁴

¹Junior Resident, ²Head of Department, ³Assistant Professor, ⁴Senior Resident (OBG), SIMS, Hapur, U.P.

Abstract

Objectives: To study the perinatal and maternal outcome in patients with meconium stained liquor in first stage of labour.

Methodology: This retrospective study was carried out on 180 antenatal females reporting for delivery between 36-40 weeks gestation with single live fetus in cephalic presentation & results were recorded.

Results: In our study, 56.66% of the babies among the meconium liquor (study) group were admitted in NICU against 28.88% in the clear liquor (control) group. 2.22% of the babies in the study group developed HIE as compared to none in the control group. 16.66% of the babies developed septicemia in the study group as compared to 4.44% in the control group.

Conclusion: Perinatal morbidity and mortality was significantly higher in the meconium liquor group as compared to the clear liquor group. The rates of Complicated (Caesarean section and instrumental) delivery were also reported to be higher in the study group.

Keywords: Meconium, cardiotocography, instrumental delivery, meconium aspiration syndrome.

Introduction

10-20 % of term pregnancies are associated with meconium stained liquor. Meconium is a green, viscous liquid that first appears in fetal ileum by 10 wks gestation. The passage of meconium in utero and its aspiration during intrauterine life or when the baby takes its first breath can result in meconium aspiration syndrome and hence result in significant perinatal morbidity and mortality. Factors such as placental insufficiency, maternal hypertension, pre-eclampsia, oligo-hydramnios or maternal drug abuse (tobacco, cocaine) result in intrauterine passage of meconium¹.

Amniotomy is recommended to detect passage of meconium in utero during labour. Amniotomy is also recommended in labour to detect meconium stained liquor when the fetal heart is non reassuring. Continuous fetal heart rate monitoring (cardiotocography) is recommended once meconium stained liquor is detected. Several mechanisms are proposed for causation of detrimental effects of meconium in fetus. Meconium reduces the levels of zinc in amniotic fluid which may reduce the antibacterial property, predisposing to intraamniotic infections. In presence of fetal stress such as fetal hypoxia, the gasping action of fetus may aspirate the meconium into the lungs where meconium may neutralize the action of surfactant and promote lung tissue inflammation by activating neutrophils and macrophages. In persistence of hypoxia, meconium aspiration can lead to pulmonary vascular hypertrophy and pulmonary hypertension.

It has also been found to be associated with increased risk of cerebral palsy, neonatal seizures and encephalopathy. Meconium aspiration syndrome can still occur even when caesarean section is done, and, considerable morbidity may result both to newborn and mother. Meconium aspiration syndrome occurs in about 5% of deliveries with meconium stained amniotic fluid² and death occurs in about 12% of infants with meconium aspiration syndrome³. Facilities like CTG and fetal blood sampling to detect detrimental effect on fetus are
not available in most of the hospitals in India. It is for this reason that this study was undertaken to compare the outcomes in the two groups.

Materials & Method

Study Design: A Retrospective study

Venue: SIMS, HAPUR, U.P.

Sample Size: 180 Patients with single live fetus in cephalic presentation between 36-40 weeks.

All women meeting the selection criteria were selected and divided into two groups on the basis of presence or absence of meconium in liquor in 1st stage of labour. Group with meconium stained amniotic fluid was labeled as exposed (study group) while the other group with clear or meconium free amniotic fluid was labeled as unexposed (control group). The records were taken on the basis of demography, fetal heart rate abnormality, mode of delivery, Apgar score at 1 minute after birth, NICU admission and related complications.

Inclusion Criteria:
- 36-40 completed Weeks pregnancy
- Single live fetus in cephalic presentation
- No other identifiable high-risk factor

Exclusion Criteria:
- Previous Caesarean section
- Gross congenital anomaly
- Chorioamnionitis
- Cord prolapse
- Absent fetal heart variability, late deceleration, fetal bradycardia.
- Multifetal gestation

\* Maternal disease (Diabetes mellitus, pre-eclampsia).

A total of 180 patients meeting the study criteria were allocated into two groups, namely, meconium stained liquor group (90 patients) and clear liquor group (90 patients).

The maternal and perinatal outcomes were subsequently compared between the two groups.

<table>
<thead>
<tr>
<th>Outcome variables computed for frequency &amp; percentage.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Mode of delivery.</td>
</tr>
<tr>
<td>2. Apgar scoring.</td>
</tr>
<tr>
<td>4. NICU admission.</td>
</tr>
<tr>
<td>5. Need for mechanical ventilation.</td>
</tr>
<tr>
<td>6. Mortality for exposed &amp; unexposed group.</td>
</tr>
</tbody>
</table>

Table 2. Comparison of latent phase & active phase of labour in meconium stained liquor & clear liquor groups.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Meconium in Liquor</th>
<th>Clear Liquor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age (yrs)</td>
<td>25.20 yrs</td>
<td>24.02 yrs</td>
</tr>
<tr>
<td>Mean gestational age (weeks)</td>
<td>39.40 wks</td>
<td>38.30 wks</td>
</tr>
<tr>
<td>Mean birth wt. (kg)</td>
<td>2.60 kg</td>
<td>2.72 kg</td>
</tr>
<tr>
<td>Supervised pregnancy</td>
<td>46(51.11%)</td>
<td>52(57.77%)</td>
</tr>
<tr>
<td>Unsupervised pregnancy</td>
<td>44(48.88%)</td>
<td>38(42.22%)</td>
</tr>
</tbody>
</table>

In this table we compared mean maternal age (in years), mean gestational age (in weeks) & mean birth weights between meconium stained liquor & clear liquor groups. It included 46 booked patients in meconium stained liquor group compared to 52 in clear group. It included 44 un-booked patients (meconium group) as compared to 38 in clear group.
In this table, we have compared patients detected with MSAF at a cervical dilatation less than 4 cm vs those detected to have meconium in liquor at ≥ 4 cm dilatation. Patients having less than 4 cm Cx dilatation had a better perinatal outcome compared to those detected at > 4 cm Cx dilatation.

### Table 3: Comparison of period of gestation in meconium stained liquor & clear liquor groups.

<table>
<thead>
<tr>
<th>Period of Gestation</th>
<th>Meconium</th>
<th>Clear</th>
</tr>
</thead>
<tbody>
<tr>
<td>36-37 wks</td>
<td>06(6.66%)</td>
<td>21(23.33%)</td>
</tr>
<tr>
<td>38-39 wks</td>
<td>26(28.88%)</td>
<td>48(53.33%)</td>
</tr>
<tr>
<td>40 wks</td>
<td>58(64.44%)</td>
<td>21(23.33%)</td>
</tr>
</tbody>
</table>

The average gestational age in exposed group was 39.66 weeks while in unexposed it was 38.30 with no statistical difference, probably because of shorter interval gestational age inclusion only from 36 to 40 weeks.

### Table 4. Comparison of mode of delivery in meconium and clear liquor groups.

<table>
<thead>
<tr>
<th>Mode of Delivery</th>
<th>Meconium</th>
<th>Clear</th>
</tr>
</thead>
<tbody>
<tr>
<td>LSCS (fetal indication)</td>
<td>18(20%)</td>
<td>10(11.11%)</td>
</tr>
<tr>
<td>LSCS (other indications)</td>
<td>16(17.77%)</td>
<td>11(12.22%)</td>
</tr>
<tr>
<td>Instrumental vaginal delivery</td>
<td>12(13.33%)</td>
<td>4(4.44%)</td>
</tr>
<tr>
<td>Normal vaginal delivery</td>
<td>44(48.88%)</td>
<td>65(72.22%)</td>
</tr>
</tbody>
</table>

As shown in this table, in our study, 37.77% of the patients in meconium group had Cesarean section as compared to 23.33% in the control group. The incidence of Instrumental deliveries likewise was 13.33% : 4.44% (Meconium vs Clear liquor groups). The p values in this table are, thus, statistically significant (0.01).

### Table 5. Perinatal outcome in meconium versus clear liquor groups.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Meconium*</th>
<th>Clear*</th>
</tr>
</thead>
<tbody>
<tr>
<td>EARLY NEONATAL DEATH</td>
<td>3(3.33%)</td>
<td>1 (1.11%)</td>
</tr>
<tr>
<td>NICU ADMISSION</td>
<td>51(56.66%)</td>
<td>26(28.88%)</td>
</tr>
<tr>
<td>APGAR &lt;3 at birth</td>
<td>18(20%)</td>
<td>10(11.11%)</td>
</tr>
<tr>
<td>Need For Mechanical Ventilation</td>
<td>16 (17.77%)</td>
<td>12 (13.33%)</td>
</tr>
<tr>
<td>HIE</td>
<td>2(2.22%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>NEONATAL SEPSIS</td>
<td>15(16.66%)</td>
<td>4 (4.44%)</td>
</tr>
</tbody>
</table>

* - Incidence >100% as same child may figure in other categories too.

56.66% of the babies among the meconium liquor group were admitted in NICU against 28.88% in the clear liquor group. 2.22% of the babies in the meconium group developed HIE as compared to none in the clear group. 16.66 % of the babies developed features of sepsis in the study group as compared to 4.44% in the control. Comparing both the groups, the p value of NICU admission is 0.0001 & p value of Neonatal sepsis is 0.007.

### Discussion

The passage of meconium in utero may be a sign of fetal maturity or may reveal fetal hypoxia or increased vagal stimulation\(^4\). It is often assumed that, an abnormal fetal heart rate in the presence of meconium stained liquor, indicates fetal hypoxia and acidosis, especially in the setup where additional diagnostic facilities like cardiotocography and fetal scalp blood pH estimation are not available. Although meconium is sterile, its passage into amniotic fluid is important because of the risk of meconium aspiration syndrome (MAS) and its sequelae. The presence of meconium in liquor during labour is known to be associated with an increased risk of perinatal mortality. The average gestational age in exposed group was 39.66 weeks while in unexposed it was 38.30 weeks with no statistical difference, probably because of shorter interval gestational age, as only cases from 36 weeks to 40 weeks of gestation were included in this study. Similar results were obtained when data was compared for perinatal outcome in both the groups.

In the study by Becker et al\(^5\), no statistically relevant difference was noted in Apgar values of defined subgroups. Only 14 babies out of 2246 studied had unsatisfactory Apgar scores. 10 (0.9%) of them were in MSAF group and 4 (0.4%) in control group (p-value 0.108). In the study by Patil et al\(^6\), 19% of babies with MSAF had unsatisfactory Apgar scores. In the study by Wong SF\(^7\), 29% of MSAF vs 19.4% of clear amniotic fluid had low 1 min Apgar scores. The results were comparable to our study with 20 % of patients in the meconium group having unsatisfactory Apgar as compared to 11.11% in the clear liquor group with a relative risk of 1.94%. In the study by Desmond et al\(^8\), incidence of birth asphyxia was 26.66%. Both, the modes of delivery, as well as foetal outcome, were affected by the presence of meconium stained liquor as compared to clear liquor group. Presence of meconium, hence, should be monitored closely and additional monitoring facilities such as CTG, if available, can guide the obstetrician to decide the mode of delivery and any other necessary intervention in time. Meconium Stained Amniotic Fluid...
in presence of low Apgar scores is directly responsible for high neonatal morbidity and mortality.

In the study by Becker et al\(^5\), 17.4% of patients in meconium group had caesarean section compared to 9.6% in control group (p-value <0.01). Similarly, in study by Wong SF\(^7\) 13.2% of MSAF vs 8.8% of clear amniotic fluid had Caesarean section.

These results were comparable to the results obtained in our study. 31.1 % of the patients in meconium group had caesarean section as compared to 21.1% in the control group. The difference was statistically significant. In the study by Patil et al\(^6\), 42% of the patients with MSAF had caesarean section while in study by Goud et al\(^9\), incidence of thin and thick MSAF (35% & 29%) was noted in normal vaginal delivery and (65% & 71%) in cases of caesarean section. In the study by Naveen S et al\(^10\), 49.1% of MSAF cases had caesarean section while 10.4% of clear amniotic fluid cases had caesarean section.

**Conclusion**

Perinatal morbidity and mortality were significantly higher in the meconium group as compared to the clear liquor group. The rates of caesarean section/ instrumental delivery were also reported to be higher in study group. The incidence of NICU admissions, respiratory distress in newborn, birth asphyxia, Apgar score<3 at birth, mechanical ventilation for resuscitation were all significantly higher in the meconium liquor group.

Patients who underwent caesarean section for fetal indication had a significantly better perinatal outcome as compared to those who underwent vaginal delivery.

Patients detected with MSAF at a cervical dilatation less than 4cm had a better perinatal outcome as compared to those detected at > 4cm probably because patients who were detected with meconium at cervical dilatation less than 4 cms were immediately taken up for caesarean section in view of prolonged amniotomy to delivery interval while those who were detected with meconium at cervical dilatation more than 4 cms were given a trial of vaginal delivery provided the fetal heart was normal. They were taken up for caesarean only when fetal heart showed any abnormality or when any other indications for caesarean were detected.

**Funding:** No funding sources.

**Conflict of Interest:** None declared.

**Ethical Approval:** The study was approved by the Institutional Ethics Committee.

**References**

Salivary pH as a Factor in Oral Health and its Correlation with Diet

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Abstract

Aim: The study aims to determine how Indian foods affect salivary ph. This study also includes assessment of correlation between different food items and occurrence of dental caries.

Methodology: 100 subjects were included in this study. By means of a questionnaire, They were asked to choose the food they consume predominantly on a daily basis. Their salivary pH values were noted down with the help of pH paper. DMFT index was used to assess their risk for dental caries.

Results: 87 percent of individuals consumed rice every day. Among these individuals, 64 percent of them, had DMFT scores greater than 5 and 72 percent of them had an acidic pH. Also, there was no significant differences between the pH values of vegetarians and non-vegetarians. This may be because the non-vegetarians in this study consumed meat only rarely or twice or thrice in a week. The survey results were coded using Microsoft Excel (2007) and percentage information was obtained for each category of comparison. Statistical analysis was done using SPSS software (version 20; independent T-Test was used)

Conclusion: In this study population, there is a direct influence of diet (mainly carbohydrates) in the development of caries

Keywords: Caries, diet, pH, risk, saliva.

Introduction

Dental caries is the most prevalent dental disease(1). The aetiology and pathogenesis of dental caries are multifactorial, that is, there are so many factors that contribute to the pathogenesis of dental caries and the factors are prone to alterations depending on the time and environment. So, one cannot exactly determine the and quantify the amount of progression of caries. Kyes demonstrated that dental caries is infectious transmissible disease(2). Streptococcus has been associated with prevalence of dental caries (3). Streptococcus forms a part of the normal microbial flora in the oral cavity. It is in the presence of other factors that cavitation occurs. So, Streptococcus alone cannot cause a cavitation and cavitation occurs in the presence of other factors which renders the organism cariogenic. The aim of any treatment should be to eradicate the causative agent in order to avoid recurrence. Eradication of the causative agent can be completely achieved if the infection is prevented at an earlier stage. This applies for eradication of dental caries as well. The nature and composition of saliva plays an important role in maintaining and protecting the oral health by balancing the physiological and biochemical parameters and by the process of remineralisation.

Saliva is a complex fluid which is secreted by both minor and major salivary glands(4). Saliva has a wide range of applications in diagnosing systemic and oral health. Saliva is used as a diagnostic tool in monitoring plasma concentrations of medicines or other substances(5,6). Saliva plays an important role in caries prevention since it has buffering capacity that helps in balancing
mineralisation imbalances in the saliva. If the pH of saliva is greater than 6, the saliva contains phosphate in very high concentrations with regard to hydroxyapatite. When the pH falls below the critical level (5.5) the hydroxyapatite dissolves and the phosphates are released in an attempt to restore the pH balance (7). Low buffering capacity is usually associated with caries development because of its impaired neutralisation of plaque acids and reduced re-mineralization of early enamel lesions (8,9). An association between low caries levels and high salivary buffering capacity has been also demonstrated (10,11). If the buffering potential is not compromised, caries activity cannot occur. Also, in the presence of early caries activity, promoting remineralisation will inhibit the progression of caries. There are many potential remineralising agents such as fluoride, xylitol, bioactive glass etc, which can be used to remineralise tooth structure rather than removing caries and replacing it with a filling (12).

This study includes evaluation of the oral hygiene status by means of an OHIS index. Bacterial plaque is a biofilm that covers all the oral structures. Major components of the plaque includes salivary proteins and macromolecules (13). If the plaque has a more alkaline pH than saliva or crevicular fluid, calculus formation occurs (14). This study takes into consideration the salivary pH and the diet and correlates it with the prevalence of dental caries which is evaluated by means of DMFT index.

Materials and Method

For a population of 130 individuals, the sample size necessary was calculated to be 97, with 5% confidence interval and 95% confidence level. This study included 100 subjects from a random population of 130 individuals of the age group 20-60. By means of a questionnaire, the information about the food they consume predominantly on a daily basis were collected along with the information about the frequency of consumption of that particular food. The frequency was obtained in terms of everyday consumption, consuming twice or thrice a week and rare consumption. From the survey it was found that the predominant components in diet for this population included rice, wheat and meat. They were hence classified according to their diet into vegetarians and non-vegetarians. Those who consume meat were classified as non-vegetarians and those who did not consume meat were classified as vegetarians. The saliva was collected in a sterile dispenser by asking the subjects to spit normally. The diet history and saliva was collected in the morning 2 hours after breakfast. Their salivary pH values were noted down with the help of narrow range pH strip. The pH strip had pH markings - 5.0, 5.5, 6.0, 6.5, 7.0, 7.5 with corresponding standardised colour codings from yellow (5.0, 5.5) to green (6.0, 6.5) to blue (7.0, 7.5). One third to one half of the pH paper was dipped into the saliva once and left undisturbed until colour change occurred. The colour change in the pH strip was compared with that of the standardised colour for different pH values. The colour which matched closely similar to the colour change in the pH strip was designated the corresponding pH value (figure 1). For comparison pH values were noted down as being acidic (pH values - 5.5, 6, 6.5, 7) or alkaline (7.5). The neutral pH 7 was considered under acidic pH since it indicates progress towards acidic pH suggestive of caries activity. DMFT was used to assess their risk for dental caries. The number of decayed teeth, the number of missing teeth due to caries and the number of fillings in every individuals oral cavity was assessed by clinical examination. The DMFT scores were obtained by adding the number of decayed, missing and filled teeth. Teeth missing due to periodontal compromise or trauma was excluded by asking for history of mobility or trauma respectively. Only teeth which were lost or extracted due to cariogenic progress was considered. The survey results were coded using Microsoft Excel (2007) and percentage information was obtained for each category of comparison. Statistical analysis was done using SPSS software (version 20; independent T-Test was used).

Figure 1: Determining the pH of saliva using a pH paper.
Results

As mentioned earlier, based on their responses, it was found that the common dietary intake was confined to rice, wheat and meat predominantly. The consumption of other food items showed inconsistent frequency of consumption and therefore excluded from the study. From table 1, 87 percent of individuals consumed rice every day. Among these individuals, 64 percent of them, had DMFT scores greater than 5 and 72 percent of them had an acidic pH. 12 percent consumed rice twice or thrice in a week. 1 percent of the population reported to consume rice rarely. 1 percent of the population consumed wheat every day. Among these individuals, 50 percent of them had DMFT values greater than 5 and 60 percent had an acidic pH. 92 percent of the population consumed wheat twice or thrice in a week and 7 percent consumed wheat rarely. Similarly, 7 percent consumed meat every day. Among these individuals, 43 percent had DMFT greater than 5 and 52 percent of them had an acidic pH. 85 percent consumed meat twice or thrice a week and 8 percent consumed meat rarely.

From table 2, 27 percent of the subjects were vegetarians and 73 percent of them were non-vegetarians. Among the vegetarians, 53 percent had DMFT values greater than 5 and 42 percent of them had an acidic pH. Among the non-vegetarians, 48 percent of the subjects had DMFT values greater than 5 and 42 percent of them had an acidic pH.

Table 1: Correlation of salivary pH with various food consumed and dental caries

<table>
<thead>
<tr>
<th>Food consumed</th>
<th>Frequency of consumption</th>
<th>Percentage (%)</th>
<th>DMFT&gt;5 (%)</th>
<th>DMFT&lt;5 (%)</th>
<th>Acidic pH (%)</th>
<th>Alkaline pH (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice</td>
<td>Everyday</td>
<td>87</td>
<td>64</td>
<td>36</td>
<td>72</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>Twice/thrice a week</td>
<td>12</td>
<td>34</td>
<td>66</td>
<td>54</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td>Rarely</td>
<td>1</td>
<td>20</td>
<td>80</td>
<td>20</td>
<td>80</td>
</tr>
<tr>
<td>Wheat</td>
<td>Everyday</td>
<td>7</td>
<td>50</td>
<td>50</td>
<td>60</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Twice/thrice a week</td>
<td>50</td>
<td>45</td>
<td>55</td>
<td>42</td>
<td>58</td>
</tr>
<tr>
<td></td>
<td>Rarely</td>
<td>43</td>
<td>15</td>
<td>85</td>
<td>15</td>
<td>85</td>
</tr>
<tr>
<td>Meat</td>
<td>Everyday</td>
<td>7</td>
<td>43</td>
<td>57</td>
<td>52</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>Twice/thrice a week</td>
<td>85</td>
<td>54</td>
<td>46</td>
<td>51</td>
<td>49</td>
</tr>
<tr>
<td></td>
<td>Rarely</td>
<td>8</td>
<td>55</td>
<td>45</td>
<td>50</td>
<td>50</td>
</tr>
</tbody>
</table>

Table 2: Correlation of salivary pH and dental caries with vegetarian and non-vegetarian diet

<table>
<thead>
<tr>
<th>Diet</th>
<th>Percentage (%)</th>
<th>DMFT&gt;5 (%)</th>
<th>DMFT&lt;5 (%)</th>
<th>Acidic pH (%)</th>
<th>Alkaline pH (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vegetarian</td>
<td>27</td>
<td>53</td>
<td>47</td>
<td>42</td>
<td>58</td>
</tr>
<tr>
<td>Non-vegetarian</td>
<td>73</td>
<td>48</td>
<td>52</td>
<td>40</td>
<td>60</td>
</tr>
</tbody>
</table>

Table 3: Correlation of prevalence of dental caries and oral hygiene

<table>
<thead>
<tr>
<th>OHIS</th>
<th>DMFT&gt;5</th>
<th>DMFT&lt;5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent-0</td>
<td>18%</td>
<td>82%</td>
</tr>
<tr>
<td>Good- 1-1.2</td>
<td>48%</td>
<td>52%</td>
</tr>
<tr>
<td>Fair-1.3-3</td>
<td>90%</td>
<td>10%</td>
</tr>
<tr>
<td>Poor3.1-6</td>
<td>72%</td>
<td>28%</td>
</tr>
</tbody>
</table>

From table -3, it is observed that, 82% of those who maintain excellent oral hygiene have DMFT values less than 5 and 28% of those with poor oral hygiene have DMFT values less than 5. 90% of the individuals who maintained a fair but not good oral hygiene had a DMFT score greater than 5( highest DMFT score of the 4 categories). 72% of the individuals whose oral hygiene was poor, had DMFT scores greater than 5.

Independent T-Tests done using SPSS revealed a statistically significant relationship between oral hygiene and prevalence of dental caries (p value < 0.05). There was no statistically significant relationship between dental caries and dietary intake as seen between the vegetarians and non vegetarians.

Discussions

Salivary pH plays an important role in determining the mechanism of dental caries. Bacteria in the biofilm ferment dietary carbohydrates and cause production of
acids as by-products of metabolism. Due to this acid production, the pH of saliva decreases and becomes acidic. Hence, acidic saliva will result in and is suggestive of demineralisation\(^{(15,16)}\). The progress of dental caries depends on balance between demineralisation and remineralisation. While remineralisation of the tooth will lead to reversal of carious lesion, demineralisation will result in cavitation. Here comes the role of saliva as a buffer. The saliva restores the pH of the biofilm by losing calcium and phosphate to the tooth structure. If this buffering capacity is impaired, the carious process will continue and spread\(^{(17)}\).

In this study, acidic salivary pH was found in 65% of the population. The everyday consumption of rice and wheat is directly related to the increase in acidic pH. Rice contains increased amount of carbohydrates than wheat. However, wheat also contains carbohydrates but in lesser quantities.

Since caries prevalence and progression is multifactorial, wide range of studies report various prevalence rates and various risk factors which keep changing from time to time and between different individuals. A study by Gokul et al, reported that consumption of oily food and non-vegetarian food results in alkalinity in the pH of saliva\(^{(18)}\). In this study, there was no significant differences between the pH values of vegetarians and non-vegetarians(Table 2).

This may be due to the fact that only 7 percent of the population consume meat everyday and they consume carbohydrates in their diet predominantly. 93% of those who consume meat, reported that they consumed meat either twice or thrice a week or rarely. A study by Stephan and Miller was the first article to be publishes regarding the association between salivary pH and diet. In this study, they showed that the pH of the saliva lowered significantly within 3 minutes after human teeth were rinsed with sucrose solution\(^{(19,20)}\). In this study, the percentage of subjects with acidic pH is increased (72%) in those who consume carbohydrate every day. Also, in the percentage of subjects with increased acidic pH, an increased DMFT values were observed (Table 1). In a study by Bowen et al, it was proven that the frequency of consumption of cariogenic food contributed significantly to the progression of caries\(^{(21)}\). This finding is consistent with the present study in which those who consume rice, wheat every day have an increased percentage of DMFT values greater than those who consume twice or thrice a week or rarely. In a study by Gopinath, it was found that 45% of those who had high caries incidence (DMFT>5) had acidic pH.

In this study, there is no statistical significance found between caries prevalence and diet.( p value > 0.05), though the percentage difference indicated that prevalence of dental caries was associated with carbohydrate containing diet. However, statistically significant relationship between oral hygiene and diet was observed in this study (p value<0.05).

Conclusion

Dental caries is multifactorial and is caused by various factors of which salivary buffering capacity, diet and oral hygiene are considered in this study. Though saliva has buffering capacity, the composition of saliva is influenced by diet. Increased consumption of carbohydrates is easily metabolised by oral flora and results in a lowered pH. However, in this study population, it is evident that maintenance of good oral hygiene influences the incidence and prevalence of dental caries rather than the diet. Caries prevalence was not significantly different between the vegetarian and non-vegetarian groups, but caries prevalence was higher in individuals who did not maintain good oral hygiene. So, results from this study emphasises on the importance of maintaining good oral hygiene.

Ethical Clearance: obtained from the ethical committe of Saveetha Dental College

Conflict of Interest: No

Source of Funding: Self

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An Analytical Study on Physical Activity, Functional Capacity and Sleep Health in Patients with Type 1 and Type 2 Diabetes

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Abstract

Background: Diabetes prevalence and complications are increasing which emphasizes the need of management in various possible ways. Physical inactivity tends to decrease the functional capacity. Similarly, Physical activity and sleep are inter related. Due to dearth of details on the physical activity level, functional capacity, sleep debt levels and their relationship in diabetic population, this study was taken.

Objective: To measure Physical Activity level, Functional capacity, Sleep debt and the relationship between them in type 1 and type 2 Diabetics.

Method: In this observational study on diabetic patients of 30 –65 years age without any diabetic complications, the Global Physical Activity and Sleep Inventory Questionnaire were used to evaluate Physical Activity and Sleep debt. Functional capacity was assessed by 6-minute walk test. Body Mass Index, Waist Hip ratio, Blood sugar were measured. Data were analyzed by Mann-Whitney U test, Chi-square test, Odds ratio, Spearman correlation method using SPSS software 15.1 version.

Results: The physical inactivity was higher in type 1 diabetic patients (93.33%) than type 2 (69.67%). By odds ratio, type 1 diabetic individuals had more risk of Sleep debt. Patients with low Physical Activity level had more Sleep debt and there was significant (p< 0.05) negative correlation between Physical Activity level and Sleep Inventory score in type2 diabetics.

Conclusion: Type 1 diabetic had low physical activity level in spite of having functional capacity similar to type 2. Sleep debt was more in type 1 diabetic and individuals with low physical activity level. Thus difference exist between type 1 and 2 diabetes in the physical activity and sleep debt, which needs to be considered during exercise training diabetic management.

Keywords: Physical activity- Functional capacity- Sleep debt- Type 1 diabetes-Type 2 diabetes.

Introduction

Diabetes is a leading global health problem with global prevalence of 8.8% and about 79.2 million affected in India by 2017(1). The Physical activity recommendation for diabetic patients - 150 minutes per week of moderate - vigorous physical activity(2)(3). The variations in the Physical activity level among Type 1 and type 2 diabetic patients is not known. The functional capacity tends to decrease if the individuals are being less active for longer period. Presently Sleep deprivation is also a major health problem and it has an effect on physical well-being. Diabetic patients have sleep disturbances due to poor glycemic control or due to sleep disturbance, the glycemic control may be alternated (4). In diabetic management, Sleep is also one component to be addressed, as study says there is association between
sleep duration (either little or more) and diabetic prevalence and impaired glucose tolerance\(^5\). As sleep is linked with diabetes and physical well-being, it has to be addressed and its effects on physical activity have to be analyzed for better management and prevention. Thus in this study, the Physical activity level, functional capacity and Sleep debt in type 1 and type 2 diabetic patients was analyzed for the better understanding to formulate exercise strategies for management and prevention.

**Method**

This was a cross sectional study done with Institutional ethics clearance on patients with type 1 and type 2 diabetic patients during September 2017 to March 2018. The subjects in age group between 30 to 65 years; diagnosed to be diabetic more than 1 year and being able to read and understand English were included in the study by obtaining informed consent. Patients with sensory neuropathy, foot ulcers or other serious musculoskeletal problems were excluded. Anthropometric measures BMI and Waist Hip ratio were measured and laboratory details like Fasting Blood Glucose, Post Prandial blood glucose values were noted.

The recruited subject’s Physical activity level was evaluated using Global Physical Activity Questionnaire (GPAQ) which collects information on physical activity participation in 3 domains (activity at work, travel to and from places and recreational activities) and time spent on sedentary behavior\(^6\)\(^7\). Sleep debt was assessed using Sleep Inventory Questionnaire consisting of 17 items to which the respondent simply responds with “yes” or “no”. To score this test, the number of “yes” responses is simply counted from the total score of 17. The score above 7 is set as a cutoff point denoting the individual has evidences of sleep debt\(^8\). Functional Capacity by Six-Minute Walk Test conducted in a level corridor of 30 m long with markings for every 2.5mts. The distance walked by the individual, pre and post vital changes and other complaints (if any) reported were noted\(^9\).

**Statistical Analysis:** In this study the variable distribution was tested by Shapiro-wilk’s test. The baseline characteristics age, BMI, WHR, FBS, PPBS are described by their mean and standard deviation values; gender is described by counts and percentages. For comparison of Physical activity level, Functional capacity among Type 1 and Type 2 diabetes group, the Mann – Whitney U test is used. For sleep debt analysis among type 1 and type 2 diabetic patients, Odds ratio and the Chi-square test, were used, as indicated, \(p\) values \(< 0.05\) were considered to be statistically significant. Spearman rho correlation was done to assess a potential association between Physical Activity level and Functional capacity; Physical Activity level and Sleep Inventory score and between Functional capacity and Sleep Inventory score in both type 1 and type 2 Diabetes.

Analysis was done by using SPSS software 15.1version.

**Results**

In this study, the proportion of female patients was higher in both type 1 and type 2 diabetic group. Both type 1 and type 2 diabetics were overweighted. The fasting and post prandial Blood Sugar level was higher in type 1 than type 2 diabetes. The changes in Physical activity level among type 1 and type 2 diabetes was statistically significant with the \(p\) value of 0.01, when categorized into Physically inactive (< 600) and Physically active (> 600) (Table 2). There were higher odds (1.61) of sleep debt in type 1 Diabetes than type 2 (Table 3). Sleep debt was more among both type 1 and also in type 2 diabetic individuals with low Physical Activity level\((p< 0.05)\) (Table 4).

**Table 1: Baseline Characteristics of participants in type 1 and type 2 Diabetes**

<table>
<thead>
<tr>
<th></th>
<th>(T_1D) (n=30)</th>
<th>(T_2D) (n=56)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>14 (46.67%)</td>
<td>20 (32.15%)</td>
</tr>
<tr>
<td>Female</td>
<td>16 (53.33%)</td>
<td>36 (67.85%)</td>
</tr>
<tr>
<td>Age</td>
<td>48.76 (3.15)</td>
<td>52.76 (5.70)</td>
</tr>
<tr>
<td>BMI</td>
<td>25.13 (3.15)</td>
<td>26.22 (5.70)</td>
</tr>
<tr>
<td>WHR</td>
<td>0.87 (0.045)</td>
<td>0.88 (0.048)</td>
</tr>
<tr>
<td>FBS</td>
<td>189.5 (49.40)</td>
<td>138.9 (35.41)</td>
</tr>
<tr>
<td>PPBS</td>
<td>255.8 (86.16)</td>
<td>189.76 (53.26)</td>
</tr>
<tr>
<td>GPAQ</td>
<td>360.67 (269.22)</td>
<td>586.39 (763.07)</td>
</tr>
<tr>
<td>6MWD</td>
<td>388.56 (37.25)</td>
<td>378 (65.07)</td>
</tr>
<tr>
<td>SIS</td>
<td>6.86 (1.58)</td>
<td>6.03 (2.12)</td>
</tr>
</tbody>
</table>

Mean, SD Standard Deviation, n number, % percentage

\(T_1D\) – Type 1 Diabetes; \(T_2D\) – Type 2 Diabetes; BMI – Body Mass Index; WHR – Waist Hip Ratio; FBS – Fasting Blood Sugar; PPBS – Post Prandial Blood Sugar; GPAQ – Global Physical Activity Questionnaire Score; 6MWD – Six Minute Walk Distance; SIS – Sleep Inventory Score
Table 2: Comparison of Physical Activity among Type 1 and Type 2 Diabetes

<table>
<thead>
<tr>
<th>Physical Activity Level (GPAQ score)</th>
<th>T1D</th>
<th>T2D</th>
<th>Chi square Value</th>
<th>p value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inactive (Below 600)</td>
<td>28</td>
<td>39</td>
<td>6.3698</td>
<td>0.011</td>
</tr>
<tr>
<td>Active (Above 600)</td>
<td>2</td>
<td>17</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Chi square test [T1D – Type 1 Diabetes; T2D- Type 2 Diabetes]

Table 3: Analysis of Sleep debt in Type 1 and Type 2 Diabetes

<table>
<thead>
<tr>
<th></th>
<th>No sleep debt</th>
<th>Sleep debt</th>
<th>Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1D</td>
<td>11</td>
<td>19</td>
<td>1.61</td>
</tr>
<tr>
<td>T2D</td>
<td>27</td>
<td>29</td>
<td>(0.64 - 3.99)</td>
</tr>
</tbody>
</table>

[T1D – Type 1 Diabetes; T2D- Type 2 Diabetes]

Table 4: Analysis of Sleep debt with categorized physical activity level in Type 1 and Type 2 Diabetes

<table>
<thead>
<tr>
<th>GPAQ</th>
<th>Sleep</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No sleep debt</td>
<td>Sleep debt</td>
</tr>
<tr>
<td>T1D</td>
<td>Low</td>
<td>10 (35.7%)</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>1 (50%)</td>
</tr>
<tr>
<td>T2D</td>
<td>Low</td>
<td>14(35.9%)</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>7(53.8%)</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>4(100%)</td>
</tr>
</tbody>
</table>

*Chi-square test, p ≤ 0.05, n number, % percentage

Correlation analysis

Type 1 Diabetes: Correlation analysis in type 1 and type 2 diabetes were done by using Spearman’s Rho Correlation method. There was very weak negative correlation between Physical Activity level (GPAQ score) and Functional capacity (6MWD) with p value of 0.37 (statistically not significant) suggesting that if the Physical Activity level increases, the Functional capacity decreases. There was very weak positive correlation between Physical Activity level (GPAQ score) and Sleep Inventory score with p value of 0.57 (statistically not significant) suggesting that if the Physical Activity level increases, there was an increase in Sleep Inventory score. There was weak negative correlation between Functional capacity (6MWD) and Sleep Inventory with p value of 0.399 (statistically not significant), suggesting that if the Functional capacity increases, the Sleep Inventory score decreases which means that by increase in Functional capacity, the Sleep debt decreases.

Table 5: Correlation Analysis between Physical Activity Level, Functional Capacity and Sleep Debt in Type 1 and Type 2 Diabetic Patients.

<table>
<thead>
<tr>
<th>Variable 1</th>
<th>Variable 2</th>
<th>Type 1 diabetes</th>
<th>Type 2 diabetes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>r value</td>
<td>p value*</td>
<td>r value</td>
</tr>
<tr>
<td>GPAQ</td>
<td>-0.169</td>
<td>0.373</td>
<td>0.248</td>
</tr>
<tr>
<td>GPAQ</td>
<td>0.107</td>
<td>0.572</td>
<td>-0.317</td>
</tr>
<tr>
<td>6MWD</td>
<td>-0.301</td>
<td>0.106</td>
<td>-0.115</td>
</tr>
</tbody>
</table>

*Spearman Rho Correlation

Discussion

Physical activity level among type 1 and type 2 diabetes: The incidence and pathogenesis of diabetes can be accelerated due to physical inactivity and can lead to subsequent morbidity and mortality (10). Similarly by being physically active, the progression of diabetes can be retarded reversed. The result of the present study shows that majority of the type 1 and type 2 diabetic individuals had low physical activity level. In type 2 diabetics, 69.6% and in type 1 diabetes, 93.33% of individuals had low physical activity. This emphasizes the need of Physical activity in the management of diabetes. Previous study has shown difference in Physical activity level among type 1 and type 2 diabetes (11). The present study is in accordance with the same study, but was done in a South Indian population using GPAQ Questionnaire. In the present study, by categorizing Physical Activity level - type 2 diabetic patients showed...
similar results. But larger percentage of type 1 diabetic individuals were with low physical activity level. The changes in Physical activity level of type 1 diabetic patients may be due to cultural and regional variations when compared to western countries. There were larger percentage of female patients and many were home maker by occupation. This may be an reason for reduction in Physical activity level where the need of being physically active in moderate to vigorous level is less and recreational and leisurely activities differs from western population to Indian population.

**Functional capacity among type 1 and type 2 diabetes:** Functional capacity was assessed by 6 Minute Walk Test and there was no significant change in the functional capacity among type 1 and type 2 diabetes. Though the functional capacity was similar in both groups, the six minute walk distance achieved by both group was less than that of the healthy individuals. Thus recommendation of physical activity is emphasized for improvement of functional capacity. Low exercise capacity is associated with higher adiposity and poor glycemic control in type 2 diabetics\(^{(12)}\)\(^{(13)}\). In this study even though both types had similar functional capacity, the majority of type 1 had low physical activity than the type 2 diabetes. This may be due to the facts like fear of hypoglycemia, tiredness or sedentary life style \(^{(14)}\). Thus the exercise or physical activity prescription needs extra care in type1 diabetes by considering their functional capacity and the factors that hinders from being physically active.

**Sleep debt in diabetes:** The sleep factor has been considered as it has an effect on both diabetes and physical activity level \(^{(15)}\). Poor sleep pattern in 64% of their study participants has been reported before \(^{(16)}\). In present study there were higher odds of sleep debt in type 1 diabetes affecting PA more than type 2 diabetics. The sleep debt was more among the individuals with low physical activity level and it was reduced as the physical activity level increases. It highlights the importance of considering sleep evaluation and management in diabetic patients in India.

**Correlation analysis in type 1 and type 2 diabetes:**

The results of correlation analysis states that, in type 2 diabetes - the physical activity level is positively correlated with functional capacity and negatively correlated with the sleep inventory score. Thus it states that by improving Physical Activity level, the Functional capacity improves and the sleep debt is also reduced. Similarly Functional capacity is negatively correlated with Sleep Inventory score, indicating that with increase in sleep debt the functional capacity can be affected. But in type 1 diabetes, the correlation analysis states that Physical activity level is negatively correlated with functional capacity. This was because; the individuals’ active participation in day to day Physical activity is less, in spite of having good functional capacity. Unlike type 2 diabetes, the effects of physical activity on sleep is not similar in type 1 diabetes. There may be other factors that influences the sleep quality. Functional capacity is negatively correlated with sleep inventory score suggesting that with increase in sleep debt the functional capacity is affected.

**Conclusion**

This study concludes that both type 1 and type 2 diabetic individuals had larger proportion of individuals with low physical activity level and low functional capacity. Type 1 diabetic patients are less active, in spite of having better functional capacity when compared to type 2 diabetes. Sleep debt is more among type 1 diabetes and in diabetic individuals with low Physical Activity level. Therefore Physical activity, Functional capacity and Sleep debt are important components to be considered in management of diabetes for evaluation and prescription of Physical activity or exercise.

**Conflict of Interest:** The authors in this study had no conflicts of interest.

**Ethical Clearance:** The study had ethical clearance from the Institutional ethics committee.

**Source of Funding:** Nil

**References**


Title: Knowledge, Attitude and Practice Regarding Hepatitis B Infection among Nursing Staff of Tertiary Care Hospital in South India

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Abstract

Background: Hepatitis B is the major global concern and leading cause of morbidity and mortality. It can be prevented with strategies like safe and effective vaccination, increasing awareness and by adhering to universal precautions.

Objectives: To evaluate knowledge, attitude and practice towards Hepatitis B infection and vaccination status against Hepatitis B among staff nurses working in CMCH &RC.

Material and Method: A cross sectional descriptive study was conducted in CMCH & RC, Irungalur, Trichy. Study population included 145 nursing staffs through purposive sampling technique who were contacted in person from various departments at the time of study. The data was analyzed using appropriate statistical software SPSS version 22.

Results: Among the study participants 64.7% had adequate knowledge regarding Hepatitis B. Around 16% were not fully aware about mode of transmission, 23% did not know that it spreads through unsterilized instruments while, 46% were not fully aware about the vaccination schedule & 20% of them did not know that its preventable. About 86.5% had positive attitude towards Hepatitis B. Out of total 145 nurses, 22.4 % didn’t follow the recommended practices towards prevention of Hepatitis B. Out of the total 145 participants, 35% nurses were not vaccinated against Hepatitis B at the time of our study.

Conclusion: One third of the nursing staff are not fully aware about the Hepatitis B infection. Around 16% nurses are not aware about mode of transmission of Hepatitis B. One third of the nurses are not vaccinated against Hepatitis B at the time of our study. Health education programs should be conducted on regular basis to increase level of knowledge and preventive practices in order to protect nursing staff from acquiring this deadly infection.

Keywords: Hepatitis B, knowledge, attitude, practice, staff nurses.

Introduction

Hepatitis B is an acute systemic infection with major pathology in the liver, caused by Hepatitis B virus (HBV) and transmitted usually by the parenteral route. Although an effective vaccine is available, but still it continues to be a major public health concern.¹ Hepatitis B virus (HBV) infection has been a major cause of morbidity and mortality among health care workers.² About two billion individuals have been infected with HBV at some point worldwide in time in their lifetimes and 360 to 400 million people (5% of the world’s population) are chronic carriers.³,⁴ HBV and its consequences are estimated to cause 600,000 deaths each year, a tenth of deaths worldwide.¹ Hepatitis
B shows variable clinical manifestations ranging from asymptomatic HBV carriers to complete liver failure, and it becomes chronic, often progresses to chronic Hepatitis, cirrhosis, and hepatocellular carcinoma. Majority of HBV infections are sub-clinical, as a result approximately 80% of all infections are undiagnosed. It has been estimated that 14.4% of hospital workers are infected with HBV and HCV. Universal work precautions as defined by Centre for Disease Control, are a set of precautions designed to prevent transmission of Hepatitis B/C virus, Human immunodeficiency virus (HIV) and other blood borne infections when providing first aid or health care. Universal work precautions apply to blood, other body fluids containing visible blood, semen, and vaginal secretions. Hepatitis B is the most commonly transmitted blood borne infection. If a nurse is exposed to the blood of HIV/HBV infected patient, she is 100 times more likely to be infected with HBV than HIV. The risk of acquiring HBV infection from occupational exposure is at least 30% from percutaneous or mucosal exposure to blood and body fluids from a patient with acute or chronic HBV infection. About 66,000 Hepatitis B viral infections are reported per year due to needle stick injuries. In India, the carrier rate of HBsAg in hospital staff has been found to be higher (10.87%) than in voluntary blood donors (6%) and in the general population (5%). As health-care workers (HCWs) remain at a high-risk of transmission by skin prick with infected or contaminated needles and syringes, also through accidental inoculation of minute quantities of blood during the surgical and dental procedures, it is very important for them to follow proper measures of infection control and prevention. Nosocomial transmission can be prevented by the vaccination of health care workers. Hepatitis B vaccines, for prevention have been evaluated in clinical trials to determine protective level of serum antibodies, i.e. Anti-HBs. Persons who respond to HBV vaccine with titers of anti-HBs 10mIU/ml or greater are protected against acute and chronic HBV infection. Nurses are probably the most common health care staff exposed to needle prick injuries and contact with infectious fluids. They are exposed to this risk right from there student career. Hence it is important that nurses as well as nursing students should have a thorough knowledge regarding Hepatitis B to minimize the health care settings acquired infections among them and other health personnel. Knowledge and attitudes of health care workers plays a key role in prevention of spread of infection. Therefore, the present study was conducted to assess the knowledge, attitude and vaccination status among staff nurses, regarding Hepatitis B.

Objectives of the Study:

1. To assess the knowledge, attitude and practice regarding Hepatitis B infection among staff nurses working in CMCH &RC, Trichy.
2. To study vaccination status of the study participants.

Methodology:

- **Study Design:** Hospital-based Cross sectional study.
- **Study Setting:** CMCH &RC.
- **Study Population:** 145 staff nurses.
- **Duration of the study:** 2 months (February – March 2017).
- **Sampling technique:** Purposive sampling.
- **Tools for data collection:** Structured questionnaire.

Method of Data analysis and interpretation: Data was analyzed according to objectives of the study using descriptive and inferential statistics and was presented in the form of tables, graphs. We adopted scoring system for assessing knowledge, attitude and practice. There were totally 16 questions for assessing knowledge, 5 questions each to assess attitude and practice. For each correct answer 1 score was given and wrong answer was given 0 score. Any score above 8 was labeled as good knowledge while less than 8 was considered as poor knowledge. Attitude was scored by giving 1 for positive attitude and 0 for negative attitude. Score above 3 was considered as satisfactory for attitude and practice. Practices regarding Hepatitis B were assessed by giving 1 score for correct practice to prevent the infection while 0 for incorrect practice.

Data collection tool: The nurses were contacted in person according to their availability in various departments. Information regarding purpose of the study was given to the participants and after receiving consent to participate in the study, Data was collected using pre-designed, pretested structured questionnaire through face to face interview. Confidentiality of the collected information was fully assured to the participants. Pilot study was done and necessary changes in the proforma were done to increase accuracy of the results. Data was designed to study socio-demographic factors.
Results

Out of the total 145 study participants, majority i.e. 68.24% were in the age group of 25-30, followed by 27.42% in the age group of 30-35 and 4.34% were above 35 years of age.

As shown in Table -1, among the study participants 64.7% had adequate knowledge regarding Hepatitis B infection. But around 16% are not fully aware about mode of transmission, 23% did not know that it spreads through unsterilized instruments. Around 7% nurses were unaware of universal safety precautions, while 46% of them did not know the full vaccination schedule.

About 86.5% had positive attitude towards preventing Hepatitis B. (Fig-1) Around 92% nurses felt that vaccination should be taken compulsorily in order to prevent the disease. While 18% did not feel that universal precautions should be followed at workplace, around 15% felt that it’s not necessary to report each case of needle stick injury and 8% of the nurses had negative attitude towards following biomedical waste management guidelines.

When we studied the actual responses regarding practice, 77.6% of the participants followed recommended practices towards Hepatitis B (fig-2). Around 65% nurses have undergone screening to rule out Hepatitis B, 8% nurses don’t use gloves and masks while handling hospital wastes, while only 65% of them have completed vaccination. Around 3% of them don’t follow biomedical waste management guidelines.

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Question</th>
<th>Positive response</th>
<th>Negative response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Have you heard of Hepatitis B</td>
<td>118</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td></td>
<td>81.4%</td>
<td>18.6%</td>
</tr>
<tr>
<td>2</td>
<td>Causative agent of Hepatitis B</td>
<td>111</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td></td>
<td>76.6%</td>
<td>23.4%</td>
</tr>
<tr>
<td>3</td>
<td>Can Hepatitis B be transmitted by needle stick injury</td>
<td>121</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td></td>
<td>83.4%</td>
<td>16.6%</td>
</tr>
<tr>
<td>4</td>
<td>Can Hepatitis B be transmitted by vertical transmission</td>
<td>84</td>
<td>61</td>
</tr>
<tr>
<td></td>
<td></td>
<td>57.9%</td>
<td>42.1%</td>
</tr>
<tr>
<td>5</td>
<td>Can Hepatitis B be transmitted by infected blood transfusion</td>
<td>121</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td></td>
<td>83.4%</td>
<td>16.6%</td>
</tr>
<tr>
<td>6</td>
<td>Can Hepatitis B be transmitted by unsterilized surgical instruments</td>
<td>111</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td></td>
<td>76.6%</td>
<td>23.4%</td>
</tr>
<tr>
<td>7</td>
<td>Can Hepatitis B be transmitted by sexual intercourse</td>
<td>78</td>
<td>67</td>
</tr>
<tr>
<td></td>
<td></td>
<td>53.8%</td>
<td>46.2%</td>
</tr>
<tr>
<td>8</td>
<td>Most chronic Hepatitis B infection are symptomatic/ asymptomatic</td>
<td>62</td>
<td>83</td>
</tr>
<tr>
<td></td>
<td></td>
<td>42.8%</td>
<td>57.2%</td>
</tr>
<tr>
<td>9</td>
<td>Do you know all universal safety precautions and biomedical waste</td>
<td>135</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>management practices</td>
<td>93.1%</td>
<td>6.9%</td>
</tr>
<tr>
<td>10</td>
<td>What will you do if you miss the third dose of vaccine</td>
<td>62</td>
<td>83</td>
</tr>
<tr>
<td></td>
<td></td>
<td>42.8%</td>
<td>57.2%</td>
</tr>
<tr>
<td>11</td>
<td>HIV is more infectious than Hepatitis B</td>
<td>39</td>
<td>106</td>
</tr>
<tr>
<td></td>
<td></td>
<td>26.9%</td>
<td>73.1%</td>
</tr>
<tr>
<td>12</td>
<td>Whether Hepatitis B is preventable</td>
<td>117</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td></td>
<td>80.7%</td>
<td>19.3%</td>
</tr>
<tr>
<td>13</td>
<td>Ideal age of vaccination</td>
<td>61</td>
<td>84</td>
</tr>
<tr>
<td></td>
<td></td>
<td>42%</td>
<td>58%</td>
</tr>
<tr>
<td>14</td>
<td>What is the vaccination schedule</td>
<td>78</td>
<td>67</td>
</tr>
<tr>
<td></td>
<td></td>
<td>53.8%</td>
<td>46.2%</td>
</tr>
<tr>
<td>15</td>
<td>Is post exposure prophylaxis available for hepatitis B</td>
<td>121</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td></td>
<td>83.4%</td>
<td>16.6%</td>
</tr>
<tr>
<td>16</td>
<td>Booster dose of Hepatitis B is required when the antibody level is less</td>
<td>83</td>
<td>62</td>
</tr>
<tr>
<td></td>
<td>than</td>
<td>57.2%</td>
<td>42.8%</td>
</tr>
</tbody>
</table>
**Discussion**

**Knowledge:** Regarding awareness about Hepatitis B in our study, 81.4% of the study participants were aware of it. This finding is almost similar to study done in Andhra Pradesh among nurses of a teaching hospital. Around 76.6% of our study subjects knew that causative agent of Hepatitis B is a virus, which is almost similar to findings from research in Andhra Pradesh. The knowledge regarding all modes of transmission is 71.02%, in our study while it was 76% according to findings of study conducted at Punjab. In our study group 83.4% knew that Hepatitis B can be transmitted through needle stick injury; which is better than a similar study done in Lucknow which showed only 50% were aware of it, while it was only 40% in another study conducted in central part of India.

In the present study about 93.1% had knowledge about universal safety precautions and biomedical waste management. This finding is in agreement with another study conducted in a teaching hospital in North India. In the present study, 55.3% of staff nurses had in detail knowledge about prevention of Hepatitis B through vaccination; this is in contrast to another research conducted where 95% were aware of vaccination.

A major concern is regarding knowledge about post exposure prophylaxis. In our study, 83.4% had knowledge regarding the availability of post exposure prophylaxis. This is better than another study where only 20% had knowledge about post exposure prophylaxis.

**Attitude:** Around 24.7% of our respondents believed that they were not at risk of contracting Hepatitis B infection due to their profession in contrast to findings of study conducted at Indore, 73% of the respondents thought that they were not at risk of infection. 36.3% respondents believed that they cannot acquire Hepatitis B infection from their patients. Nearly 95% of study subjects thought that Hepatitis B vaccination must be compulsory. This finding agrees with similar study conducted in Lucknow. 86.2 % of our study sample were of the idea that reporting each and every case of needle stick injury is essential which was comparable with results obtained in Lucknow. This was better when compared with study done in Central India where 53.3% of respondents only think that recapping of needles is dangerous. Nearly 92.4% think that they must follow biomedical waste management guidelines.

**Practice:** According to our study findings, around 90% nurses wear gloves and masks routinely while handling hospital waste while according to reports of the research done at Lucknow, 60% of the nurses follow guidelines correctly. In our study about 28% of nurses were exposed to needle stick injury while according to findings of study conducted at Indore, 24, 46% of nurses were exposed to needle stick injury.

Vaccination status of our study participants was compared with the studies carried out in various parts of India. We got following results:

- 64.1% - SetiaS et al
- 78.2% - Reang T et al
93% - Saroshe S. 
65% - Mahore R et al 
50% - Shukla M et al 
65% - Present study.

Universal safety precautions were followed by 81% of our respondents while it was 60% according to the results of the study done at Lucknow. This finding is in agreement with other study done in North India. Similarly, in our study 71.1% of the participants had the habit of using needle destroyer similar results were obtained in Lucknow study. Around 97.2% of nurses follow biomedical waste management guidelines in our study. This finding is better than the study conducted in Lucknow where only 65% followed it.

**Conclusion**

There is urgent need to raise the awareness about Hepatitis B among nurses who are continuously at risk in order to prevent the spread of fatal infection. Vaccination of the unvaccinated nurses on priority basis is recommended.

**Conflict of Interest:** None declared.

**Ethical Clearance:** Obtained from Institutional Ethical Committee.

**Funding Source:** Self.

**References**


Effectiveness of Puppet Show on Knowledge about Child Safety Based on Learning Styles among School Children at Udupi District in India

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¹MSc Nursing Student, ²Dean, ³Assistant Professor in Community Health Nursing Department, Manipal College of Nursing, Manipal Academy of Higher Education, Manipal, Karnataka, India

ABSTRACT

Introduction: Child injury is a global public health issue. Creating awareness on child safety among children is very necessary for the better understanding of the problems among children.

Objective: to identify the learning styles, incidence of child injury, knowledge regarding child safety, effectiveness of puppet show as a teaching method in improving the knowledge on child safety, find the difference in the knowledge scores regarding child safety among 5th and 6th standard students with different learning styles.

Methodology: A total of 111 participants from 5th and 6th standard were selected for the study, using multistage cluster sampling method.

Results: Among 111, most (55%) were visual learners and remaining were auditory learners. The overall occurrence of child injuries (involved 4 areas i.e road injury, pedestrian injury, sports and playground injury and good touch and bad touch) was 98.19% among study participants. In the pre-test, majority of the participants (76.6 %) had poor knowledge and 23.4 % had satisfactory knowledge and none of them had excellent or good knowledge on child safety. In the post-test 36.9 % had excellent knowledge and 38.7 % had good knowledge, 24.3% had satisfactory knowledge and none had poor knowledge. Puppet show was effective in increasing the knowledge level on child safety (Z=-9.153, P=0.001). Puppet show as a teaching method, does not make any difference in the knowledge grasping capacity of students with different learning styles (Z= -1.626, P = 0.104).

Conclusion: The study concluded that puppet show as a teaching method is a useful and effective teaching strategy which can be utilised in order to teach the students.

Keywords: Knowledge, child safety, puppet show, learning styles.

Introduction

Child injury is a global public health issue. In 2011, World Health Organisation (WHO) estimated that over 6, 30,000 children under the age of 15 died because of injuries. A large number of these injuries (for example, drowning, burns, falls) occur in or around the home.¹ The leading cause of death for child injuries were due to transportation. There were also a substantial number of pedestrian and pedal cyclist deaths among children (Center for Disease Control and Prevention [CDC] 2015).² Hence creating awareness on child safety among children is very necessary for the better understanding of the problems among children. Teaching can be fruitful, by
identifying different learning styles among them which plays an important role in the future life. Learning styles have individual differences. There are different teaching methods which aid in learning, and puppet show is one among them. Puppets change the ambiance of whole classroom by creating more opportunities for creativity, collaboration, critical thinking, and curiosity. [3] Amy & Larisa (2004) conducted a study with the aim to measure the relation between the uses of puppetry as a teaching method in the classroom among 32 elementary schools of Brooklyn, New York. The study findings showed that puppetry is a very significant teaching method for students. Puppetry outshines by increasing students’ interest in learning, which contributes in increasing their attention and involvement in classroom activities. [4]

Materials and Method

The researchers used a quantitative approach and quasi-experimental pre-test post-test design in the study. The study was conducted for a period of 1 year. In the study, two schools were selected comprising of 120 students, out of which 9 were absent during the pre-test and were excluded from the study. The sample size required was 38 in each group. But the researcher enrolled all the remaining students, who met the inclusion criteria in the study, which led to a total sample size of 111 (60 visual learners + 51 auditory learners). Depending on the scores obtained in the self-assessment questionnaire on learning styles, the students were assigned to the different groups. The data were collected from 5th and 6th standard students of selected schools in the month of January 2017. Two schools from Kundapur block were selected using multistage cluster sampling technique. Written assent from participants and consent from parents was obtained prior to the study. A participant information sheet was provided to each participant and confidentiality was maintained throughout the study period. Initially demographic information and childhood injury information were collected by administering demographic proforma and childhood injury assessment questionnaire. Further, learning styles of the students were assessed by self-administered learning style assessment questionnaire. Depending on the scores obtained by the students in learning style assessment tool students were assigned to group 1 (visual learners) and group 2 (auditory learners). Even though the required sample size was 38 each in both the groups, all the students studying in 5th and 6th standard, who met the inclusion criteria were involved in the study, which led to a total sample size of 111. On the next day pre-test was conducted by administering the structured knowledge questionnaire on child safety to both the groups to assess their knowledge on child safety, which was followed by providing intervention to both the groups on the same day i.e. teaching on child safety using puppet show as a teaching method. After 8th day post-test was conducted by administering the knowledge questionnaire once again to both the groups to find the effectiveness of puppet show on knowledge about child safety.

Ethical Consideration: Administrative permission and ethical clearance were obtained before data collection. Informed consent from parents of the participants and assent from participants was also obtained before conducting the study.

Statistical Analysis

The data were analysed by using Statistical Package for the Social Sciences (SPSS) version 16.0. Frequency and percentage was computed to analyse the sample characteristics. As the data did not follow normalcy, non-parametric test were used to analyse the data; Wilcoxon signed rank test to assess the effectiveness of puppet show on child safety and Mann Whitney U test to find out the difference in the median post –test knowledge scores regarding child safety among 5th and 6th standard students with different learning styles.

Results

Out of 111 participants, most (75.7%) of them belonged to the age of 10 to 11 years and the mean age was 11 years (63.1%); 54.1% were studying in 6th standard; 51.4 % were males and most (50.5%) belonged to joint family. 57.7% of the participants father were skilled workers; 79.3% mothers were unskilled workers; majority (65.8%) reported that they had previous knowledge on child safety; and 36% of them acquired knowledge from television. Most(55%) of the participants were visual learners and remaining 45% were auditory learners.

The overall occurrence of child injuries (involved 4 areas i.e road injury, pedestrian injury, sports and playground injury and good touch and bad touch) was 98.19% among the study participants. Most (41.4%)
of the injuries occurred while talking to friends and walking beside the road carelessly; while riding bicycle on the road (45%) and while riding the bicycle at a very high speed (40.5%). Majority (91%) had injury while running in the ground. Only 26.1% participants had fracture of lower limbs. Few of them (14.4%) reported that a stranger touched them with bad intension, while travelling in the local bus either by standing or sitting. The overall occurrence of child injuries was 98.19% among study subjects.

Majority of the participants (76.6%) had poor knowledge and 23.4% had satisfactory knowledge, whereas none of them had excellent or good knowledge. In the post-test 36.9% had excellent knowledge and 38.7% had good knowledge, 24.3% satisfactory and none had poor knowledge. The puppet show was effective in increasing the knowledge on child safety among 5th and 6th standard students (Z = -9.153, P<0.05).

The puppet show as a teaching method, does not make any difference in the knowledge grasping capacity of students with different learning styles (visual learners or auditory learners) (Z= -1.626, p=0.104).

Table 1: Frequency and percentage distribution of sample characteristics

<table>
<thead>
<tr>
<th>Sample characteristics</th>
<th>Frequency (f)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9-10</td>
<td>27</td>
<td>24.3</td>
</tr>
<tr>
<td>11-12</td>
<td>84</td>
<td>75.7</td>
</tr>
</tbody>
</table>

Table 2: Frequency and percentage distribution of incidence of child injury

<table>
<thead>
<tr>
<th>Sample characteristics</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency (f)</td>
<td>Percentage (%)</td>
</tr>
<tr>
<td>a. Pedestrian Injury</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have you injured yourself while crossing the road?</td>
<td>26</td>
<td>23.4</td>
</tr>
<tr>
<td>talking to friends and walking beside the road carelessly?</td>
<td>46</td>
<td>41.4</td>
</tr>
<tr>
<td>using cell phone to call/listen to music while walking on the footpath?</td>
<td>13</td>
<td>11.7</td>
</tr>
</tbody>
</table>
b. Road injury
Have you injured yourself while riding bicycle on the road? 50 45 61 55
  overtaking another vehicle on the road? 14 12.6 97 87.4
  travelling by 2 wheeler with parents/relative without helmet? 5 4.5 106 95.5
  turning the bicycle at a round about? 20 18 91 82
  riding the bicycle at a very high speed? 45 40.5 66 59.5

c. Playground injury
Have you injured yourself while running in the ground? 101 91 10 9
  Have you fractured, your lower limbs while playing in the ground? 12 10.8 99 89.2
  your upper limbs while playing in the ground? 29 26.1 82

d. Good touch bad touch
Did you experience that you are being touched by your teacher with bad intention? 0 0 111 100
  your neighbour with bad intention? 7 6.3 104 93.7
  your relative with bad intention? 5 4.5 106 95.5
  your sibling with bad intention? 8 7.2 103 92.8
  your friend with bad intention? 9 8.1 102 91.9
  your family doctor with bad intention? 1 0.9 110 99.1
  a stranger while travelling in the local bus either by standing or sitting? 16 14.4 95 85.6

Table 3: Wilcoxon signed rank test on comparison of pre-test and post-test knowledge scores on child safety

<table>
<thead>
<tr>
<th>Groups</th>
<th>Median</th>
<th>Range</th>
<th>Z value</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test score</td>
<td>12</td>
<td>14 (4-18)</td>
<td>-9.153</td>
<td>0.001*</td>
</tr>
<tr>
<td>Post-test score</td>
<td>23</td>
<td>15 (15-30)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significant at<0.05 level of significance

Table 4: Mann Whitney U test on difference in the median post-test knowledge scores regarding child safety among children with different learning styles

<table>
<thead>
<tr>
<th>Learning styles</th>
<th>Median</th>
<th>Inter Quartile range</th>
<th>Z value</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual learners (61)</td>
<td>22</td>
<td>15 (15-30)</td>
<td>-1.626</td>
<td>0.104</td>
</tr>
<tr>
<td>Auditory learners (50)</td>
<td>24</td>
<td>14 (16-30)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Discussion

The present study findings showed that majority of the participants (76.6%) had poor and 23.4% had satisfactory knowledge, whereas none of them had excellent or good knowledge. In the post-test 36.9% had excellent and 38.7% had good knowledge, 24.3% satisfactory and none had poor knowledge. These findings are supported by a study conducted by Indhumathy & Thenmozhi (2016) to assess the knowledge and practice on road safety regulations among 50 primary school children in a rural community, Chennai, India. The results of the study showed that most (32%) of them had inadequate knowledge, 40% had moderately adequate and 28% had adequate knowledge on road safety regulations. Study findings of Devanarayan, Frederick & Soni (2016) found out that majority (74.33%) had highest knowledge in the area of cycling on roads and least knowledge in the area of walking on the road (43.83%). Majority (71%) had average knowledge and 29% had good knowledge on road safety measures. Study conducted by Amy & Larisa (2004) also found there was a positive correlation (0.63) between use of puppets and student attention: puppetry is a very significant teaching method for students, puppetry outshines by increasing students interest in learning which contributes to their attention and involvement in classroom activities.

The present study revealed that among 111 students majority (55%) of the participants were visual learners and remaining were auditory learners (45%) as the study included only 2 types of learning styles. The study findings are supported by a study conducted by Prithishkumar & Michael at Tamil Nadu, India, who found that among the students who answered the Visual Auditory Read/Write and Kinaesthetic (VARK) learning style questionnaire, 86.8% were multimodal in their learning preference, and 13.8% were unimodal. The commonest learning preference was the bimodal category with the highest percentage seen in aural kinaesthetic (33%) and aural + read/write (16.5%). Another study conducted by Vishrutha, Prarthana, Chaitra and Vandana (2016) to know the preferred learning styles and to find out whether gender differences exist in the learning patterns, Mangalore, Karnataka. Among 175 students of age group 13-15 years. The results showed that in general, 44.6% students preferred unimodal, 20.6% bimodal, 13.1% trimodal and 21.7% quadramodal learning styles. Among 95 females 44.2% preferred unimodal, 20% bimodal, 10.5% trimodal and 25.3% quadramodal whereas among 80 male participants 45% preferred unimodal, 21.3%, 16.3% and 17.5% preferred bimodal, trimodal and quadramodal learning patterns respectively. When compared with male and female participants, the most preferred leaning style was aural with a score of 58.3% and 78.6% respectively. Therefore the study concluded that choosing the best preferred way of learning can help the students as well as teachers to achieve a common goal.

The present study revealed that there is a significant difference in the median pre-test and post-test knowledge scores (Z = -9.153) which is statistically significant at 0.05 level and it is inferred that puppet show was effective in increasing the knowledge level on child safety among 5th and 6th standard students.

A study conducted by Mathew (2014) on effectiveness of structured teaching program on road safety measures among primary school children in selected schools at Bangalore, India showed that the structured teaching program was highly effective with the p value of 0.001 and unpaired t value was 15.73. The study findings of Kohli (2014) which was conducted among school children at selected urban schools in Ludhiana, India, showed that the pre-test mean knowledge score of experimental and control group was 19.66 and 19.91 and post test score was 31.94 and 21.41 respectively and also the teaching program was found effective in increasing the knowledge with the horizontal t test value between pre-test and post-test of experimental group was 18.06(p=0.001) and vertical t test value between post-test of control and experimental group was 198.67(p= 0.001).

Limitations of the Study: The study is limited to 5th and 6th standard students of selected schools in the rural areas of Udupi district. Therefore generalization of the study can be done only to the similar population

Conclusion

The study concluded that puppet show as a teaching method, more effective for visual learners when compared with auditory learners in terms of increase in knowledge and is an effective teaching strategy which can be utilised in order to teach the students.

Ethical Clearance: Obtained from Institutional Ethics Committee of Kasturba Hospital, Manipal
REFERENCES


Impact of Blood Pressure on Cognitive Functions of Middle-Aged Male and Female Individuals

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ABSTRACT

Background: The relationship between Blood pressure (BP) and cognitive function (CF) has not yet been established with evidential matter. However, many studies are there which proved the negative impact of increasing Blood pressure (BP) on cognitive function (CF), with studies, “for” and “against” the observation, both in equal proportion. However, less studies have probed the gender influence as a factor which can affect the interaction of BP with CF. Hence, we aimed to evaluate the association of BP and gender with CF.

Method: The cross-sectional study is conducted on 90 middle-aged male and female subjects aged 40-60 years. Anthropometric and physiological parameters were measured using standard techniques and CF assessed with the help of MMSE. The correlation between BP and CF has been done and the results compared between males and females.

Results: There was statistically significant positive correlation detected between Systolic BP (SBP), Diastolic BP (DBP), Mean arterial BP (MAP) and the MMSE scores only in males with no such correlation found in female subjects.

Conclusions: In this study of middle-aged subjects, it was found that with increase in BP (SBP, DBP & MAP) level within the prehypertensive range, there can be improvement in the CF, only in males. This effect may be is because of a probable gender influence on the interaction between BP level and CF in middle-aged men, who have adequate androgens stores in the body, which has a neuroprotective effect in the men, which is lacking in the perimenopausal woman.

Keywords: Blood pressure; cognitive function; mini-mental status examination; mean arterial pressure; gender.

Introduction

In 1947, average life expectancy in India was 32 years with birth rate being high and few people surviving till old age. With the advancement in medical sciences and implementation of family planning program, the crude birth rate and death rate declined significantly with the average life expectancy of an Indian going up to 68.3 years1. Along with this development comes the burden of various diseases, or sequelae or complications of diseases afflicted during middle-age (Diabetes Mellitus, hypertension, obesity, coronary artery disease etc.) in the elderly. However, age-associated cognitive impairment transcending to dementia and precipitating later into Alzheimer’s Disease (AD) is associated with worse scenario. Dementia is a neurodegenerative disease. It has multiple factors influencing it, resulting in varying prognosis, subjected to inter-individual variation. It is associated with huge morbidity and socio-economic impact. The various factors affecting cognitive function (CF) are age, gender, level of education, socio-economic status, intelligence, blood pressure level etc. Cognitive brain function constitutes the ability to work with the information in a meaningful way, irrespective of domain, and applying it in future, after judging it2.
Because of these varied factors affecting an individual’s CF, it turns out to be personalised, dynamic entity, which evolves based upon the information fed, experiences faced and conclusions arrived. One of the most important factor affecting cognitive function profoundly is age. Ageing affects the individual in a myriad number of ways, with elderly being the most common group afflicted by dementia. However, the changes in the physical structure of the brain are concretely linked with respective changes in CF. The most common domains of Cognitive function affected by age are attention and memory. Even higher level of cognitive function which includes language processing and decision-making also are adversely affected by it, showing a decline as age progresses.

Another factor being blood pressure (BP), which when maintained within the prescribed range, can not only halt the progress of on going damage of cognitive function in the middle-aged, but also reduce the risk of dementia in future in the late-life. Many studies also stress upon the gender-based unequal affliction of Alzheimer’s dementia to be due to hormonal make-up of the individual, along with his or her genetic make-up. Normally, females show better performance in certain domains like verbal fluency, perceptual speed, accuracy and fine motor skills. On the other side, males outperform females in certain domains like spatial, working memory and mathematical abilities. There is a lot of dearth in studies which can elucidate the effect of BP on CF, taking into account the effect of gender, association or no association can be ascertained in middle-age subjects, belonging to the category of normotensives or prehypertensives.

In this scenario, to throw further light upon a probable link between BP and CF, with the influence of gender, our study aimed to evaluate alteration in CF in relation to BP of male and female subjects.

Materials and Method

A cross sectional study was conducted in the Department of Physiology, Shri B. M. Patil Medical College, Hospital and Research Centre, BLDE (Deemed to be University), Vijayapur, Karnataka. 90 healthy volunteers, including technicians, clerks, poets, daily wagers, of age between 40 and 60 years with Normal BP, Systolic Blood pressure (SBP) <120 and Diastolic Blood Pressure (DBP) <80 mmHg & Prehypertension (SBP between 120-139 mmHg and DBP between 80-89 mmHg) were selected randomly. Among them, 66 were male and 24 were female. Subjects with a history of Diabetes Mellitus, secondary hypertension, Stroke, Head injury, CHD-congenital heart disease, CAD-coronary artery disease, VHD-valvular heart disease, Cardiac arrhythmias, PVD-Peripheral vascular disease, those on any Psychiatric medication, those with any Kidney disorders, those with any Liver disease, those on medications – anti hypertensive, antiarrhythmics, anticoagulants history were excluded.

After getting Institutional Ethical Committee clearance, informed consent was obtained from all the participants. The cognitive function is assessed by the Mini-Mental Status Examination (MMSE). The criteria of minimum high school education of the patients are considered for the assessment of cognition by MMSE scale. The MMSE assesses five areas of CF including orientation, attention, calculation ability, recall and language.

Result interpretation: The maximum score is- 30

MMSE: 26-30-normal cognitive function
   25-Borderline cognitive function
   20-24-cognitive impairment
   <20- Dementia.

Statistical Analysis: Data analysis was performed using SPSS Software Version 17. Continuous data was presented using Mean ± SD. Results were presented using diagrams. Unpaired ‘t’ test/Mann Whitney U test were used to test difference between two groups on continuous variables. Correlation Coefficient was used to find the correlation between Cognitive functions and other variables. Scatter Diagrams were also used to show the correlation between Cognitive variables and other variables. A probability value (p value) of less than or equal to 0.05 at 95% Confidence interval was considered as statistically significant.

Results

Table 1 depicts the anthropometric parameters measured in males and females. There is a statistically significant difference between them pertaining to height with the male subjects showing Mean ± SD values as 162.3 ± 9.24 and female subjects’s value being, 151.67 ± 5.36. Similarly with respect to weight also, the male
subjects showed statistically significant higher value of 67.53 ± 9.77, when compared to females, who showed the value to be 60.41 ± 6.33. There was no such statistically significant difference found with respect to Body Mass Index (BMI), when males were compared with females, with their values being 25.39 ± 3.30 and 26.19 ± 2.53 respectively. With respect to body surface area (BSA) however, male subjects showed statistically significant higher values of 1.70 ± 0.13, when compared to female subjects’ values being 1.54 ± 0.103. According to table 2, there was no statistically significant difference noted in between male and female subjects with respect to physiological parameters, namely, Pulse rate (PR), SBP, DBP, Mean Arterial Pressure (MAP), Pulse pressure (PP).

In Table 3 also, there was no statistically significant difference in between male and female subjects pertaining the MMSE scores used to evaluate the CF. According to table 4 and the following correlation graphs, our study shows that there is a statistically significant positive correlation between SBP, DBP, MAP & MMSE scores only in case of males when compared to females.

In our study as in Table - 3 & Figure -1 to 3 Correlation between MMSE and Physiological parameters -SBP(P≤0.001*), DBP (P=0.0227*), MAP (P=0.037*) showed significant difference in Males compared to Females and in PR,PP -No significant difference noted in Males compared to females.
**Table 3: Correlation between MMSE and Physiological parameters**

<table>
<thead>
<tr>
<th>Correlation between MMSE and</th>
<th>Correlation coefficient (r)</th>
<th>Significant value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PR among Males</td>
<td>( r = 0.045 )</td>
<td>( P = 0.719 )</td>
</tr>
<tr>
<td>PR among Females</td>
<td>( r = 0.027 )</td>
<td>( P = 0.901 )</td>
</tr>
<tr>
<td>SBP among Males</td>
<td>( r = 0.4586 )</td>
<td>( P \leq 0.001^* )</td>
</tr>
<tr>
<td>SBP among Females</td>
<td>( r = 0.2125 )</td>
<td>( P = 0.3304 )</td>
</tr>
<tr>
<td>DBP among Males</td>
<td>( r = 0.2802 )</td>
<td>( P = 0.0227^* )</td>
</tr>
<tr>
<td>DBP among Females</td>
<td>( r = 0.059 )</td>
<td>( P = 0.7834 )</td>
</tr>
<tr>
<td>MAP among Males</td>
<td>( r = 0.259 )</td>
<td>( P = 0.037^* )</td>
</tr>
<tr>
<td>MAP among Females</td>
<td>( r = 0.107 )</td>
<td>( P = 0.628 )</td>
</tr>
<tr>
<td>PP among Males</td>
<td>( r = 0.196 )</td>
<td>( P = 0.118 )</td>
</tr>
<tr>
<td>PP among Females</td>
<td>( r = 0.058 )</td>
<td>( P = 0.791 )</td>
</tr>
</tbody>
</table>

\( P > 0.05 \): Not Significant, \( ^* P \)-value \( \leq 0.05 \): Significant
\( ^{**}P \)-value \( \leq 0.01 \): Highly Significant \( ^{***}P \)-value \( \leq 0.001 \): Very Highly Significant.
Results of our study shows there is a statistically significant positive correlation between systolic blood pressure (SBP), diastolic blood pressure (DBP) and mean arterial blood pressure (MAP), with MMSE scores only in males, implying a probable gender influence on the blood pressure (BP) affected cognitive function (CF) or on CF alone, which is to be assessed and discussed. Age-associated cognitive decline (CD) becomes apparent only in elderly individuals who are more than 60 yrs old.

The above-mentioned gender disparity pertaining to CF has always been debatable, without any established cause, surrounded with many speculations. However, according to Nicolas Cherbuin et al, the main type of BP which had the potential of causing this disparity was MAP. Accordingly, the elevated MAP was associated with greater regional gray matter volume and on contrary, the reverse effect was found in females wherein smaller regional gray matter volume was observed. It also asserted that it was largely due to elevated DBP values which led to higher MAP levels and not SBP. Subsequent inference being that greater regional gray matter led to better cognitive performance in males, which is in agreement with our study. Therefore, we can infer that there is a mysterious interaction between MAP levels and brain physiological mechanisms which led to this gender disparity.

The positive correlation between SBP and DBP with MMSE scores can be explained by the study done by Brut VL et al who proved that prior to 50 yrs of age, it is men who are more prone for hypertension when compared with premenopausal women. However, after menopause the situation slightly reverses, with females becoming equally predisposed to the same. This observation was authenticated by Wiinberg et al who found that BP increases both in men and women with aging, but however, the mean BP was 6-10 mm Hg higher in males compared with females, as evidenced by 24 hr ambulatory BP recording device. Therefore finding of positive correlation between BP levels and MMSE (CF) can be attributed to the genetic constitutional differences in between males and females.

According to Janowsky JS, it is the androgens deficiency in the elderly, which led to cognitive decline mediated by loss of significant synapses in hippocampus, increased amyloid deposition and changes in neurotransmission in prefrontal cortex. Therefore, we can interpret that men in middle-age have adequate androgen levels which may act as neuroprotective agent, thereby preventing the onset of cognitive decline in them. One of the other findings in our study being no statistically significant finding observed in females, does not rule out the effect of BP on the CF. It is just a matter of perspective. We can say that there is no cognitive decline seen, due to the neuroprotective nature of Estrogen in them. Our study included perimenopausal women, without enquiry into their menstruation status which might prove to be a limitation of this study.

At the level of genes, however, there is one study which suggests the APOE4 mediated cognitive deficit, is an essential risk factor in the future development of AD, especially in the elderly females. However, one has to keep in mind the subjective cognitive decline (self-perceived cognitive worsening without any impairment in cognitive performance) is an essential risk factor for memory decline, mild cognitive impairment and AD, which was not assessed in my study, as it being a cross-sectional study and not a prospective study associated with a follow-up into the future, which happens to be another limitation of my study.

However, it remains unexplored whether the hormonal influence and genetic constitution of an individual interacts with the factor involved in pathogenesis of hypertension like Renin-Angiotensin system, in a co-ordinated manner or act independently to influence the CF in a positive or negative manner. Therefore, more studies should be conducted to address this gender disparity, so that the prediction of cognitive impairment or dementia or AD, becomes easy, which can in turn change the trajectory of the CF for the better, in asymptomatic early stages itself.

Conclusion

We would like to conclude on the note that gender influence may have an established effect on CF of an individual, without concrete evidence of a probable hormonal influence being responsible for it which is not for certain, due to various studies, “for” and “against” studies. Likewise, there may be gender influence even on the BP levels, which varies with age, such that men are always at high risk of getting afflicted with hypertension when compared to premenopausal women, the disparity being neutralized when postmenopausal women get compared with men.
Limitations of the Study: One of the key limitations of the study is the total number of subjects who participated in the study, who should be in much larger numbers to enhance the power of association between BP and CF in males compared with females. Secondly, in this study, the menstruation status of the female subjects was not enquired into, which can be a limitation of this study. Finally, in case of a prospective study design, one can more firmly assert or deny the level of association of the gender on the BP affected CF.

Conflict of Interest: Nil.

Source of Funding: Nil.

Ethical Clearance: All procedure performed in studies involving human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

REFERENCES


Prevalence of Work Related Musculoskeletal Disorders among Sugarcane Farmers in Muzaffarnagar, India

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ABSTRACT

Background: India is an agrarian economy with millions of people involved in farming and agricultural related activities. The agricultural tasks involve risks that are associated with development of musculoskeletal disorders among farmers. Thus in our study we attempt to analyze the prevalence of musculoskeletal disorders among sugarcane farmers of Muzaffarnagar district in Uttar Pradesh.

Method: A total of 120 male subjects aged between 20 – 60 years were recruited based on the inclusion criteria. Nordic Musculoskeletal Questionnaire was used to identify the presence of Musculoskeletal Disorders.

Result: The descriptive analysis of data revealed four common musculoskeletal disorders affecting sugarcane farmers: lower back pain (55%), knee pain (44%), Shoulder pain (23%) and Upper back pain (13%) 

Conclusion: Based on the findings of this study, it is hereby recommended that sugarcane farmers should be enlightened on a regular basis on the high prevalence of the WMSDs among them, and the precautionary measures to be taken in order to prevent the development. Age of farmers, their years of working and the long hours they spent working in a standing position may be significant factors that contribute to the high prevalence of the WMSDs among them. The most commonly affected body parts included the low back, knees and upper back.

Keywords: prevalence, sugarcane farmers, musculoskeletal disorders, Nordic

Introduction

India is one of the largest producers of sugarcane in the world after Brazil. The sugar industry is one of the important agro-based industries that contribute to the development of economy and support about 50 million farmer families. Muzaffarnagar located in western Uttar Pradesh is primarily agrarian with 78.13% geographical area under cultivation. Sugarcane is the main cash crop in this part.

Farming is one of the most important occupations in India. It is generally perceived as a healthy outdoor occupation. However, numbers of studies have classified farming as a risky and hazardous job. Because of the nature of farm work, farm workers are at particular risk of developing the musculoskeletal disorders (MSDs), besides a large number of other health problems. Farming was rated as one of the most dangerous occupations in the United States way back in 1990 when the national safety council of the United States acknowledged agriculture as one of the three most hazardous sectors in the working world.

Agricultural farmers and workers engage in activities which require physical labour for a long duration of time and they are exposed to multiple risk factors of
MSD including abnormal posture, lifting heavy loads, exposure to vibration, slips and falls and other manual labour which makes them more prone to develop MSDs\textsuperscript{1}. Based on the International Labour Organization, Globally 74% of the agricultural workers are living in Asia and Pacific regions\textsuperscript{4}. Since 68% of the population is living in rural areas, agriculture-based activities play an important role in improving the rural economy of India\textsuperscript{8}. Agriculture and its related activities have provided nearly 60% of the employment opportunities in India\textsuperscript{4}. Work-related musculoskeletal disorders are found to be associated with work absenteeism, loss of productivity and economic loss to the worker, industry and the nation\textsuperscript{4}. Agriculture and its allied sectors have contributed to 18.2% of the Gross Domestic Product (GDP) of India for the year 2013-14. Presence of MSDs among agricultural workers will result in a reduction in their work capacity which may reflect in a reduction in economic contribution from agriculture sector\textsuperscript{4}. The agriculture sector in India is mainly unorganized with only 2.4% of the agricultural activities are being formal\textsuperscript{10}. Though measures have been taken by Government of India to enhance the availability of social security measures to a large section of informal agricultural workers, coverage of health insurance and other social security services remains less for these workers and hence the health of the farmers is more or less neglected\textsuperscript{11,12}.

Hence, this study was designed to investigate the prevalence of the WMSDs among sugarcane farmers, the most commonly affected body parts, the risk factors of the WMSDs among sugarcane farmers in Muzaffarnagar, Uttar Pradesh.

**Material and Method**

The present cross-sectional study was conducted in selected villages of Muzaffarnagar, Uttar Pradesh (India). A screening list was administered and only those subjects were considered for the study that fulfilled the inclusion and exclusion criteria. Using convenient sampling method, a sample of 120 full-time sugarcane farmers aged between 20 – 60 years, able to read and understand the local language Hindi and with a working experience of minimum 2 years was included in the present study\textsuperscript{13}. Farmers with a history of spinal trauma or known diabetic were not included\textsuperscript{14,15}. Farmers with any neurologic, cardiovascular or psychiatric illness were excluded. Part-time farmers involved in other jobs besides farming were also excluded\textsuperscript{16,17}.

Subjects were explained about the purpose and nature of the study. Consent for participation was obtained and necessary instructions were given before administration of the tool. There was no further assistance or prompting to the respondents. All the subjects were assured of the confidentiality of their responses. Subjects were interviewed for musculoskeletal discomfort using Nordic Musculoskeletal Questionnaire\textsuperscript{18}. Subjects were asked whether, at any time during the last 12 months and/or 7 days they have had any trouble in the lower back, shoulders, neck, upper back, elbow, wrist, hand, hip, thigh, knee, ankle and feet. Specific questions then concentrated on each anatomical region.

**Statistical Analysis**

Statistical analysis was done using SPSS 20.0 version software. Descriptive statistics was used to analyze subjects’ characteristics such as age, height, weight, BMI, working experience. Percentage and ratios were used to calculate the prevalence of musculoskeletal disorders.

**Result**

A total of 120 male subjects participated in the study. Their demographic data were analyzed by comparing means of descriptive analysis. Their age, height, weight and BMI was recorded (Table 1). The mean age (in years) was 44.01 ± 8.31. Table 1 gives details of the mean and standard deviation of these data. The work experience of the subjects and working hours per day and working days per week is depicted in Table 2. The farmers had a work experience of 22.6 years on an average. About 72.5% of participants worked 5 days per week, 16.6% worked 4 days per week and 10.9% worked for about 2 – 3 days per week. Out of 120 farmers, about 63.3% worked 8 – 10 hours a day. Another 16.7% and 9.2% were working for 6 -8 hours and less than 6 hours a day respectively.

Based on body region wise analysis (Table 4) the most common WMSDs reported among the participants included lower back pain (55.8%), knee pain (44.2%) and shoulder pain (23.3%). Some participants reported multiple body parts of discomfort while others had a single body part of discomfort. The musculoskeletal problems in 12 months prior to being interviewed are depicted in Table 5 with low back, upper back and shoulder having
most problems. Table 5 shows musculoskeletal problems in one week prior to participation with low back, knee and shoulder having the most musculoskeletal problems.

Table 1: demographic detail of subjects

<table>
<thead>
<tr>
<th>Demographic Details N = 120</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
</tr>
<tr>
<td>Height</td>
</tr>
<tr>
<td>Weight</td>
</tr>
<tr>
<td>BMI</td>
</tr>
<tr>
<td>Work Experience</td>
</tr>
</tbody>
</table>

Table 2: Work Duration

<table>
<thead>
<tr>
<th>Working days/week</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 – 3 days</td>
<td>13</td>
<td>10.9</td>
</tr>
<tr>
<td>4 days</td>
<td>20</td>
<td>16.6</td>
</tr>
<tr>
<td>5 days</td>
<td>87</td>
<td>72.5</td>
</tr>
</tbody>
</table>

Table 3: Major areas of bodily pain

<table>
<thead>
<tr>
<th>Body Parts</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neck</td>
<td>16</td>
<td>13.3</td>
</tr>
<tr>
<td>Shoulders</td>
<td>28</td>
<td>23.3</td>
</tr>
<tr>
<td>Elbows</td>
<td>13</td>
<td>10.8</td>
</tr>
<tr>
<td>Wrist/Hands</td>
<td>17</td>
<td>14.2</td>
</tr>
<tr>
<td>Upper Back</td>
<td>16</td>
<td>13.3</td>
</tr>
<tr>
<td>Lower Back</td>
<td>67</td>
<td>55.8</td>
</tr>
<tr>
<td>Hips/Thighs</td>
<td>18</td>
<td>15.0</td>
</tr>
<tr>
<td>Knees</td>
<td>53</td>
<td>44.2</td>
</tr>
<tr>
<td>Ankle/Feet</td>
<td>11</td>
<td>9.2</td>
</tr>
</tbody>
</table>

Discussion

The study was designed to evaluate the prevalence of the WMSDs among sugarcane farmers in Muzaffarnagar, Uttar Pradesh. The prevalence of the WMSDs among the Sugarcane farmers was observed to be 51%. Pain due to musculoskeletal discomfort affects almost all parts of the body depending upon the physical movement characteristics and work setup. In this cross-sectional study, we found a high prevalence of WMSDs in sugarcane workers. From the results, we found that prevalence was more in the lower back (50%), knee (44%), and shoulder (23%). However, this particular study found results different from other similar studies in which workers had a high prevalence of wrist pain. Workers engage in sugarcane cutting activities, they work approximately for 7-8 hours. Such activity usually happens for many consecutive days.

The first factor related to WMSDs was that of repetitive motions. In our study, during the sugarcane cutting, the sugarcane workers swung their arms over their heads and bent their bodies repetitively when they cut sugarcane and moved residual grasses for approximately 4 hours per day. Such motions place the average sugarcane workers at risk of developing WMSDs because they often lead to both muscle spasms and poor blood circulation. Moreover, tendons, joints, and other soft tissues eventually became fatigued and subsequently injured1, 16. This finding is in agreement with previous studies, which also indicated that repetitive motions will eventually result in WMSDs17.

The second factor related to WMSDs was an awkward posture. Sugarcane workers repetitively pulled bunches of sugarcane, lifted them, and then threw them into trucks. As they were doing that they continually contorted their bodies and lifted their hands above their heads. They also tiptoed on their feet. When the farmers did the work, they repetitively moved their arms and legs in manners that were inconsistent with natural anatomical postures. All this led to excessive workloads for both their muscles and tendons as the workers continually need to maintain their body balance. This finding was...
similar to previous studies among both rubber workers in Malaysia\(^{19}\) and farm workers in the United States\(^{20,21}\).

The third factor that was related to WMSDs was forceful exertion. For example, sugarcane workers had to engage in work that required various strenuous such as lifting the bunches of sugarcane. Lifting and forceful movements also put these individuals at risk of developing WMSDs as they repeatedly lifted, pushed, and pulled large and heavy objects. When those objects were moved, the workers’ spines were repeatedly subjected to high-pressure forces. When their spines received high pressure for excessive periods of time, the workers were at risk of losing their balance. In this case, the workers experienced muscle strain, muscle stress, and pain in their back\(^{20}\). This was in accordance with other studies that show a relationship between forceful exertion and WMSDs\(^ {21}\).

The repetitive movements resulting from manual sugar cane cutting make the attention and concentration required for this activity very difficult, which raises the probability of musculoskeletal disorders. The symptoms reported are work-related and the prevalence of MSDs would increase over time due to cumulative exposure\(^ {22,23}\). The workers involved in this study used to perform repetitive tasks. Low back pain was found the highest symptoms followed by the hip & knee (Low back & knee pain is associated with prolonged standing, exerting or twisting the torso). The result of this study showed that the highest prevalence of MSDs pain was found on the low back, knee, and then less commonly affected the neck and the hand/wrist.

The workers in our study performed highly repetitive tasks and maintained a static posture for up to an hour at a time. Other studies also showed that repetitive tasks have been found to be associated with WMSDs\(^ {21}\). The symptoms of neck and shoulder pain are also significantly related to repetitive work\(^ {19}\). Repetitive activity in a short period of time also increases the prevalence of hand and wrist injuries\(^ {23,24}\). The result of the study found that the prevalence of MSDs pain on the hand/wrist 14%. The result might relate to the flexing or extending the wrists during cutting the sugarcane\(^ {24,25}\). The results of this study show a high prevalence among sugarcane farmers. Based on the results, preventive measure for reducing exposure level and consequently preventing MSDs can be prescribed.

### Conclusion

Based on the findings of this study, it is hereby recommended that sugarcane farmers should be enlightened on a regular basis on the high prevalence of the WMSDs among them, and the precautionary measures to be taken in order to prevent the development. Age of farmers, their years of working and the long hours they spent working in a standing position may be significant factors that contribute to the high prevalence of the WMSDs among them. The most commonly affected body parts included the low back, knees, upper back and shoulder.

### Future Research

Further study is needed to study another criterion like functional assessment. Studies with a large sample are needed to find out an association and establishing the contribution with a greater amount of certainty about the different risk factors on farmers.

### Source of Funding: Self

### Conflict of Interest: There is no conflict of interest related to this manuscript

### Ethical Clearance: All the procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000 (5). Informed consent was taken from the subjects prior to the study.

### REFERENCES


Effectiveness of a Training Program on Improving the Knowledge, Attitude and Skill in Providing Cardiopulmonary Resuscitation (CPR)—An Interventional Study

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¹MSc Nursing, ²Assistant Professor (Selection Grade), ³Assistant Professor (Senior Scale), Dept. of Medical Surgical Nursing, Manipal College of Nursing Manipal, MAHE, Manipal

ABSTRACT

Background and Aim: The key factor in any cardiac arrest situation is the amount of time lost before a patient is shifted to the hospital. This study aimed to develop awareness among the study participants in cardiac emergencies and to enhance their knowledge, attitude and skill in performing hands-on Cardio Pulmonary Resuscitation (CPR), to bring down the rate of deaths due to sudden cardiac arrest outside hospitals.

Subjects and Method: The study was conducted using pre-experimental research design and convenient sampling technique was used to select 80 employees working in a selected institute as study participants. Data was collected over a period of six weeks using three different tools viz. structured knowledge questionnaire, attitude scale and skill checklist on CPR.

Results: In the pre-test 26.2% of the participants had average level of knowledge and 73% had poor knowledge on CPR, whereas in the post-test 42.5% had good knowledge and 55% had average knowledge on CPR. Only 20% of the participants had favorable attitude towards CPR in the pretest, which did not have a significant change during the post-test as 82.5% of the participants still maintained unfavourable attitude. However the skill of the participants increased from 100% of the participants being unskillful in the pre-test to 76.2% gaining the basic skills on CPR and the rest of the participants were given remediation until they became skillful.

Conclusion: The training program was effective in increasing the knowledge, and teaching the participants with skills of providing CPR.

Keywords: Attitude, Cardiopulmonary Resuscitation, Knowledge, Clinical Skill, Education

Introduction

Cardiac arrest is an emergency situation both in the hospital and out of hospital, if not attended on time it considerably adds to the mortality of a given population. Cardio Pulmonary Resuscitation (CPR), a part of Basic Life Support (BLS) – is one such skill, which if initiated on time can improve the survival rate and prevent the burden of death due to sudden cardiac arrest.¹

Sudden Cardiac arrests are very common cause of death all around the world as they can happen to anyone at any time. As per the statistical update published by the American Heart Association (AHA) in 2013, the incidence of out-of-hospital cardiac arrest is around 326,200 annually and the average survival rate is 10.6% and survival with good neurologic function is 8.3%. About 88% of cardiac arrests happen outside of hospitals so there is a high likelihood that an average citizen will be the first one on scene and may be able to save the life of person experiencing sudden cardiac arrest. Rescuer education and the quality of training given are critical factors in delivering effective CPR.¹⁻³ A study conducted
in North Carolina by Hansen MC, Kragholm K, Pearson AD, Tyson C, Monk L, Myers B et al amongst 4961 patients, during the years 2010-2013, with out-of-hospital cardiac arrest on whom resuscitation was identified and attempted. First responders were police officers, firefighters, rescue squad, or life-saving crew trained by state wise initiatives to perform basic life support and the use of automated external defibrillators (AEDs) until arrival of the Emergency Medical Service. The study reports that the combination of bystander CPR and first responder defibrillation increased from 14.1% in 2010 to 23.1% in 2013. Even the rates of survival with favourable neurological outcome increased from 7.1% in 2010 to 9.7% in 2013 and were associated with CPR initiated by ‘by-standers’.4

The current study aims at creating awareness among the study participants, in cardiac emergencies and to enhance their knowledge, attitude and skill in performing hands-on CPR, with a view to bring down not only the rate of deaths due to sudden cardiac arrest outside hospitals, but also to improve the rate of survival amongst victims who experience cardiac emergencies in “out of hospital” scenario.

Materials and Method

This study was an evaluative pre-experimental study conducted among the employees of a selected institute in Udupi district, Karnataka. The objectives of the study were to assess the knowledge, attitude, skill in providing Cardiopulmonary Resuscitation (CPR) among the employees and to determine the effectiveness of the training program on Cardiopulmonary Resuscitation (CPR) among the employees. Informed consent was obtained from the participants.

Convenience sampling technique was used for the selection of the participants and the sample consisted of all the security personnel working in the institute. The sampling criteria included current employees who were physically able to participate in the study and could read and write in English and Kannada or Hindi. The tools that were used to collect the data were demographic proforma, structured knowledge questionnaire on CPR, attitude scale on CPR and skill checklist on CPR.

The data were collected over a period of six weeks. In the beginning, a pre-test was conducted for all participants on their existing knowledge on CPR by asking them to answer twenty self-administered multiple choice questions and their attitude towards the training program on CPR was assessed by asking them to fill a ‘three point’ rating scale on different aspects of the training program on CPR. A single rater assessed their skill on CPR. During the skill test, participants were supposed to perform the sequence of CPR on a standard manikin, and a rater evaluated their skill using a checklist based on the 2015 American Heart Association (AHA) guidelines. The skill checklist included checking for unresponsiveness by shouting and shaking the manikin, asking for help and calling EMS, checking the carotid pulse, baring the victim’s chest and locating the CPR hand position, performing the first cycle of compressions, and giving two breaths after the first cycle of compressions. For each step, the participant got one score for appropriate performance and zero for inappropriate one. A total score of 14 was given for complete performance in all steps. A single rater evaluated all the tests. After the pretest, all the participants attended a CPR training program on the same day for three hours in which techniques of CPR was taught to them by means of power-point presentation and live demonstration. Post-test on knowledge, attitude and skill were conducted in the similar way after seven days using the same tools that were used in the pretest.

Results

The collected data was analyzed using SPSS (Statistical Package for the Social Sciences) version 20 for Windows. The data was analyzed anonymously and expressed as means and percentage. Wilcoxon signed rank test and paired t-test were used for statistical analysis, and p-value of <0.05 was considered statistically significant.

Out of 80 participants, majority 68(85 %) were in the age group of 20-40 years and 59(73.8%) of the participants were males and 21(26.2%) were females. Majority 54(67.5%) had education less than 10th standard and none of the participants had any previous training or knowledge on CPR (Table 1).

Table 1: Description of sample characteristics

<table>
<thead>
<tr>
<th>Participants characteristics</th>
<th>Frequency (f)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-40</td>
<td>68</td>
<td>85.0</td>
</tr>
<tr>
<td>&gt;40</td>
<td>12</td>
<td>15.0</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>59</td>
<td>73.8</td>
</tr>
<tr>
<td>Female</td>
<td>21</td>
<td>26.2</td>
</tr>
</tbody>
</table>
In the pre-test, majority 59(73.8%) had poor knowledge and only 21(26.2%) had average knowledge on CPR. Whereas in the post-test only 2.5% had poor knowledge and 42.5% had good knowledge on CPR (Table 2).

<table>
<thead>
<tr>
<th>Educational qualification</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Classes &lt; 10&lt;sup&gt;th&lt;/sup&gt; standard</td>
<td>54</td>
<td>67.5</td>
</tr>
<tr>
<td>Classes 10&lt;sup&gt;th&lt;/sup&gt; standard-PUC</td>
<td>18</td>
<td>22.5</td>
</tr>
<tr>
<td>Degree holder (any stream)</td>
<td>2</td>
<td>2.5</td>
</tr>
<tr>
<td>Others (any other special training)</td>
<td>6</td>
<td>7.5</td>
</tr>
</tbody>
</table>

**Previous knowledge on CPR**

<table>
<thead>
<tr>
<th>Category</th>
<th>Pre-test</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>79</td>
<td>98.8</td>
</tr>
<tr>
<td>Yes</td>
<td>1</td>
<td>1.2</td>
</tr>
</tbody>
</table>

In the pre-test, majority 59(73.8%) had poor knowledge and only 21(26.2%) had average knowledge on CPR. Whereas in the post-test only 2.5% had poor knowledge and 42.5% had good knowledge on CPR (Table 2).

<table>
<thead>
<tr>
<th>Category</th>
<th>Pre-test</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good knowledge</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Average knowledge</td>
<td>21</td>
<td>26.2</td>
</tr>
<tr>
<td>Poor knowledge</td>
<td>59</td>
<td>73.8</td>
</tr>
</tbody>
</table>

Majority (80%) of the participants had unfavourable attitude towards training program on CPR in the pre-test. After the training program, majority (82.5%) still maintained unfavourable attitude towards training program on CPR (Table 3).

<table>
<thead>
<tr>
<th>Category</th>
<th>Pre-test</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Favourable</td>
<td>16</td>
<td>20</td>
</tr>
<tr>
<td>Unfavourable</td>
<td>64</td>
<td>80</td>
</tr>
</tbody>
</table>

In the pre-test none of the participants were skilful on CPR. However in the post-test majority (76.2%) attained the skills in giving CPR and 23.8% could not attain the required skill and they were given remediation until they could attain 100% skills (Table 4).

<table>
<thead>
<tr>
<th>Category</th>
<th>Pre-test</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skillful</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Unskillful</td>
<td>80</td>
<td>100</td>
</tr>
</tbody>
</table>

Further statistical analysis showed that there was significant increase in knowledge $(t=7.565 \ p<0.01)$ and skill $(t= 7.908 \ p<0.01)$ after the training program on CPR (Table 5). But there was no significant change in attitude $(t=1.479 \ p=0.14)$ after the training program (Table 6).

**Table 4: Skill of participants on CPR**

<table>
<thead>
<tr>
<th>Category</th>
<th>Pre-test</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skillful</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Unskillful</td>
<td>80</td>
<td>100</td>
</tr>
</tbody>
</table>

**Table 5: Wilcoxon’s sign rank values computed between the pre-test and post-test knowledge and skill scores**

<table>
<thead>
<tr>
<th>Total scores</th>
<th>Median</th>
<th>Wilcoxon Sign rank value (t)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge scores</td>
<td></td>
<td>-7.565</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Pre-test</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-test</td>
<td>13</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 6: Paired t-test values computed between the pre-test and post-test scores on attitude**

<table>
<thead>
<tr>
<th>Total Scores</th>
<th>Mean</th>
<th>SD</th>
<th>Paired t-test value (t)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test</td>
<td>31.80</td>
<td>3.573</td>
<td>-1.479</td>
<td>0.14</td>
</tr>
<tr>
<td>Post-test</td>
<td>32.54</td>
<td>3.635</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The increase in post-test scores in knowledge and skill were significantly associated with the training program as the p-value in both knowledge and skill was <0.05. However the p-value of attitude was >0.05 and it was inferred that the training program on CPR brought significant change in the post-test scores of knowledge and skill.
Discussion

A number of studies have been done all over the world among different category of sample to show the efficacy of bystander initiated Cardio Pulmonary Resuscitation in saving the lives of the out-of hospital cardiac arrest victims. The present study showed that there was significant increase in knowledge and skill after the training program on CPR, however there was no major changes in the attitude scores of the participants.

The findings of this study are supported by an observational study conducted in Nepal in the year 2012, which was aimed at exploring the level of knowledge and attitude on Basic Life Support (BLS) among medical and paramedical staff (N=150). The findings revealed that the participants had inadequate knowledge on BLS. CPR training significantly influenced the BLS knowledge of the participants. Those who had received some CPR training within 5 years obtained the highest mean score of 8.62 ± 2.49, whereas those who had training >5 years back and without training obtained mean score of 5.54 ± 2.38 and 6.1 ± 2.29 respectively. The study concluded that the knowledge of trained personnel was better than those of untrained ones.5

In the present study there was no significant changes in the attitude scores of the participants after the training program. This finding is supported by a survey conducted by Chew.S.K et al (2009) at Malaysia among 55 dental students and 73 school teachers to assess the willingness to perform bystander CPR after completion of their BLS training. The findings showed that, only 29.0% of the total 128 participants said that they would offer to perform CPR under any cardiac arrest condition and 69.0% said that they would just offer to call the ambulance but they would not offer to perform CPR. When analyzed separately, only 16.4% of school teachers said that they would perform CPR as compared to 45.5% of dental students (p<0.001).6 Thus the study findings concluded that knowing how to perform CPR does not necessarily translate into willingness to perform CPR.

Another survey was conducted by Narayan RPD, Biradar VS, Reddy TM, Bk S at Bangalore in the year 2015, which aimed to assess the knowledge and attitude on Basic Life Support (BLS) among the dental interns and post-graduate students. The findings showed that dental interns and postgraduate students had average knowledge about BLS. Among 202 participants, 121 (59.9%) had a positive attitude and 81 (40.1%) had a negative attitude towards BLS. Hence the investigators concluded that Cardiopulmonary resuscitation (CPR) should be considered as part of the dental curriculum. Workshops on a regular basis should be focused on skills of CPR for dental students.7

Conclusion

American Heart Association strongly recommends that all victims of cardiac arrest should receive, at a minimum, high-quality chest compressions. The training program was successful in improving the knowledge, attitude and skills of security personnel in providing Cardio Pulmonary resuscitation (CPR). This may improve the out of hospital survival rate of cardiac arrest victims, which the participants come across during their service and may help them in saving many lives.

Ethical Clearance: Taken from the ethics committee (IEC 678/2015).

Source of Funding: None

Conflict of Interest: There are no conflicts of interest.

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3. AHA Statistical Update available from http://circ.ahajournals.org/content/early/2012/12/12/CIR.0b013e31828124ad.full.pdf
Comparative Evaluation of the Effectiveness of Apron with Mandarin Collar and Open Collar in Prevention of Microbial Contamination on Street Clothing

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ABSTRACT

Aim: To comparatively evaluate the protecting efficiency of mandarin collar aprons as against the open collar aprons.

Settings and Design: Cross-sectional randomized comparative study

Methods and Material: Ten post graduate students were given a verbal written set of instructions to be followed during the study. Each study participant was made to wear an open collar and a mandarin collar aprons separately on two different days. The microbial samples were collected using a sterile swab from the chest area of the street clothing at the beginning of the day at dental clinic (Pre patient care) and at the end of the day at dental clinic (Post patient care). The obtained samples were microbiologically analyzed and the difference in the colony count between the two types of aprons were compared.

Results: Significantly more number of gram positive cocci were seen in open collar apron group, when the difference between the pre work and post work colony counts were compared (p=0.031).

Conclusion: Mandarin collar aprons offer significantly better protection of the street clothing of the dental health care providers than the closed collar aprons against the colonization of gram positive cocci.

Keywords: White coat, protection, efficiency, dentists

Introduction

Infectious diseases and cross infections are the challenging domains unavoidably present in all the health care systems of many countries.[1] Thus, adaptation of appropriate biosafety measures becomes vital component while considering the safety of the health care worker as well as the patient.[2,3] In dentistry, professionals are exposed to pathogenic microorganisms present in oral cavity and the surrounding environment (nose, throat, and respiratory tract).[3] The well documented ones include various nosocomial pathogens, such as methicillin-sensitive Staphylococcus aureus (MSSA), methicillin-resistant Staphylococcus aureus (MRSA), vancomycin-resistant Enterococci (VRE) and gram negative organisms, MRSA being the most pathogenic organism.[4]

Cross-infection in dental field is highly expected. It can occur through infected aerosols, blood, saliva, body fluids, devices, instruments or environmental surfaces.[4,5] The concepts of infection control are strictly embraced in the dental profession after the identification of...
of risks associated with the Hepatitis B virus in 1970s and Human Immunodeficiency Virus in 1980s.\cite{6}

According to the CDC guidelines 2003, use of personal protective equipment (PPE)/Personal protective clothing (PPC) is the vital component to prevent cross infection and cross contamination in dentistry.\cite{7} The PPC includes head cap, gloves, footwear, eye-wears, masks and lab coats (apron). The lab coat/apron is an integral part of PPC and it covers the uniform, street clothing, and skin, thus protecting them from possible contamination due to blood, body fluids and other potentially infectious materials.\cite{2} Apron acts like a safety barrier, which allows the Dental Health Care Provider (DHCP) to work in a high-risk environment while ensuring prevention of transmission of disease to him/herself and rest of the family members.

Two designs of aprons (Open collar apron and Mandarin collar apron) are popularly available in the market. However, there is insufficient evidence to recommend a particular design of apron to be used by DHCP. Thus, the present study was conducted to comparatively evaluate the protecting efficiency of mandarin collar aprons as against the open collar aprons on street clothing.

**Materials and Method**

It was a cross-over randomized study conducted at Manipal College of dental sciences, Mangalore. The processing of the collected microbiological samples were done at Department of Microbiology, KMC hospital, Mangalore. The total study duration was 6 months and the sample size was 10.

**Sample size calculation:** The sample size was calculated based on the study by Reis RF et al \cite{2}, using an alpha of 5% with the corresponding z value of 1.96 in an established formula, the minimum calculated sample size was 10 participants, each of them being evaluated twice separately for the protective efficiency of open collar and mandarin collar aprons.

The study participants were postgraduate students from the Department of Paedodontics and Preventive Dentistry and the Department of Conservative dentistry and Endodontics of Manipal College of Dental Sciences, Mangalore. Ten postgraduates belonging to either of the departments were included in the study if they had at least 5 patient treatment appointments of 45 minutes each. Those who had any known skin infections and/or taking any topical/systemic antibiotics were excluded from the study. Study subjects who didn’t follow the given set of written instruction on the day of the study were also excluded.

Ethical approval for the study was obtained before initiating the study from Institutional Ethics Committee of Manipal College of Dental Sciences, Mangalore (Ref No: 16125). The study participants were provided with written information sheet, which detailed the purpose of the study and the study procedure. Approval to participate in the study was taken in an informed consent form after allowing them to read and understand the information sheet.

**Procedure:** Verbal and written instructions were given to all the study participants on duration of wearing the apron, washing and usage criteria. A set of new open collar and mandarin collar aprons were provided to all the study participants and they were expected to wear the aprons above the street clothing on the day of study as every other day. The aprons and street clothing worn on the study day by all the study participants were laundry washed at a single center. The postgraduates were told to wear their laundry washed fresh street clothing on the day of study and their aprons were carried to the Clinics in well sealed pouches. Each participant was made to wear open collar and mandarin collar aprons on two different days (allocation was done randomly using toss of coin). The usage criteria for both the aprons were same. Study participants were strictly asked to not to leave the clinic premise during study duration.

**Method of Sample collection:** The sample collection was done twice a day for each participant while wearing a particular type of apron (either open collar or mandarin collar) - Pre patient care (8.30 a.m) and Post patient care (1.30 p.m). The collection of microbiological sample from the Street clothing was performed under aseptic condition by the technique of rolling a swab, which consisted of passing the swab on the chest area of the street clothing. Sterile swabs (with a wooden stick handle) moistened in Brain Heart Infusion medium were used for the sample collection.

**Culturing and the identification of the bacteria:** The swabs were cultured on blood agar and Mac Conkey agar. The inoculated media were incubated aerobically
at 37°C for 24 hours and examined for total bacterial counts and the presence of other possible pathogens according to standard protocol. The bacteria were identified by assessing colony characteristics, Gram reaction, motility and biochemical tests as per previously described protocols.[8]

**Statistical Analysis:** The statistical analysis was done using SPSS Version 15.0. The comparison between open collar and mandarin collar aprons for each category of microorganisms was done using Wilcoxon sign rank test.

The values were represented in percentiles and mean ± SD. Level of significance was considered as p ≤ 0.05.

**Results**

Table 1 presents the comparison of the pre patient care and post patient care difference in colony count for each category of microorganisms between open collar apron and mandarin collar apron. Staph aureus, E coli, Klebsiella, Diptheroids, Acitenobacter Baumannii, Staph epidermis, Staph citreus and few other Gram Negative Bacilli (GNB) showed similar median values of colonization and there was no statistically significant difference between pre patient care and post patient care contamination level viz these organisms (p values of 0.25, 0.25, 0.5, 1.0, 0.75, 1.0, 1.0 and 0.43 respectively), when mandarin collar apron was compared to open collar apron. However, the difference between pre patient care and post patient care of open collar apron was highest for Acitenobacter Baumannii, E coli and GNB than that of the mandarin collar, though it wasn’t statistically significant. However, significantly more number of colonies were seen in open collar apron group, when the difference between the pre patient care and post patient care colony counts of total gram positive cocci (including even staph aureus, staph epidermis, staph citreus) were compared (p=0.031).

<table>
<thead>
<tr>
<th>Category</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Median</th>
<th>Percentile 25</th>
<th>Percentile 75</th>
<th>Z</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fungus</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*Difference in open</td>
<td>0.4</td>
<td>0.97</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-1.342</td>
<td>0.5</td>
</tr>
<tr>
<td>*Difference in mandarin</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GNB</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*Difference in open</td>
<td>10805.3</td>
<td>31117.08</td>
<td>1.5</td>
<td>0</td>
<td>40</td>
<td>-0.944</td>
<td>0.438</td>
</tr>
<tr>
<td>*Difference in mandarin</td>
<td>9000</td>
<td>28460.5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GPC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*Difference in open</td>
<td>95.1</td>
<td>282.91</td>
<td>2</td>
<td>0</td>
<td>15</td>
<td>-2.207</td>
<td>0.031</td>
</tr>
<tr>
<td>*Difference in mandarin</td>
<td>0.1</td>
<td>0.32</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*The difference here refers to the difference in the number of colonies between pre patient care and post patient care.

†Gram Negative Bacilli
‡Gram Positive Cocci

**Discussion**

No doubt that the PPC or apron is a biosafety measure in the health care field, when improperly used, may become a source of infection.[6] Also, when the aprons are improperly designed may not offer complete protection. The two known designs of aprons used by the dental health care workers are: open collar aprons and mandarin collar aprons. The mandarin collar aprons hypothetically should offer better protection than the open collar aprons. However, the evidence in support
of this hypothesis is still lacking in literature. Thus, this study was done to comparatively evaluate the protecting efficiency of mandarin collar aprons against the open collar aprons.

Chest was chosen as the site for determining the type and amount of existing microbial flora on the street clothing, at the end of the working day. Microbial contamination was thought to be highest in the chest area due to the direct contact with blood, saliva, aerator splashes during the clinical procedure. Since mandarin collar aprons cover the chest area, sample collection from here also helps in evaluating the effectiveness of the Mandarin collar of the lab coat in prevention of bacterial colonization on the street clothing.

To take of the possible confounding factors, the sample collection was done for each subject twice—pre and post work and the difference was compared. Also, a specific set of instructions were given both verbally and in written form to all the study participants and it was looked that they were strictly followed during the study.

The results of the present study showed that the street clothes of the dental care provider were highly colonized with GNB and acitenobacter after patient care in both the groups. These findings are in contrary to the studies done by Wong D et al, Banu A et al, Priya H et al, Malini M et al where authors found considerably higher colonies of gram positive cocci among all the tested health care workers. However, these studies evaluated the microbial contamination of the white coat/apron whereas the present study evaluated the microbial contamination of the street clothing, thereby assessing the protective efficacy of the aprons. Also, the studies by Wong D et al, Banu A et al were done at a hospital set up in contrary to the dental set up of the present study. Study by Qaday J et al showed the presence of GNB too in the contaminated white coat, however at a hospital set up.

Reis PF et al reported in their study that the major colonizers of the dental coat used by professionals are of genus staphylococcus followed by Klebsiella and Enterobacter. Staph aureus, staph epidermis, staph citreus, Klebsiella were isolated from the street clothing even in the present study, thereby suggesting the presence of these organisms in any dental set up and vulnerability of dental care providers to subsequent infections. These infections are of clinical significance and concern, especially the ones caused by Staphylococcus aureus. Staphylococcus aureus is considered one of the most important pathogenic bacteria and is responsible for series of infections in human beings. Treatment of infections caused by staph aureus is a challenge due to its high resistance to various drugs. Another interesting finding of the present study is when staph citreus, staph epidermis, staph aureus were individually compared there was no statistically significant difference found between open collar and mandarin collar. However, when all the gram positive cocci put together compared, the mandarin collar apron showed significantly low contamination of the street clothing.

Our study showed E coli were unable to colonize the street clothing of the dental care provider, when he/she wore mandarin collar apron, where as their number increased when the care provider wore an open collar apron. However, this difference was not statistically significant and there are no supporting evidence in the literature to state this finding.

Microorganisms are omnipresent, so undoubtedly they colonize in all the favorable conditions, to which even the street cloth worn under the white coat is not an exception. While contamination of skin and clothing by “splashes” or touch is practically unavoidable in any health care set up including dentistry, the white coat worn over personnel clothing plays a pivotal role in offering the personal protection.

Limitations: The present study was conducted with a small sample size. Also, we included postgraduate students posted either at Conservative Dentistry and Endodontics and Pediatric dentistry. The type of possible contamination may vary in other clinical and non-clinical departments. Thus, future studies are advised evaluating the protecting efficiency of aprons on a larger sample size including study participants from all dental specialties.

Conclusion

Within the limitations, results of our study suggest that mandarin collar aprons offer better protection of street clothing compared to the closed collar aprons.

Conflict of Interest: Nil

Source of Funding: Self
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A Comparative Study on Awareness and Preventive Practices Regarding Dengue Fever among Selective Semi-Urban and Rural Population in Chennai, India

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ABSTRACT

Background: Dengue fever is a preventable infection, and success of dengue control depends largely on good knowledge, attitudes and practices of targeted communities towards the disease and its preventive measures.

Method: Cross-sectional study was conducted with sample size of 95 in each area. The study was carried out during the inter-epidemic period (April-June 2018). Simple random sampling technique was used to select the samples. A validated pre-tested questionnaire was used to collect the data. Analysis was done using proportions and chi-square test.

Results: The majority (94.8%) of the respondents in this study had known about Dengue fever. More than half (53.1%) of people were practicing preventive measures against Dengue. No significant difference in knowledge regarding the dengue, its vector, its breeding places and active biting time was found between the semi-urban and rural population, however there was a significant difference in knowledge about common symptoms in semi-urban and rural populations.

Conclusion: Preventive practices are not found to be satisfactory. Thus behavior change communication is the need of the hour. Strengthening of surveillance along with periodic health education to the community by the health personnel is required.

Keywords: Dengue Fever, Preventive Practices, Awareness, Behavior Change Communication

Introduction

Dengue fever is a systemic Arboviral disease caused by the dengue virus and transmitted by bite of infected female Aedes mosquitoes¹. Infections can also be transmitted through blood transfusion, organ transplantation and vertically from mother to child.²-⁶ Although infection with dengue virus may be asymptomatic, it may lead to a wide spectrum disease that ranges from non-severe fever to potentially fatal clinical manifestations.¹,⁷,⁸

Globally, 294 million inapparent and 96 million apparent dengue infections were estimated in 2010.⁷ Dengue virus has five serotypes⁹, and infection with a certain serotype usually confers lifelong serotype-specific immunity, but a temporary immunity to other serotypes. Moreover, more frequent and severe complications can occur in subsequent infection with a different serotype.¹⁰,¹¹ Due to the absence of effective antiviral agents, efforts focus on interrupting human-vector contact through targeting the adult vector and its immature stages by eliminating its breeding habitats in and near households.¹,¹² Nevertheless, the incidence of dengue fever epidemics is escalating, and its endemic transmission expands to a wider geographical range.⁷

Vaccines are in the way to prevent Dengue, one promising vaccine the recombinant live-attenuated tetravalent dengue vaccine (CYD-TDV), commercially

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known as Dengvaxia is available but the Strategic Advisory Group of Experts on Immunization recommends the introduction of CYD-TDV only in high-endemicity settings, i.e., where seroprevalence rates of the virus are 70% or greater in the age group to be targeted by vaccination.13-15

The major underlying cause of dengue outbreaks in India is unplanned urbanization, development of slums and deficient water management systems leading to the proliferation of the mosquito breeding sites and thereby facilitating the spread of the disease. Recently dengue has been epidemic in India in the year 2017, where Tamil Nadu has one of the highest numbers of about 23,294 cases (NHP 2018) and 65 deaths.16

Dengue fever is a preventable infection, and success of dengue control depends largely on good knowledge, attitudes and practices of targeted communities towards the disease and its preventive measures. Community involvement after educational campaigns could be more effective than insecticide spraying alone in reducing mosquito breeding habitats and hence in preventing and controlling dengue.17

Hence this study was planned to assess and compare the knowledge, attitude and preventive practice regarding dengue among adults in rural and semi-urban populations in the field practice area of a private Medical college on the outskirts of Chennai in Thiruvallur District.

Materials and Method

The study was approved by the Institutional Ethical Committee. Sample size calculated was 95 in each area taking 65.5% awareness in Rural population and 45% in slum community15 with a confidence level of 95% and an allowable error of 17.5%. The study was carried out during the inter-epidemic period (April-June 2018). Simple random sampling technique was used to select the samples. A validated pre-tested, semi-structured questionnaire was used to collect the data pertaining to dengue from participants, which included information pertaining to the mode of spread, clinical symptoms, vector characteristics and preventive measures.

At the end of the interview, health education was delivered by providing important information related to dengue fever through a pamphlet.

Results

The study was conducted among 192 adult participants with a response rate of 100% (96 from semi-urban and 96 from the rural population). The sociodemographic characteristics such as gender, age, literacy and occupational status of the study sample are shown in Table 1. On comparison of study subjects based on gender, the majority of females were interviewed in both areas. On comparison of occupational status between semi-urban and rural population, in semi-urban area majority belonged to semi-skilled occupational category while in a rural area nearly half were unemployed (Table 1).

<table>
<thead>
<tr>
<th>Sociodemographic profile</th>
<th>Semi-urban area N = 96 (%)</th>
<th>Rural area N = 96 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>34 (35.4%)</td>
<td>37 (38.5%)</td>
</tr>
<tr>
<td>Female</td>
<td>62 (64.5%)</td>
<td>59 (61.40%)</td>
</tr>
<tr>
<td>Age group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-30</td>
<td>29 (30.2%)</td>
<td>34 (35.4%)</td>
</tr>
<tr>
<td>31-40</td>
<td>44 (45%)</td>
<td>24 (25%)</td>
</tr>
<tr>
<td>41-50</td>
<td>13 (13.5%)</td>
<td>22 (22.9%)</td>
</tr>
<tr>
<td>51-60</td>
<td>6 (6.25%)</td>
<td>8 (8.3%)</td>
</tr>
<tr>
<td>Above 60</td>
<td>4 (4.2%)</td>
<td>8 (8.3%)</td>
</tr>
<tr>
<td>Educational status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>6 (6.3%)</td>
<td>15 (15.6%)</td>
</tr>
<tr>
<td>Primary</td>
<td>13 (13.5%)</td>
<td>24 (25%)</td>
</tr>
<tr>
<td>Middle</td>
<td>17 (17.7%)</td>
<td>20 (20.8%)</td>
</tr>
<tr>
<td>Higher secondary</td>
<td>14 (14.6%)</td>
<td>19 (19.8%)</td>
</tr>
<tr>
<td>Graduate and above</td>
<td>46 (47.9%)</td>
<td>18 (18.8%)</td>
</tr>
<tr>
<td>Occupational status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployed</td>
<td>22 (22.9%)</td>
<td>43 (44.8%)</td>
</tr>
<tr>
<td>Unskilled</td>
<td>10 (10.4%)</td>
<td>16 (16.7%)</td>
</tr>
<tr>
<td>Semi-skilled</td>
<td>24 (25%)</td>
<td>15 (15.6%)</td>
</tr>
<tr>
<td>Skilled</td>
<td>13 (13.5%)</td>
<td>10 (10.4%)</td>
</tr>
<tr>
<td>Clerical, Shop-owner, Farmer</td>
<td>12 (12.5%)</td>
<td>10 (10.4%)</td>
</tr>
<tr>
<td>Semi-profession</td>
<td>6 (6.3%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Profession</td>
<td>9 (9.4%)</td>
<td>2 (2.1%)</td>
</tr>
</tbody>
</table>

In the present study 182 (94.8%) participants told they knew about dengue fever, 93 (96.8%) in semi urban and 89 (92.7%) in rural area.
Among people who knew about dengue, 95.6% people reported Dengue was viral fever, this knowledge was found to be significantly higher in semi-urban population (98.9%) than rural population (92.1%). (Table 2)

Table 2: Knowledge about dengue

<table>
<thead>
<tr>
<th></th>
<th>Semi-urban (n = 93)</th>
<th>Rural (n = 89)</th>
<th>Total (n = 182)</th>
<th>$X^2$</th>
<th>p value</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dengue is viral fever</td>
<td>92 (98.9%)</td>
<td>82 (92.1%)</td>
<td>174 (95.6%)</td>
<td>4.9892</td>
<td>0.025506</td>
<td>Significant</td>
</tr>
<tr>
<td>Transmission of dengue</td>
<td>89 (95.7%)</td>
<td>82 (92.1%)</td>
<td>171 (94%)</td>
<td>1.0173</td>
<td>0.313158</td>
<td>Not significant</td>
</tr>
<tr>
<td>Type of mosquito causing</td>
<td>17 (18.7%)</td>
<td>12 (13.5%)</td>
<td>29 (15.9%)</td>
<td>0.7811</td>
<td>0.376814</td>
<td>Not significant</td>
</tr>
<tr>
<td>dengue</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Active biting time of</td>
<td>55 (59.1%)</td>
<td>48 (53.9%)</td>
<td>103 (56.6%)</td>
<td>0.502</td>
<td>0.47863</td>
<td>Not significant</td>
</tr>
<tr>
<td>Dengue mosquito</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breeding places of Dengue</td>
<td>78 (83.8%)</td>
<td>75 (84.2%)</td>
<td>153 (84.1%)</td>
<td>0.0054</td>
<td>0.941438</td>
<td>Not significant</td>
</tr>
<tr>
<td>mosquito</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fever is the most common</td>
<td>83 (89.2%)</td>
<td>57 (64%)</td>
<td>140 (76.9%)</td>
<td>8.5286</td>
<td>&lt;0.0001</td>
<td>Highly significant</td>
</tr>
<tr>
<td>symptom of dengue</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Life threatening</td>
<td>48 (51.6%)</td>
<td>15 (16.8%)</td>
<td>63 (34.6%)</td>
<td>26.1735</td>
<td>&lt;.00001</td>
<td>Highly significant</td>
</tr>
<tr>
<td>complications of Dengue</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In the present study 94% of the people correctly told about Dengue transmission, the knowledge was found to be slightly more in semi-urban area (95.7%) than in rural area (92.1%). In the present study only 15.9% people knew about the type of mosquito causing dengue.

More than half 56.6% people had knowledge regarding active biting time of Dengue mosquito, this was found to be more in semi-urban area (59.1%) than in rural area (53.9%).

84.1% respondents reported correctly about the breeding places of Dengue mosquito in this study. In the present study when inquired about the symptoms of dengue more than two third of the respondents 76.9% reported fever as the common symptom, this knowledge was found to be significantly higher (86.5%) in semi-urban than in rural areas (59.4%). Regarding the most life-threatening complications of dengue only one third of the participants, more than half (51.6%) in semi-urban area and only 16.8% in rural area stated that the complications were bleeding, shock and fever. The difference was found to be statistically highly significant.

Table 3: Attitude towards dengue

<table>
<thead>
<tr>
<th></th>
<th>Semi-urban (n = 96)</th>
<th>Rural (n = 96)</th>
<th>Total (n = 192)</th>
<th>$X^2$</th>
<th>p value</th>
<th>Interpretations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Will approach to the</td>
<td>94 (97.9%)</td>
<td>90 (93.8%)</td>
<td>184 (95.8%)</td>
<td>2.087</td>
<td>0.148562</td>
<td>Not significant</td>
</tr>
<tr>
<td>hospital if get fever,</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>during dengue outbreaks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Will participate in the</td>
<td>83 (86.5%)</td>
<td>41 (42.7%)</td>
<td>124 (64.6%)</td>
<td>40.167</td>
<td>&lt;0.00001</td>
<td>Highly significant</td>
</tr>
<tr>
<td>dengue awareness program,</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>during dengue outbreaks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Will take self-medications</td>
<td>22 (22.9%)</td>
<td>34 (35.4%)</td>
<td>56 (29.2%)</td>
<td>5.881</td>
<td>0.015305</td>
<td>Significant</td>
</tr>
<tr>
<td>for fever, during</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>dengue outbreaks</td>
<td></td>
<td></td>
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</tbody>
</table>

In the present study 95.8% people in total reported that they will approach the hospital if they get fever during dengue outbreaks. This was found to be more in semiurban area (97.9%) in comparison to rural area.
Nearly 64.6% people expressed their desire to participate in Dengue awareness program. This was found to be significantly higher in semi-urban (86.5%) population in comparison to rural (42.7%) population. This difference is statistically highly significant.

In the present study when asked about the self-medication for fever during dengue outbreaks, one third of the total population expressed they will go for that. Attitude of Self medication was found to be significantly more in Rural area than in semi-urban area. (Table 3).

### Table 4: Practices to prevent dengue

<table>
<thead>
<tr>
<th></th>
<th>Semi-urban (n = 96)</th>
<th>Rural (n = 96)</th>
<th>Total (n = 192)</th>
<th>X²</th>
<th>p value</th>
<th>Interpretations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water containers are tightly covered</td>
<td>55(57.3%)</td>
<td>47(49.0%)</td>
<td>102(53.1%)</td>
<td>1.3386</td>
<td>0.247288</td>
<td>Not significant</td>
</tr>
<tr>
<td>Personal protective devices like mosquito repellents/nets/full sleeve clothes used</td>
<td>47(49.0%)</td>
<td>54(56.3%)</td>
<td>101(52.6%)</td>
<td>1.0236</td>
<td>0.311664</td>
<td>Not significant</td>
</tr>
</tbody>
</table>

Regarding the practice towards dengue prevention, more than half (53.1%) of the participants were covering the water containers tightly. This practice was found to be more in semi urban area (57.3%) in comparison to rural area (49.0%). About 52.6% of the total participants were using one or the other methods of Personal protection against mosquito bites. This practice was found to be more in rural areas (56.3%) in comparison to semi-urban area (49.0%) (Table 4).

### Table 5: History of dengue in the family within past 1 year

<table>
<thead>
<tr>
<th></th>
<th>Semi-urban</th>
<th>Rural</th>
<th>Total</th>
<th>X²</th>
<th>p value</th>
<th>Interpretations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of people who have been diagnosed with dengue fever in the past one year within their family</td>
<td>13</td>
<td>5</td>
<td>18</td>
<td>3.9234</td>
<td>0.047619</td>
<td>Significant</td>
</tr>
</tbody>
</table>

In the present study 18 participants reported that someone from their families was diagnosed with Dengue in last one year. Dengue cases were reported more from Semiurban area (13 people) than in rural area (5) the difference was found to be statistically significant(Table 5).

### Discussion

The current study had documented the knowledge, attitude and practices of preventive and control measures regarding Dengue in a selective semi-urban and rural area near Chennai. The majority (94.8%) of the respondents in this study had known about Dengue fever. A similar study in Delhi had reported a high level of awareness (96.3%). In a study done in Brazil 78% of subjects knew about dengue whereas, in Thailand, knowledge about dengue was 67%. The study done in Kuala Kangsar district found that 78% of subjects knew about dengue.

In this present study, 94% reported correctly that dengue was transmitted by bite of mosquito. Jogdand KS & Yerpude PN reported 78.7% respondents knew that dengue fever was transmitted by mosquito in Guntur similarly Malhotra G et al reported that 72.62% respondents mentioned mosquito bite as cause of dengue in North India. Swaddiwudhipong et al reported that more than 90% respondents knew that the disease is transmitted by mosquito.

While there was no significant difference in knowledge regarding the dengue, its vector, its breeding places and active biting time between the semi-urban and rural population, there was a significant difference in knowledge about common symptoms in semi-urban and rural populations. Thus subjects in semi-urban were better aware of common symptoms of dengue. This might be due to the recent awareness campaigns and programs in the semi-urban study area, as a result of the recent dengue epidemic.
In our study, around 56.6% of the participants had correct knowledge about the biting habit of Dengue mosquito. However, in the study conducted by Malhotra G et al only 4% of the participants had the knowledge about biting habit of Dengue mosquito. 84% of participants in our study knew about breeding places of Dengue mosquito which was similar to the study done by Matta et al who reported 79.8% respondents knew about breeding place of mosquito.

In the present study self-medication for fever during dengue outbreaks was reported by 22.9% in semi-urban and 35.41% in the rural area which clearly shows that the knowledge about self-medication has to improved drastically in both rural and semi-urban area.

Regarding the practices to prevent dengue, 53.1% of people were covering their water containers tightly and 49.0% of semi-urban people and 56.3% of rural people are using either mosquito repellents/nets/full sleeve clothes and it was found to be less as compared with Malhotra G et al who reported 59.5% of slums and 70.5% of rural population were practicing either mosquito repellents/nets/full sleeve clothes. However in a study done in Pondicherry, almost everyone (99.3%) used some form of personal protection measures. In this study no significant difference was found in preventive practices between semi-urban and rural populations.

In the present study occurrence of dengue in the past one year was found to be marginally higher in semi-urban (13) than in rural (5) area even though they have better knowledge regarding dengue and its transmission. In a similar study conducted by Chellaiyan VG et al nearly 4 people were exposed to dengue previously in Kanchipuram district of Tamil Nadu.

**Conclusion**

Knowledge and attitude regarding dengue fever are found to be good in the study population. However preventive practices are not found to be satisfactory. Thus behavior change communication is the need of the hour. Strengthening of surveillance along with periodic health education to the community by the health personnel is required. Mass media in the form of TV and radio plays an important role in reaching out to the masses. Mass media should be used by the Government to improve the knowledge and preventive practices regarding the Vector-borne diseases including Dengue fever.

**Conflict of Interest:** Nil

**Source of Funding:** Self

**Ethical Clearance:** Obtained from the Institutional Ethical Committee of Saveetha Medical College.

**REFERENCES**


Maternal Deaths in Trasnskei Region of South Africa a Case Report

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Abstract

Every day, approximately 830 women die from preventable causes related to pregnancy and childbirth. Ninety-nine percent of all maternal deaths occur in developing countries. Its incidence is higher in women living in rural areas and among poor communities, according to the World Health Organization (WHO) in 2015. The objective of this case report is to highlight the problem of maternal deaths in the Transkei region of South Africa. A 31-year-old woman was brought to hospital with a history of bleeding vaginally. She was not complaining of labor pain, only of bleeding profusely. When the patient collapsed, cardiopulmonary resuscitation (CPR) was started, and the patient was defibrillated. Intubation was carried out and IV adrenaline was given, but there were no signs of recovery. Resuscitation was called off, and the patient was declared dead.

The patient was the mother of five children. She had delivered four children vaginally, and one by caesarean section. At autopsy, the woman was found to be obese and pale. There was a copious amount of blood in the peritoneal cavity. A full-term mature fetus was floating on the umbilical cord, and lower segment of the uterus was found ruptured. The history, pathophysiology and cause of death are discussed in this report. Preventive measures are suggested. In conclusion, the incidence of maternal death is unacceptably high in the Transkei region. The matter needs urgent attention.

Keywords: Maternal deaths, ruptured uterus, medical negligence.

Introduction

Globally, an estimated 287,000 maternal deaths occurred in 2010, a decline of 47% from the levels in 1990, but far below the 75% reduction required by 2015. Maternal mortality has declined only slowly, although the annual rate of decline at global level has risen, from 2% between 1990 and 2000 to 3.4% between 2000 and 2010. The occurrence of maternal mortality is more concentrated in certain regions, with sub-Saharan Africa and Southern Asia accounting for 56% and 29% respectively. The risk of a woman in a developing country dying from a pregnancy-related cause is about 23 times higher compared to a woman living in a developed country.

The figures on maternal mortality in South Africa are inconclusive. Reports vary considerably in their claims. A report submitted in Parliament (2013) indicated that thousands of women die each year in South Africa before, during or soon after childbirth. According to this report, the South Africa maternal mortality rate was 300 per 100,000 in 2010. The maternal mortality rate in the country is higher than in several of its neighboring countries, including Botswana (160 per 100,000) and Madagascar (240 per 100,000), but lower than in Zimbabwe (570 per 100,000) and Lesotho (620 per 100,000). Another source of report is the Health News Service, which has mentioned that South Africa has cut maternal deaths from 189.5 per 100,000 births in 2009 to 132.9 per 100,000 in 2012/13. However, the rate is still high, far from meeting international commitments to cut maternal mortality to 38 per 100,000 births by
2015 as part of the global Millennium Development Goals (MDGs).  

In developed countries the prevalence of uterine rupture in women who have had a previous caesarean section is in the region of 1%, whereas in women who have not had caesarean sections, it is extremely rare (<1 per 10000). Uterine rupture is a serious obstetric complication causing high morbidity and mortality, particularly in less and least developed countries. A major risk factor in uterine rupture is obstructed labor. Black African women have a high incidence of contracted pelvis. Other risk factors for uterine rupture include multiparity and particularly grand parity. A series of five cases reported by the author in 2004 showed that there were several avoidable causes of maternal deaths necessitating improved services in the Transkei region. A review of current institutional policies, protocols, and practice guidelines may help to reduce the number of maternal deaths. The purpose of this case report is to highlight the problem of maternal deaths in the Transkei region of South Africa.

Case history: A 31-year-old woman who was living in a deep rural area of Transkei and who was expecting her fifth baby was brought to hospital with a history of bleeding vaginally. Blood was dripping down on the floor. She was not complaining of labor pain, only of bleeding profusely. The patient was drowsy, confused and pale on examination. She was put in the left lateral position, and attempts were made to insert an intravenous line (IV), but this proved to be difficult, as she was obese. Staff tried to insert the IV line on the hand, forearms, cubital fossae, feet, and right side of the neck, but failed. The medical officer on duty was called to help. An ultrasound examination showed placenta praevia grade IV in the transverse position and no fetal heartbeat was detected. The patient’s pulse and heartbeat were not palpable. Cardio-respiratory resuscitation (CPR) was started and the patient was defibrillated. Intubation was carried out and IV adrenaline was given, but there were no signs of recovery. Resuscitation was called off, and patient was declared dead, as the pupils were fixed and dilated and there were no pulse, heartbeat or any sign of respiration.

Fig. 1: Floating full-term foetus with attached umbilical cord taken from abdominal cavity

The patient had delivered four children vaginally and one by caesarean section. She attended an antenatal clinic about one and a half months earlier, and was asymptomatic, without any abnormality detected on urine examination. At autopsy, the woman was obese and pale. There was a copious amount of blood in the peritoneal cavity. A full-term mature fetus was floating in the uterus (Figure 1). The uterus was 20 x 14 x 4 cm in size. The lower and anterior segment of the uterus was ruptured (Figure 2). An umbilical cord attached to the fetus was separated. The fetus was full-term and 2.9 kg in weight.

Fig. 2: Ruptured lower segment of uterus

Discussion

Mthatha (Umtata) was the capital city of the former Republic of Transkei. It is a poverty-stricken area located in the coastal area and is now part of the Eastern Cape Province of South Africa. The poor socio-economic status
of people in this region, along with poor health services rendered by the government, is affecting them seriously. The poor and weak, such as women and children, are most affected, as they face hazardous situations on a daily basis. The poor also have less chance of survival in emergencies because they have less access to health services. The poor socio-economic status of the patient was associated with a high risk of adverse events such as inadequate medical management. This happened in the case of this patient, who noticed bleeding at 5:00, but only reached hospital at 9:00. There are mud roads in the area and there is a shortage of ambulances. Moreover, there was no qualified specialist, who could have taken a decision and operated immediately. This could have saved the life of this unfortunate patient and her baby. Poor women in remote areas are least likely to receive adequate health care.

Women die as a result of complications during pregnancies. The major complications are severe bleeding, infection and high blood pressure. Severe bleeding kills a woman within an hour if she is unattended. Rupture of the uterus is a very uncommon complication, but it is not that uncommon in this region (Figure 1 and 2). The patient was not complaining of labor pain, but of bleeding profusely, which must be considered an ominous sign, and she should immediately have been taken to theatre for a caesarean section. Labor pain occurs because of uterine contraction, and a ruptured uterus is unable to contract.

There is delay in reaching hospitals, which are under-resourced anyway. Poverty, distance, lack of information, inadequate services and cultural practices are the factors contributing to maternal deaths in this region. These factors must be considered so that South Africa can meet the MDG 5 maternal health goal - to reduce the maternal mortality rate by three-quarters and achieve universal access to reproductive health.

South Africa is a country where there is a first and a third world together. There are large disparities within the country. The health care services are also extremely poor in the former Transkei region, resembling those in Afghanistan, whereas they may be extremely good, up to first world standard, in metropolitan cities Cape Town. There are no statistics to support this claim, but circumstantial evidence suggests that the rate of maternal deaths in the former Transkei region is very high. The phenomenon is under-investigated, under-reported and information on maternal deaths in this region is under-disseminated, despite the fact that government places great emphasis on maternal deaths. Almost all of these deaths occur in low-resourced settings, and most could have been prevented. Maternal mortality is a health indicator that shows very wide gaps between rich and poor and between urban and rural areas, both between countries and within them. The high number of maternal deaths in some areas of the world reflects inequities in access to health services.

In the case studied, the medical officer who was putting the patient in the lateral position, carrying out an ultrasound examination and putting IV lines in this patient, was in fact wasting time. In this case it would have been possible to save the mother and baby, if someone had been competent enough to carry out an emergency caesarean section. The medical personnel responsible for this unfortunate mishap could face possible litigation for negligence or omission, in respect of the death of the patient as well as the baby. At least it would have been possible to save the baby if a caesarean section had been performed in the perimortem period. A review of current institutional policies, protocols and practice guidelines, plus training of rural doctors, may help to reduce maternal mortality in this region of Transkei.

Acknowledgment: I would like to thank the Maternity Manager in this area for providing me with useful information regarding this case.

Ethical issue: This case report has granted ethical clearance by the ethical committee of University of Transkei, South Africa.

Conflict of Interest: None

Source of Funding: It is self-funded.

References


Sudden Death in a Road Traffic Accident: A Case Report

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Abstract
Road traffic accidents are associated with deaths due to different mechanisms. Loss of blood as a result of multiple injuries is the commonest in majority of cases. The severity of these injuries depends on the force of impact of a vehicle. The speed, type of car, and direction of impact are the main determining factors in causation of injuries.

This article presents uncommon cases of RTA deaths. The first case is one of instantaneous death by a head on collision. There were multiple large lacerations on both legs and thigh associated with fractures of leg, thigh and pelvic bones, but almost no blood was found at the scene. The foul play was suspected. The history and autopsy findings have been discussed.

Keywords: Sudden, cause and mechanism, death.

Introduction
Road traffic accidents lead to 1.2 million deaths worldwide.\(^1\) WHO estimates that by 2020 these accidents will rank third place.\(^1\) It is difficult to ascertain that how many of them are not a really died in accidents. Motor vehicles could be used as a weapon either to conceal the crime. In case of charge, it will only amount to be culpable homicide not to a murder. Injuries sustained in road traffic accidents (RTA) are the same as any other mechanical trauma caused by blunt, sharp and penetrating objects. These result in death or disability of an individual depending on the severity of injuries.

Generally, sudden and instantaneous deaths are not common in RTAs. An injured person survives for some time as compensatory mechanisms try to maintain milieu interior. In RTA’s victims generally die of head injury, hemorrhage or asphyxia depending on the site of injury. Intentional RTA’s are very difficult to investigate, and therefore, remain unrecognized at autopsy. It may be a safe way to commit a crime. Most RTA victims are poorly autopsied, as the immediate cause of death is easily determined. Sometimes the sequence of events needs to be reconstructed, as the relatives will want foul play to be excluded.

Case history: XY a 25-year old young woman met with an accident while she was driving a small car. She had a head on collision and died at the scene of the accident. When she was removed from the car, there was hardly any blood around the body. The investigating officer also noticed this. The boyfriend suspected foul play, as the tearing of muscles looked very much like incisions.

Fig. 1: Road Traffic Death in Absence of Bleeding
At autopsy, there were multiple linear lacerations on both legs and thighs with fractures of right femur, right tibia & fibula and the pelvis (Figure 1). There were minor contusions and abrasions on the front of chest and forehead. All internal organs were intact.

**Discussion**

Road traffic accidents cause number of injuries of varying degrees. Some result in instantaneous death. Injuries vary from simple abrasions to complex combination of lacerations, sharp cuts, and occasionally penetrating injuries. Often the victims bleed to death. The rapidity of bleeding will decide how soon the victim will die. This will again depend upon the site of injuries that has severed the blood vessels. Sooner the bleeding is stopped, the better it is for survival of the victims.

Despite the large wounds in the legs and only a small amount of blood in the pelvis though the bone was fractured, the victim succumbed quickly (Figure 1). This leads to the hypothesis that the heart may have stopped suddenly or there was sudden peripheral vasoconstriction. She may have died so fast that there was no time to bleed. Blunt force can affect the function of organs without leaving anatomical marks. Important example is fatal cardiac arrhythmia after an impact to the chest. 2 (Nordrum, 2005). Extreme sympathetic stimulation can also lead to ventricular fibrillation and sudden death.

Release of vaso-constrictive paracines by the endothelium lead to vasoconstriction. Vasoconstriction temporarily decreases flow and pressure within the vessel, helping formation of platelet plug. 3 A study on cardiac and regional hemodynamic effects of histamine N-methyltransferase inhibitor metoprine in hemorrhage-shocked rats has showed that histaminergic system activation leads to mobilization of compensatory mechanisms in hemorrhagic shock. 4 Careful examination of victims at autopsy will help to rule out any foul play. Although, there may be homicide accidents, it is so difficult to prove homicide intentions. Insurance policy and compensatory damage claims will perhaps have a greater influence on the investigation of the circumstances of the accident, the extent of examination of the injured, and the number of accident reconstructions.

Complete history of an accident along with meticulous autopsy could help in finding out any clue about the intention of criminal mind. Forensic pathologist should take some extra steps in revealing the facts and explain to relatives the true nature of events.

**Ethical Issue:** The author has ethical permission for collecting data and publication (approved project No. 4114/1999) from the Ethical Committee of the University of Transkei, South Africa.

**Conflict of Interest:** None

**Source of Funding:** It is self-funded.

**References**

The Role of Dermacyn Solution in the Treatment of Infected Diabetic Foot Ulcers in Basrah: A Randomized Clinical Trial Study

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Abstract

Dermacyn (super-oxidized solution) is a new therapy used as topical dressing in open wounds. The aim of the study is to assess the effectiveness of Dermacyn solution as topical dressing in infected diabetic foot ulcers (DFUs). This is a randomized clinical trial study, done in Al-Fayha Diabetic Foot Clinic between Jan. 2018 till May 2019. Sixty- six adult Type 2 diabetic patients divided into two groups, group A (n = 33) using (Dermacyn) while in group B (n = 33) using Normal Saline (N/S). Mean age of patients (52.65+ 8.14) years. Most of patients in group A (81.8%) are improved with healed ulcers while (48.5%) of patients in group B with the same outcome with significant statistical difference.

There is very significant statistical difference in healing time between group A (Dermacyn) (40.74+3.84) days and group B (N/S) (51+3.41) days. The Dermacyn was effective.

Keywords: Basrah. Diabetic foot ulcers. Dermacyn, Infection.

Introduction

About 25% of diabetic patients develop diabetic foot ulcers (DFUs)1. More than half of cases (56%) of DFUs will be infected.

Lower limb amputation in one-fifth of cases of infected DFUs2. Diabetic foot lesions are the most cause of hospital admissions of diabetic patients3.

Peripheral neuropathy is the main etiology of developing DFUs4. Testing loss of protective sensation:

1. 10 g monofilaments (Semmes- Weinstein)
2. Standard 128 Hz tumming fork
3. Pin-prick sensation
4. Ankle reflexes5

Vascular examination include clinical sign and symptoms of PAD and palpation of pedal pulses in both feet, measurement of Ankle brachial index (ABI)6. University of Texas is one of the classification of diabetic foot wounds. University of Texas system classification (UT) consist of 4 grades and 4 stages, it shows greater association with increase risk of amputation and prediction of ulcer healing7.

Diabetic foot infection (DFI) start as traumatic wound in most of the cases. The infection is diagnosed by clinical signs and symptoms of the inflammation. There are three types of infections in diabetic patients mild, moderate and severe8.

The important factors of treatment of infected DFU consist of multidisciplinary team, control of blood sugar, foot care and debridement of infected wound conditions.

Many topical agents are used for infected ulcer, povidone, iodine, eusol, hydrogen peroxide and other topical agents used in the past for infected wounds.

Each one have their own complications. Dermacyn (Super oxidized solution) is a new therapy with electrochemically processed aqueous solution and neutral PH. It is safe and efficient9.
Super oxidized solution effective and safe against bacteria, viruses and fungi. The aims of this study to assess the effectiveness of Dermacyn solution as topical dressing in infected diabetic foot ulcers DFUs as compared with Normal Saline and to evaluate the time of healing of the DFUS (healed, unhealed, minor amputation, major amputation).

**Patient and Method**

**Study design:** This is a randomized clinical trial study was taken in Al-Fayha Diabetic Foot clinic, Basra, Iraq, between January 2018 till May 2019. The total number of patients were sixty-six with infected diabetic foot wounds. After taken informed consent from the patients, patient divided into 2 groups by alternative assign way in a 1:1 ratio, group A using daily wound dressings with Dermacyn Solution (Super oxidized solution) (legal manufacture Oculus Innovative Sciences, Inc Petaluma, CA 94954 USA) and group B using daily wound dressing with normal saline. We preferred not to use povidone – iodine solution due to its toxic effect on human fibroblast and delayed wound healing.

**Exclusion criteria:** All patients with peripheral arterial disease (PAD) were excluded from the study.

**Investigations:** The diagnosis of infection depend on clinical basis and assessment of severity according to Infectious Diseases Society of America (IDSA) while wound classification by UT System classification.

Full history, general examination of patients, local examinations of the foot lesions, laboratory investigations (Hb, WBC, RBC, HbA1c and Renal Function test) were performed to all patients. According to HbA1c, patients are considered as uncontrolled diabetes (7-9) % and poor diabetes control as HbA1C > 9.0 %.

**Standard treatment of the patients:**

1. Control of blood sugar
2. Multi-disciplinary team approach to all patients.
3. The empirical antibiotics therapy depends on the severity of the infection and most likely microorganism were used.

The definitive antibiotic was started after obtaining the result of deep tissue specimen’s culture and sensitivity within 3 days to be continued until the recovery of infection.

4. Surgical wound debridement to all patients in this study done in the Operative Theater. At the final step of the surgical debridement, cleaning the wounds with normal saline and take tissue specimens and send it in special sterile container within 10-20 minutes to the laboratory for culture and sensitivity only aerobic culture.

5. After the surgical debridement of DFUs start to irrigate the wound in the operating theatre with either Dermacyn solution or Normal Saline solution as topical wound dressing.

6. Start daily dressings with gauze soaked with Dermacyn or normal saline for 8 weeks, and follow up the patients for a year to assess the outcomes of infected DFUs which were:

   a. **Healing:** continuous viable epithelial covering over the ulcer.
   b. **Unhealed ulcer:** not complete re-epithelization of the wound.
   c. **Minor amputation:** limited to the toes or at level of the foot, not need prosthesis for walking.
   d. **Major amputation:** those above the level of ankle, wither below knee, knee disarticulation above knee and hip disarticulation.

**Statistical analysis:** The data (variables and outcomes) were collected for both groups and statistical analysis was done using SPSS version 19. The significant difference between two groups is when p value <0.05.

**Results**

**Demographic and disease characteristics of the studied groups:** Each group contain 33 infected diabetic foot ulcers, male to female ratio (13/20) in group B and (11/22) in group A. Mean age in group A was (52.58±8.37) years and (52.73±8.05) years in group B. Duration of diabetes mellitus (D.M) was 12.24±4.75 years in group A and 12.86± 4.66 years in group B. Duration of symptoms in group A was 21.12±11.5 days and in group B was 21.97 days.

Ten cases (55.6%) of the uncontrolled diabetic patients were in group B while twenty five case (52.1%) of poorly controlled diabetic patients were in group A. According to type of treatment of D.M, most of cases (58.3%) of group A were in oral treatment while most
cases (54.8%) of group B in insulin treatment and oral, and yet all these differences were not significant statistically as shown in Table 1.

**Investigation characteristic of the studied group:**
Most of severe infections (IDSA classification) were in group A (57.1%) while most of moderate infection (55.3%) in group. According to wound classification (U.T), most of cases of group A were Grade 2 Stage B (60.6%) while most of cases of group B were Grade 3 Stage B (60.6%). The most frequent Microorganisms (before wound dressing) for group A is E. coli (36.4%), while it is staphylococcus aureus for group B (N/S) about (30.3%). Although there is some differences between group A and B in IDSA classification, wound classifications and type of Microorganism, the differences are not significant statistically between the two groups seen in Table 2.

**The outcome of diabetic foot ulcers in the studied groups:** The outcome shows most of the patients in group A (Dermacyn) (81.8%) are improved with healed ulcer while (48.5%) of patient in group B ended with healed ulcer. 3 cases (9.1%) ended with unhealed ulcer in group A while 6 cases (18.2%) ended in group B. 3 cases (9.1%) ended with minor amputation while 8 cases (24.2%) in group B. As in Table 3 and this difference is significant statistically.

**The Duration of healing of diabetic foot ulcers in the studied groups** shows there is very significant statistical difference in healing time between group A (Dermacyn) 40.74+ 3.84 days and group B (N/S) 51+3.41 day, As in Table 4.

**Distribution of outcomes of diabetic foot ulcers among types of diabetes control:** highest percent of our studied sample was poorly controlled diabetes and from patients of uncontrolled diabetes more than half of them ended with healed ulcer as well more than 68.8% of poorly controlled diabetes ended with the same outcome, and the difference between the type of diabetes control was not significant regarding the outcome as seen in Figure1.

### Tables and Figures

**Table 1. Demographic and disease characteristics of the studied groups**

<table>
<thead>
<tr>
<th></th>
<th>Group A (Dermacyn)</th>
<th>Group B (N/S)</th>
<th>Solution groups</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>N. of patients</td>
<td>33</td>
<td>33</td>
<td>66</td>
<td></td>
</tr>
<tr>
<td>Male/Female ratio</td>
<td>11/22</td>
<td>13/20</td>
<td>24/42</td>
<td></td>
</tr>
<tr>
<td>Mean age ±Std. Dev (years)</td>
<td>52.58±8.367</td>
<td>52.73±8.052</td>
<td>52.65±8.148</td>
<td></td>
</tr>
<tr>
<td>Duration of D.M (years)</td>
<td>12.24±4.750</td>
<td>13.48±4.56</td>
<td>12.86±4.66</td>
<td></td>
</tr>
<tr>
<td>Duration of symptoms (days)</td>
<td>21.12±11.5</td>
<td>21.96±10.67</td>
<td>21.55±11.03</td>
<td></td>
</tr>
<tr>
<td>HbA1c</td>
<td>Uncontrolled diabetes Count (%)</td>
<td>8(44.4%)</td>
<td>10(55.6%)</td>
<td>18 (100%)</td>
</tr>
<tr>
<td></td>
<td>Poorly controlled diabetes Count (%)</td>
<td>25(52.1%)</td>
<td>23(47.9%)</td>
<td>48 (100%)</td>
</tr>
<tr>
<td>Type of treatment</td>
<td>Oral treatment Count (%)</td>
<td>14(58.3%)</td>
<td>10(41.7%)</td>
<td>24(100%)</td>
</tr>
<tr>
<td></td>
<td>Insulin and oral treatment Count (%)</td>
<td>19(45.2%)</td>
<td>23(54.8%)</td>
<td>42(100%)</td>
</tr>
<tr>
<td>Hb level</td>
<td>Normal Count (%)</td>
<td>13(65.0%)</td>
<td>7(35.0%)</td>
<td>20(100%)</td>
</tr>
<tr>
<td></td>
<td>Anemia Count (%)</td>
<td>20(43.5%)</td>
<td>26(56.5%)</td>
<td>46(100%)</td>
</tr>
<tr>
<td>Renal function</td>
<td>Normal Count (%)</td>
<td>33(55.0%)</td>
<td>27(45.0%)</td>
<td>60(100%)</td>
</tr>
<tr>
<td></td>
<td>Abnormal Count (%)</td>
<td>0(0.0%)</td>
<td>6(100%)</td>
<td>6(100%)</td>
</tr>
</tbody>
</table>

P value is above 0.05 for all these characteristics and the differences are not significant between the two groups.
Table 2. Investigation characteristics of the studied groups

<table>
<thead>
<tr>
<th></th>
<th>Group A (Dermacyn)</th>
<th>Solution type</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Count (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IDSA classification</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate infection</td>
<td>17 (44.7%)</td>
<td>21 (55.3%)</td>
<td>38 (100%)</td>
</tr>
<tr>
<td>Severe infection</td>
<td>16 (57.1%)</td>
<td>12 (42.9%)</td>
<td>28 (100%)</td>
</tr>
<tr>
<td>Wound classification (U.T)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade 2 Stage B</td>
<td>20 (60.6%)</td>
<td>13 (39.4%)</td>
<td>33 (100%)</td>
</tr>
<tr>
<td>Grade 3 Stage B</td>
<td>13 (39.4%)</td>
<td>20 (60.6%)</td>
<td>33 (100%)</td>
</tr>
<tr>
<td>Microorganisms type (before wound dressing)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gram +ve</td>
<td>17 (54.8%)</td>
<td>14 (45.2%)</td>
<td>31 (100%)</td>
</tr>
<tr>
<td>Gram -ve</td>
<td>16 (45.7%)</td>
<td>19 (54.3%)</td>
<td>35 (100%)</td>
</tr>
<tr>
<td>Microorganisms name (before wound dressing)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Staph aureus</td>
<td>10 (30.3%)</td>
<td>10 (30.3%)</td>
<td>20 (30.3%)</td>
</tr>
<tr>
<td>E.coli</td>
<td>12 (36.4%)</td>
<td>6 (18.8%)</td>
<td>18 (27.3%)</td>
</tr>
<tr>
<td>Other bacteria</td>
<td>11 (33.3%)</td>
<td>17 (50.9%)</td>
<td>28 (42.4%)</td>
</tr>
</tbody>
</table>

P value is above 0.05 for all these characteristics and the differences are not significant statistically.

Table 3 the outcome of diabetic foot ulcers in the studied groups

<table>
<thead>
<tr>
<th></th>
<th>Group A (Dermacyn)</th>
<th>Solution groups</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Count (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outcome of diabetic foot ulcers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Healed ulcer</td>
<td>27</td>
<td>16</td>
<td>43</td>
</tr>
<tr>
<td>%</td>
<td>81.8%</td>
<td>48.5%</td>
<td>65.2%</td>
</tr>
<tr>
<td>Unhealed ulcer</td>
<td>3 (9.1%)</td>
<td>6 (18.2%)</td>
<td>9 (13.6%)</td>
</tr>
<tr>
<td>Minor amputation</td>
<td>3 (9.1%)</td>
<td>8 (24.2%)</td>
<td>11 (16.7%)</td>
</tr>
<tr>
<td>Major amputation</td>
<td>0 (0.0%)</td>
<td>3 (9.1%)</td>
<td>3 (4.5%)</td>
</tr>
<tr>
<td>Total %</td>
<td>33</td>
<td>33</td>
<td>66</td>
</tr>
</tbody>
</table>

P value = 0.028

Table 4 The duration of healing of diabetic foot ulcers in the studied groups

<table>
<thead>
<tr>
<th></th>
<th>Solution groups</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Group A (Dermacyn)</td>
<td>Group B (N/S)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Healing duration (Days)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>40.74</td>
<td>51.00</td>
</tr>
<tr>
<td>No.</td>
<td>27</td>
<td>16</td>
</tr>
<tr>
<td>Std. Dev</td>
<td>3.84</td>
<td>3.41</td>
</tr>
<tr>
<td>Range</td>
<td>30-50</td>
<td>46-58</td>
</tr>
</tbody>
</table>

P value <0.00001
Discussion and Conclusion

Super oxidized solution (SOS) will substitutes available antiseptics in the future for topical dressing in infected wounds.

The cytotoxic effect on human fibroblasts leads to limitation in using available antiseptics, in this study we don’t use povidone- iodine (PI) due to their effect on human fibroblasts even in diluted solutions of (PI)at concentration 0.01% and 0.025% leads to regression of fibroblast growth and totally inhibited by concentration of 0.1% and 1% of povidone- iodine16.

In the study done by Luca Dallapoala, 200617, on patients suffering from infected diabetic wounds to evaluate the effect of Dermacyn (SOS) as compared with 10% povidone- iodine (PI). In group A (SOS) with mean age 69.4+ 8.45 years, duration of diabetes melitis 18.2+10.3 years, male/female 69/41 while group B (PI) with mean age 69.8+ 7.53 years, duration of diabetes melitis 16.7+10 years, male/female 76/32.

Outcomes measures, including healing time for group A which was 43 days and 55 days for group B with significant time of healing of DFU. These results just similar to our study which showed healing time of 40.74+ 3.84 days for group A (Dermacyn) days and 51+3.41 days for group B (N/S).

As well, in to Luca Dalla poala et al study the major amputation about 4.5 % in (SOS) groups and 9.3% in group B (PI) while in our study there was no major amputation in group A (SOS), but it was 4.5% in group B (N/S).

In the study of Kanthy 2018 randomized controlled study to compare the effect of topical (SOS) dressing on infected diabetic foot ulcers (group A) group B (topical povidone- iodine dressing), in this study the commonest isolated microorganisms in group A were E.coli and pseudomonas.

E.coli and pseudomonas (26.7%) for each while staph aureus in group B, in our study, the commonest isolated organisms were E. coli (36.4%) in group A (Dermacyn) and staph aureus (30.3%) in group B (N/S)18.

In comparison with study of Marzoq et al, a cohort study to assess outcome of diabetic foot ulcers in Basra/ Iraq. 60% of the cases were healed, 8% were unhealed, 25% ended with minor amputation and 5% ended with major amputation. In our study in group A (Dermacyn) 81.8% of cases were healed, 9.1% were unhealed, minor amputation (9.1%) with no major amputation19.
Dermacyn solution was effective as topical dressing in infected diabetic foot ulcers (DFUs), by decreasing duration of healing of DFUs and improving the outcome.

Acknowledgement: We would like to thank the workers at the Fayha Diabetic Foot Clinis for their help in finishing this study.

Statement of ethics: Written informed consent was obtained from each patient in the study. Ethical approval obtained from the Research Ethics Committee of the Basrah Health Directorate.

Funding source: Self

Disclosure statement: Nil

References


Determinants of Exclusive Breastfeeding Duration on Infants in Girimaya Community Health Center Pangkalpinang City

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Abstract

The practice of early initiation of breastfeeding and exclusive breastfeeding was low in Indonesia. The aim of the study was to analyze sociodemographic factors and post-natal factors of mothers for the duration of exclusive breastfeeding. This type of research was observational with a prospective cohort design. The population was all mothers giving birth in the range from March to April 2017 and recorded in the cohort report at the Girimaya Health Center as many as 37 people. Data analysis used the Logrank Test. The results of the study were the characteristics of respondents, generally aged 20-35 years (75.7%), higher education (59.5%), not working (67.6%), parity ≤ 2 (64.9%), not implementing early initiation of breastfeeding to her baby (67.6%). Macro nutrient intake in mothers, including lack of energy (70.3%), carbohydrates (51.4%), protein (70.3%) and fat (70.3%). Micronutrient intake was lacking, namely calcium (100%), phosphorus (70.3%), iron (100%), vitamin B (73.0%), vitamin C (70.3%). The duration of breastfeeding for infants was up to 2 months of 62.2% and babies not given exclusive breastfeeding of 86.5%. Independent variables that did not have an influence on the duration of exclusive breastfeeding were maternal age (p = 0.281), education (p = 0.985), exclusive breastfeeding (p = 0.688), parity (p = 0.628), early initiation of breastfeeding (p = 0.087), macro and micro nutrient intake (p > 0.05). The duration of exclusive breastfeeding for infants had not reached 6 months and only lasts for 2 months and no independent variables had been found that influenced the duration of exclusive breastfeeding.

Keywords: Exclusive breastfeeding, Early Initiation of Breastfeeding, Macro and micro nutrient intake.

Introduction

Exclusive breastfeeding in the world is still relatively low. Infants under the age of 6 months exclusively breastfed worldwide are still less than 40%¹. The percentage of exclusive breastfeeding in the world is still lacking and the SDGs (Sustainable Development Goals) is targeting an increase in the percentage of infants younger than 6 months who are exclusively breastfed by 50%². Based on the Indonesian Health Profile (2015), the coverage of exclusive breastfeeding in Indonesia was only 55.7%³. This figure has decreased based on the results of Nutrition Status Monitoring (PSG) in Indonesia in 2016 which stated that exclusive breastfeeding coverage only reached 29.5%⁴. The target set in the Ministry of Health’s Strategic Plan (2015-2019) was 50% for exclusive breastfeeding in Indonesia.

Socio-demographic factors have an influence on exclusive breastfeeding. Maternal working status has a strong influence on the failure of exclusive breastfeeding⁵. Working mothers have a greater risk of not giving exclusive breastfeeding than mothers who do not work⁶. The level of income and knowledge of mothers about breastfeeding can influence exclusive breastfeeding⁷.⁸. Post-natal factors experienced by mothers can also influence the failure of exclusive breastfeeding⁹. One of the causes of the production of breast milk is not optimal because of poor nutritional intake of mothers, an unbalanced diet and also consuming less food so the

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production of breast milk is not sufficient for babies. Nutrient intake plays an important role in terms of supporting maximum breast milk production because breast milk production is influenced by the prolactin hormone associated with maternal nutrition\(^{10}\).

The research problem is that the percentage was still low and the target of exclusive breastfeeding in Bangka Belitung was not yet achieved so this research is important and aimed to analyze the main factors that influence exclusive breastfeeding.

**Method**

This study was an observational study with a prospective cohort design. The location of this study was in the working area of Girimaya Health Center in Pangkalpinang City. Data collection was carried out in April-October 2017. The population in this study were all mothers who gave birth in the range from March to April 2017 and were recorded in a cohort report at the Girimaya Health Center in Pangkalpinang City of to 37 people. The sampling technique in this study used total sampling. The research variables were age, education level, working status, parity and maternal early initiation of breastfeeding behavior, macro nutrition and micro nutrition intake, duration of exclusive breastfeeding. Data analysis used the Logrank Test with a significance level of \(p < 0.05\).

**Results**

Table 1 Characteristics of Respondents

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 20 years</td>
<td>3</td>
<td>8.1</td>
</tr>
<tr>
<td>20-35 years</td>
<td>28</td>
<td>75.7</td>
</tr>
<tr>
<td>&gt; 35 years</td>
<td>6</td>
<td>16.2</td>
</tr>
<tr>
<td>Educational Level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Higher education</td>
<td>22</td>
<td>59.5</td>
</tr>
<tr>
<td>Primary education</td>
<td>15</td>
<td>40.5</td>
</tr>
<tr>
<td>Working Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Working</td>
<td>12</td>
<td>32.4</td>
</tr>
<tr>
<td>Not Working</td>
<td>25</td>
<td>67.6</td>
</tr>
<tr>
<td>Parity Number</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 2</td>
<td>24</td>
<td>64.9</td>
</tr>
<tr>
<td>&gt; 2</td>
<td>13</td>
<td>35.1</td>
</tr>
</tbody>
</table>

Table 1 shows that the majority of respondents aged 20-35 years that of 75.7% with high education category of 59.5% and most of the respondents did not work and the number of parities ≤ 2 of 64.9%.

Table 2: Implementation of Early Breastfeeding Initiation, Macro and Micro Nutrition Intake on Respondents

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early Initiation of Breastfeeding (IMD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>12</td>
<td>32.4</td>
</tr>
<tr>
<td>No</td>
<td>25</td>
<td>67.6</td>
</tr>
<tr>
<td>Calories intake</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Over</td>
<td>3</td>
<td>5.4</td>
</tr>
<tr>
<td>Sufficient</td>
<td>12</td>
<td>24.3</td>
</tr>
<tr>
<td>Deficient</td>
<td>22</td>
<td>70.3</td>
</tr>
<tr>
<td>Carbohydrate intake</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Over</td>
<td>7</td>
<td>18.9</td>
</tr>
<tr>
<td>Sufficient</td>
<td>11</td>
<td>29.7</td>
</tr>
<tr>
<td>Deficient</td>
<td>19</td>
<td>51.4</td>
</tr>
<tr>
<td>Protein Intake</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Over</td>
<td>2</td>
<td>5.4</td>
</tr>
<tr>
<td>Sufficient</td>
<td>9</td>
<td>24.3</td>
</tr>
<tr>
<td>Deficient</td>
<td>26</td>
<td>70.3</td>
</tr>
<tr>
<td>Fat intake</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Over</td>
<td>3</td>
<td>8.1</td>
</tr>
<tr>
<td>Sufficient</td>
<td>8</td>
<td>21.6</td>
</tr>
<tr>
<td>Deficient</td>
<td>26</td>
<td>70.3</td>
</tr>
<tr>
<td>Calcium intake</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deficient</td>
<td>37</td>
<td>100</td>
</tr>
<tr>
<td>Phosphor intake</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sufficient</td>
<td>11</td>
<td>29.7</td>
</tr>
<tr>
<td>Deficient</td>
<td>26</td>
<td>70.3</td>
</tr>
<tr>
<td>Iron intake</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deficient</td>
<td>37</td>
<td>100</td>
</tr>
<tr>
<td>Vitamin A intake</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sufficient</td>
<td>31</td>
<td>83.8</td>
</tr>
<tr>
<td>Deficient</td>
<td>6</td>
<td>16.2</td>
</tr>
<tr>
<td>Vitamin B intake</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sufficient</td>
<td>10</td>
<td>27</td>
</tr>
<tr>
<td>Deficient</td>
<td>27</td>
<td>73</td>
</tr>
<tr>
<td>Vitamin C intake</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sufficient</td>
<td>11</td>
<td>29.7</td>
</tr>
<tr>
<td>Deficient</td>
<td>26</td>
<td>70.3</td>
</tr>
</tbody>
</table>

Table 2 shows that most respondents had macro and micro nutrition intake with a category less than the respondent’s nutritional adequacy rate except for Vitamin A intake.

Table 3: Duration of exclusive breastfeeding in the Girimaya Community Health Center

<table>
<thead>
<tr>
<th>Duration of exclusive breastfeeding</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 month</td>
<td>1</td>
<td>2.7</td>
</tr>
<tr>
<td>2 months</td>
<td>23</td>
<td>62.2</td>
</tr>
<tr>
<td>4 months</td>
<td>3</td>
<td>8.1</td>
</tr>
<tr>
<td>6 months</td>
<td>5</td>
<td>13.5</td>
</tr>
<tr>
<td>Exclusive</td>
<td>5</td>
<td>13.5</td>
</tr>
<tr>
<td>Not exclusive</td>
<td>32</td>
<td>86.5</td>
</tr>
</tbody>
</table>

Table 3 shows that the majority of breastfeeding duration was 2 months at 62.2% and only 13.5% included exclusive breastfeeding.
Table 4 Duration of Exclusive Breastfeeding Based on Education, Working status, Parity, and Practices of Early Initiation of Breastfeeding in the Work Area of Girimaya Community Health Center

<table>
<thead>
<tr>
<th>Educational Level</th>
<th>Mean of Exclusive Breastfeeding</th>
<th>Percentage</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>25%</td>
<td>50%</td>
</tr>
<tr>
<td>Low</td>
<td>2.000</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>High</td>
<td>2.045</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Working Status</th>
<th></th>
<th>2</th>
<th>1</th>
<th>1</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Working</td>
<td>1.833</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>0.688</td>
</tr>
<tr>
<td>Not working</td>
<td>2.120</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

| Number of Parities|                                 | 2   | 1   | 1   |     |
|                   | ≤ 2 times                       | 2.083| 2   | 1   | 1   | 0.628|
|                   | > 2 times                       | 1.923| 2   | 1   | 1   |

<table>
<thead>
<tr>
<th>Early initiation of breastfeeding</th>
<th></th>
<th>2</th>
<th>1</th>
<th>1</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Perform</td>
<td>2.833</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>0.087</td>
</tr>
<tr>
<td>Not perform</td>
<td>1.640</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Table 4 shows that most of the variables did not have a relationship with the average duration of breastfeeding with p > 0.05. The average duration of breastfeeding for mothers with low education level and mothers with high education level of 2 months. Then based on the average duration of breastfeeding for working mothers of 1.8 months while mothers who are not working of 2.1 months. The average duration of breastfeeding for mothers with parity ≤ 2 times of 2 months, while mothers with > 2 times of 1.9 months. The average duration of breastfeeding for mothers who performed early initiation of breastfeeding was 2.8 months, while mothers who did not perform early initiation of breastfeeding was 1.6 months.

Table 5: Duration of Exclusive Breastfeeding According to Macro and Micro Nutrition Intake for Mothers in the Girimaya Health Center Work Area

<table>
<thead>
<tr>
<th>Nutrition Intake</th>
<th>Mean Lama Pemberian ASI</th>
<th>Median</th>
<th>Log Rank</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Over</td>
<td>4</td>
<td>4</td>
<td>5.621</td>
<td>0.06</td>
</tr>
<tr>
<td>Sufficient</td>
<td>2.583</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deficient</td>
<td>1.455</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carbohydrate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Over</td>
<td>4.286</td>
<td>4</td>
<td>9.877</td>
<td>0.007</td>
</tr>
<tr>
<td>Sufficient</td>
<td>1.364</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deficient</td>
<td>1.579</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protein</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Over</td>
<td>4</td>
<td>2</td>
<td>4.154</td>
<td>0.125</td>
</tr>
<tr>
<td>Sufficient</td>
<td>2.667</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deficient</td>
<td>1.654</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fat</td>
<td></td>
<td></td>
<td></td>
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Table 5 shows that the majority of nutrient intake had no relationship with the duration of breastfeeding with a value of p > 0.05, except carbohydrate intake which had a significant relationship with the value of p = 0.007.

### Discussion

The results showed that more babies who failed to be given exclusive breastfeeding were 86.5% (32 people) while babies who were successfully given exclusive breastfeeding were 13.5% (5 people). Failure to give exclusive breastfeeding was mostly caused by the mother feeling her baby is hungry and not enough if only given exclusive breastfeeding. The probability of successful exclusive breastfeeding for up to 6 months was 15%.

Failure of exclusive breastfeeding occurs in many people who still have myths and beliefs as well as misconceptions about newborn food. Many myths and beliefs such as “If you want your child to say sweet, then given honey at birth” or also “If you want your child to say firmly, then knife-shaving water should be given.” In addition, the wrong understanding that considers the baby to cry at birth because of hunger so that the baby is immediately given food such as porridge, fruit, and drinks such as tea and even coffee. In addition, the lack of knowledge about exclusive breastfeeding can have an impact on the failure of exclusive breastfeeding. Based on interviews with several respondents, many of the respondents knew about breastfeeding but not exclusive breastfeeding. Respondents feel successful in giving exclusive breastfeeding even though they had previously tried formula milk. Respondents feel proud to give breast milk although not exclusively.

The average education of respondents was high school/vocational school, education is one of the factors that influence knowledge, education that has been taken by someone will affect their knowledge about nutrition. Good nutritional knowledge will cause someone to be able to compile a good menu for consumption.

A person’s sufficient nutritional knowledge will increasingly take into account the type and amount of food he gets for consumption.

Interviews with several respondents indicated that the respondent’s husband did not allow his wife to work even though the respondent was able and willing to work. The results showed that there was no relationship between maternal working status and duration of exclusive breastfeeding. Mostly, failure to give exclusive breastfeeding not from working mothers but from mothers who did not work. Work is not a reason for not giving exclusive breastfeeding. Many ways can be performed so that mothers can continue to give milk to their children, one of which is by milking it and storing it in the refrigerator. Mother’s work was expected to have a major influence on breastfeeding behavior by mothers because mother’s work will affect the time that a mother can set aside to take care of her child.

Then, mothers with children ≤ 2 should be able to focus more attention on their babies so that they give more exclusive breastfeeding. On the contrary, the percentage of failure to give exclusive breastfeeding to mothers with a number of children ≤ 2 was higher. This can be caused by a lack of information that is known by mothers and mothers feel able to provide formula milk. The time of early initiation of breastfeeding significantly influenced the continuity of exclusive breastfeeding for infants 0-6 months. The hazard ratio between the time of initiation more than the first hour after birth and the time of initiation in the first hour was 1.661. This showed that the time of initiation of breastfeeding more than one hour after birth had a risk of 1.661 times greater than the time of initiation of breastfeeding in the first hour to start giving food other
than breast milk. Early initiation of breastfeeding can create a bond of love between mother and baby so as to increase the duration of exclusive breastfeeding\(^2\).

**Conclusion**

The probability of duration of exclusive breastfeeding for infants up to 6 months was only 15%. Variables that did not significant relationship duration of exclusive breastfeeding were age, education, working status, parity, early initiation of breastfeeding, macro and micronutrient intake.

**Ethical Clearance:** Taken from Health Polytechnic of Pangkalpinang committee.

**Source of Funding:** Health Polytechnic of Pangkalpinang

**Conflict of Interest:** None

**References**


Ethical Issues in Relation to Evidenced-Based-Medicine and Hippocratic Oath

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Abstract

During the past few years, there has been a burgeoning interest in evidence based medicine. Doctors practising evidence-based medicine will identify and apply the most efficacious interventions to maximize the quality and quantity of life for the individual patient, and this should raise rather than lower the cost of their care.

The unlimited needs of human beings would not have been a problem if we had all the necessary and sufficient resources. The fact is, however, that our resources are limited. The Hippocratic Oath teaches us to care for individual patients and to enhance their welfare, irrespective of resource constraints. By focusing on the needs of the individual patient, advocates of evidence-based medicine refuse to acknowledge the benefits in terms of future treatment of other patients. The present writer will discuss, with various examples, the need to redefine the centuries-old ethical issues based on the lines of the Hippocratic Oath in relation to the care of today’s patient.

Keywords: Ethics, Evidenced-based medicine, and Hippocratic Oath.

Introduction

In recent times close scrutiny of the ethical behaviour of doctors has produced some negative consequences. During the millennia in which medicine has been practiced, much has been written about ethics. Nowadays, there is no shortage of codes, declarations and of ethics committees to tell us what to do. These developments raise questions of the status of the general principles of ethics and of the significance of particular assertions in that field. There is also the important question of whether or not there has been, or is, any connection at all between utterances about medical ethics and the behaviour of the members of our profession. The present writer believes that the ethical problems confronting doctors are becoming more complex, and that they need to be addressed before they cause irreversible damage.

Determining the allocation of limited critical care resources is an inevitable development. Criteria proposed to assign such limited resources among patients are not defined. It has been argued that the allocation of critical care resources could be based on the principals of patient entitlement to health care, responsibilities of the physician to the critically ill patient, and beneficence. However, based on analysis of the philosophical tenants of the Hippocratic Oath, there is little to support the concept of “sin” taxes or patient triage on the basis of judgment on the moral merit of the patient.

Euthanasia: The legalization of euthanasia created certain tension when it was compared with those traditional medical principles that seemed to embody respect for the sanctity of life. It also created a real need for us to explore what is meant by “harm in relation to dying patients”. When we consider that we must train physicians so that they not only understand ethical issues, but also show the virtues in their clinical practice, it becomes imperative for us to strive to train them in virtue rather than in mere knowledge. We can only do this by conveying a real sense of sincerity to the needs of the patient and an ability to relate to patients as people, and not as problems. Such attitudes take shape in a training programme in which practical situations
are explored and discussed and the limits of scientific medical responses to those challenges are exposed.\textsuperscript{4}

**Costs Vs Ethics:** Unfortunately, this kind of practice is hardly seen in clinical practice, and in the present writer’s, the human race is moving in the wrong direction and therefore is regressing.

The recent approach of family practitioners in their training programme could be appreciated, especially the issue of teaching human development and behaviour. It seems that the rhetoric of the market has been submerged in legislation and managerial rules which tend to increase the power of central administrators instead of delegating control to local providers and purchasers. Would a new Hippocratic Oath require the delivery by professionals of knowledge-based medicine be as efficient, but have lower transaction costs than the creation of an internal market? Who should regulate the health care market, and how?

How best can reform be sequenced? Is reform in funding an essential ingredient in the reform process?\textsuperscript{3} A few years ago, when ethical problems in Germany were discussed in public, the Hippocratic Oath was quoted as the valid norm for medical ethics. Although no physician swears this oath in Germany, it is necessary to know its contents, its origin and its role in the history of medicine. And it is also necessary to raise some questions: What are the ethical claims of the Hippocratic Oath? Does it really originate from Hippocrates? Do specific medical ethics exist over time? Do specific medical ethics exist in general? And if it exists, can it be normative ethics? A short survey of the multiple dependence of the medical situations shows that ethics in medicine must undertake a new beginning. It cannot be normative ethics; it cannot be situation ethics; it must be differential ethics. It has to respect rules and declarations, but it also has to compare the benefits and risks. In the centre of such ethics stands the responsibility of the physician. To assume this responsibility, the physician needs knowledge, the ability to make decisions, as well as a conscience.\textsuperscript{4}

The modern clinical trial is a form of human experimentation. There is a long history of disregard for individual rights of patients in this context. Steps must be taken to protect the interests of the patient when such outside influences exist. Physicians must respect the individual patient’s rights and hold such interest paramount. These principles are the basis for informed consent.\textsuperscript{5} The changing nature of health care delivery in the South Africa should look after the interest of the population’s health, bearing in mind individual rights.

Physicians are taught in the Hippocratic tradition to care for individual patients and enhance their welfare, irrespective of resource constraints. If physicians enjoy clinical freedom, meaning the freedom to practise inefficiently, then “clinical freedom is dead, and no one regrets its passing.”\textsuperscript{6} Inefficient practice deprives other patients of care from which they could benefit. In the world of economic recession, resources are limited due to limited allocation of budget in the health sector. There is a need to optimise resource allocation.

**Evidenced–Based-Medicine Vs Ethics:** By focusing on the need of the individual patient, advocates of evidence- based medicine refuse to acknowledge that this opportunity is lost - i.e. benefits in terms of the future treatment of other patients. Such an approach is perceived as unethical by those who are concerned with achieving maximum health benefits for the general population from a limited budget. As Maynard contends, “to ignore costs is to ignore the risk to others of premature mortality and avoidable suffering.”\textsuperscript{7} Doctors practising evidence-based medicine will identify and apply the most efficacious interventions to maximise the quality and quantity of life for individual patients. This may raise rather than lower the cost of their care.\textsuperscript{7} If the patient has cancer of the neck and face, he may prefer to die rather than receive “commando surgery” which would give him only a few months of poor quality life, justifying voluntary euthanasia.

The Hippocratic Oath preaches to physicians to do everything possible for the individual patient. This is alright ethically if you have unlimited financial resources. In this world a patient can be treated using one of two therapies, A and B. A proponent of evidence-based medicine contends that the choice of therapy should be determined by the systemic review of the current knowledge base.\textsuperscript{8} Thus, if therapy A produces 5 years of good life or healthy years of life, and therapy B produces 10 years, a physician who favours evidence-medicine would choose therapy B.

Physicians who disregard costs in making decisions for their patient’s therapy may use the community’s scarce health-care resources inefficiently. For example, if therapy A costs R1500 and therapy B costs R7000, then therapy A produces a unit of outcome better, a healthy year of life for R300, whereas therapy B produces a healthy year for R700. So therapy B, relative to therapy A, produces 5 healthy years of life for R5500. In terms of value for money, therapy A is a more cost-
effective treatment: it produces a healthy year for only R300. Given a fixed budget of R70 000, therapy A will produce over 130 healthy years more than therapy B.

A proponent of evidence-based medicine, who advocates efficacy as the factor that determines the physician choice, would select therapy B if he practised what he preached. The public health physician concerned with achieving the maximum number of healthy years of life from a given budget (in South Africa 260 billion rands in one financial year) would opt for therapy A. Thus, the physician who supports an evidence-based approach would argue that scarce resources be allocated on the basis of interests of the individual patient and efficacy. By contrast, the public-health physician would contend that scarce health-care resources be allocated according to the interests of the society as a whole, and on the basis of efficiency. Here, we must have to review the Hippocratic traditional Oath, placing individual patient ethics against population-health link ethics.

Acquired Immunodeficiency Syndrome (AIDS) caused by the human immunodeficiency virus (HIV) may turn out to be the largest lethal epidemic infection ever. The estimated global number of HIV-infected adults in 1993 was 13 million, with projections of up to 40 million by the year 2000. Now the ethical considerations arise. Are surgeons obliged to operate on HIV-positive or AIDS patients? Some surgeons adhere strictly to the Hippocratic Oath, whereas others reserve the right to be selective on whom they operate, except in emergencies. Is it worth to operate on a haemodialysed advanced case of AIDS? Is it important to adhere to the Hippocratic Oath to save each and every life in such hopeless cases? There appears to be no problem if we have unlimited resources, but when the budget is limited then we are wasting money on hopeless patients at the cost of the population at large.

The Hippocratic physician did not treat hopeless cases, and that such an approach was not only consonant with paradigms of ancient medicine, but with contemporary medicine as well. The contemporary attitude towards the treatment of hopeless cases and the concept of “supportive treatment” and “palliative therapy” are probably based on cost saving for the benefit of the population at large. Furthermore, a review of 20th century practice and a content analysis of the Oath administered in medicals school in US and Canada observed that the Oath was changing with time.

**Conclusion**

The Hippocratic Oath is poorly and differently practiced in the medical profession. It has also different meanings for different physicians in different parts of the world. Whatever its significance, if justice is sought for the individual patient to preserve his/her life, this will cost enormous amounts should you practice evidence-based medicine in the Hippocratic way. These limited resources could be efficiently utilised to save many more lives. Therefore, it is the present writer’s position that the Hippocratic Oath must be revised, keeping in the mind that we have to serve more people with limited resources.

**Ethical issue:** This report approved by ethical committee of University of Transkei, south Africa for publication.

**Conflict of Interest:** None

**Source of Funding:** It is self-funded.

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The Effect of Periapical Radiography X-Ray Radiation on Platelets, Leukocyte, Hemoglobin and Mean Corpuscular Volume (MCV) in Mice (Mus Musculus)

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Abstract

Periapical radiographs are intraoral radiographs that can provide clearer and more detailed information about the teeth and surrounding tissue. Based on the recommendations of the International Atomic Energy Agency (IEA) and the Nuclear Energy Supervisory Agency (BAPATEN), the dose level for intraoral dental examination is 7 mGy. X-ray radiation produced by periapical radiographs can cause cell damage in the body, which one of the cells that is damaged is hematopoietic cells in the bone marrow.

Purpose: The purpose of this study was to prove a decrease in thrombocytes (platelets), leukocytes, hemoglobin count and the value of Mean Corpuscular Volume (MCV) in mice (Mus musculus) due to X-ray radiation periapical radiographs.

Method: This study was a true experimental design with a post test only with control group design that was given 1, 7, and 10 times the exposure of periapical radiographs of X-ray radiation in the treatment group then compared to the untreated control group. The measurement of the dose absorbed by the mouse in this study was carried out using dosimeters, and after 24 hours the treatment was given, it is then calculated the number of mouse leukocytes by using a hematology analyzer.

Results: The results showed a decrease in blood in the first exposure group, which are platelets 713 x103 cells / μL, leukocytes 7.61 × 103 / μL, hemoglobin 13.71 g / dL, and MCV 52.967 fl. The decrease in the 7-exposure group was platelets 699.5x103 cells / μL, leukocytes 6.03 × 103 / μL, hemoglobin 12.81 g / dL, and MCV 52.167 fl. The decrease in the 10-exposure group was platelets 688,833 x103 cells / μL, leukocytes 5,20 × 103 / μL, hemoglobin 12,06 g / dL, and MCV 51,483 fl. Thus, it can be concluded that the decrease in number that occurs in mouse is still within the normal limits.

Keywords: Periapical radiographs, platelets, leukocytes, hemoglobin, MCV.

Introduction

Periapical radiographs produce X-ray radiation which can cause ionization in body cells. Ionization can cause cell damage in the body, one of the cells that is damaged is hematopoietic cells in the bone marrow.1,2 Radiation doses of 1-10 Gy result in severe hematopoietic cell damage and hematopoietic cells that have a difficult damage to repair. X-ray radiation less than 1 Gy can also result in hematopoietic cell damage, but hematopoietic cells that experience the damage can be repaired.3,4,5,6

Decreased platelets and leukocytes due to X-ray radiation occur on the first and second day after radiation.3,5,11 Dentists who carry out invasive actions in thrombocytopenia patients can increase the risk of prolonged bleeding. As well as post surgery, a good immune system is expected from the patient to help the wound healing process. The results of this study are aimed at making dentists more careful in carrying out invasive actions to patients after one and two days of periapical radiograph radiographs, and reducing the risk of developing oral disorders such as SAR.5,12,13
Patients who receive a larger dose of X-ray radiation will experience a greater effect on the body, therefore the International Atomic Energy Agency (IAEA) and the Nuclear Energy Supervisory Agency (BAPETEN) make limits on doses that can be absorbed by patients for intraoral radiographic examination is 7 mGy. In fact, many patients repeat repetition of periapical radiographs. Repeated shooting can result in larger patients receiving radiation doses, even patients can receive doses above 7 mGy.\textsuperscript{4,14,15,16}

Based on the description of the background above, the researcher wanted to examine the effect of periapical radiographs of X-ray radiation on the decrease in platelet counts, leukocytes, hemoglobin, and MCV in mice.

**Materials and Method**

This study uses a true experimental research design by using post-test only with control group design. The samples in this study were 24 male mice with the age of 3-4 months and 25-30 grams of body weight. The material used in this study is a 5 ml Diethyl ether and anti-coagulant in the form of 10% EDTA. The tool used during this study was the dental radiographic unit brand ASAHI with a power supply of 60 kv electric current of 10 mA, dosimeter, wire cage to put mice when radiographed, 1 ml syringe, micro tube which already contained 10% EDTA as much as 0.01 ml, mice maintenance cages, eating places and mice drink bottles, hematology analyzers and stopwatch.

In the first stage of the study, mice were adapted for 7 days by being fed BR2 Comfeed and standard distilled water. The adaptation that was carried out, then followed by grouping mice randomly into 4 groups, namely the control group, group 1 X-ray radiation exposure, group 7 exposure to X-ray radiation, and group 10 times the exposure to X-ray radiation.

The dose produced at one time X-ray radiation is 0.95 mGy. The exposures were carried out 1.7 and 10 repetitions with a distance of 1 minute interval in each repetition. Mice that have been carried out X-ray radiation at the Gusti Hasan Aman Hospital RSGM Banjarmasin will be taken to the Banjarbaru Veterinary Center for blood sampling.

24 hours after X-ray radiation, it is anesthetized then, taken blood in the heart of mice using 1 ml syringe. The blood sample that has been obtained will be placed in the microtube in which there is 10% EDTA as much as 0.01 ml. The blood samples that have been obtained will be carried out a complete blood test using the hematology analyzer, and the results of the data obtained will get parametric tests using One Way Anova.

**Results**

When doing X-ray radiation in mice, the researcher also calculated the doses amount of X-ray radiation absorbed by mice using dosimeters. The number of radiation doses received by mice at 1 time X-ray radiation exposure is 0.95 mGy, the dose received by mice at 7 times exposure to X-ray radiation is 6.64 mGy, and the dose received by mice at 10 times exposure to X-ray radiation is 9.54 mGy. Twenty-four hours after X-ray radiation periapical radiographs in mice, blood was taken to measure platelet counts, leukocytes, hemoglobin and MCV of mice.

![Platelet counts in mice in each treatment](image)

![Leukocyte counts in mice in each treatment](image)
In Figures show that there is a decrease in platelet count, hemoglobin and MCV leukocytes after mice receive X-ray radiation. The greater the frequency of exposure to periapical radiographs of X-ray radiation, the greater the decrease in platelets, leukocytes, hemoglobin and MCV in mice. This shows that the more the frequency of repetition of periapical radiographs, the greater the effect caused to the body.

The results of the data on the average platelet count, hemoglobin and MCV leukocytes after mice receive X-ray radiation. The greater the frequency of exposure to periapical radiographs of X-ray radiation, the greater the decrease in platelets, leukocytes, hemoglobin and MCV in mice. This shows that the more the frequency of repetition of periapical radiographs, the greater the effect caused to the body.

The results of the data on the average number of leukocytes, then a normality test was performed using Saphiro-Wilk. The results of the normality test show that the data is normally distributed. This is because in each treatment p > 0.05 with a significance value in the control group is 0.456, in the group 1 time exposure is 0.632, in the group 7 times exposure is 0.415 and in the group 10 times exposure is 0.349. The results of the study with a significance value of p = 0.909.

The results of the data on the average amount of hemoglobin then a normality test was performed using Saphiro-Wilk. The results of the normality test show that the data is normally distributed. This is because in each treatment p > 0.05 with a significance value in the control group is 0.361 and in the group 10 times exposure is 0.51. The results of the study were continued with homogeneity tests with Leven’s test. In the homogeneity test shows that the data is distributed homogeneously with a significance value of p = 0.124.

The results of the data on the average number of MCVs, then normality tests were performed using Saphiro-Wilk. The results of the normality test show that the data is normally distributed. This is because in each treatment p > 0.05 with a significance value in the control group is 0.361 and in the group 10 times exposure is 0.51. The results of the study were continued with homogeneity tests with Leven’s test. The homogeneity test shows with a significance value of p = 0.866.

Data that has been normally distributed and homogeneous will be continued with the One Way ANOVA parametric test with a confidence level of 95% (α = 0.05) to determine whether there is a difference in the spread of data. The One Way ANOVA test results obtained p = 0.000, which means that there are significant differences between the treatment groups. Furthermore, the data analysis was continued by a follow-up test, the Bonferroni Post Hoc test.
Providing the results of Post Hoc Bonferroni, it can be seen that in the control group there were significant differences with the group 7 times exposure to X-ray radiation, and the group 10 times exposure to X-ray radiation. One group of X-ray radiation exposures showed significant differences with the group 10 times exposure to X-ray radiation.

**Discussion**

The decrease in platelet counts, leukocytes, hemoglobin and MCV in this study occurred because of the damage to **Hematopoietic stem cells (HSC)** in the bone marrow. Periapical radiographs of X-ray radiation produce ionization energy.\(^5,17,18\)

X-ray radiation that causes HSC DNA damage in SSBs is easy to repair, so the HSC will return to normal. SSCs undergoing HSB damage will go through several stages of the repair process including detection of damaged DNA strands, cutting of damaged DNA strands, damaged DNA strand synthesis, and the process of connecting new DNA strands. The SSbs protein repair process requires UvrABC protein.\(^19\)

X-ray radiation that damages HSC DNA by DSBs will be detected by the RAD50 protein. The RAD 50 protein that has detected damage will activate the Ataxia Telangiectasia Mutated (ATM). The ATM serves to activate Checkpoint kinase 2 (CHK2), CHK2 will work by stopping cell mitosis and carrying out checks on damaged cells. ATM also activates P53, then the activated P53 will activate the upregulated modulator of apoptosis (PUMA) p53 to begin the apoptosis process. PUMA works in two ways, namely by activating proapoptotic proteins such as Bax and Bak, and blocking the work of antiapoptotic proteins such as BCL-2 and BCL-x. Proapoptotic proteins that have been active will cause disruption of the integrity of mitochondrial cells, so that cytochrome-c which initially binds to mitochondria will be released and bind to Apaf-1. The bond between cytochrome-c and Apaf-1 will cause caspase 9 activation and end in Activation of caspase 3 will cause endonuclease proteins to fragment DNA, besides that caspase 3 also causes proteases to degrade cell nuclei and cell cytoskeleton. The nucleus and cytoskeleton of cells that have been damaged will cause cells to experience apoptosis which will eventually form apoptotic bodies.\(^14,17,21\) Apoptosis that occurs in HSC results in disruption of blood cell production in the body which results in decreased platelet counts, leukocytes, hemoglobin and MCV in the body’s circulation.\(^22,23,24,25\)

The results of this study indicate that there is a decrease in platelet count, leukocytes, hemoglobin and MCV values that are not significant in the group 1 time radiation exposure with the dose produced at 1 time exposure is 0.95 mGy, the dose of 0.95 mGy is still far below the dose limit set by BAPETEN. There was a decrease in platelet count, leukocytes, hemoglobin and a significant MCV value in the group given 7 times exposure to X-ray radiation with the dose produced at 7 times exposure was 6.64 mGy. The decreased platelet count, leukocytes, hemoglobin and significant MCV values were also seen in the group 10 times exposure to X-ray radiation with the dose produced at 10 exposures was 9.54 mGy, the dose had exceeded the radiation dose limit set by BAPETEN. The decrease in platelet value, leukocytes, hemoglobin and MCV values in this study were compared with the control group.\(^4,14,15\)

That increasing the dose of X-ray radiation periapical radiography can cause a decrease in the number of leukocytes that are increasingly significant. Showed a significant reduction in leukocyte counts in rats receiving larger radiation doses, namely the number of rat leukocytes in the control group at 9.99×10^3/μL, the number of leukocytes in the group with the dose of 0.1 Gy was 9.41×10^3/μL and the number of leukocytes in the group with a dose of 0.5 Gy was 6.47 ×10^3 / μL. This is because mice have a normal leukocyte count of 2-10×10^3/μL. Statistically the administration of 7 and 10 repetitions of exposure with doses absorbed close to and above 7 mGy showed a significant reduction in leukocyte count. This study remains to be minimized because the decrease in hemoglobin and MCV is the trigger factor for recurrent aphthous stomatitis (RAS) which is one of the ulcers in the oral cavity that causes pain.\(^24\)

In this study it can provide information to the public that the effects after x-ray periapical radiographs are not as dangerous as the effects caused by radiotherapy. Based on this study stated that 7 times the frequency of x-ray repetition periapical radiographs is the maximum frequency limit that can be done to patients, it would be better if the frequency of radiograph periapical radiograph repetition was given to patients less than 7 repetitions.\(^15,16\)

**Source of Funding:** Domestic government
Conflict of Interest: There is no conflict of interest in this study.

Ethical Clearance: This study obtained a label of ethics escaped by the number:136/KEPKG-FKGULMM/EC/I/2019 on Januari 2019.

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Radiation Doses from Computed Tomography Practice in Regional Hospital Center Hassan II of Agadir, Morocco

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Abstract

Purpose: Radiation doses for Computed Tomography (CT) procedures have been reported, including a total of 120 CT examinations conducted in radiology service of Hassan II hospital of Agadir.

Materials and Method: This study consisted of examining the data of a total of 120 patients at the rate of 30 per localization. All CT examinations were performed with a GENERAL Electric 16 CT with Automatic Exposure Control System. The data that collected for each diagnostic exam chosen included scanner acquisition parameters, number of series, use of the contrast medium, and rotation time as well as slice thickness, the displayed CT dose index (CTDIvol) and the Dose Length Product (DLP). Effective dose and DRL were evaluated using the International Commission on Radiological Protection (ICRP) conversion factor and approach.

Results: The average effective dose (Eeff), the displayed CT dose index (CTDIvol), dose length product (DLP) were 7,28±2,35 mSv, 10,80±3,80 mGy and 428,35±138,26 mGy.cm respectively at chest CT. For abdomen-pelvis CT, there were 12,48±5,58 mSv, 9,30±2,99 mGy and 805,43±359,98 mGy.cm respectively. Those at chest abdomen-pelvic CT were 11,72±3,98 mSv, 10,82±2,53 mGy and 755,97±251,52 mGy.cm respectively. For lumbar CT, there were 12,12±2,32 mSv, 26,46±5,24 mGy and 787,00±14937 mGy.cm respectively.

Conclusion: Our values are lightly higher than the standards of some European countries. This first ever survey of CT practice in Hassan II Hospital of Agadir confirmed the need to improved training of health professionals involved in computed tomography on factors affecting image quality and dose and protocols optimization.

Keywords: CT examinations, Radiation Risks, effective Dose, DRLs.

Introduction

Computed tomography (CT-scan) is recognized as the most significant medical source of human exposure due to ionizing radiations in diagnostic radiology. In its 2008 annual report, the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) estimated that, on a global scale, CT-scans represented only 5% of medical imaging procedures but contributed 34% to the annual collective dose 1. Patients’ radiation protection must consequently be increased during CT-scan examinations.

With fast and constant technological improvements, CT-scan has become the most required examination in various clinical situations. Several indications, such as pretherapeutic workup of diverse malignant tumours...
and total body scan, request the exploration of different regions of the body, and thus the raise of patient-dose. North African countries as Morocco experienced the augmentation number of CT-scan machines in public and private health facilities. In 2018 more than 250 CT machines are available in Morocco compared to 125 in 2007.

To decrease patients’ exposition to x-rays, the principles of justification and optimization are the basis. Regular use of clinical imaging reference guidelines is the key for justification. The principle of optimization is the liability of manufacturers, the radiologists and radiographers who must try to use the lowest doses for appropriate image quality (ALARA). The diminution of patient-dose needs then the accurate application of optimization principle which requires to have “diagnostic reference levels” (DRLs) as an optimization tool. They are a simple standard for identifying situations where the patient’s dose levels are strangely high. Every user of ionizing radiation should refer to these DRLs to assess his practice. During CT examinations, the CT dose index (CTDI), the Dose Length Product (DLP) and the effective dose are the most ordinary used dosimetric parameters for DRLs. 97/43 Euratom Directive requires to each state member to improve and use DRLs.

In Morocco, although the increasing numbers of CT-machines, the Diagnostic Reference Levels (DRL) has not furthermore been established. Former studies have shown large variability in the dose administered to patients for the same types of examinations.

This pilot study was to estimate the doses delivered during four (CT) procedures in order to establish local diagnostic reference level (DRL) per CT scan examination in Hassan II Hospital of Agadir.

**Materials and Method**

The data used in this study were collected from the radiology service of Hassan II Hospital of Agadir. All CT examinations were performed with a GENERAL Electric 16 CT with Automatic Exposure Control System. The machines are regularly controlled for quality measurements and all the measure parameters were within acceptable range.

A total of 120 patients were considered for four CT imaging procedures in this study. Patient-related parameters (age, diagnostic examination purpose, use of contrast media) and patient dose were collected. In addition, other exposure-related parameters were taken into consideration such as gantry tilt, tension (kV), tube current (mA), exposure time, slice thickness, table increment, number of slices, and start and end positions of scans on patient dose the displayed CT dose index CTDI$_{vol}$ (mGy) and the dose length product DLP (mGy, cm). Effective dose and DRL were evaluated using the International Commission on Radiological Protection (ICRP) conversion factor.

Statistical analysis was performed using Microsoft Office Excel 2007. Quantitative variables are expressed as arithmetic mean (denoted further as mean), third quartile (75th percentile). The CT data were analyzed using descriptive statistics. For multi-phase studies, average CTDI$_{vol}$ (mGy) per sequence and total DLP per examination were calculated as representative values used for further analysis. Median DLP and CTDI$_{vol}$ (mGy) data were used to estimate the typical dose. The DRL for Hassan II Hospital of Agadir were set based on the rounded third quartile values of distributions of medians for the CTDI$_{vol}$ (mGy) and DLP (mGy,cm) values. The results were compared with international DRL data.

**Results**

Of the 120 CT-examinations collected, 25% were chest, 25% abdomino-pelvic, 25% chest-abdomen-pelvis and 25% lumbar spine 25% chest. The mean age of patients was 48 ± 17 years [20 - 90 years] with 60% aged 45-year-old.

**Acquisition Parameters**: For the four procedures, all protocols were helical with a voltage of 120 kV. The maximum mAs was recorded for Chest abdomino pelvic and lumbar spine CT-scans (350 mAs average) with highly variable acquisition parameters (Table N°1).

**Table No. 1: Mean Acquisition parameters for the four commonest CT-exams**

<table>
<thead>
<tr>
<th>CT-Procedures</th>
<th>kV</th>
<th>mAs</th>
<th>Length of acquisition (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chest</td>
<td>120</td>
<td>163</td>
<td>42</td>
</tr>
<tr>
<td>Abdomen pelvic</td>
<td>120</td>
<td>183</td>
<td>78</td>
</tr>
<tr>
<td>Chest abdomen pelvic</td>
<td>120</td>
<td>350</td>
<td>69</td>
</tr>
<tr>
<td>Lumbar spine</td>
<td>120</td>
<td>350</td>
<td>29</td>
</tr>
</tbody>
</table>

**Patient-Doses for Four Commonest CT-Exams:**

The greatest DLP was observed on lumbar spine CT-scans (mean 651 mGy,cm) but the most variability of patient-doses was found in the abdomen pelvic CT with differences up to 7 times (Table No. 2).
Table No. 2: Means and ranges of CTDI\textsubscript{vol} and DLP for each group of CT-scans procedures

<table>
<thead>
<tr>
<th>CT Procedures</th>
<th>CTDI\textsubscript{vol} (mGy)</th>
<th>DLP (mGy·cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Range</td>
</tr>
<tr>
<td>Chest</td>
<td>9</td>
<td>5-17</td>
</tr>
<tr>
<td>Abdomen pelvic</td>
<td>6</td>
<td>4-11</td>
</tr>
<tr>
<td>Chest abdomen pelvic</td>
<td>9</td>
<td>5-15</td>
</tr>
<tr>
<td>Lumbar spine</td>
<td>22</td>
<td>15-28</td>
</tr>
</tbody>
</table>

57th Percentiles of CTDI\textsubscript{vol} and DLP Compared to Some Countries’ Values

The 57th percentile of the distribution of DLPs in our sample allowed us to determine DRLs for chest, abdominopelvic, chest abdominopelvic and lumbar spine CT-scans for adults in radiology service of Hassan II hospital of Agadir (Table N°3).

Table No. 3: DRLs for CT procedures from our study compared with other studies.

<table>
<thead>
<tr>
<th>CT Procedures</th>
<th>Our study DRLs</th>
<th>France 2016\textsuperscript{13}</th>
<th>UK 2014\textsuperscript{14}</th>
<th>Cameroun 2017\textsuperscript{15}</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CTDI</td>
<td>DLP</td>
<td>CTDI</td>
<td>DLP</td>
</tr>
<tr>
<td>Chest</td>
<td>11</td>
<td>428</td>
<td>9</td>
<td>344</td>
</tr>
<tr>
<td>Abdomen pelvic</td>
<td>9</td>
<td>805</td>
<td>13</td>
<td>641</td>
</tr>
<tr>
<td>Chest abdomen pelvic</td>
<td>11</td>
<td>756</td>
<td>11</td>
<td>771</td>
</tr>
<tr>
<td>Lumbar spine</td>
<td>26</td>
<td>787</td>
<td>30</td>
<td>762</td>
</tr>
</tbody>
</table>

Discussion

We carried out this descriptive study in order to propose DRLs in radiology service of Hassan II hospital of Agadir for four commonest adults CT-scans examinations. The 57th percentile of DLP for chest, abdominopelvic, chest abdominopelvic and lumbar spine CT-scans were respectively 428 mGy·cm, 805 mGy·cm, 756 mGy·cm and 787 mGy·cm.

The DRLs from our study are globally higher than those in United Kingdom \textsuperscript{14}, apart from the chest abdominopelvic procedure. On the other hand, our DRLs are lower than those in Cameroon \textsuperscript{15} for chest CT-scan. Our patient-doses are then between DRLs of an industrialized country as United Kingdom with very modern facilities and advance culture of optimization and the DRLs of an African country like Cameroon. While waiting for a national campaign for establishing DRLs, those determined in this study can be used for optimization in Hassan II Hospital of Agadir. For patient radioprotection reasons, Radiologists should systematic include notification of DLP on radiological reports.\textsuperscript{7}

Higher DRLs are observed on lumbar spine CT-scans as in United Kingdom, France and Cameroon\textsuperscript{12-14}; this can be explained by the presence of numerous high attenuating bony structures in the spine requiring the application of high doses for adequate images quality.

In this first pilot study, we have assessed preliminary results which can already be used for optimization though waiting for national study for establishment of DRLs with the support of the competent authorities. Further studies are also requested to establish DRLs in pediatric CT and conventional radiography in Morocco.

Conclusion:

In radiology department of Hassan II Hospital of Agadir, DLP values of 428 mGy·cm, 805 mGy·cm, 756 mGy·cm and 787 mGy·cm respectively for chest, abdominopelvic, chest abdominopelvic and lumbar spine CT-scans can be used as diagnostic reference levels in CT imaging in adults. These values are lightly higher than the standards of some European countries. This first ever survey of CT practice in Hassan II Hospital of Agadir confirmed the need to improved training of health professionals involved in computed tomography on factors affecting image quality and dose and protocols optimization.

Ethical Clearance: All authors hereby declare that all experiments been performed in accordance with ethical standards laid down in 1964 Declaration of Helsinki.

Source of Funding: Self-funded by authors.

Conflict of Interest: Nil
References


3. Health map situation of the supply of care, January 2018, Ministry of Health Morocco


Validity, Inter- and Intra-Reliability of New Equipment Innovation for Increasing Lung Volume Training and Measuring Chest Expansion Measurement among Healthy People

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Abstract

Objective The purposes of this study were to investigate the validity and reliability of new equipment innovation for increasing lung volume training and measuring chest expansion in healthy people.

Method This study considered 30 healthy participants (15 male, 15 female) who were aged between 18 to 70 years (47.23± 19.29 years). The chest expansion measurements were taken with cloth tape measurement at 3 levels of the rib cage (upper, middle and lower levels). The lung volume training was determined by intensive spirometer (vodylne). The new equipment innovation was investigated through chest expansion and lung volume.

Results The pearson’s correlation analysis was performed to establish the validity of cloth tape and new equipment innovation. The study findings suggested that the investigated measurement tools were significantly correlate with the upper, middle and lower chest level chest expansion and lung volume considering (r = 0.898, r = 0.925 and r = 0.896, p < 0.05, respectively). Moreover, validity of new equipment innovation and vodylne showed significantly good correlation in upper, middle and lower chest level (r = 0.668, r = 0.689 and r = 0.734, p < 0.05, respectively). Intra-class Correlation Coefficient (ICC) values for intra-rater reliability in upper, middle and lower chest part were 0.958, 0.979 and 0.976, respectively. Inter-rater reliability ICCs in upper, middle and lower chest part were 0.922, 0.959 and 0.944 that showed high reliability.

Conclusion A new equipment innovation for increasing lung volume training and measuring chest expansion was valid and reliable considering intra-item and inter-item correlation. However, it might for lung volume training and measuring chest expansion.

Keywords: Respiratory rehabilitation, Chest expansion, Reliability, Validity.

Introduction

The patients with median sternotomy and abdominal surgery¹, such as lung cancer surgery or receiving lobectomy, coronary artery bypass surgery (CABG)², thoracic scoliosis³, lung transplantation⁴, Abdominal surgery⁵, including abdominal aortic aneurysm (AAA) surgery was commonly received anesthesia during the surgery. After surgery, the patients usually decreased lung volume⁶ and need to pulmonary rehabilitation by physical therapy for preventing and treating the respiratory complications including lung deflation (atelectasis), infectious pulmonary disease (pneumonia), and mucus hypersecretion⁷⁸⁹. The tape was often examined for measuring chest expansion. The measurement had taken at upper, middle and lower lobes

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for evaluating the expansion\textsuperscript{10}. Chest expansion (CE) was used for measuring rib cage mobility and found to be related to lung volume\textsuperscript{11}. The intensive spirometer (IS) is commonly known as lung volume improvement devices included vodylne which is the equipment for improving the lung volume and used for follow-up of the interventions. There were several studies used the vodylne for 5 to 15 minutes per hour with 5-12 times repetitions. However, those studies showed that lung volume had increased significantly\textsuperscript{11}\textsuperscript{12}. Though it was expensive therefore, the researcher was interested about a new device which would be convenient to use. Furthermore, the researchers were aimed to invent innovative applied equipment which would be able to use in 2 forms with one device to measure the lung expansion and to provide treatment to increase the lung volume. However, it has not been studied before. Therefore, needs to find out the validity along with intra-rater and inter-rater reliability to develop a new measurement tool. In addition, it would be beneficial to plan for the future patients after the median sternotomy and abdominal surgery.

**Method**

**Participants:** For this preliminary study, 30 healthy subjects aged between 18 and 80 years old were recruited from physical therapy\textsuperscript{13} (15 women, 15 men). There are three age ranges including 18-29 years old, 30-59 years and 60 years or more. There were 10 people in each age range including 5 men, 5 women. Measurement had taken by 3 physiotherapists who had a high level of reliability in each measurement. The subjects were randomly allocated for performing the reliability and validity tests of artificial devices. Inclusion criteria considered as healthy person, able to understand the experiment, be able to follow the instruction correctly, no history of smoking or ex-smoker for at least last 5 years.

The exclusion criteria for selecting the subjects considered as those subjects who had congenital disease or a history of respiratory diseases such as pneumonia, and pleural effusion. In addition, subjects with chest bone and muscles abnormalities such as scoliosis, had neurological and mental state problems also excluded. A written informed consent was obtained from all the participants. The first person/assessor measured the validity of the artificial device which was compared with the standard method for measuring the lung expansion and using vodylne as the lung volume. The second and third person measured the reliability and training within the same evaluators and in between the evaluators (Intra rater and Inter-rater reliability). The evaluators measured the first day and re-evaluated in 2\textsuperscript{nd} weeks for studying intra-rater reliability measurement. Both evaluators did the measurement at the same day and time. The assessors maintained the sequences of the subjects randomly before and after each assessment. However, each evaluator was in a separate room for testing the inter-rater reliability measurement.

**Chest expansion (CE) measurement:** The subjects were sitting on the chair with put the hands together on their head. The assessor used a measurement tape for measured the chest expansion. Three points (3) points considered for measuring the upper, middle and lower excursion thoracic including 2\textsuperscript{nd} inter-costal space, 4\textsuperscript{th} inter-costal space and the end of the xiphoid process respectively\textsuperscript{14}. The subjects took breathin and out for 2-3 times and end of exhale and then took deepest breath. The testers recorded the different values from the deepest inhalation and the maximum exhalation value in centimeters. The subjects were evaluating for 2 times and the highest values were selected to analyze data.

**Vodylne measurement:** The subjects were sitting on chair and practicing the deep breathing in and out for releasing the breath slowly for about 2-3 times. Then they opened the mouth piece completely and breathe slowly and hold for 3-5 seconds or as long as they can hold and continued until the mouth close. After that they breathed out and hold. The testers read the numerical value of the air volume on the device. The procedures were repeated and selected the maximum value for analysis.

The new equipment innovation for increasing lung volume training and measuring chest expansion measurement.

The new equipment innovation were measuring by tape was measured three levels including upper, middle, and lower chest. New device relies on the principle for using measurement of chest expansion measurements and training to increase lung volume. It can adjust the strap up and down to measure various levels and also can be extended according to the chest size in each person. After wearing, we can measure the chest size directly and also, if we want to practice, you can adjust the extension, increase the length of the chest as the therapist needs and fix the position without moving from the fix frame with two sound sensors, mid axillary line
of both sides. It can train the patient to breathe until the sound loud. Moreover, it was used for follow up on the chest expansion.

**Statistical Analysis:** Values were expressed by mean and standard deviation. The validity was analyzed by Pearson correlation coefficient test. The reliability was analyzed by Intra-class Correlation Coefficient (ICC). The significance level was set at $P \leq 0.05$ or less. All data were analyzed by using SSPS.

**Results**

**Characteristic data:** This study considered 30 healthy people. There were 15 males, 15 females. The average age and BMI were $47.23 \pm 19.29$ years, $23.22 \pm 3.21$ kg/m$^2$. The chest expansions were measured at the 2$^{nd}$ rib, 4$^{th}$ rib-and the xiphoid process. It was used by the cloth tape as the standard method of using it. However, new equipment innovations and measurement of the lungs volume had taken by using vodylne. The characteristics of data showed as the Table 1.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Mean ± SD (min-max)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Sex (n)</td>
<td>Male (15), female (15)</td>
</tr>
<tr>
<td>2. Age (years)</td>
<td>$47.23 \pm 19.29$</td>
</tr>
<tr>
<td>3. Height (cms)</td>
<td>$160.43 \pm 8.95$</td>
</tr>
<tr>
<td>4. Weight (kg)</td>
<td>$59.76 \pm 9.71$</td>
</tr>
<tr>
<td>5. BMI (kg/m$^2$)</td>
<td>$23.22 \pm 3.21$</td>
</tr>
</tbody>
</table>

BMI, body mass index; SD, standard deviation.

**Validity of new equipment innovations:** The validity of the data was measured by the Pearson coefficient statistics. The study findings suggested that the correlation for measuring the chest expansion by using the cloth tape measurement and new equipment innovations was positively correlated at all levels ($P < 0.05$) (Table 2). These results showed good to very good level of correlations as presented at the Table 2.

In addition, the correlation between new equipment innovations and vodylne for measuring the lung volume showed positively related with each other as presented at Table 3. The upper, middle and lower chest levels were 0.668, 0.689 and 0.734 ($P < 0.05$), respectively.

**Table 2** The correlation chest expansion all levels were measured between new equipment innovations and clot tape.

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Measuring tape</th>
<th>$r$</th>
<th>$P$</th>
</tr>
</thead>
<tbody>
<tr>
<td>New equipment innovation</td>
<td>1. The expansion of the upper chest</td>
<td>0.898</td>
<td>$&lt; 0.05$</td>
</tr>
<tr>
<td></td>
<td>2. The expansion of the middle chest</td>
<td>0.925</td>
<td>$&lt; 0.05$</td>
</tr>
<tr>
<td></td>
<td>3. The expansion of the lower chest</td>
<td>0.896</td>
<td>$&lt; 0.05$</td>
</tr>
</tbody>
</table>

**Table 3** The correlation of lung volume between new equipment innovations and vodylne all chest levels.

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Measuring tape</th>
<th>$r$</th>
<th>$P$</th>
</tr>
</thead>
<tbody>
<tr>
<td>New equipment innovation</td>
<td>1. The expansion of the upper chest</td>
<td>0.668</td>
<td>$&lt; 0.05$</td>
</tr>
<tr>
<td></td>
<td>2. The expansion of the middle chest</td>
<td>0.689</td>
<td>$&lt; 0.05$</td>
</tr>
<tr>
<td></td>
<td>3. The expansion of the lower chest</td>
<td>0.734</td>
<td>$&lt; 0.05$</td>
</tr>
</tbody>
</table>

**Inter-reliability of new equipment innovations:**

Inter-reliability for measuring the expansion of upper, middle and lower chest were measured by cloth tape and new equipment innovations. It had shown by the ICC of cloth tape measurement and new equipment innovations as presented at the Table 4. The inter-reliability of all chest levels showed very high (0.90 -1.00) level of reliability measured with both the measurement tape and with new equipment innovations.

**Table 4** Inter-reliability of new equipment innovations.

<table>
<thead>
<tr>
<th>Equipment</th>
<th>ICC</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring cloth tape</td>
<td>1. The expansion of the upper chest</td>
<td>0.963</td>
</tr>
<tr>
<td></td>
<td>2. The expansion of the middle chest</td>
<td>0.964</td>
</tr>
<tr>
<td></td>
<td>3. The expansion of the lower chest</td>
<td>0.964</td>
</tr>
<tr>
<td>New equipment innovation</td>
<td>1. The expansion of the upper chest</td>
<td>0.922</td>
</tr>
<tr>
<td></td>
<td>2. The expansion of the middle chest</td>
<td>0.959</td>
</tr>
<tr>
<td></td>
<td>3. The expansion of the lower chest</td>
<td>0.944</td>
</tr>
</tbody>
</table>

**Intra -reliability of new equipment innovations:**

The intra-reliability at all levels measured with both cloth tape and the new equipment innovations was a very high level of reliability (0.90 -1.00) as included at the Table 5.
Table 5 Intra-reliability for measuring the upper, middle and lower chest expansion by measuring new equipment and tape.

<table>
<thead>
<tr>
<th>Equipment</th>
<th>ICC</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring cloth tape</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. The expansion of the upper chest</td>
<td>0.968</td>
<td>0.947, 0.983</td>
</tr>
<tr>
<td>2. The expansion of the middle chest</td>
<td>0.962</td>
<td>0.936, 0.979</td>
</tr>
<tr>
<td>3. The expansion of the lower chest</td>
<td>0.958</td>
<td>0.930, 0.978</td>
</tr>
<tr>
<td>New equipment innovation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. The expansion of the upper chest</td>
<td>0.958</td>
<td>0.930, 0.978</td>
</tr>
<tr>
<td>2. The expansion of the middle chest</td>
<td>0.979</td>
<td>0.965, 0.989</td>
</tr>
<tr>
<td>3. The expansion of the lower chest</td>
<td>0.976</td>
<td>0.960, 0.987</td>
</tr>
</tbody>
</table>

Discussion

This study aims to find out the validity and both the intra-rater reliability and inter-rater reliability of new equipment innovations. The correlations of chest expansion at upper, middle and lower levels were measured by using the cloth tape and new equipment innovations. Pearson’s correlation analysis was performed to establish the validity. These findings suggested that, there had a good to very good level positive significant correlation. Moreover, the correlation of lung volume between new equipment innovations device innovation and vodylno had a positive statistical correlation including moderate to good levels. The inter-rater reliability of this study showed that the ICC values at upper, middle and lower chest levels were very high in both cloth tape and new equipment innovations. The previous study showed the cloth tape was intra-class correlation coefficients 0.81 to 0.91 in men which were highly reliable15). The intra-rater ICC (1,2) with 95% confidence interval was used to assess the test-retest reliability. All ICC values for intra-rater reliability were from 0.95 to 0.96 at all chest levels, which was high reliable. These finding were similar according to the previous study of Nishigaki and et al (2013)16. That study developed an artificial device (BREATH) biofeedback named BREATH for measuring the chest expansion and displayed via an automatic computer monitor. It had a high correlation coefficient (r = 0.76-0.87) and high intra- and inter-evaluator reliabilities (ICCs = 0.82-0.94). It was similar according to the study of Liu and et al (2017)17) which showed that the cloth tape, a wearable strain sensor (WSS) which was used to measure the respiration movement, had a high validity and reliability (ICCs = 0.94 to 0.98). Moreover, Debouche and et al (2016)10) studied the intra-rater and inter-rater reliability of chest expansion (CE) measurement tool and stated that it was good for upper and lower CE in healthy subjects. They evaluated the correlation between chest expansion (CE) measurement and lung functions including forced expiratory volume (FEV1), forced vital capacity (FVC), and vital capacity (VC). The study findings illustrated that the upper and lower CE measurements had significantly positive correlation with lung function and inspiratory muscle strength. These findings suggesting that CE measurements may be represent the indirect information on lung volume function and inspiratory muscle strength. In addition, the chest expansion had good reliability (0.85 to 0.97) which can be used for monitoring disease progression and efficacy of intervention people with ankylosing spondylitis (AS)18).

The findings of this research of the new equipment innovations had a high the validity and reliability and can be used in further research for physical therapy treatment in order to measure the chest expansion and lung volume training in patients with respiratory disease such as patients who would have the thoracic surgery and abdomen surgery in order to therapeutic efficacy of new equipment innovations.

Conclusion

Chest expansion measurements using a cloth tape and new equipment innovations for training to increase lung volume at upper, middle and lower chest levels were well correlated along with good to high intra- and inter-rater reliability in the healthy subjects with different age range. Therefore, this new equipment innovation would use to evaluate the chest expansion and to provide the training of lung volume in clinical and study the research in the future.

Conflict of Interest: There were no conflicts of interest

Acknowledgements: This work was supported by the grants funded by the Faculty of Associated Medical Sciences, Chiang Mai University, Thailand. We thank all patients who participated in this study. The authors also thank Miss Thanyaret Chitan, Miss Siramon Sornkla, and Miss Kusalin Khamtue for collecting part of the data.

Ethical Clearance: Approved number AMSEC-61FB-004.
References


An Analysis of the Correlation between Life Skills and Self-Efficacy with the Risk of Teenage Pregnancy

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Abstract

Background: Approximately 21 million women aged from 15 to 19 years old in developing countries are pregnant every year. At the same time, around 16 million of women aged between 15 to 19 years old give birth annually. The Age-specific Fertility Rate (ASFR) in Indonesia for 15-19 years old group is 36 per 1000 women. 13.1 % of teenage girls aged from 15 to 19 give the first birth and 36.7% have already given birth before. The reasons behind this teenage pregnancy and marriage in Indonesia are the lack of life skills and low self-efficacy. Teenagers with lack of life skills are more likely to be influenced by their peers, in this case, to have sex before marriage. Teenage pregnancy often leads to a high rate of maternal and infant mortality, and high-risk infants.

Purpose: This research was aimed at analyzing the correlation between life skills and self-efficacy with the risk of teenage pregnancy.

Method: This study was a quantitative correlational research with cross-sectional study approach. It involved 126 third-grade students of a senior high school in Pekanbaru, Indonesia who were selected using stratified random sampling. Data were collected using life skills, self-efficacy, and pregnancy prevention questionnaires. Collected data were analyzed using Chi Square

Results: The results showed that 71 students (56.3%) had poor life skills and 80 students (63.5%) had low self-efficacy. 66 students (52.45%) are at risk of pregnancy. Correlational analysis between life skills and the risk of teenage pregnancy showed $\rho$ value: $0.002 < \alpha$: 0.05 and OR: 3.433. It meant that teenagers with poor life skills had three times greater risk of pregnancy compared to the ones with good life skills meanwhile correlational analysis between self-efficacy and the risk of teenage pregnancy resulted in $p$ value: $0.000 < \alpha$: 0.05 and OR: 6.000. It showed teenagers with low self-efficacy had a six times greater risk of pregnancy compared to the ones with high self-efficacy.

Conclusions: There is a significant correlation between life skills, self-efficacy and the risk of teenage pregnancy. Future researchers are expected to conduct a further research project using quasi-experimental design by including intervention of more innovative health promotion with more interesting media considered to be more attractive to teenagers.

Keywords: Teenage pregnancy, life skills, self-efficacy.

Introduction

Every year approximately 21 million women aged from 15 to 19 (2 million of those aged are below 15) in developing areas across the globe are pregnant. At the same time, around 16 million of women aged between 15 to 19 (2.5 million of those aged are under 16) give birth annually¹.². The Age-specific Fertility Rate
The Age-specific Fertility Rate (ASFR) in Indonesia for 15-19 years old group is 36 per 1000 women. 13.1% of teenage girls aged from 15 to 19 give the first birth and 36.7% have already given birth before.

In Riau, 8.7% of the similar age group are pregnant while 22.1% of them have already given birth before. Even though the rate seems to be small, but it is actually higher compared to Indonesian Survey Demography and Health 2007 in which 1.9% of teenage girls give the first birth and 6.6% have already given birth before. This is mainly caused by the rising number of sexually active teenagers.

The percentage of pre-marital sexual intercourse among teenagers aged between 15 to 19 years have increased from 4.5% to 3.7%. The lack of innovative teenage sexual counseling is shown by a low percentage of 45% of unmarried female teens aged from 15 to 19 years being acquainted with where to get teenage counseling service. Discussion partners that female teens like most are their friends of the same age (60%), mothers (44%), and teachers (43%).

Life skills and self-efficacy of Indonesian teenagers are still considered low. Teenagers with lack of life skills are more likely to be influenced by their peers, in this case, to have sex before marriage. It is indicated by teenagers’ most common reasons to have sexual intercourse: being curious (57.5% of male teens), letting it happen (38% of female), and being forced by a partner (12.6% of female). Teenage pregnancy often leads to a high rate of maternal and infant mortality, and high-risk infants.

The strategies to decrease the rate could be performed by giving education, promoting positive attitude and self-development, and providing health services. These strategies have been proven to successfully help to bring down the rate to be 82% of the teenage pregnancy across the USA and in some of the states.

All the data revealed above lead to a question: is there correlation between life skills and self-efficacy with teenage pregnancy?

Material and Method

This was correlational research with cross-sectional approach. It involved 126 third-grade students of a public senior high school in Pekanbaru. Samples were taken by using stratified random sampling. The illustrative questionnaire was being used for interviewing the students. The data was taken for 3 day, 2 July, until 4 July, 2018. The correlation between variables was tested using chi square. This study has been approved by the committee of research ethics, Faculty of Medicine, Andalas University (approval number 480/KEP/FK/2018).

Results

Univariate Analysis

Table 1: Distribution of respondents characteristic based on Age

<table>
<thead>
<tr>
<th>Age</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 year</td>
<td>76</td>
<td>60.3</td>
</tr>
<tr>
<td>17 year</td>
<td>50</td>
<td>39.7</td>
</tr>
<tr>
<td>Total</td>
<td>126</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 2: Distribution life skills, self-efficacy and risk of pregnancy

<table>
<thead>
<tr>
<th>Variable</th>
<th>Kategorik</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life skills</td>
<td>Good</td>
<td>55</td>
<td>43.7</td>
</tr>
<tr>
<td></td>
<td>Poor</td>
<td>71</td>
<td>56.3</td>
</tr>
<tr>
<td>Total</td>
<td>126</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>High</td>
<td>46</td>
<td>36.5</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>80</td>
<td>63.5</td>
</tr>
<tr>
<td>Total</td>
<td>126</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Risk of Pregnancy</td>
<td>At risk</td>
<td>60</td>
<td>47.6</td>
</tr>
<tr>
<td></td>
<td>Not at risk</td>
<td>66</td>
<td>52.4</td>
</tr>
<tr>
<td>Total</td>
<td>126</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Table 1 show that 76 teenagers are 16 years old (60.3%). 71 teenagers have poor life skills (56.3%) (see table 2). Regarding self-efficacy, table 2 shows that 80 teenagers have low self efficacy (63.5%) and 66 teenagers are at risk of pregnancy (52.4%) as shown in table 2.
Bivariate Analysis:

Table 3: Correlation analysis life skills and self-efficacy with the risk of teenage pregnancy in Pekanbaru

<table>
<thead>
<tr>
<th>Variable</th>
<th>Risk of Pregnancy</th>
<th>Total</th>
<th>%</th>
<th>p-value</th>
<th>OR (CI 95 %)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not at Risk</td>
<td>At Risk</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>N</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Life skills</td>
<td>Good</td>
<td>17</td>
<td>38</td>
<td>55</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Poor</td>
<td>43</td>
<td>28</td>
<td>71</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
<td>66</td>
<td>126</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Self-Efficacy</td>
<td>High</td>
<td>10</td>
<td>36</td>
<td>46</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>50</td>
<td>30</td>
<td>80</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
<td>66</td>
<td>126</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Table 3 shows that there is a correlation between life skills with the risk of teenage pregnancy in Pekanbaru. It is indicated by the result where p-value: 0.002 < α (0.05) and OR: 3.433, meaning that teenagers with poor life skills have three times greater risk of pregnancy compared to the ones with good life skills.

There is a correlation between self-efficacy with risk of teenage pregnancy. It is indicated by the result where p-value: 0.000 < α (0.05) and OR (6.000), meaning that teenagers with low self-efficacy have six times greater risk of pregnancy compared to the ones with high self-efficacy (see table 3).

Discussion

The study revealed that 76 out of 126 samples are 16 years old (60.3%). Teenagers are going through their life searching for self-identity. During this period, they are experiencing various physical changes and are often very curious about everything new to them, which affect their emotional state. They experience identifiable changes in their sexual organ, they begin to feel how beautiful it is to fall in love with somebody, and often they have a high sexual desire. Curiosity to get new experiences is a leading factor which drives teenagers to commit high-risk behaviors. Teenagers aged 16 to 18 years, categorized as mid-teen, start to develop new behavior and way of thinking while searching for self-identity. They learn to make their own decision, and they start to have sexual imagination. Furthermore, the acceptance from and being interested in opposite-sex individuals become a very important thing to teenagers. Age may describe one’s maturity in deciding on what and how to act in life. The older the age, the more matured someone in making a choice.

The researcher assumes that mid-teens are still unstable and easily influenced. This assumption comes from the facts that teenagers are searching for identity, very curious and courageous to risk themselves since they think that they have the freedom to do anything they want to. 71 of the samples still have poor life skills (56.3%). Life skills are tools and instrument for every individual to adapt and behave positively, which allow him or her to effectively encounter any demand and challenge in life. A life skill is a knowledge which helps someone to implement their skill and knowledge to live a healthy life. Teenagers are required to learn to be independent in positive ways of learning. However, if this demand is not completed, they may experience psychological problems in the future. These problems are also affected by teenagers’ inability to make a decision. A problem that they must be ready to face in the future is the presence of various options for everything ranging from the simplest to the most complicated ones. Based on the questionnaire result submitted from the samples, teenagers with good life skills are the ones who have the capability to think positively. They spend their free time with meaningful activities and reject negative influence from their environments. In contrast, teenagers with poor life skills are indicated by lack of self-confidence, lack of ability to make a decision, and tend to easily accept negative influence. That is the reason why teenagers with poor life skills have the probability to perform such negative behavior which could harm themselves and other individuals.
Most of the samples of this study have low self-efficacy: 80 persons (63.5%). Self-efficacy is someone’s belief in his or her ability to empower motivation, cognitive resources, and a series of action considered necessary to cope with any situation he or she is experiencing\cite{16}.

Self-efficacy is developed from gradual skill growth along with continuous experiences. Self abilities that someone has gained draw self steadiness and confidence which he or she can utilize to achieve goals with maximum efforts\cite{17}.

The questionnaire result shows that teenagers with high self-efficacy have higher confidence and better behavior compared to teenagers with low self-efficacy.

The study also revealed that 66 samples (52.4%) are at risk of pregnancy. Free sex has become one of which causes the risk of pregnancy. Free sex comes from a teenager’s lack of family attention, curiosity, desire to do what most people do, poor life skills, and low self-efficacy\cite{18}.

Mass media also have an important role in shaping the risk of teenage pregnancy. Every media company knows what they should do to attract their audience’s attention including teenagers. The trending media for teenagers to follow most today are the electronics media\cite{19}. The researcher assumes that teenagers lacking family attention but having high curiosity without self-control ability are more likely to fall into free sex trap, which may attract the risk of pregnancy.

The result of this study indicates that there is a correlation between life skills with the risk of pregnancy on teenagers. (p-value: 0.002 < α:0.05) and OR value: 3.433 means that teenagers with poor life skills have a three times greater risk of pregnancy than the ones with good life skills.

Nowadays teenagers tend to respond permissively toward free sex. This is caused by the rapidly increasing number of teenagers who build a special relationship, which then widely opens the chance of premarital sex. It becomes worst when there are more people who tend to think that free sex is a small problem while it is actually a serious problem that everyone must avoid\cite{20}.

According to\cite{21} premarital sex among teenagers is provoked by myths which exist and are believed by some teenagers. Some young couples, for instance, believe that sexual intercourse is a proof of true love, while some others consider one-time sexual intercourse will not cause pregnancy.

This study reveals that there is a correlation between self-efficacy with the risk of pregnancy among teenagers in Pekanbaru. This is based on the result where p-value: 0.000 < α so that H0 is rejected. OR value: 6.000 means that teenagers with low self-efficacy have a six times greater risk of pregnancy compared to the ones with high self-efficacy.

A high self-confidence drives teenagers to gain self-efficacy so that they have the courage to take responsibility for every decision they have made. They have a better understanding on the risk or the consequence of whichever action they take. This understanding can prevent themselves from risky behaviors including the risk of teenage pregnancy\cite{1}.

### Conclusion and Suggestion

There is a significant correlation between the variables (life skills and self-efficacy) with the risk of teenage pregnancy. Future researchers are expected to conduct a further research project using quasi experimental design by including a more innovative health promotion with more interesting media considered to be more attractive to teenagers.

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**Ethical Clearance:** Health Research Ethics Committee, Faculty of Medicine Andalas University of Padang Indonesia

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The Development of the Thesis-Writing Perfectionism Inventory

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1Student of Doctoral Program of Universitas Negeri Malang, Indonesia,  
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Abstract

Previous studies proved that perfectionism is one of the factors causing procrastination in thesis writing. Unfortunately, no inventory that specifically measures perfectionism in the context of thesis writing had been developed. Therefore, this study aimed to develop an inventory of thesis-writing perfectionism that meets several psychometric requirements. The inventory was constructed through four steps: (1) specifying the construct of perfectionism; (2) constructing the measurement model; (3) performing confirmatory factor analysis; and (4) testing the validity of the measurement model. 200 subjects were involved in the study. The validity and reliability of the inventory were examined using exploratory and confirmatory factor analysis and Cronbach’s alpha. These steps successfully validated 10 of 20 initially constructed items.

Keywords: Perfectionism, procrastination, thesis writing, assessment, research and development.

Introduction

Procrastination in academic tasks can be found widely in many education settings. A study reported 40–50% of students to be in the chronic level of procrastination(1). In detail, it was also reported that 87% of students have delayed in preparing and submitting their assignments, 68% in presenting assignments, and 62% in preparing themselves for the exam(2). Moreover, other studies conducted in Indonesia also affirm similar results. A study conducted in Universitas Surabaya found that 30.9% of 316 subjects conducted academic procrastination at high to very high level(3). A similar research conducted in Universitas Pendidikan Indonesia also discovered that 44.08% of students were always procrastinating, 53.55% occasionally procrastinating, and only 2.07% never procrastinating(4).

One of the most often postponed academic assignments by undergraduate students is thesis writing. According to data obtained from the Office of Information Center of Universitas Negeri Malang in January 2018, there are 3.687 (12.45%) of 29.613 bachelor’s degree students were delaying their graduation. 96% of them graduated late due to their procrastinated thesis writing. Moreover, it was also reported in a study conducted in Institut Agama Islam Negeri Antasari that thesis writing was one of the factors delaying the graduation of the students(5). The similar result was also observed at the Faculty of Psychology, Universitas Surabaya(6).

Perfectionism is one of the predictors of procrastination. Several studies showed that it has a direct effect on procrastination(7,8) Other studies also proved that perfectionism is a good predictor of academic procrastination through self-efficacy(9), self-regulation(10), and motivation(11). Based on the studies, it can be concluded that perfectionism is one of the variables that must be considered in the procrastination intervention.

Unfortunately, there are no assessment tools that can measure the perfectionism in the context of thesis writing specifically. The existing perfectionism scales only measure the perfectionism in the general context(12-15). The scales are widely used in various research and counseling/psychotherapy services and have adequate psychometric eligibility in their own respective contexts. However, because of the general
context they use, measuring perfectionism in the thesis writing context using these instruments is not really appropriate.

Based on the discussed background, this study aimed to develop a scale called the Thesis-Writing Perfectionism Inventory (TW-PI). The inventory was developed based on the construct of self-oriented perfectionism proposed by Hewitt & Flett\(^{(12,16)}\) and two main indicators of perfectionism proposed by Rice, et al.\(^{(17)}\) *High standard* refers to an individual’s tendency to adhere to standards that are excessively high about his/her performance, while *discrepancy* refers to the belief that he/she will find the standards difficult to achieve. In order to measure the perfectionism in thesis writing context specifically, the items of the TW-PI was constructed in the context of thesis writing.

**Material and Method**

The study applied research and development design. To develop the scale, the study followed the steps of: (1) defining the construct of perfectionism; (2) developing the construct measurement model; (3) conducting confirmatory factor analysis (CFA) to empirically evaluate whether the developed construct confirms the theory or not; and (4) evaluating the validity of the measurement model\(^{(18)}\).

200 undergraduate students of Universitas Negeri Malang (UM) writing their thesis participated in the study. The number was obtained by multistage cluster sampling. Firstly, the researcher identified the number of students writing the thesis in eight faculties at UM. Based on subjects grouping according to their faculties, 25% of departments from each faculty were randomly chosen as representatives of the faculties. Finally, the researcher randomly selected 200 students writing the thesis in the representative departments to determine the final sample. Selected subjects were then contacted by telephone or email to fill out the online or offline prototype of the scale.

The construct validity of the scale was evaluated using the exploratory factor analysis (EFA) by checking the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO-MSA) value. If the KMO-MSA value is ≥ 0.5 with \( p \leq 0.05 \), the analysis can be continued. In addition, if the value of the MSA for a particular item is ≥ 0.5, it can go for further analysis. The next step is extracting the eligible items with the varimax method. The item that has a loading of ≥ 0.5 for an indicator will be regarded as a good item. However, the item will be regarded as not meeting the theoretical assumptions if it is extracted into an incorrect indicator. Thus, the item must be discarded even though it has a loading of ≥ 0.5 statistically. Furthermore, indicators that have a loading of ≥ 0.5 for a developed construct will be determined as an eligible indicator. Valid items and indicators based on the EFA will then be tested for their reliability with the Cronbach’s alpha. The coefficient of Cronbach’s alpha used in the study is > 0.7. The next is performing CFA with a second-order technique. The analysis will test the unidimensionality of the TW-PI. In this study, it will be determined by The Root Mean Square Error of Approximation (RMSEA) of ≥ 0.08. The validity of an item for an indicator and an indicator for a construct will be determined by the Lambda of ≥ 0.4.
Table 1: The Initial Blueprint of the TW-PI

<table>
<thead>
<tr>
<th>Variable</th>
<th>Indicators</th>
<th>Items</th>
</tr>
</thead>
</table>
| Thesis-Writing Perfectionism | High Standard     | 1. I want to write an extraordinary thesis  
2. Writing an ordinary thesis makes me uncomfortable  
3. I will try to write a thesis as perfect as possible  
4. I will not show the thesis to my supervisor before it is well written  
5. I feel disappointed in myself if my supervisor finds weaknesses in my thesis  
11. I don’t care about the quality of the thesis, my goal is to get it done immediately  
12. For me, the thesis does not need to be perfect  
13. Reaching the minimum standard is enough for my thesis  
14. The ideal thesis will only complicate myself  
15. It is fine if the quality of my thesis is mediocre |
|                           | Discrepancy        | 6. I find it difficult to write a thesis with a standard that I set  
7. The thesis I wrote is not enough to reach the standard I set  
8. With the remaining time, it seems difficult to write a thesis according to my standards  
9. Even though I have come this far, I feel that my thesis has not reached the standard I have dreamed of  
10. It turned to be very difficult to carry out the thesis writing plan I made  
16. I think I have reached my target in writing a thesis  
17. It’s not too difficult to reach the standard I want in writing a thesis  
18. I am satisfied with my thesis  
19. I am happy with my achievement in thesis writing  
20. My thesis is currently sufficient to represent the standard I want |

Favorable Items: 1-10; Unfavorable Items: 11-20

Findings

The Initial Blueprint of the TW-PI: Based on the review of the main indicators of perfectionism and the context of thesis writing, the researcher constructed 20 items extracted from two indicators: high standards and discrepancy. Detailed descriptions of indicators and items are displayed in table 1. Four Likert answer choices were provided for each of these items, ranging from disagree to strongly agree.

The Result of EFA, Cronbach’s Alpha, and CFA: The EFA of 20 items of the TW-PI showed that the ten of them had a loading factor of ≥0.5, while the other ten (items 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10) had a loading factor of < 0.5. Therefore, the ten were categorized as valid items, while the rests were invalid. Likewise, both TW-PI indicators had a loading factor of 0.758 on the Thesis-Writing Perfectionism variable. The EFA also grouped the ten valid items into two appropriate indicators. Items 11, 12, 13, 14 and 15 were grouped in high standard, while items 16, 17, 18, 19 and 20 in discrepancy. Cronbach’s alpha analysis was then performed on the ten to evaluate their reliability. The result showed that the items were completely reliable since they have the Cronbach’s alpha coefficient of > 0.7. The detail results are summarized in table 2.

The items were then tested using CFA to evaluate the unidimensionality of the measurement model and the validity of each item. The details of the results are shown in table 2. It can be seen in table 2 that the RMSEA was 0.073 which means that the measurement model was good. The value of Chi-Square was 201.41 with a probability of 0.05303 which means that the measurement model had obtained adequate empirical support. Furthermore, The Lambda of all items and indicators was > 0.4, which means that the items and indicators were valid.
Table 2. The Result of EFA, Cronbach Alpha Analysis, and CFA

<table>
<thead>
<tr>
<th>Indicators</th>
<th>EFA</th>
<th></th>
<th>Cronbach’s Alpha</th>
<th></th>
<th>CFA</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Item</td>
<td>Loading Factor</td>
<td>Cronbach’s Alpha</td>
<td>Corrected Item-</td>
<td>Lambda</td>
<td>RMSEA</td>
<td>Chi-Square</td>
</tr>
<tr>
<td></td>
<td>Grouping</td>
<td></td>
<td></td>
<td>Total Correlation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Standard</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Loading Factor = 0.758;</td>
<td>11</td>
<td>0.802</td>
<td></td>
<td>0.639</td>
<td>0.62</td>
<td>0.073</td>
<td>201.41</td>
</tr>
<tr>
<td>Lambda = 0.72)</td>
<td>12</td>
<td>0.921</td>
<td></td>
<td>0.726</td>
<td>0.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>13</td>
<td>0.878</td>
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<td>0.473</td>
<td>0.52</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>0.811</td>
<td></td>
<td>0.396</td>
<td>0.54</td>
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</tr>
<tr>
<td></td>
<td>15</td>
<td>0.897</td>
<td></td>
<td>0.711</td>
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</tr>
<tr>
<td>Discrepancy</td>
<td></td>
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<tr>
<td>(Loading Factor = 0.758;</td>
<td>16</td>
<td>0.821</td>
<td></td>
<td>0.628</td>
<td>0.55</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lambda = 0.59)</td>
<td>17</td>
<td>0.865</td>
<td></td>
<td>0.512</td>
<td>0.51</td>
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<tr>
<td></td>
<td>18</td>
<td>0.876</td>
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<td>0.376</td>
<td>0.60</td>
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<tr>
<td></td>
<td>19</td>
<td>0.915</td>
<td></td>
<td>0.572</td>
<td>0.51</td>
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</tr>
<tr>
<td></td>
<td>20</td>
<td>0.923</td>
<td></td>
<td>0.587</td>
<td>0.69</td>
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</tr>
</tbody>
</table>

Source: Processed Primary Data

Discussion

Perfectionism is individual’s tendency to set high standards excessively for him/herself so that it makes him/her hesitate to act immediately\(^{(19)}\). He/she demands him/herself to always be competent, great, and excel in all fields he/she considered important\(^{(20)}\). This definition refers to the unidimensional construct of perfectionism. However, after 1990s, the concept of perfectionism shifted from unidimensional to multidimensional\(^{(21)}\). One of the most popular concepts of multidimensional perfectionism is that put forward by Hewitt & Flett\(^{(12,16)}\) and Frost, et al.\(^{(13)}\)

Hewitt & Flett said that perfectionism has three dimensions: (1) self-oriented perfectionism; (2) other-oriented perfectionism; and (3) socially prescribed perfectionism\(^{(12,16)}\). In another side, Frost et al. also stated that it has six dimensions: (1) concern over mistakes; (2) doubts about action; (3) personal standards; (4) parental expectations; (5) parental criticism; and (6) organization\(^{(13)}\). Compared to the dimensions proposed by Hewitt & Flett which contain the classification of the actors of perfectionism, the dimensions by Frost, et al. seems to explain the indicators of perfectionism. However, Egan, et al.\(^{(22)}\) criticized these dimensions because they do not represent the core dimensions of perfectionism. They categorized parental expectation and parental criticism as causes of perfectionism and not the perfectionism itself. Concern over mistakes and doubts about action were also criticized because both were considered to be a same construct so they must be put together. Furthermore, Frost et al. also doubted organization as a dimension of perfectionism\(^{(13)}\). In conclusion, the remaining two dimensions are considered to be the core dimensions of perfectionism, namely: (1) the combination of concern over mistakes and doubts about action; and (2) personal standards.

The results of the study reinforce the criticism of Egan, et al. that the six indicators of perfectionism proposed by Frost et al. are not entirely correct. Confirming the criticism, the results of this study show that high standards (personal standards) and discrepancy (the combination of concern over mistakes and doubts about action) have a high loading factor for the thesis-writing perfectionism variable. Therefore, these two indicators are appropriate to represent the thesis perfectionism construct. This is also proven by items grouping on the two appropriate indicators which means that the items are extracted correctly from the two. These results confirm the previous research by Rice, at al. that found high standards and discrepancy as the main dimensions of perfectionism\(^{(17)}\)

Psychometrically, the TW-PI has conditions that must be owned by a scale. The results of EFA, CFA, and Cronbach’s alpha showed that the scale is valid and reliable. When compared to similar instruments, this scale has the advantage of a small number of items. That way, the scale can serve simple assessment that is increasingly needed lately. As known, counseling services which lately tend to be brief require assessment instruments that are also brief and simple. However, because the TW-PI is in its early stages of development, one of its shortcomings is that it has not been proven to
correlate with a similar scale. Therefore, the convergent validity of this scale is still unknown. The task of the next research is to examine the correlation of the TW-PI with other similar scales.

**Conclusion**

The development and validation process of the TW-PI had selected ten valid and reliable items and eliminated the other ten that do not meet the psychometric requirements. These items are only intended to measure the level of perfectionism in the context of thesis writing. Therefore, the score resulted is the total score of perfectionism in thesis writing. The higher the score, the higher the perfectionism tendency of the subject. On the contrary, the lower the score the lower the perfectionism tendency. Compared to similar instruments, the TW-PI has several advantages: (1) it only contains 10 items so that it is very efficient to use; and (2) it is very appropriate to be used in counseling setting. One of the disadvantages of the TW-PI is the number and homogeneity of the samples used in the development process. This sample number limits the use of the TW-PI only to the population of subjects involved.

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**Ethical Clearance:** The Ethical Clearance was taken from the Research Ethics Committee of UM

**References**

7. Yao MP. An Exploration of Multidimensional Perfectionism, Academic Self-Efficacy, Procrastination Frequency, and Asian American Cultural Values in Asian American University Students. The Ohio State University; 2009.


The Effectiveness of the Combination Therapy of Risperidone, Group Psychotherapy and Occupational Therapy on Cognitive Functions and the Quality of Life of Schizophrenia Patients

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Abstract

Schizophrenia is a chronic disorder that could cause a high morbidity and mortality. This study aimed to determine the effectiveness of combination therapy of risperidone, group psychotherapy, and occupational therapy on cognitive functions and quality of life of schizophrenia patients. The study compared the score of Schizophrenia Cognition Rating Scale of Indonesian version (SCoRSVI) and the score of the World Health Organization Disability Assessment Schedule (WHODAS 2.0) between schizophrenia patients who received the occupational therapy (occupational therapy group) and those who did not received occupational therapy (control group). This study was a longitudinal analytic study with a prospective cohort approach which was conducted at South Sulawesi Province Special Hospital (RSKD). Each group consisted of twenty-two schizophrenia patients who were hospitalized for the first time from June to August 2018, and were divided by randomized consecutive sampling technique. Our findings indicated that the comparison of SCoRSVI and WHODAS 2.0 scores between Occupational therapy group and the control group were significant on the eighth week (p = 0.03 and p = 0.010, consecutively). Result showed that the occupational therapy was effective when combined with antipsychotic therapy and the group psychotherapy to improve cognitive function and the quality of life of the schizophrenia patients, especially in long term therapy.

Keywords: Schizophrenia, group psychotherapy, occupational therapy, cognitive function, quality of life.

Introduction

Schizophrenia is a clinical syndrome of psychopathology that can be classified into positive symptoms, negative symptoms and disorganize symptoms. In 2013, Indonesian Health Research data showed that the prevalence of severe mental disorders in Indonesia such as schizophrenia reaches approximately 400,000 people or 1.7 per 1000 population. Moreover, 1% of the population in the world suffered from schizophrenia.¹,² Furthermore, schizophrenia is a chronic disease that could cause quite high morbidity and mortality, which end to a high medical cost. Morbidity and medical costs of relapse schizophrenia patients are greater than in the first episode of schizophrenia. The consequences are loss of daily productivity, poor response to treatment, longer period of treatment, longer time to achieve remission, and greater costs for treatment.

Cognitive function and the severity of negative symptoms are most often associated with the occurrence of dysfunction in the social ability.³ Cognitive dysfunction has direct impacts on a personal social performance and social function which result in an inability to work or perform daily activities that could cause poorer quality of life. The quality of life itself can be defined as subjective and objective perceptions of individuals regarding their physical, psychological,
social and environmental conditions which they experience in their daily lives. In fact, the treatment for cognitive dysfunction have not been optimally studied and often ignored in many Health Service Institutions in Indonesia. Previous study indicated that schizophrenia patients who received group psychotherapy as an adjuvant therapy to risperidone showed improvement in clinical symptoms better than the control group who only received risperidone.

Recently, approach to schizophrenia patients includes multi-dimensional interventions to reduce the abnormal behaviors in various domains. Rehabilitation, as one of the approaches, is the process of refunctioning and redeveloping to improve their psychological, social and occupational function. Occupational therapy is one of the medical rehabilitation for physical and mental disorders patients which combine the art and science to lead patients to selective activities in order to improve and maintain their health, as well as to prevent disability through various activities and work.

It is believed that the most effective way to handle patients with schizophrenia is by combining psychopharmacology with psychosocial interventions such as psychotherapy, family therapy, and occupational therapy. There have been several studies shown a significant relationship between cognitive function and the quality of life in schizophrenia patients, and many researchers had try to intervene with various modes of therapy to improve cognitive function and the quality of life of schizophrenia patients. However, there is no study has been carried out to assess the effect of occupational therapy on schizophrenias in combination with group psychotherapy, in terms of cognitive function and their quality of life. This study aimed to determine the effectiveness of the combination therapy of risperidone, group psychotherapy, and occupational therapy on cognitive function and the quality of life of schizophrenia patients.

**Materials and Method**

This study is a longitudinal analytic study with a prospective cohort approach which was conducted at South Sulawesi Province Special Hospital (RSKD) from June to August 2018. The subject of this study were schizophrenia patients who were hospitalized in the RSKD from June to August 2018 who met the inclusion criteria and were given group psychotherapy and were treated with risperidone.

The demographic data of the subject was collected, then the baseline cognitive function were assessed using the Indonesian version of the SCoRS instrument and the quality of life using WHODAS 2.0. Clinical interviews was conducted to determine abstract thinking abilities and creative talent. The occupational therapy was given by psychologists and occupational therapists from the South Sulawesi Special Hospital. Cognitive function (SCoRSVI) and quality of life (WHODAS 2.0) were assessed on the 4th week or 12 sessions of the occupational therapy and on the 8th week or 24 sessions of the occupational therapy. The differences between the scores of SCoRSVI and WHODAS 2.0 in control group and experimental group were evaluated from the baseline, on the 4th week and on the 8th week of the study. Data were collected and processed using computer programs, using statistical univariate and bivariate analysis.

**Results**

There were 27 subjects received risperidone therapy, group psychotherapy and occupational therapy and 25 subjects only received risperidone therapy and group psychotherapy who met the inclusion criteria. Five subjects from the occupational therapy group and 3 subjects from the non-occupational therapy group were excluded because the family decided to take them home.

The comparison of SCoRSVI score in the baseline between the occupational therapy group with the non-occupational therapy group was not significant with p = 0.500. After 4 weeks of therapy, the comparison of SCoRSVI score between the occupational therapy group and the non-occupational therapy group remained not significant with p = 0.157. The comparison of SCoRSVI score between the occupational therapy group and the non-occupational therapy group was significant after 8 weeks of therapy with p = 0.03. The decrease in SCoRSVI score between the occupational therapy group and the non-occupational therapy group showed more significant differences after 8 weeks of therapy (Table 1).
Table 1: The Comparison SCoRSVI score between the non-occupational therapy group and occupational therapy group

<table>
<thead>
<tr>
<th>Variabel</th>
<th>Group</th>
<th>N (n = 44)</th>
<th>SCoRSVI Score Group 1* and Group 2**</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean</td>
</tr>
<tr>
<td>SCoRSVI baseline</td>
<td>Group 1*</td>
<td>22</td>
<td>44.41</td>
</tr>
<tr>
<td></td>
<td>Group 2**</td>
<td>22</td>
<td>45.23</td>
</tr>
<tr>
<td>SCoRSVI 4th Week</td>
<td>Group 1*</td>
<td>22</td>
<td>42.73</td>
</tr>
<tr>
<td></td>
<td>Group 2**</td>
<td>22</td>
<td>41.14</td>
</tr>
<tr>
<td>SCoRSVI 8th Week</td>
<td>Group 1*</td>
<td>22</td>
<td>38.86</td>
</tr>
<tr>
<td></td>
<td>Group 2**</td>
<td>22</td>
<td>34.32</td>
</tr>
</tbody>
</table>

Mann-Whitney test. *non-occupational therapy group, **occupational therapy group.

The differences in WHODAS 2.0 score in the baseline between the occupational therapy group and the non-occupational therapy group were not significant with p = 0.604. The differences in WHODAS 2.0 score between the occupational therapy group and the non-occupational therapy group were significant on the 8 weeks of therapy with p = 0.010. The significant decrease in WHODAS 2.0 score was seen on the 8th week (Table 2).

Table 2: The Comparison WHODAS 2.0 score between non-occupational therapy group and occupational therapy group

<table>
<thead>
<tr>
<th>Variabel</th>
<th>Group</th>
<th>N (n = 44)</th>
<th>WHODAS 2.0 Score Group 1* and Group 2**</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean</td>
</tr>
<tr>
<td>WHODAS 2.0 baseline</td>
<td>Group 1*</td>
<td>22</td>
<td>41.27</td>
</tr>
<tr>
<td></td>
<td>Group 2**</td>
<td>22</td>
<td>43.59</td>
</tr>
<tr>
<td>WHODAS 2.0 4th Week</td>
<td>Group 1*</td>
<td>22</td>
<td>37.59</td>
</tr>
<tr>
<td></td>
<td>Group 2**</td>
<td>22</td>
<td>38.14</td>
</tr>
<tr>
<td>WHODAS 2.0 8th Week</td>
<td>Group 1*</td>
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<td>32.50</td>
</tr>
<tr>
<td></td>
<td>Group 2**</td>
<td>22</td>
<td>29.18</td>
</tr>
</tbody>
</table>

*T-Test Independent, **Mann-Whitney Test. *non-occupational therapy group, **occupational therapy group.

The comparison of the differences SCoRSVI score between the occupational therapy group and the non-occupational therapy group on the 4 weeks of therapy and on the 8 weeks of therapy were significantly different with p = 0.000. The comparison of the differences in WHODAS 2.0 score between the occupational therapy group and the non-occupational therapy group on the 4 weeks of therapy and on the 8 weeks of therapy was significantly different with p = 0.000 (Table 3).

Table 3: The Comparison Score difference of SCoRSVI dan WHODAS 2.0 between non-occupational therapy group and occupational therapy group

<table>
<thead>
<tr>
<th>Variabel</th>
<th>Group</th>
<th>N (n = 44)</th>
<th>SCoRSVI score Group 1* and Group 2**</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean</td>
</tr>
<tr>
<td>Score Diff. baseline -4th Week</td>
<td>Group 1*</td>
<td>22</td>
<td>1.68</td>
</tr>
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<td></td>
<td>Group 2**</td>
<td>22</td>
<td>4.09</td>
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<tr>
<td>Score Diff. 4th Week-8th Week</td>
<td>Group 1*</td>
<td>22</td>
<td>3.86</td>
</tr>
<tr>
<td></td>
<td>Group 2**</td>
<td>22</td>
<td>6.82</td>
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<tr>
<td>Score Diff. baseline -8th Week</td>
<td>Group 1*</td>
<td>22</td>
<td>5.55</td>
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<tr>
<td></td>
<td>Group 2**</td>
<td>22</td>
<td>10.91</td>
</tr>
</tbody>
</table>

Mann-Whitney test. *non-occupational therapy group, **occupational therapy group.
Wilcoxon Sign Rank test showed significant differences in the SCoRSVI score between the baseline and the 4th week (p = 0.000) and between the 4th week and the 8th week (p = 0.000), either in the occupational therapy group or in the non-occupational therapy group (Table 4).

**Table 4: The Comparison of SCoRSVI score at baseline to 4th week, and 4th week to 8th week at non-occupational therapy group and occupational therapy group.**

<table>
<thead>
<tr>
<th>Variabel</th>
<th>Group</th>
<th>N (n = 44)</th>
<th>SCoRSVI Score Group 1* and Group 2**</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean</td>
</tr>
<tr>
<td>SCoRSVI baseline-4th Week</td>
<td>Group 1*</td>
<td>22</td>
<td>44.41</td>
</tr>
<tr>
<td></td>
<td>Group 1*</td>
<td>22</td>
<td>42.73</td>
</tr>
<tr>
<td>SCoRSVI 4th Week-8th Week</td>
<td>Group 1*</td>
<td>22</td>
<td>42.73</td>
</tr>
<tr>
<td></td>
<td>Group 1*</td>
<td>22</td>
<td>38.86</td>
</tr>
<tr>
<td>SCoRSVI baseline-4th Week</td>
<td>Group 2**</td>
<td>22</td>
<td>45.23</td>
</tr>
<tr>
<td></td>
<td>Group 2**</td>
<td>22</td>
<td>41.14</td>
</tr>
<tr>
<td>SCoRSVI 4th Week-8th Week</td>
<td>Group 2**</td>
<td>22</td>
<td>41.14</td>
</tr>
<tr>
<td></td>
<td>Group 2**</td>
<td>22</td>
<td>34.32</td>
</tr>
</tbody>
</table>

*Wilcoxon Sign Rank Test.* *non-occupational therapy group, **occupational therapy group.

Wilcoxon Sign Rank test showed significant differences in the WHODAS 2.0 score between the baseline and the 4th week (p = 0.000) and between the 4th week and the 8th week (p = 0.000), either in the occupational therapy group or in the non-occupational therapy group (Table 5).

**Table 5: The comparison of WHODAS 2.0 Score at baseline to 4th week, and 4th week to 8th week at non-occupational therapy group and occupational therapy group**

<table>
<thead>
<tr>
<th>Variabel</th>
<th>Group</th>
<th>N (n = 44)</th>
<th>WHODAS 2.0 Score Group 1* and Group 2**</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean</td>
</tr>
<tr>
<td>WHODAS 2.0 baseline-4th Week</td>
<td>Group 1*</td>
<td>22</td>
<td>41.27</td>
</tr>
<tr>
<td></td>
<td>Group 1*</td>
<td>22</td>
<td>37.59</td>
</tr>
<tr>
<td>WHODAS 2.0 4th Week-8th Week</td>
<td>Group 1*</td>
<td>22</td>
<td>37.59</td>
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<td>WHODAS 2.0 baseline k-4th Week</td>
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<td>43.59</td>
</tr>
<tr>
<td></td>
<td>Group 2**</td>
<td>22</td>
<td>38.14</td>
</tr>
</tbody>
</table>

*Wilcoxon Sign Rank Test.* *non-occupational therapy group, **occupational therapy group.

**Discussion**

In this study, the occupational therapy group received risperidone therapy, group psychotherapy and occupational therapy 24 times over 8 weeks. In the non-occupational therapy group, only received risperidone therapy and group psychotherapy. Occupational therapy is generally given 1-3 times a week, 1-3 hours per session from 6 weeks to 6 months. Gender distribution showed more male (68.2%) in the occupational therapy group, and the same percentage between men and women (50%) in the non-occupational therapy group. This was in accordance with the literature that schizophrenia was more commonly occur in men than in women.12,13

Wilcoxon Sign Rank test showed a significant differences in the SCoRSVI score between the baseline and the 4th week (p = 0.000), as well as between the 4th week and the 8th week (p = 0.000), either in the occupational therapy group or in the non-occupational therapy group. Wilcoxon Sign Rank test showed significant differences in WHODAS 2.0 score between the baseline and the 4th week (p = 0.000) as well as between the 4th week and the 8th week (p = 0.000),
either in the occupational therapy group or in the non-occupational therapy group. This describes that from the baseline, the 4th week and the 8th week, either in the occupational therapy group or in the non-occupational therapy group, had shown significant improvements in cognitive function and the quality of life. According to the Wilcoxon Sign Rank test, there were significant differences in the SCoRSVI score at the baseline to the 4th week (p = 0.000) and at the 4th week to the 8th week (p = 0.000), either in the occupational therapy group or in the non-occupational therapy group. Similarly, Wilcoxon Sign Rank test showed significant differences in WHODAS 2.0 scores at the baseline to the 4th week (p = 0.000) and at the 4th week to the 8th week (p = 0.000), either in the occupational therapy group or in the non-occupational therapy group. This indicates that from the baseline to 4th week then to the 8th week, either in the occupational therapy group or in the non-occupational therapy group, had shown significant improvements in cognitive function and the quality of life.

However, comparison of the mean scores difference between SCoRSVI and WHODAS 2.0 in the occupational therapy group and the non-occupational therapy group, from the baseline and from the 4th week to the 8th week, showed a significant results were p≤0.000. This showed that treatment with risperidone therapy, group psychotherapy combined with occupational therapy was more effective in improving the clinical symptoms of schizophrenia disorder than if it were only given risperidone therapy with group psychotherapy. This support the theory that our brain stores information by modifying neuronal connections.

**Conclusion**

It was concluded that there was an improvement in cognitive function and the quality of life in both the occupational therapy group given risperidone therapy combined with group psychotherapy and occupational therapy, as well as the non-occupational therapy group given risperidone therapy with only group psychotherapy combination. The improvement of cognitive function and the quality of life in the occupational therapy group was better than the non-occupational therapy group. Occupational therapy was effective when combined with antipsychotic therapy and group psychotherapy in improving cognitive function and the quality of life. Further study was recommended in comparing occupational therapy on schizophrenia patients between hospitalized and non-hospitalized ones. It is important to conduct study in comparing the effectiveness of occupational therapy with other psychotherapeutic modalities in schizophrenia patients. It was also important to evaluate patient condition after therapy and how they interact with their environment. Hospital and government health insurance needs to consider carrying out occupational therapy in hospitalized schizophrenia patients because it could shorten the length of stay in the hospital.

**Ethical Clearance:** The research data and experiment has taken the approval from South Sulawesi Province Special Hospital (RSKD) and Hasanuddin University Makassar

**Funding Source:** This research was privately funded.

**Conflict of Interests:** There are no conflict of interest

**References**


Compliance with the Baby Friendly Hospital Initiative Programme in Two Hospitals Designated “Baby-Friendly” in Kirkuk City, Iraq, an Evaluation Study

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1Gli - College of Nursing - Kirkuk University - Iraq, 2Senior Lecturer - Queen’s University Belfast - UK, Professor Linda Johnston - University of Toronto - Canada, 3Lecturer - Queen’s University Belfast - UK, 4Consultant Neonatologist - Belfast Trust - UK, 5College of Medicine - Kirkuk University - Iraq

Abstract

Background: Although the Baby Friendly Hospital Initiative (BFHI) was implemented in Iraq since 1992, a remarkable regression in exclusive breastfeeding has been highlighted by UNICEF (2011). Kirkuk province has experienced the lowest rate of breastfeeding initiation in the first hour of life, with higher neonatal and under five years mortality rates. International organizations have recommended a focus on breastfeeding practices and strengthening the implementation and monitoring of BFHI program in Iraqi provinces.

Method: Two-phase study was carried-out in two-designated Baby-Friendly hospitals (Azadi Teaching Hospital and Kirkuk General Hospital), using a standardized questionnaire. Monitoring BFHI tools utilised to measure the compliance with BFHI. Carolina B-KAP survey questionnaires were used to assess knowledge, attitudes, and practices of clinical and non-clinical staff and to measure the components of Organisational Readiness for Change (ORC) theory through practical and theoretical knowledge of hospitals processes. The Chi-square test of independence was performed to test for group differences in the responses to the Carolina B-KAP questionnaire.

Results: There was compliance in both hospitals with step 1,7 and 10 of the Ten Steps to Successful Breastfeeding, and the International Code of Marketing Breastmilk Substitutes (the Code). However, a non-compliance with step 3, 4, 5,6,8 and 9 were present. KGH also showed non-compliance with step 2 (training on BFHI). A total of 143 participants (124 clinical and 19 non-clinical) responded to the survey. ATH were more likely to have greater knowledge of infant feeding, than respondents working in KGH (p < 0.05). Responses indicated that (61.7%) of participants reported that healthy full-term newborns within their care had started to breastfeed within 60 minutes after birth. In terms of matching infant feeding with appropriate clinical support plans, the results show that respondents agreed or strongly agreed on the need for additional guidance and training (78.3%).

Conclusion: Increased compliance with the BFHI programme can have positive impact on breastfeeding initiation, duration and exclusivity. Maternity departments in Kirkuk hospitals must fully implement Baby Friendly Hospital Initiative to support an increase in exclusive breastfeeding rates. Also, implementation of Baby Friendly Community Initiative (BFCl) can provide community support for breastfeeding.

Keywords: Baby Friendly Hospital Initiative (BFHI), the Ten Steps to Successful Breastfeeding, International Code of Marketing Breastmilk Substitutes (the Code), Organisational Readiness for Change (ORC).

Introduction

The Baby Friendly Hospital Initiative (BFHI) is evidence-based practice programme initiated in 1991 by the United Nations Children’s Fund (UNICEF) and World Health Organisation (WHO), and its designated to increase the rates of initiation, duration and exclusivity...
of breastfeeding worldwide.\textsuperscript{1} BFHI consist of the Ten Steps for Successful Breastfeeding, and the International Code for Marketing of Breastmilk Substitutes which is a key element of the international standard for promoting, protecting and supporting breastfeeding.\textsuperscript{2} The BFH assessment process, otherwise known as the BFH designation process or accreditation, consists of a set of tools initiated in 1991 and revised and updated in 2006 to 2009. This process was designed based on the BFI quality cycle (Figure 1).\textsuperscript{3} Changing staff attitudes continues to be the greatest challenge to those hospitals that wish to achieve Baby-Friendly certification.\textsuperscript{4} Organisational readiness for change (ORC) is key factor in the effective implementation of new strategies, programs and practices in healthcare facilities.\textsuperscript{5} ORC embodies two important principles for the implementation of change, collective efficacy and collective commitment.\textsuperscript{6,7}

Two main gaps have been identified through the literature review. First, there is a dearth of studies which apply Organisation Readiness for Change (ORC) theory to assess clinical and non-clinical staffing levels required to deliver the BFH programme. Second, few researchers have sought to understand how the organisational cultures of individual hospitals influence compliance with the Ten Steps to Successful Breastfeeding and the Code. The aims of this paper, therefore, are as follows:

1. To determine if the two BFHI designated hospitals in Kirkuk have sustained adherence to the Ten Steps to Successful Breastfeeding and the Code.
2. To assess the levels of support reported by clinical and non-clinical staff to successfully deliver the BFHI programme.

Material and Method

A quantitative approach was carried out in the maternity departments of two public hospital, Azadi Teaching Hospital (was accredited as a Baby Friendly Hospital in June 2014) and Kirkuk General Hospital (was in the final stage of accreditation), in the city of Kirkuk, Iraq. Both hospitals had high birth rates (13,000 and 15,000 births respectively in 2014).

The standardized instrument Monitoring Baby Friendly Hospitals tools, gathered hospital level data regarding the implementation of BFHI. This mechanism was used to confirm the hospital’s commitment to Step 1 (policy) and Step 2 (training) of the Ten Steps to Successful Breastfeeding and the Code. The questionnaires for breastfeeding mothers [interview of 60 postpartum mothers (experienced vaginal birth or caesarean section birth) across the two participating hospitals through stratified sampling on random basis] were used to confirm the hospital’s commitment to the Steps 3 to 10, of the Ten Steps.

A survey utilized Carolina B- knowledge, attitudes and practices (Carolina B-KAP) questionnaires Nickel\textsuperscript{11} were used to assess these aspects in clinical and non-clinical staff (were 125 employees in ATH and 105 in KGH by using self-selecting convenience sample) in relation to the BFHI, and to measure the components of Organisational Readiness for Change (ORC) theory through practical and theoretical knowledge of hospitals processes.
Data Analysis

Descriptive statistics were utilised as per the UNICEF/WHO guidance for data analysis. Summarising the data and interpretation of the finding of the Monitoring Baby Friendly Hospital tool, including the questionnaire for breastfeeding mothers, was undertaken to identify the level of the hospital’s adherence with BFHI steps. The data from Carolina B-KAP questionnaires were entered and analysed by the researcher using SPSS program.

Findings: The results of Monitoring Baby Friendly Hospitals tool revealed a partial commitment to providing maternal and infant health services under the BFHI program in Azadi Teaching Hospital (ATH), (Table 1) and Kirkuk General Hospital (KGH) (Table 2).

Table 1: Monitoring of the BFHI in Azadi Teaching Hospital.

<table>
<thead>
<tr>
<th>Steps</th>
<th>Question Code</th>
<th>Minimum Requirement Needed</th>
<th>Findings from ATH</th>
<th>Compliance Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>1.1</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td></td>
<td>1.2</td>
<td>YES</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.3</td>
<td>YES</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td>S2</td>
<td>2.1</td>
<td>At least 80% of the BFHI clinical staff + 3h. clinical</td>
<td>97% (n = 110) +YES</td>
<td>YES</td>
</tr>
<tr>
<td></td>
<td>2.2</td>
<td>YES</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.3</td>
<td>YES</td>
<td>Needs Improvement</td>
<td></td>
</tr>
<tr>
<td>S3</td>
<td>3.1</td>
<td>70%</td>
<td>0%(n = 0)</td>
<td>NO</td>
</tr>
<tr>
<td>S4</td>
<td>4.1</td>
<td>At least 80% on 3 items and 70% on 2. The second item can be reduced to 50% in a special circumstance</td>
<td>70%(n = 21)</td>
<td>NO</td>
</tr>
<tr>
<td></td>
<td>4.2</td>
<td>73%(n = 22)</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>4.3</td>
<td>73%(n = 22)</td>
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<td>13%(n = 04)</td>
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<td>73%(n = 22)</td>
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</tr>
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<td>S5</td>
<td>5.1</td>
<td>At least 80% on 3 items and 50% on 2</td>
<td>70%(n = 21)</td>
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<td>57%(n = 17)</td>
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<td>S6</td>
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<td>80%</td>
<td>67%(n = 20)</td>
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<td>80%</td>
<td>97%(n = 29)</td>
<td>YES</td>
</tr>
<tr>
<td>S8</td>
<td>8.1</td>
<td>80%</td>
<td>63%(n = 19)</td>
<td>NO</td>
</tr>
<tr>
<td></td>
<td>8.2</td>
<td>80%</td>
<td>47%(n = 14)</td>
<td></td>
</tr>
<tr>
<td>S9</td>
<td>9.1</td>
<td>80%</td>
<td>40%(n = 12)</td>
<td>NO</td>
</tr>
<tr>
<td></td>
<td>9.2</td>
<td>80%</td>
<td>77%(n = 23)</td>
<td></td>
</tr>
<tr>
<td>S10</td>
<td>10.1</td>
<td>80%</td>
<td>90%(n = 27)</td>
<td>YES</td>
</tr>
<tr>
<td></td>
<td>10.2</td>
<td>80%</td>
<td>87%(n = 26)</td>
<td></td>
</tr>
<tr>
<td>The Code</td>
<td>C.1</td>
<td>YES</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C.2</td>
<td>80%</td>
<td>100%(n = 30)</td>
<td>YES</td>
</tr>
</tbody>
</table>
## Table 2: Monitoring of the BFHI in Kirkuk General Hospital

<table>
<thead>
<tr>
<th>Steps</th>
<th>Question Code</th>
<th>Minimum Requirement Needed</th>
<th>Findings from KGH</th>
<th>Compliance statuses</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>1.1</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td></td>
<td>1.2</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td></td>
<td>1.3</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>S2</td>
<td>2.1</td>
<td>At least 80% of the BFHI clinical staff + 3h. clinical</td>
<td>74% (n = 69) +YES</td>
<td>NO</td>
</tr>
<tr>
<td></td>
<td>2.2</td>
<td>YES</td>
<td>YES</td>
<td>Needs Improvement</td>
</tr>
<tr>
<td></td>
<td>2.3</td>
<td>YES</td>
<td>Needs Improvement</td>
<td></td>
</tr>
<tr>
<td>S3</td>
<td>3.1</td>
<td>70%</td>
<td>0%(n = 0)</td>
<td>NO</td>
</tr>
<tr>
<td>S4</td>
<td>4.1</td>
<td>At least 80% on 3 items and 70% on 2, The second item can be reduced to 50% in a special circumstance</td>
<td>67%(n = 20)</td>
<td>NO</td>
</tr>
<tr>
<td></td>
<td>4.2</td>
<td>70%</td>
<td>70%(n = 21)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4.3</td>
<td>03%</td>
<td>03%(n = 01)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4.4</td>
<td>77%</td>
<td>77%(n = 23)</td>
<td></td>
</tr>
<tr>
<td>S5</td>
<td>5.1</td>
<td>At least 80% on 3 items and 50% on 2</td>
<td>83%(n = 25)</td>
<td>NO</td>
</tr>
<tr>
<td></td>
<td>5.2</td>
<td>90%</td>
<td>90%(n = 27)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5.3</td>
<td>80%</td>
<td>80%(n = 24)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5.4</td>
<td>47%</td>
<td>47%(n = 14)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5.5</td>
<td>Not Included</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S6</td>
<td>6.1</td>
<td>80%</td>
<td>67%(n = 20)</td>
<td>NO</td>
</tr>
<tr>
<td>S7</td>
<td>7.1</td>
<td>80%</td>
<td>97%(n = 29)</td>
<td>YES</td>
</tr>
<tr>
<td>S8</td>
<td>8.1</td>
<td>80%</td>
<td>43%(n = 13)</td>
<td>NO</td>
</tr>
<tr>
<td></td>
<td>8.2</td>
<td>80%</td>
<td>37%(n = 11)</td>
<td></td>
</tr>
<tr>
<td>S9</td>
<td>9.1</td>
<td>80%</td>
<td>70%(n = 21)</td>
<td>NO</td>
</tr>
<tr>
<td></td>
<td>9.2</td>
<td>80%</td>
<td>97%(n = 29)</td>
<td></td>
</tr>
<tr>
<td>S10</td>
<td>10.1</td>
<td>80%</td>
<td>93%(n = 28)</td>
<td>YES</td>
</tr>
<tr>
<td></td>
<td>10.2</td>
<td>80%</td>
<td>93%(n = 28)</td>
<td>YES</td>
</tr>
<tr>
<td>The Code</td>
<td>C.1</td>
<td>YES</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C.2</td>
<td>80%</td>
<td>100%(n = 30)</td>
<td></td>
</tr>
</tbody>
</table>

**Survey results:** The response rate was 62% across both hospitals with 143 participants in total (124 clinical and 19 non-clinical staff).

**Knowledge of infant feeding:** The results in (Table 3) show that for items 1-3 and 6, respondents working in ATH were more likely to have greater knowledge of infant feeding, as they responded correctly to these items, than respondents working in KGH (p < 0.05).

## Table 3: Group differences in knowledge of infant feeding: ATH versus KGH.

<table>
<thead>
<tr>
<th>Items</th>
<th>df</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Breastfeeding too frequently can cause sore nipples</td>
<td>5.841</td>
<td>1</td>
</tr>
<tr>
<td>2. Maternal body temperature</td>
<td>8.538</td>
<td>1</td>
</tr>
<tr>
<td>3. Hospital policies that interfere with breastfeeding</td>
<td>24.557</td>
<td>4</td>
</tr>
<tr>
<td>4. Latching during breastfeeding</td>
<td>6.664</td>
<td>4</td>
</tr>
<tr>
<td>5. Encouraging successful breastfeeding</td>
<td>11.337</td>
<td>4</td>
</tr>
<tr>
<td>6. Acceptable medical reason to supplement a breastfeeding infant in the hospital</td>
<td>12.372</td>
<td>4</td>
</tr>
<tr>
<td>7. Optimal duration for exclusive breastfeeding</td>
<td>8.826</td>
<td>3</td>
</tr>
</tbody>
</table>
(77.4%, n = 96) always recommend breastfeeding to the mothers in their care who have not decided how to feed their babies. Responses indicated that (61.7%, n = 58) of participants (out of 88 participants involved with Labor and delivery care) reported that healthy full-term newborns within their care had started to breastfeed within 60 minutes after birth.

**Attitudes toward commitment and ability in the workplace:** The participants responded to 15 questions which measured the components of Organisation Readiness for Change (ORC) across five categories. The first category related to their opinion about clinical staff in the maternity facility where they work and whether they needed additional guidance (Table 4). In terms of matching infant feeding with appropriate clinical support plans, the results show that respondents agreed or strongly agreed on the need for additional guidance or training (78.3%, n = 112).

**Table 4: Attitude towards commitment and ability in the workplace (N = 143)**

<table>
<thead>
<tr>
<th>Items</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>Slightly Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>In my opinion, clinical staff in the maternity facility where I work need additional guidance/training/skills in:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Matching infant feeding plans with appropriate clinical support.</td>
<td>0.0 (0.0)</td>
<td>1 (.7)</td>
<td>12 (8.4)</td>
<td>15 (10.5)</td>
<td>73 (51.0)</td>
<td>39 (27.3)</td>
</tr>
<tr>
<td>Counselling / teaching all pregnant women about the benefits and practices of breastfeeding.</td>
<td>1 (.7)</td>
<td>6 (4.2)</td>
<td>3 (2.1)</td>
<td>13 (9.1)</td>
<td>66 (46.2)</td>
<td>48 (33.6)</td>
</tr>
<tr>
<td>Referring patients to breastfeeding resources in the community at discharge.</td>
<td>14 (9.8)</td>
<td>9 (6.3)</td>
<td>8 (5.6)</td>
<td>11 (7.7)</td>
<td>49 (34.3)</td>
<td>44 (30.8)</td>
</tr>
</tbody>
</table>

**Discussion**

Increases in exclusive breastfeeding rates are associated with high compliance with BFHI practices. Participated hospitals in this study showed non-compliance with many steps of the Ten Steps to Successful Breastfeeding. Specifically, a non-compliance in KGH in relation to step 2 was due to the low proportion of clinical staff who had participated in the training courses, which was below the required rate set by the UNICEF and WHO guideline.

There was a non-compliance in both hospitals with Step 3. Given that the total number of births in both hospitals for 2014 exceeded 28000, a small prenatal clinic in both hospitals cannot be expected to cover Step 3. This finding is consistent with the result obtained by Zakarija-Grkovic as a minimum compliance with the same step was reported.

The knowledge of participated hospitals staff was varied according to the hospitals as there is a gap in knowledge to support breastfeeding, respondents working in ATH were more likely to have greater knowledge of infant feeding. This can be linked to lack of training in KGH when that hospital showed non-compliance with step 2 of the BFHI. A study on BFHI confirmed that lack of health training affects the rate of correct answers on breastfeeding knowledge.

The rate of initiation of breastfeeding (within first hour of birth) in accredited (BFHI) hospitals is greater than those of non-accredited. Based on the opinion of staff working in labour and delivery care, our findings showed that up to 61.7% of healthy, full-term newborns initiate breastfeeding within the first hour of birth. This rate is significantly associated with respondents from KGH (p < 0.05). A survey in the District of Shaqlawa, Erbil, Iraq, found a statistically significant relationship between delivery in BFHI hospitals and initiation of breastfeeding.

Readiness in healthcare organisations is required before implementing evidence-based interventions. Changing staff attitudes requires time and remains the greatest challenge for those wishing to attain Baby Friendly certification. Our findings indicated that the clinical staff require more guidance, training and skills in terms of matching infant feeding plans with appropriate clinical support plans (78.3%). This result was significantly associated with the respondents working at KGH, and those in the age group 31-40 years (p < 0.05).

**Conclusion**

Maternity departments in Kirkuk must fully implement Baby Friendly Hospital Initiative. Organisational Readiness for Change is vital in successful
implementation of the BFHI. Training on BFHI develops the knowledge and skills of staff concerned. Community support of optimal breastfeeding practices in Kirkuk is needed through implementation of the Baby Friendly Community Initiative (BFCI) to increase the rates of exclusive breastfeeding at six months.

**Conflict of Interest:** Nil

**Source of Funding:** This study was funded by the official representative of the Iraqi Ministry of Higher Education and Scientific Research (MOHESR) in the UK and Ireland.

**Ethical Clearance:** Ethical approval and permission to access participants was obtained from the School of Nursing and Midwifery Research Ethics Committee, Queen’s University Belfast and the Ministry of Health in Iraq.

**References**


The Evaluation of Professional Burnout among Health Workers at EL Idrissi Hospital in Morocco

Hassan Saidi¹, Salma Ammor²-³, Zakaria Abidli¹, Abdeslam Amri⁴, Mounir Bouzaaboul⁴, Abdelmajid Soulaymani¹, Abderrazzak Khadmaoui¹

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Abstract

Background: Today, workplace stress is a scourge that has serious individual, organizational, social and economic consequences.

Objective: This study aims to understand the phenomenon of burnout among health professionals at EL Idrissi Hospital in Kenitra.

Materials and Method: This is a cross-sectional descriptive study carried out at El Idrissi Hospital in Kenitra, Morocco, on burnout, using the Maslach Burnout Inventory (MBI) adapted for health personnel.

Results: Out of the 70 questionnaires sent to health professionals at Idrissi Hospital, 65 respondents, including 13 doctors (20%) and 52 nurses (80%). The average age of the respondents is 41±1.32 years, with a minimum age of 22 years and a maximum age of 59 years. The results of the Maslach Burnout Inventory show that 22 out of 65 respondents (33.85%) are people with a high degree of emotional exhaustion, thus a high degree of depersonalization and a low degree of achievement. So we can consider these people as pathological cases. A high emotional exhaustion score was observed in 55.4% of respondents and a high depersonalization score in 40%, while a low degree of achievement with a percentage of 66.1%.

Conclusion: From our results, we have found that burnout is a real threat to the mental health of health professionals at the el idrissi de kénitra hospital. Intervention by higher authorities is essential to combat this problem.

Keywords: Professional burnout, Maslach, Health professionals, Morocco.

Introduction

According to Maslach & Jackson, burnout is mental and physical exhaustion for people whose work requires constant contact with others¹, caused by exposure to emotionally demanding work situations².

In 2016, Maslach & Leiter defined burnout as an inadequate response to chronic stress consisting of emotional exhaustion, depersonalization, and reduced personal accomplishment. Emotional exhaustion refers to the decrease and loss of emotional resources, the feeling of being emotionally exhausted due to work, along with the feeling that one has nothing to offer psychologically to others³-⁴. Depersonalization consists of the development of negative attitudes and feelings and insensitivity and lack of compassion towards the people they serve. Reduced personal accomplishment at work is the tendency to evaluate oneself and one’s own work negatively, together with avoidance of interpersonal
relationships, low productivity and the inability to withstand pressure.

People who experience all three symptoms have the greatest degree of burnout, although emotional exhaustion has been identified as the hallmark of burnout, with health professionals being among those who experience it most frequently. Among the reasons for this, one should emphasize: increased stress as a result of the need to respond quickly to the needs of patients and families, the high stakes associated with their caregiving decisions that could result in harm to patients, and the work overload and the need for working long hours and often shiftwork in a complex working environment.

International epidemiological studies have focused on the extent of burnout in hospitals, such as: in Finland, 30.1% of healthcare workers with burnout syndrome and in France, 5% of general practitioners with burnout.

At the African level, a study carried out in Cameroon showed a burnout prevalence of 42.4% among general practitioners in the city of Douala. In Morocco, a study carried out in four Moroccan hospitals among anaesthesia resuscitation staff shows that 70% of respondents have professional exhaustion syndrome. Another study conducted on fifth-year medical students in Rabat showed that 44% of medical students were highly exhausted.

Despite these studies, the number of works carried out at national level with carers remains relatively low and the studies are mainly descriptive. In this sense, the objective of our study is to assess the prevalence of burnout syndrome among healthcare professionals at Al Idrissi Hospital in Morocco.

Material and Method

Type and study area: This is a descriptive and analytical cross-sectional epidemiological study carried out during the months of April and May 2016, in the El Idrissi hospital in Kenitra, Morocco.

Sample: This study was conducted on 52 nurses and 13 physicians working full time in the hospital.

Assessments: Data collection was done through a questionnaire, distributed to health personnel with questions on identity and certain socioeconomic and socio-demographic characteristics, plus Maslach Burnout Inventory (MBI) test questions. This is the Maslach Burnout Inventory (MBI) version adapted to caregivers or MBI-HSS (“Human Services Survey”), which consists of 22 items with a 7-point rating (between 0 = never and 6 = sever several times a day), assessing how often the caregiver experienced the experience, feeling or emotion in question. These items allow nine of them to establish an emotional exhaustion score (numbered from 0 to 54), five other separate items define the depersonalization score (numbered from 0 to 30) and the last eight, that of personal achievement (numbered from 0 to 48).

Emotional Exhaustion (EE): is assessed by items: 1, 2, 3, 6, 8, 13, 14, 16 and 20 (result between 0 and 54).
- Total less than 17: EE level low.
- Total between 18 and 29: moderate level of EA.
- Total greater than 30: high level of EE (pathologic)

Depersonalization (DP): is evaluated by items: 5, 10, 11, 15 and 22 (result between 0 and 30).
- Total less than 5: degree of low DP.
- Total between 6 and 11: moderate degree of DP.
- Total greater than 12: high degree of DP (pathologic).

Personal Achievement (PA): is assessed by items: 4, 7, 9, 12, 17, 18, 19 and 21 (result between 0 and 48).
- Total greater than 40: low degree of AP.
- Total between 34 and 39: moderate PA level.
- Total less than 34: high degree of AP (pathologic).

Statistics Analyses: The data collected are entered in Excel, after filtration have been transferred to a support of the SPSS software (trial version). These data are subjected to descriptive and analytical statistical analyses. A descriptive analysis is used to determine the socio-demographic profile. Thus, we used the analysis of multiple correspondences in order to determine the correlations between the different modalities studied.

Results

Sociodemographic characteristics of sample: Among 70 questionnaires sent to health professionals at the Idrissi hospital, 65 feedbacks including 20% doctors and 80% nurses, which correspond to a participation rate equal to 92.8%. Indeed, out of a total of 65 interviewees
38.6% are in emergency / resuscitation, the others are distributed on the departments of surgery, radio and laboratories, as well as the departments of cardiology and maternity. The distribution is represented in a fair way between the female and the male sex, the frequencies are respectively 52.5% and 47.7%, with a sex ratio equal 1, 1. The average age of respondents is 41 ± 1.32 years, with a minimum age of 22 years and a maximum age of 59 years (table 1).

Table 1. Sociodemographic characteristics of the study population

<table>
<thead>
<tr>
<th>Socio-demographic characteristics</th>
<th>Number of people</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doctor</td>
<td>13</td>
<td>20%</td>
</tr>
<tr>
<td>Nurses</td>
<td>52</td>
<td>80%</td>
</tr>
<tr>
<td>Department</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emergency</td>
<td>25</td>
<td>38.6%</td>
</tr>
<tr>
<td>Radio</td>
<td>6</td>
<td>9.2%</td>
</tr>
<tr>
<td>Surgery</td>
<td>7</td>
<td>10.7%</td>
</tr>
<tr>
<td>Maternity</td>
<td>6</td>
<td>9.2%</td>
</tr>
<tr>
<td>Cardio</td>
<td>8</td>
<td>12.3%</td>
</tr>
<tr>
<td>Resuscitation</td>
<td>5</td>
<td>7.6%</td>
</tr>
<tr>
<td>Laboratory</td>
<td>8</td>
<td>12.3%</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Women’s</td>
<td>34</td>
<td>52.53%</td>
</tr>
<tr>
<td>Man</td>
<td>31</td>
<td>47.7%</td>
</tr>
<tr>
<td>Average±Standard deviation Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>41 ± 1.32 years</td>
<td></td>
</tr>
</tbody>
</table>

MBI scale (Maslach Burn out Inventory): The results of Maslach Burn out Inventory’s scale showed that 55.4% have high emotional exhaustion, 40% are depersonalized and 66.1% suffer from a low sense of personal accomplishment. 33.8% had severe burnout (Table 2).

Table 2: The distribution of respondents according to the three dimensions of the syndrome of personal exhaustion

<table>
<thead>
<tr>
<th></th>
<th>Low</th>
<th>Middle</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotional exhaustion</td>
<td>21 (32.3%)</td>
<td>8 (12.3%)</td>
<td>36 (55.4%)</td>
</tr>
<tr>
<td>Depersonalization</td>
<td>17 (26.2%)</td>
<td>22 (33.8%)</td>
<td>26 (40%)</td>
</tr>
<tr>
<td>Personal achievement</td>
<td>43 (66.1%)</td>
<td>18 (27.7%)</td>
<td>4 (6%)</td>
</tr>
</tbody>
</table>

The projection of the different modalities of the variables that showed significant trends in space 1 and 2 of the multiple correspondence analysis is shown in Figure (1). This analysis reveals two groups:

- First group brings together people qualified as pathological and who are generally physicians in emergency, resuscitation and cardio services. These people are over the age of 45 so there is a high degree of emotional exhaustion, a high degree of depersonalization and a low degree of achievement.
- Second group consists of nurses under 35 years old who represent the surgical services and laboratories. These people are characterized by moderate degree of the three dimensions, so these are individuals to monitor.
- The third group consists of nurses with a high achievement and moderate exhaustion and depersonalization. They represent maternity services and are young people between 25 and 35 years old.

![Figure 1: Presentation of the modalities according to axes 1 and 2 of the ACM.](image)

Discussion

This study examined the prevalence of burnout syndrome in population of healthcare professionals who work in the El idrissi Hospital in Kenitra, Morocco. We found that 33.85% of professionals were suffering from burnout syndrome. This result is in harmony with studies carried out on Tunisian healthcare populations with burnout rates ranging from 30 to 34% [11-12]. At the national level, a study conducted on doctors in training at the Ibn Rochd University Hospital found that 31.8% of respondents with severe burnout were found to have this result in line with our study [13]. On the other hand,
international studies that have shown small percentages of burnout such as Portugal\textsuperscript{16} and Ecuador\textsuperscript{17}. A possible explanation for these differences in prevalence are the differences in the social and economic situation surrounding the Moroccan health professional compared to other countries.

Considering the dimensions of burnout, in our study we noted a high level of emotional exhaustion and depersonalization was found in 55.4% and 40% of cases, respectively, while a low level of professional achievement was found in 66.3% of cases; this result is in harmony with a Moroccan study on professional exhaustion in radiological settings\textsuperscript{18}, but with different results than those found in the literature\textsuperscript{19-20-21}. Along with, epidemiological studies have also found high rates of emotional exhaustion, depersonalization, and low personal accomplishment in healthcare professionals, ranging from 20.5\% to 59.0\% in emotional exhaustion, between 7.6\% and 61.0\% in depersonalization and between 16.7\% and 49.0\% in reduced personal accomplishment\textsuperscript{22-23-24}. A systematic search of MEDLINE/PubMed, PsychINFO/Ovid, Embase, CINAHL/EBSCO and Web of Science was conducted for original research published between 1997 and 2017, has demonstrated that the overall estimated pooled prevalence for emotional exhaustion was 40\% (CI 31\%-48\%) for depersonalisation was 22\% (CI 15\%-29\%) and for low levels of personal accomplishment was 19\% (CI 13\%-25\%)\textsuperscript{25}.

Burnout has serious effects on physical and psychological health. It is associated with cardiovascular disorders and musculoskeletal\textsuperscript{26-27}, as well as with depression, anxiety and alcohol addiction\textsuperscript{26, 28}. likewise, burnout is associated with high costs for society and organizations because it can result in personal and family deterioration\textsuperscript{29} and affects workers’ productivity\textsuperscript{30}. It is associated with higher medically certified sickness absence and absenteeism\textsuperscript{29} decreased job satisfaction and intention to leave the current job\textsuperscript{29, 31-32}. Furthermore, in the case of health professionals, burnout impacts the quality of care provided\textsuperscript{33} and patient satisfaction\textsuperscript{34}.

**Conclusion**

The results of this study showed that burnout is a real scourge that affects the psychological health of carers at El idrissi hospital in Kenitra, Morocco. for this reason, managers must carry out psychological awareness and support campaigns to minimize the risk among this working population.

**Significance Statement:** This study discovered the burnout syndrome among caregivers at El idrissi Hospital. That can be beneficial for health authorities. This study will help the researchers to uncover the critical areas of psychological health that many researchers were not able to explore. Thus a new theory on the assessment of burnout among caregivers in the Moroccan context may be arrived at.

**Conflict of Interest:** The authors declare that there are no conflicts of interest.

**Ethical approval:** The procedures were carried out in accordance with the recommendations of the Internal Ethics Committee of the Ibn Tofail University Kenitra. This procedure were examined and approved by the Committee.

**Source of Funding:** This work is not financial

**References**


Serum Ferritin Levels for Iraqi Patients with Hashimoto’s Thyroiditis

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²MOH / Medical City / National Center for Educational Laboratories, Baghdad, Iraq

Abstract

Background: The estimation of ferritin and related variables by complete serum iron profile, for Iraqi hashimoto’s patients to see the effect of thyroid hormone insufficiency, which may lead to deficiency of ferritin iron stores, this may be quite useful during the diagnosis and treatment of hashimoto’s patients.

Patients and Method: The study was performed at National Center of Teaching laboratories of Medical city institute in Baghdad. Fifty newly diagnosed patients with hashimoto’s and forty apparently healthy controls. Diagnosis based on thyroid profile analysis including: Thyroid Stimulating Hormone (TSH), Thyroxine (total T4) and Triiodothyronine (total T3), estimation of antibodies against thyroperoxidase, iron profile including: serum ferritin, serum iron, total iron-binding capacity (TIBC), unsaturated iron-binding capacity (UIBC) and Transferrin saturation (TSAT) for both groups.

Result: The hashimoto’s patients have elevated levels of anti-TPO, TSH, TIBC, UIBC and TSATs compared with controls. Anti-TPO, TSH, UIBC and TSAT were significantly higher than that of controls, while TIBC is not significant. In other hand, hashimoto’s patients have lowered levels of Total T3, Total T4, Ferritin and Iron as compared with controls. Total T4, Ferritin and Iron were significantly lower than that of control, while Total T3 is not significant.

Conclusion: Statistical application for the current study by employing Receiver Operation Characteristic curve (ROC curve) shows the validaty of anti-TPO in addition to serum iron and total T4 to be used as a biomarkers for detection of hashimoto’s thyroiditis.

Keywords: Hashimoto’s thyroiditis, Hypothyroidism, Iron, Ferritin.

Introduction

Ferritin is the major iron storage protein of the body. A small amount of ferritin released into the blood stream and act to transport the iron to areas where it is needed(1). The free iron is toxic, it forms reactive oxygen species through Fenton reaction(2). Ferritin act as antioxidant by limiting the formation of reactive oxygen species, and modifying their damaging effect on cellular structures(3). Also it acts as a buffer against iron deficiency and iron overload(4), so it is used as a diagnostic test for iron-deficiency anemia(5), also reflect thyroid function(6) because, low ferritin (low iron), is one of the most important causes of low thyroid function (7). Iron is a component of many enzymes including thyroid peroxidase (TPO) which has a key role in the initial two steps in thyroid hormone biosynthesis(8). Serum ferritin levels must be healthy for optimal thyroid hormone levels(5). Reference ranges for blood ferritin is about 28 to 397 ng/ml for men, and 6 to 159 ng/ml for women. Blood ferritin below 12 to 30 ng/ml indicates depletion of iron stores (ferritin) and is a diagnostic criterion for iron deficiency(9). Subclinical hypothyroidism is associated with iron-deficiency anemia and lower ferritin levels(10). Hashimoto’s thyroiditis (chronic lymphocytic thyroiditis) is an autoimmune disorder that causes inflammation of the thyroid gland. Symptoms of Hashimoto’s thyroiditis
are the same as hypothyroidism, and include feeling cold, dry skin, depression, fatigue, sleepiness, and weight gain. Patients with hashimoto’s thyroiditis typically shows an increased number of antibodies against thyroid-specific proteins, including thyroperoxidase and thyroglobulin. T lymphocytes, invade the thyroid gland cause silent, painless inflammation that destroys it; ultimately, the individual produces little or no thyroid hormone and becomes hypothyroid(11). Gradual thyroid failure, due to autoimmune-mediated destruction of the thyroid gland involving apoptosis of thyroid epithelial cells, with high serum concentrations of antibodies against one or more thyroid antigens (12). Infiltrating lymphocytes show cytotoxic effect on thyroid follicular cells (TFC), alters its integrity and modulates their metabolic and immune function(13). HT is thought to arise from an interaction between genetic susceptibility factors, epigenetic effects and various environmental triggers (e.g. iodine, infection)(14)(15). Additional factors include stress, climate, age and gender. Both cellular and humoral immunity play a role in HT pathogenesis(13). During the early stage of thyroiditis, the levels of thyroid hormones (T3 and T4) may be normal. With chronic hypothyroidism, the thyroid hormone levels fall, and the level of thyroid-stimulating hormone (TSH) becomes high. Estimation of iron profile may be of help for HT.

**Patients and Method**

The study was performed at National Center of Teaching laboratories of Medical city institute in Baghdad. Fifty newly diagnosed patients with hashimotos (27males, 23females) and forty apparently healthy as controls (22males, 18females). Age range for hashimoto’s patients(18-64)years with mean age(36.79 ±13.94),age range for controls(18-48)years with mean age(28±8.49).The diagnosis was based on detailed history and thyroid profile analysis, In addition to the estimation of antibodies against thyroperoxidase, serum ferritin, serum iron, TIBC, UIBC and TSAT was carried for both groups. Enzyme immunoassay (Gen Way Biotech Inc.) for the quantitative determination of autoantibodies to TPO (thyroid peroxidase) is used. TSH, Total T3, Total T4, and Serum ferritin test done by Immulite 2000 autoanalyzer. Serum iron, TIBC and UIBC by Diemension rxl autoanalyzer.

**Results**

Patients samples shows elevated TSH, low level of thyroid hormone and the presence of antibodies against thyroid peroxidase (TPO antibodies), these results in addition to physical examination indicates hashimoto’s thyroiditis. The estimated mean values results revealed that the hashimoto’s patients have elevated levels of anti-TPO (88.02 ±41.26 Au / ml), TSH (4.782 ± 7.093 uLU/ml),TIBC(391.08 ± 144.14 ug /dl), UIBC(362.16 ± 131.27 ug /dl) and TSAT(34.179 ± 160.83) as compared with controls. Anti-TPO (P < 0.0001), TSH(P = 0.009), UIBC (P = 0.010) and TSAT (P = 0.002) were significantly higher than that of controls: (18.175 ± 7.249 Au/ml), (1.974 ± 0.997uLU/ml), (307.225 ± 54.836ug /dl) and (16.082 ± 3.718) respectively. While TIBC (P = 0.250) is not significantly higher than that of controls: (365.05 ± 56.537 ug /dl). In other hand, the estimated mean values results revealed that the hashimoto’s patients have elevated levels of Total T3(1.5306 ±0.4649 nmol /L), Total T4 (19.8967 ± 11.6948 ng /ml), Ferritin (5.8781 ± 11.6948 ng /ml) and Iron (45.571 ± 61.689 ug /dl) as compared with controls. Total T4 (P < 0.0001), Ferritin (P = 0.003) and Iron (P < 0.001) were significantly lower than that of control: (98.960 ± 21.801 nmol / L), (84.7755 ± 205.139 ng / ml) and (57.825 ± 12.3369 ug / dl) respectively . Total T3 (P = 0.058), is not significantly lower than that of controls: (1.7048 ± 0.3908 nmol/L).

The descriptive statistics studies of both hashimoto’s patients and controls for thyroid profile and iron profile is shown in table (1).

<table>
<thead>
<tr>
<th>Blood tests</th>
<th>Hashimoto's Patients</th>
<th>Controls</th>
<th>Normal value</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSH</td>
<td>Hashimoto's Patients</td>
<td>6.0 ± 0.18</td>
<td>1.6 – 3.12</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td></td>
<td>Controls</td>
<td>1.67 ± 0.15</td>
<td>1.6 – 3.12</td>
<td></td>
</tr>
<tr>
<td>Total T3</td>
<td>Hashimoto's Patients</td>
<td>5.1 ± 0.13</td>
<td>1.6 – 3.12</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td></td>
<td>Controls</td>
<td>1.67 ± 0.15</td>
<td>1.6 – 3.12</td>
<td></td>
</tr>
<tr>
<td>Total T4</td>
<td>Hashimoto's Patients</td>
<td>19.8967 ± 11.6948 ng/ml</td>
<td>17.399 ng/ml</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td></td>
<td>Controls</td>
<td>24.20 ± 5.87</td>
<td>22.9762 ng/ml</td>
<td></td>
</tr>
<tr>
<td>Ferritin</td>
<td>Hashimoto's Patients</td>
<td>160.71 ± 21.21 ng/ml</td>
<td>121.01 ng/ml</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td></td>
<td>Controls</td>
<td>184.25 ± 31.25 ng/ml</td>
<td>121.01 ng/ml</td>
<td></td>
</tr>
<tr>
<td>Iron</td>
<td>Hashimoto's Patients</td>
<td>84.7755 ± 205.139 ng/ml</td>
<td>57.825 ± 12.3369 ug / dl</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td></td>
<td>Controls</td>
<td>205.139 ± 54.836 ng/ml</td>
<td>57.825 ± 12.3369 ug / dl</td>
<td></td>
</tr>
<tr>
<td>TIBC</td>
<td>Hashimoto's Patients</td>
<td>391.08 ± 144.14 ug /dl</td>
<td>18.082 ± 3.718</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td></td>
<td>Controls</td>
<td>362.16 ± 131.27 ug /dl</td>
<td>18.082 ± 3.718</td>
<td></td>
</tr>
<tr>
<td>UIBC</td>
<td>Hashimoto's Patients</td>
<td>362.16 ± 131.27 ug /dl</td>
<td>18.082 ± 3.718</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td></td>
<td>Controls</td>
<td>362.16 ± 131.27 ug /dl</td>
<td>18.082 ± 3.718</td>
<td></td>
</tr>
</tbody>
</table>

Data were also subjected to Receiver Operation Characteristic curve (ROC curve) to evaluate the validation of different parameters for the detection hashimoto’s thyroiditis in Iraqi patients.
ROC curves studies confirmed the validity of Anti-TPO to detect Hashimoto’s thyroiditis in Iraqi patients. ROC curves for TSH, Total T4, Total T3 in addition to Anti-TPO are shown in Figure 1. Area under the curve, standard error and 95% confidence intervals were calculated for the variable as in table 2.

Table 2: Area under the curve, standard error\(^{(16)}\) and 95% confidence intervals for TSH, Total T3, Total T4 and Anti-TPO

<table>
<thead>
<tr>
<th>Variable</th>
<th>AUC</th>
<th>SE(^{a})</th>
<th>95% CI(^{b})</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSH</td>
<td>0.674</td>
<td>0.0580</td>
<td>0.567 to 0.770</td>
</tr>
<tr>
<td>Total T3</td>
<td>0.630</td>
<td>0.0596</td>
<td>0.521 to 0.730</td>
</tr>
<tr>
<td>Total T4</td>
<td>0.980</td>
<td>0.0143</td>
<td>0.925 to 0.998</td>
</tr>
<tr>
<td>Anti-TPO</td>
<td>1.000</td>
<td>0.000</td>
<td>0.959 to 1.000</td>
</tr>
</tbody>
</table>

\(^{a}\) DeLong et al., 1988; \(^{b}\) Binomial exact

ROC curves for ferritin, iron, TIBC, UIBC and TSAT are shown in figure 2. Area under the curve, standard error and 95% confidence intervals were calculated for the variable as in table 3.

Table 3: Area under the curve, standard error\(^{(16)}\) and 95% confidence intervals for Ferritin, Iron, TIBC, UIBC and TSAT

<table>
<thead>
<tr>
<th>Variable</th>
<th>AUC</th>
<th>SE(^{a})</th>
<th>95% CI(^{b})</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ferritin</td>
<td>0.707</td>
<td>0.0585</td>
<td>0.601 to 0.799</td>
</tr>
<tr>
<td>Iron</td>
<td>0.855</td>
<td>0.0420</td>
<td>0.764 to 0.921</td>
</tr>
<tr>
<td>TIBC</td>
<td>0.637</td>
<td>0.0612</td>
<td>0.528 to 0.736</td>
</tr>
<tr>
<td>UIBC</td>
<td>0.699</td>
<td>0.0593</td>
<td>0.593 to 0.792</td>
</tr>
<tr>
<td>TSAT</td>
<td>0.764</td>
<td>0.0524</td>
<td>0.662 to 0.847</td>
</tr>
</tbody>
</table>

\(^{a}\) DeLong et al., 1988; \(^{b}\) Binomial exact

Table 4: Sensitivity, Specificity and cut off point of thyroid profile and iron profile for hashimoto’s patients

<table>
<thead>
<tr>
<th>Variables</th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>cut off point</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anti--TPO</td>
<td>100</td>
<td>100</td>
<td>≤ 28</td>
</tr>
<tr>
<td>TSH</td>
<td>49</td>
<td>87.5</td>
<td>&gt; 3</td>
</tr>
<tr>
<td>Total T3</td>
<td>51</td>
<td>70</td>
<td>≤ 1</td>
</tr>
<tr>
<td>Total T4</td>
<td>100</td>
<td>95</td>
<td>≤ 69</td>
</tr>
<tr>
<td>Ferritin</td>
<td>87.8</td>
<td>52.6</td>
<td>≤ 28</td>
</tr>
<tr>
<td>Iron</td>
<td>70.2</td>
<td>97.5</td>
<td>≤ 39</td>
</tr>
<tr>
<td>TIBC</td>
<td>44.9</td>
<td>90</td>
<td>&gt; 426</td>
</tr>
<tr>
<td>UIBC</td>
<td>63.3</td>
<td>87.5</td>
<td>&gt; 360</td>
</tr>
<tr>
<td>TSAT</td>
<td>58.3</td>
<td>97.5</td>
<td>≤ 9</td>
</tr>
</tbody>
</table>

Discussion

Results confirmed the validity of T4 followed by Iron as biomarkers for HT, in addition to anti-TPO according to the AUC of ROC analysis. The Sensitivity, Specificity and cut off point of thyroid profile and iron profile for hashimoto’s patients estimated by ROC shown in table 4.
normal TSH, T4/T3 hormones, no thyroid antibodies and no changes in thyroid gland. Stage 2 is characterized by an overabundance of lymphocytes in the thyroid gland, that attack healthy thyroid tissues\(^{(21)}\). Subclinical hypothyroidism is shown on stage 3 of HT, at this stage, the TSH may be slightly elevated on blood tests and the levels of free T3 and free T4 are going to be normal\(^{(22)}\).

Stage 4 with overt hypothyroidism, started to have thyroid gland failure, thyroid gland will be destroyed and unable to produce its own hormone, this is the most common stage when it diagnosed. The results of current study is related to stage 4 as there is a significant increase of TSH for hashimoto’s patients if compared with controls (\(** P = 0.009\)), in addition total T4 is with highly significant decrease for hashimoto’s patients if compared with controls (\(P < 0.0001\)), total T3 also decrease in hashimo’s patients if compared with controls (\(P = 0.058\)), but it is not significant. The last stage (stage5) may be progressed for another autoimmune condition\(^{(23)}\). Ferritin is released to the blood stream in a controlled manner, it is essential for the regulation of iron homeostasis\(^{(25)}\). Ferritin is found in most tissues as a cytosolic protein, its function is cell detoxification by limiting the formation of reactive oxygen species, and modifying their damaging effect on cellular structures, with optimal levels > 50 ng/ml. In current study, highly significant decreased levels of ferritin for HT patients if compared with controls (\(** P = 0.003\)). Also serum iron shows a highly significant decreased levels for HT patients if compared with controls (\(** P < 0.0001\)). TIBC shows nonsignificant increased levels for HT patients if compared with controls (\(P = 0.25\)). UIBC shows a significant increased levels for HT patients if compared with controls\((P = 0.01)\), TSAT with a highly significant increased levels for HT patients than that of controls (\(** P = 0.002\)). The estimated high levels of TSH for hashimoto’s patients may induce inflammatory cytokines and decrease the concentration of antioxidants in the body, and this increased level of TSH may be related to the significant decrease in ferritin levels in hashimoto’s patients if compared with controls, so the estimation of serum ferritin may help in understanding the etiopathogenesis, diagnosis, and monitoring of hashimoto’s patients\(^{(26)}\). Although there is non-significant decrease in the level of Total T3 in hashimoto’s patients if compared with controls (\(P = 0.058\)), but still this decrease of Total T3 may affect ferritin level as some studies indicates that the expression of the gene for ferritin biosynthesis has been stated to be induced by T3 hormone\(^{(27)}\), and it was found that administration of T3 to hypothyroid individuals produce a significant increase in the serum ferritin level. Early detection of HT prevents the damage of the thyroid gland. First stage shows normal TSH,T4,T3 and no anti-TPO. The only reliable biomarker at the second stage of HT is the anti-TPO because of its appearance, patients does not require therapy unless the TSH level is elevated: the increase of TSH established at stage4 at which the serum iron and total T4 to be used as a reliable biomarkers, and as hashimo’s disease causes thyroid hormone deficiency, this leads to significant decrease of both ferritin and iron, that may cause the depletion of iron stores of the body if blood ferritin below 12 to 30 ng /ml. Finally: HT decrease the level of ferritin but the validity of it to be used as a biomarker is less than that of serum iron. The validity of anti-TPO, total T4 in addition to serum iron to be employed as a reliable biomarkers for the detection of HT according to the AUC of ROC analysis.

**Conclusion**

The need to new selective treatment for HT, Like the stem cells which may be used for the treatment of HT by tissue replacement for the destroyed thyroid. In addition genetic studies with checking immune cell modifications to inhibit the binding of anti-TPO with thyroperoxidase enzyme. The tumor necrosis factor alpha (TNFα) together with other mediators (cytokines), play a fundamental role in the pathogenesis of HT, therefore the use of biological drugs like anti- TNFα that targeting of one of TNFα receptors leading to the reduction of tissue and organ damage caused by inflammatory responses.

**Ethical Clearance:** Ethics committee approval was obtained

**Source of Funding:** Self-funded study

**Conflict of Interest:** None

**References**

Analysis of Household Food Security and Food Insecurity in Donggala Regency

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Abstract

This study aims to analyze the level of household food security and food insecurity in Donggala Regency. Type of research was quantitative with a cross sectional approach carried out in Donggala Regency. Two districts that were selected to represent the situation of food security based on the consideration of the results of the FIA (Food Insecurity Atlas), namely Tanantovea (food insecure areas), and Balaesang (food-resistant areas). The household sample of 100 households was selected purposively. Research variables are the characteristics of respondents (age, sex, education, occupation), income and expenditure of food, food security indicators, food security programs and poverty alleviation, food insecurity status at the household and regional level. Data analysis was descriptive and chi-square test with a significance level of p < 0.05.

The results of the study are the age characteristics of respondents, namely age 35-44 years at 29.0% and ≥ 55 years at 25.0% and the main occupation was as a farmer / breeder at 57.0%. The average per capita income of respondents was Rp 818,000 in the food insecurity group and Rp 2,227,000 in the food security group. Food expenditure was higher in the food insecurity group, which was an average of Rp. 374,660 compared to non-food family expenses, which was an average of Rp. 172,426. Most of the food insecure families are in areas that are classified as food insecurity, which was 72.0%, while households that are considered food resistant are generally in food security areas, which was 90.0%. The conclusion is that household food insecurity was significantly related to the area’s food security status. For regions with food insecurity status, households generally experience food insecurity.

Keywords: Food insecurity, Food security, Income and expenditure of food, Food security programs.

Introduction

In general, the main problem faced in the food availability system in Indonesia is the rate of the increase in national food production (supply) has not been able to catch up with the rate of increase in population food needs. The problem in the food distribution system is the limited transportation facilities and infrastructure that can reach all regions, especially remote areas and there are still many official and unofficial levies so that food prices at the household level do not provide true prices.

The impact of all these problems ultimately leads to the increasingly weak ability of households (especially poor farmers) to be able to access food sufficiently and affordably.

On the consumption side, there is a fact that shows the high population of food insecurity and hunger. Data on hunger level or Global Hungry Index (GHI) in Indonesia shows very alarming figures. At present, Indonesia’s GHI is 21.9%, meaning that Indonesia is in a critical condition in the problem of food equality. If the high cases of food insecurity and hunger in Indonesia are not immediately dealt with seriously, this will cause problems that are also serious for the quality of human resources in the future. Children under five who experience food insecurity and starvation to experience malnutrition cause their IQ is 13.7 points lower than normal children.
In Central Sulawesi, there are 7 regions that are included as food insecure areas and Donggala District is included in the order of 113 food insecure areas in Indonesia. One source of household income in rural areas is farming in general, especially rice farming. This study aims to analyse the level of household food security and food insecurity in Donggala District and its implications for food security policies in the area.

Materials and Method

This is a quantitative study with a cross sectional design. The study was conducted in Donggala District, and two sub-districts that were representative of the food security situation were selected based on consideration of the results of the FIA (Food Insecurity Atlas). These sub-districts are Tanantovea (food insecure area), and Balaesang (food security area).

A total of 50 households were selected purposively from each selected village. Purposive sampling was carried out based on household involvement (8-10 households per type of program) in food security and poverty programs, including: 1). Food Self-Reliance Village Program (mapan), 2). Food Diversification Program, 3). Village Granary Program, 4) Strengthening Food Distribution, 5). Economic Improvement Program, 6). Other programs, 7). Non-recipient of the program.

Research variables are the characteristics of respondents (age, sex, education, occupation), food income and expenditure, food security indicators, food security programs and poverty alleviation, food insecurity status at the household and regional levels. Data analysis was descriptive and Che-square test with a significance level of p < 0.05.

Table 1: Characteristics of Respondents

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 – 34</td>
<td>24</td>
<td>24.0</td>
</tr>
<tr>
<td>35 – 44</td>
<td>29</td>
<td>29.0</td>
</tr>
<tr>
<td>45 – 54</td>
<td>22</td>
<td>22.0</td>
</tr>
<tr>
<td>≥ 55</td>
<td>25</td>
<td>25.0</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>75</td>
<td>75.0</td>
</tr>
<tr>
<td>Female</td>
<td>25</td>
<td>25.0</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Graduated from Elementary school</td>
<td>26</td>
<td>26.0</td>
</tr>
<tr>
<td>Graduated from junior high school</td>
<td>34</td>
<td>34.0</td>
</tr>
<tr>
<td>Graduated from senior high school</td>
<td>34</td>
<td>34.0</td>
</tr>
<tr>
<td>Graduated from college</td>
<td>6</td>
<td>6.0</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Civil servants</td>
<td>6</td>
<td>6.0</td>
</tr>
<tr>
<td>Private employees</td>
<td>10</td>
<td>10.0</td>
</tr>
<tr>
<td>Farmers / Breeders</td>
<td>57</td>
<td>57.0</td>
</tr>
<tr>
<td>Labor / Services</td>
<td>10</td>
<td>10.0</td>
</tr>
<tr>
<td>Entrepreneurs</td>
<td>15</td>
<td>15.0</td>
</tr>
<tr>
<td>Unemployed</td>
<td>2</td>
<td>2.0</td>
</tr>
</tbody>
</table>

Table 1 shows that the group based on the age of the respondents i.e age 35-44 years by 29.0% and ≥ 55 years by 25.0% based on sex i.e male by 75.0%, and based on the level of education, graduated from junior and senior high school by 34.0%. The main occupation of respondents is as a farmer / breeder at 57.0%.

Table 2: Distribution of Per capita Income and Food Expenditures

<table>
<thead>
<tr>
<th>Description</th>
<th>Food Insecurity (Rp.)</th>
<th>Food Security (Rp.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Min – Max</td>
</tr>
<tr>
<td>Per capita income</td>
<td>818,000</td>
<td>200,000–2,700,000</td>
</tr>
<tr>
<td>Food Expenditures</td>
<td>374,660</td>
<td>75,000–1,500,000</td>
</tr>
<tr>
<td>Non Food Family Expenditures</td>
<td>172,426</td>
<td>30,000–300,000</td>
</tr>
<tr>
<td>Total Family Expenditures</td>
<td>532,886</td>
<td>105,000–2,000,000</td>
</tr>
</tbody>
</table>

Table 2 shows that the average per capita income of respondents was Rp 818,000 in the food insecurity group and Rp 2,227,000 in the food security group. Food expenditure is higher in the food insecurity group compared to non-family food expenditure, whereas in the food-security group shows that non-food expenditure is higher than food expenditure.
Table 3: Distribution of Food Security Indicators in Donggala District

<table>
<thead>
<tr>
<th>Food Security Indicators</th>
<th>Food Security</th>
<th>Food Insecurity</th>
<th>Food Security</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n1 (%)</td>
<td>n2 (%)</td>
<td>n3 (%)</td>
</tr>
<tr>
<td>P1</td>
<td>13 (26,0)</td>
<td>19 (38,0)</td>
<td>11 (22,0)</td>
</tr>
<tr>
<td>P2</td>
<td>18 (36,0)</td>
<td>14 (28,0)</td>
<td>9 (18,0)</td>
</tr>
<tr>
<td>P3</td>
<td>14 (28,0)</td>
<td>17 (34,0)</td>
<td>7 (14,0)</td>
</tr>
<tr>
<td>P4</td>
<td>20 (40,0)</td>
<td>10 (20,0)</td>
<td>5 (10,0)</td>
</tr>
<tr>
<td>P5</td>
<td>8 (16,0)</td>
<td>12 (24,0)</td>
<td>3 (6,0)</td>
</tr>
<tr>
<td>P6</td>
<td>5 (10,0)</td>
<td>7 (14,0)</td>
<td>6 (12,0)</td>
</tr>
<tr>
<td>P7</td>
<td>4 (8,0)</td>
<td>10 (20,0)</td>
<td>3 (6,0)</td>
</tr>
<tr>
<td>P8</td>
<td>1 (2,0)</td>
<td>11 (22,0)</td>
<td>3 (6,0)</td>
</tr>
<tr>
<td>P9</td>
<td>2 (4,0)</td>
<td>6 (12,0)</td>
<td>3 (6,0)</td>
</tr>
<tr>
<td>P10</td>
<td>2 (4,0)</td>
<td>3 (6,0)</td>
<td>3 (6,0)</td>
</tr>
<tr>
<td>P11</td>
<td>0 (0)</td>
<td>8 (16,0)</td>
<td>4 (8,0)</td>
</tr>
<tr>
<td>P12</td>
<td>2 (4,0)</td>
<td>5 (10,0)</td>
<td>3 (14,0)</td>
</tr>
</tbody>
</table>

Information
P1 = Concerned that staple food is available at home
P2 = Staple food supplies are few and don’t have money to buy
P3 = Cannot provide balanced nutritious food (four times) for children
P4 = Can not provide balanced nutritious food (four times) for children
P5 = Children are not getting enough food
P6 = Feeling very hungry and there is no food at home
P7 = There are family members besides children who eat less because there is not enough food
P8 = Reducing the portion of food for children because there is not enough food
P9 = There are family members other than children who do not eat all day because they do not have money
P10 = Some children don’t eat because they don’t have money
P11 = There are children who experience decrease in body balance due to lack of food or unable to buy food
P12 = There are adult family members who experience weight loss due to lack of food or being unable to buy food
n1 = Almost every day,
n2 = Almost every week,
n3 = Almost every month,
n4 = Several times a year,
n5 = Never

Table 3 shows that in general families belonging to the category of food security rarely experience indicators of food shortages such as fears of staple food supplies at home, staple food supplies are small and do not have money to buy, or cannot provide balanced nutritious food for children.

Table 4 Food Security and Poverty Alleviation Programs

<table>
<thead>
<tr>
<th>Helping program type</th>
<th>Group/area</th>
<th>Food Security</th>
<th>Food Insecurity</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>BLT (CASH DIRECT HELP)</td>
<td>5</td>
<td>10,0</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>RASKIN (RICE FOR THE POOR)</td>
<td>21</td>
<td>42,0</td>
<td>31</td>
<td>52</td>
</tr>
<tr>
<td>BOS(School Operational Assistance)</td>
<td>1</td>
<td>2,0</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Capital Help</td>
<td>0</td>
<td>0,0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Credit</td>
<td>8</td>
<td>16,0</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>Seed</td>
<td>14</td>
<td>28,0</td>
<td>7</td>
<td>21</td>
</tr>
<tr>
<td>Others</td>
<td>1</td>
<td>2,0</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>50</strong></td>
<td><strong>100</strong></td>
<td><strong>50</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Table 4 shows that some respondents said that they had received assistance from the government in the form of BLT (Direct Cash Assistance) and RASKIN (rice for the poor). In food insecure areas, the majority (60.0%) of respondents said they had received Direct Cash Assistance (BLT). Whereas in the area of food security, the number is balanced between those receiving BLT and RASKIN. Most respondents said that the program obtained could help in meeting their daily food needs (Table 5).
### Table 5 Distribution of Benefits from the Food Security Program in Donggala District

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Group/area</th>
<th>Food Insecurity</th>
<th>Food Security</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Yes</td>
<td>31</td>
<td>62.0</td>
<td>39</td>
<td>78.0</td>
</tr>
<tr>
<td>No</td>
<td>8</td>
<td>16.0</td>
<td>8</td>
<td>16.0</td>
</tr>
<tr>
<td>Sometimes</td>
<td>11</td>
<td>22.0</td>
<td>3</td>
<td>6.0</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100</td>
<td>6</td>
<td>100</td>
</tr>
</tbody>
</table>

### Table 6 Distribution of Household Food Security Levels according to Food Insecurity Intensity in Donggala District

<table>
<thead>
<tr>
<th>Household Group/area</th>
<th>Total</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>0,000</td>
</tr>
<tr>
<td>Food Insecurity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>36</td>
<td>72.0</td>
</tr>
<tr>
<td>%</td>
<td>5</td>
<td>10.0</td>
</tr>
<tr>
<td>N</td>
<td>41</td>
<td>41.0</td>
</tr>
<tr>
<td>%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food Security</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>14</td>
<td>28.0</td>
</tr>
<tr>
<td>%</td>
<td>45</td>
<td>90.0</td>
</tr>
<tr>
<td>N</td>
<td>59</td>
<td>59.0</td>
</tr>
<tr>
<td>%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 6 shows that food insecure households are mostly in areas that are included as food insecurity, which is 72.0%, while households that are classified as food security are generally in food security areas, which is 90.0%.

### Discussion

The results showed that the majority of food insecure families were in food insecure areas as well, namely 72%. Food security is realized if the entire population has physical and economic access to food to meet nutritional adequacy according to their needs, so that they can live in healthy and productive lives day after day. Other results show that the dominant factor influencing the level of food security to food insecurity is the parameter of the population living below the poverty line. High household income affects spending on food, and food-insecure households account for most of the below-average food expenditure.

Respondents in this study indicate that the majority work as farmers. This finding shows that most households in rural areas are vulnerable to food due to the low income received. This situation is thought to be due to the relatively limited employment opportunities in rural areas compared to urban areas, so that rural households have limitations in terms of income sources.

Food insecurity that occurs at the study site is included in chronic food insecurity. Chronic food insecurity is a condition that occurs and takes place continuously which is usually caused by low purchasing power and low quality of resources and often occurs in isolated and arid regions. Household income is a predictor of chronic food security in low-income urban household. We hypothesized that adolescents in low income urban households are more likely to suffer from chronic food insecurity than those in the rural areas who may have direct access to agricultural products.

**METHOD:** This report is based on data from the first two rounds of the Jimma Longitudinal Family Survey of Youth (JLFSY). Food security for households is influenced by many factors such as land ownership (physical) supported by appropriate climate and human resources (HR). Agricultural policy also determines the actors of production or the market to provide sufficient food. Improvement of farmers’ income will ensure the fulfillment of quality food in accordance with the nutritional needs. Fulfillment of this food matter reflects the level of welfare of farmers will be better.

The results showed that some of the efforts made for families including food insecurity were assistance from the government in the form of BLT (Direct Cash Assistance) and RASKIN (rice for the poor). One study showed that giving cash directly to poor families aimed at food security. Other research shows that efforts to grow household food independence by increasing productive businesses that provide additional household income. Besides utilizing the optimal yard area to increase household food diversity. In addition, there is a policy regarding investment in the agricultural sector which aims to increase food production.
Conclusion

Food insecurity at the household level is significantly related to the food security status of the area. Generally, areas that are not food security, the household experiences food insecurity.

Ethical Clearance: Taken from Faculty of Public Health Tadulako University committee.

Source of Funding: Faculty of Public Health Tadulako University

Conflict of Interest: None

References

Violence among Mental Health Nurses in Indonesia Related to Working Alliance: A Quantitative Study

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1Faculty of Medicine and Health Sciences University Malaysia Sarawak Malaysia, 2Faculty of Nursing Universitas Padjadjaran Bandung Indonesia, 3Faculty of Nursing & Pharmacy University of Nizwa Oman

Abstract
This study determined the relationship between Working Alliance and its association with Physical, Verbal, Psychological and Sexual Violence among Mental Health Nurses in Indonesian Mental Hospital. This study used a quantitative approach. A total of 120 nurses were selected in the Mental Hospital West Java Indonesia using purposive sampling. About two third of the respondent were female; 80% had an education background of bachelor and diploma. About 80% of the respondent has work experienced of more than 10 years and 60% of the nurses are currently working in acute and chronic room. Most of the nurses experiences low level of violence in all four categories (physical, verbal, Psychological and sexual) which range of 54.2% to 69.2%. Psychological violence recorded the highest percentage of violence (45.5) among all four type of violence. The percentage of Working Alliance is high about 51.1% among Mental Health Nurses. There is a significant relationship between violence and Working Alliance, wherein the higher the exposure to violence, the lower the working alliance.

Keyword: Exposure Mental Health Nurses to Violence, Working Alliance.

Introduction
Mental health nurses are confronted with their routine activities related to traumatic events and unpredictable work conditions such as paranoid, hallucination or aggressive behaviour. Several studies report a high prevalence of post-traumatic stress disorder (PTSD) in the nurses1. The experience of violence has effect on the mental health nurse performance. This not only affects the individual nurse, but also has impact on the quality of care.

The study of violence and traumatic experiences in Indonesia provide critical information, allowing for proper interventions. The relevant data will enhance the hospital management to improve polices that promote an optimum work climate and provide appropriate interventions for mental health nurses and patients. It will allow the mental health nurses to give their patients the best intervention and, thus, minimize the rate of relapse in patients with mental illness in Indonesia. Furthermore, it may answer the phenomenon of “Lack of Nursing Job Motivation” in Indonesia.

The meaning of exposure to violence in this study is the tendency of mental health nurses to be exposed to violence at mental hospitals when they are faced with schizophrenic patients who behave aggressively. Violence is defined here as the “intentional use of physical force or power, threatened or actual, against oneself, another person or a group or community, which either results in or has a high likelihood to give rise to injury, death, psychological harm, mal-development or deprivation.” 2,3

The operational definition of violence accepted within the context of this study is: ‘displaying aggressive behaviour, including spitting, scratching, deploying physical force, or the use of an object as a weapon, either to threaten or assail physically’. The sub-variable in this research relates to a definition adapted from WHO (2003)4, namely to the nurse’s exposure to physical violence (assault/attack) & psychological...
violence (emotional abuse) such as bullying/mobbing, harassment, sexual harassment, racial harassment and threat.

Working Alliance is an attitude, agreement, engagement and commitment that offer a meeting point between nurses and patients, where we may perceive violence from a different point of view. This concept is an important part of the nurse’s role as a facilitator for patients to improve and growth. Evidence shows that work alliances are effective for reducing the high burden of psychiatric nurses, related to the patient’s full dependence on nurses. A study conducted by Roche & Duffield (2010) revealed that compared to nurses in public hospitals, nurses in mental health hospitals had higher nurse-patient relationship scores. However, traumatic experiences such as patient violence against nurses adversely affect nurse performance. Previous research reports that nurses have difficulty communicating with people who threaten, behave aggressively and destructively. Indeed, traumatic experiences and exposure to violence can have a negative impact on nurses and can even impede engagement with patients.

The topic of the subject area in this research is exposure to violence among the nurses in West Java’s Mental Hospital. The justification for research is the evidence of literature that indicates the presence of violence against nurses. It is supported by previous studies by Lee, Pai-Yen 2010; Spector, Zhou Che, 2014; Chang et al. 2015; Mcmenamin 2013.

The purpose of this study was to explore empirical data on the exposure of mental health nurses to violence in Mental Hospitals, West Java, Indonesia, and on the commitment of nurses to the establishment of an alliance with psychiatric patients.

Material and Method

Research Variables: Independent variable in this study is the exposure of nurses to violence such as physical, psychological, emotional, sexual abuse committed by patients in mental hospitals. Meanwhile, the dependent variable is “working alliance” on nurses at Mental Hospitals in West Java.

Study Design: This study is correlational quantitative research method. Approach used is cross sectional where the data on variables are gathered in a certain period of time.

Location: Locations chosen to conduct this study is Mental Hospitals in West Java. The period of data collection was from the first week to the fourth week of May 2016. The hospitals were chosen as the research sites because they are the largest psychiatric hospitals in West Java and become the main referral hospitals in Indonesia.

Sample and sampling: The sampling technique used in this study is Purposive Sampling. Samples were mental health nurses having a minimum educational background of Diploma III and having worked for at least one year. Purposive sampling was applied to select 120 from all 215 mental health nurses with experiences of violence in relation to schizophrenic patients in this mental hospital.

Instruments: The traumatic experience, especially mental health nurse’s exposure to violence, was measured using Survey Questionnaire on Workplace Violence in the Health Sector, English version, from WHO (2003) which was translated and adapted into Indonesian. Before used, this instrument was subject to content test (content validity) by a mental health nursing expert (Head of Department of Mental Health Nursing Universitas Padjadjaran Indonesia). Thereafter, the instrument was tested against nurses at another mental hospital having characteristics similar to the mental hospital where the research took place. The test result of the instrument had its validity and reliability analysed statistically.

Working Alliance was measured using “Working Alliance Inventory-Short Revised (WAI-SR) for patients and “Working Alliance Inventory-Short Revised-Therapist (WAI-SRT) for nurses. Both instruments have been revised and retested for validity by Adam Horvath (2000).

Data Collection: Ethical approval from the ethics committee of mental hospitals in West Java was obtained before data collection. After that, the researcher asked for data about nurses who worked in the hospital under study, and told the head of the nurse at the hospital who met the requirements. An informed consent form was given to nurses before they received the questionnaire. Data collection in this study was conducted through a questionnaire containing items arranged based on variable indicators, distributed to respondents to get their responses to each item. It is important that the steps and method match the research question. The method in this study included filling out a questionnaire about
experience exposed to violence and commitment to the alliance. This instrument takes about 15 to 20 minutes to complete. After completing all questionnaires, respondents must return the questionnaire, and the researchers re-examine the completeness of the surveys.

**Data Analysis:** The data recorded and analysed using SPSS 20. Descriptive analysis and inferential statistics are carried out if necessary. The standard deviation of the mean (SD) was added for continuous data, while frequency and percentage were used for categorical variables. Univariate and multivariate analyses were done to determine the relationship between the nurses’ experiences of violence and Working Alliance. The confidence interval of 95% was used. The p-value of less than 0.05 was considered as significant. The alternate choices in the instrument were made using Likert scales, namely: more than 4 times a day, 1-3 times a day, 2-6 times a week, once a week, never.

**Findings**

**Socio-demographic Characteristics:** The socio-demographic characteristics discussed in the present research were based on age, gender, educational level, duration of work, and the longest workplace.

Table 1: Socio-demographic characteristics of Mental Health Nurses in West Java (n = 120)

<table>
<thead>
<tr>
<th>Socio-demographic</th>
<th>Frequency (N)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>27</td>
<td>22.5</td>
</tr>
<tr>
<td>Female</td>
<td>93</td>
<td>77.5</td>
</tr>
<tr>
<td><strong>Education Level</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D III (Associate)</td>
<td>59</td>
<td>49.2</td>
</tr>
<tr>
<td>S1 (Bachelor)</td>
<td>49</td>
<td>40.8</td>
</tr>
<tr>
<td>S2 (Master &amp; Specialist)</td>
<td>12</td>
<td>10.0</td>
</tr>
<tr>
<td><strong>Duration of Work</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less 10 years</td>
<td>26</td>
<td>21.7</td>
</tr>
<tr>
<td>11-15 years</td>
<td>41</td>
<td>34.2</td>
</tr>
<tr>
<td>16-20 years</td>
<td>32</td>
<td>26.7</td>
</tr>
<tr>
<td>more 20 years</td>
<td>21</td>
<td>17.5</td>
</tr>
<tr>
<td><strong>The longest Workplace</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Polyclinic</td>
<td>6</td>
<td>5.0</td>
</tr>
<tr>
<td>Acute Room</td>
<td>35</td>
<td>29.2</td>
</tr>
<tr>
<td>Chronic Room</td>
<td>39</td>
<td>32.5</td>
</tr>
<tr>
<td>Emergency Room</td>
<td>18</td>
<td>15.0</td>
</tr>
<tr>
<td>Drug Addiction &amp; Rehabilitation Unit</td>
<td>9</td>
<td>7.5</td>
</tr>
<tr>
<td>Administration</td>
<td>13</td>
<td>10.8</td>
</tr>
</tbody>
</table>

**Exposure to Violence among Mental Health Nurses:** Exposure-to-violence was divided into four sub-variables: physical, verbal, psychological, and sexual violence. Most of the respondents reported their experience of physical, verbal, and psychological violence. Some of claimed that they suffered violence of high intensity and others of low intensity. There are nearly half of the respondents experienced a high exposure in all violence types. On the contrary, a majority of them (69.2%) had ever experienced a low intensity sexual violence. For more details, see table 2 below.

Table 2: Characteristic of Physical, Verbal, Psychological and Sexual among Mental Health Nurses (n = 120)

<table>
<thead>
<tr>
<th>Types of violence</th>
<th>Frequency (N)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physical</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>72</td>
<td>60.0</td>
</tr>
<tr>
<td>High</td>
<td>48</td>
<td>40.0</td>
</tr>
<tr>
<td><strong>Verbal</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>70</td>
<td>58.3</td>
</tr>
<tr>
<td>High</td>
<td>50</td>
<td>41.7</td>
</tr>
<tr>
<td><strong>Psychological</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>65</td>
<td>54.2</td>
</tr>
<tr>
<td>High</td>
<td>55</td>
<td>45.8</td>
</tr>
<tr>
<td><strong>Sexual</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>83</td>
<td>69.2</td>
</tr>
<tr>
<td>High</td>
<td>37</td>
<td>30.8</td>
</tr>
</tbody>
</table>

**Working Alliance among Mental Health Nurses:** Out of the 120 respondents, 65 (54.2%) of the respondents showed low working alliance. Meanwhile, 55 (45.8%) of the respondents showed a high working alliance.

**Relationship between Socio-Demographic Characteristics and Working Alliance:** The research findings revealed that there was a significant relationship between educational level and working alliance by a P value of < 0.001. That is, the higher the educational level, the higher the mental health nurses’ capacity of working alliance.

**Relationship between Working Alliance and Exposure to Violence:** Table 3 shows the results of cross tabulations of various types of violence and work alliances. This study found that respondents with high physical violence had a low chance of work alliance or cooperation of 7.667 times than respondents who had suffered from low physical violence. Then, those who
had high exposure to verbal violence had a chance to have a low work alliance of 7.156 times than respondents with low exposure to verbal violence. While respondents with high exposure to psychological violence had the opportunity to have a low work alliance (cooperation) of 6.04 times than respondents with low psychological violence. Respondents who were experienced with exposure to high sexual violence had the opportunity to have a low work alliance of 2.692 times than respondents with low sexual violence.

Table 3. Relationship between working alliance and different type of violence

<table>
<thead>
<tr>
<th>Types of Violence</th>
<th>Working Alliance</th>
<th>pValue</th>
<th>OR 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>High</td>
<td>Total</td>
</tr>
<tr>
<td>Physical</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>46 (95.8)</td>
<td>2 (4.2)</td>
<td>48</td>
</tr>
<tr>
<td>High</td>
<td>9 (12.5)</td>
<td>63 (87.5)</td>
<td>72</td>
</tr>
<tr>
<td>Verbal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>46 (92.0)</td>
<td>4 (8.0)</td>
<td>50</td>
</tr>
<tr>
<td>High</td>
<td>9 (12.9)</td>
<td>61 (87.1)</td>
<td>70</td>
</tr>
<tr>
<td>Psychological</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>46 (83.6)</td>
<td>9 (16.4)</td>
<td>55</td>
</tr>
<tr>
<td>High</td>
<td>9 (13.8)</td>
<td>56 (86.2)</td>
<td>65</td>
</tr>
<tr>
<td>Sexual</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>30 (81.1)</td>
<td>7 (18.9)</td>
<td>37</td>
</tr>
<tr>
<td>High</td>
<td>25 (30.1)</td>
<td>58 (69.9)</td>
<td>83</td>
</tr>
</tbody>
</table>

Discussion

The Occurrence of Violence in Nurses: In this study, the rate of violence, quantitatively, in Mental Hospital, West Java, particularly in “high exposure” category, was represented by the type of psychological violence. The psychological violence account for nearly half (45.8%) of total violence, while “low exposure” in sexual assault is 30.8%. On the other hand, the results of quantitative data collection showed that high exposure to physical violence is 40.0%, high exposure to verbal violence is 41.7%, and more than half (69%) of nurses at the Mental Hospital had encountered sexual violence, despite of “low exposure” category.

Some studies found real violence in nurses at the Mental Hospital. This is consistent with earlier studies; “Violence is, actually, a fact of working life for nurses”. Similarly, Roche et al. (2010b) studies on psychiatric nurses concluded that “perceptions of violence affect job satisfaction”, while Lützén et al. (2010) reported that those nurses working in a mental health environment deal with “moral burden”. This is confirmed by other researches concluding that more than a half of mental health nurses in Taiwan were reported had have physical violence and verbal abuse. In general, the physical violence at the Mental Hospital in West Java, Indonesia, is higher than earlier findings. However, the presence of violence signals an “alarm” that violence in nurses need for special attention in many countries. Essentially, the world must give a “priority” to handling violence in those nurses.

The relationship between exposure to violence and Alliance: There is relationship between exposure to violence and Working Alliance. The higher the exposure to violence, the lower the Alliance will be. The lower the exposure to violence, the higher Working Alliance will be. It is explicable that human beings will, naturally, avoid anything that threatens or hurts them. Exposure to violence by patients lead nurses to regard patients as stressors, thereby making functions of nurses as correcting emotional patients and facilitating patients to adapt to stressors ineffective. Reduce risks of or impacts of exposure to violence can improve effective relationship of nurses and patients to achieve the goals. Nurses can do their tasks properly under secure conditions and a good environment.

Limitation of Study: The limitation of this study should be acknowledged. The samples which have taken from the patients and from the nurses are still limited. Ideally to generalize the conclusions of national quantitative research should be representative, it could be taken from all region of Mental Hospitals in all province of Indonesia.

Conclusion

Violence among mental health nurses in mental hospitals, particularly in West Java, Indonesia, is an area of concern to be addressed. The types of exposure to violence found in the hospitals include physical, psychological, verbal, and sexual abuse. Exposure to violence occurs on a low to high scale. The highest type
of exposure to violence is psychological violence, while the lowest is sexual violence. Generally, it can be said that the higher the nurse’s exposure to violence, the lower the desire to build a working alliance.

The suggestions from this study are: (1) security and safety consideration. The director of a mental health hospital needs to develop a protection and insurance program for nurses in dealing with physical, psychological, verbal and sexual violence. The importance of developing electronic systems to facilitate nurses when asking for assistance from security team, if needed, or when patients are noisy, anxious, uncontrolled and disturbing, aggressive, threatening their lives and environment. (2) Education and Training Department. It is also very important to design work alliance training and therapeutic strategies for nurses, especially in unexpected situations. (3) management aspects and (4) unit of treatment after trauma, in which all components are very important as fundamental aspects to promote the Working Alliance program at Mental Hospitals.

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Enhanced Fibrin-Lysis in Grade-1 Dengue Haemorrhagic Fever

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Abstract

Background: Dengue fever has become a major international health concern affecting especially tropical and sub-tropical regions worldwide. The pathophysiology of dengue haemorrhagic fever is complex which involve endothelial activation and plasma leakage.

The objective of the study was to determine endothelial activation and plasma leakage effects on fibrin-lysis in Grade-1 dengue haemorrhagic fever.

Method: Twenty-two patients (Males n = 14, females N = 8) with Grade-1 DHF who fulfilled the WHO protocol for dengue were recruited. Their mean age was 22.5 ±12.2 years and ranged between 4 years and 54 years old. Blood sampling was performed at febrile, defervescence and convalescence phases for the determination of fibrinogen, Von Willebrand Factor (VWF), vascular endothelial growth factor (VEGF), prothrombin fragment 1+2 (F+2) and D-dimer levels. Fifteen normal subjects were recruited to serve as normal controls.

Results and Discussion: There were no statistical differences observed between defervescence and convalescence phases compared with febrile phase for F1+2, D-dimer, VEGF, VWF and fibrinogen. At febrile phase elevated VEGF and VWF levels suggest endothelial activation and plasma leakage triggering the activation of coagulation and thrombin generation evident by increased F1+2 levels and fibrinolysis by marked fibrin lysis split product D-dimer. The levels remain elevated even at defervescence and convalescence phases. Fibrinogen levels showed a mean decline trend but remained within normal range.

Conclusion: In Grade-1 dengue hemorrhagic fever the activated vascular endothelium evident by plasma leakage triggers the activation of coagulation creating a hypercoagulable and fibrinolysis state with enhanced fibrin-lysis still persist in the convalescence phase.

Keywords: Endothelial and coagulation activation, DHF.

Introduction

Dengue fever has become a major international health concern affecting especially tropical and sub-tropical regions worldwide. The serious consequence of mosquito-borne dengue infection is well-known. Dengue is caused by a virus of the Flaviridae family and caused by four distinct and closely related virus (DEN-1, DEN-2, DEN-3 and DEN-4). Recovery from infection by one specie only provides immunity from that particular serotype¹. The actual numbers of dengue are underreported as majority of cases are asymptomatic. One study estimated that 3.9 billion people in 128 countries are at risk of dengue infection². In Indonesia, the overall incidence increased significantly from 0.05/100,000 in 1968 to 35-40/100,000 in 2013³. There is no specific treatment for dengue fever but maintaining patients’ body fluids is critical. WHO⁴ defined dengue with and

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without warning signs of plasma leakage and classified into four grades (Grades 1 to 4). The pathophysiology of dengue haemorrhagic fever (DHF) in human is complex and the clinical symptoms due mainly to immune response also involve endothelial cell activation leading to plasma leakage and triggering the activation of the haemostatic system. The endothelium plays an important regulatory role in the circulation as physical barrier involved in the control of thrombosis and thrombolysis, vascular tone and growth of blood vessels and play a critical role in a variety of human disorders. Endothelial activation may be responsible for plasma leakage and shock and is associated with elevated Von Willebrand Factor (VWF) and vascular endothelial growth factor (VEGF) a known potent regulator of vascular permeability and angiogenesis. D-dimer, the lysis product of cross-linked fibrin indicates hyperfibrinolysis in response to clotting activation and fibrin formation. It is also a marker for hypercoagulability and links with venous as well as arterial thrombotic events and used to determine thrombosis in myeloproliferative disease. It can be used as stand-alone test to exclude deep vein thrombosis. Fibrinogen is involved in both primary and secondary haemostasis playing an important role in platelet aggregation and establishing a fibrin network. It is an acute phase reactant protein converted into insoluble fibrin by thrombin during coagulation has been extensively reviewed. The conversion of prothrombin to thrombin is a key event in blood coagulation. Prothrombin fragment 1+2 (F1+2) is an activation peptide released from prothrombin during thrombin generation. Prothrombin fragment 1+2 directly reflects thrombin generation and elevated levels reflect a high risk of thrombosis. Increased activation of coagulation (F1+2) was reported in critical severe dengue infection in Indonesia and is associated with plasma leakage and thrombocytopenia. In the Brazilian study it was reported that elevated D-dimer and thrombocytopenia with reduced thrombin generation and excessive fibrinolysis are associated with bleeding complications.

The objective of the study was to determine endothelial activation and plasma leakage effects on fibrin-lysis in Grade-1 dengue haemorrhagic fever.

**Materials and Method**

The study received ethical approval from the Health Research Ethical Committee No 418/TGL/KEPK FK USU-HAM/2018, Faculty of Medicine, University of North Sumatera, Indonesia. The study was conducted at the Murni Teguh Memorial Hospital, Medan Indonesia.

**Subjects.** The patients admitted to the hospital with fever were recruited and diagnosed according to WHO protocol. Fifty DHF patients were recruited into the study. However, plasma fibrinogen was added to the study later but only thirty patients had remaining aliquots stored and we therefore decided to investigate twenty-two patients with Grade-1 DHF (males 14, females 8) with fibrinogen performed in association with VWF, VEGF, D-dimer and F1+2 levels. The mean age of the patients was 22.5 ±12.0 years and ranged between 4 years and 54 years old. The Inclusion criteria: patients who met WHO criteria for dengue fever and willing to take part in the study and had one or more dengue serology positive for either IgM/IgG antibodies or NS1antigen, Exclusion criteria: patients with other infections and systemic diseases and not willing to take part in the study.

**Normal Controls.** Fifteen normal subjects (males n = 14, female n = 1) who are normotensive, had not taken any medication recently and no history of health issues was recruited to serve as normal controls for the DHF study. Their mean age was 22.9 ± 1.1 years and ranged between 18 years and 33 years old.

**Blood Sampling and Laboratory Investigation.** From a clean venepuncture 3 mL EDTA blood was used for routine haematological investigation including serological tests for IgG/IgM antibodies and NS1 antigen (SD Bioscience, Ingbert, Germany). 10 mL of citrated blood was spun in the refrigerated centrifuge at 2500g for10 minutes and the plasma aliquoted and stored at -80°C. Citrated-plasma was used for Elisa analysis of prothrombin fragment 1+2 (F1+2), Von Willebrand Factor (VWF), vascular endothelial growth factor (VEGF) (USCN Life Sciences, Wuhan, China) and D-dimer (Vidas D-dimer Exclusion II, Biomerieux SA France), fibrinogen (Clauss).

**Statistical Analysis.** The Statistical Package for Social Sciences (SPSS 22 IBM Corp) was used to perform statistical analysis. The independent t-test for differences between groups at different DHF phases were performed together with one-way Analysis of Variance (ANOVA) and Pearson’s correlation. A P value of < 0.05 was considered statistically significant.
Results

Normal controls. Plasma F1+2 were not detectable (sensitivity < 28.1 pg/mL), VWF was mean 1.9 ± 1.4 ng/mL in 13.3% normal controls and non-detectable in 86.7% (sensitivity < 0.94 ng/mL), VEGF was mean 71.7 ± 27.9 pg/mL, D-dimer normal range was less than 500 ng/mL and fibrinogen between 2.0 and 4.0 g/L.

Comparison of parameters (mean (SD) studied in Grade-1 dengue haemorrhagic fever at febrile, defervescence and convalescence phases and compared with febrile phase.

There were no statistical differences observed between defervescence and convalescence phases compared with febrile phase for F1+2, D-dimer, VEGF, VWF except for fibrinogen which showed a downward trend at defervescence ($P = 0.07$) and at convalescence phase ($P = 0.25$) even though the mean levels were within normal range. The other parameters studied showed elevated mean levels from normal despite no significant differences between the various phases. At febrile phase elevated VEGF (mean 230.2 ± 150.5 pg/mL) and VWF (mean 122.5 ± 28.3 ng/mL) suggests endothelial activation and plasma leakage triggering the activation of coagulation and thrombin generation evident by elevated F1+2 levels (mean 345.7 ± 137.5 pg/mL) and fibrinolysis by marked fibrin lysis split product D-dimer (mean 1677.2 ± 871.5 ng/mL). The levels remain elevated at defervescence and convalescence phases, D-dimer showed a declining trend at convalescence to mean 1282.8 ± 891.2 ng/mL ($P = 0.17$) but it did not reach statistical significance and remain elevated. Fibrinogen were within normal range (mean 2.80 ± 0.71 g/L) at febrile phase but showed a declining trend at defervescence (mean 2.41 ± 0.66 g/L) ($P = 0.07$) and convalescence (mean 2.49 ± 0.97 g/L) ($P = 0.25$) contributing to coagulation and fibrin formation (Table 1).

The mean distribution of VWF, VEGF, F1+2, D-dimer and fibrinogen levels at febrile, defervescence and convalescence phases in Grade-1 DHF are shown in Figure 1.

Analysis of Variation (ANOVA). One-way ANOVA for VWF ($P = 0.61$), VEGF ($P = 0.31$), F1+2 ($P = 0.41$), D-dimer ($P = 0.20$) and fibrinogen ($P = 0.24$) did not show any significant variations between the three phases studied. This could also be in part due to the wide variations observed.

Pearson’s correlation. No significant correlation between the parameters studied except for VEGF and fibrinogen ($r = 0.278, P = 0.02$).

Table 1. Comparison of parameters (mean and SD) studied in Grade-1 dengue haemorrhagic fever at febrile, defervescence and convalescence phases and compared with febrile phase.

<table>
<thead>
<tr>
<th></th>
<th>Febrile</th>
<th>Defervescence</th>
<th>Convalescence</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1+2 pg/mL</td>
<td>345.7 (137.5)</td>
<td>329.8 (109.0)</td>
<td>402.4 (306.2)</td>
</tr>
<tr>
<td>$P$</td>
<td>0.67</td>
<td>0.46</td>
<td>0.17</td>
</tr>
<tr>
<td>D-dimer ng/mL</td>
<td>1677.2 (871.5)</td>
<td>2012.5 (1796.3)</td>
<td>1282.8 (891.2)</td>
</tr>
<tr>
<td>$P$</td>
<td>0.46</td>
<td>0.23</td>
<td>0.17</td>
</tr>
<tr>
<td>VEGF pg/mL</td>
<td>230.2 (150.5)</td>
<td>249.2 (169.3)</td>
<td>362.4 (480.5)</td>
</tr>
<tr>
<td>$P$</td>
<td>0.70</td>
<td>0.37</td>
<td>0.23</td>
</tr>
<tr>
<td>VWF ng/mL</td>
<td>122.5 (28.3)</td>
<td>115.1 (26.5)</td>
<td>116.0 (25.4)</td>
</tr>
<tr>
<td>$P$</td>
<td>0.37</td>
<td>0.37</td>
<td>0.43</td>
</tr>
<tr>
<td>Fibrinogen g/L</td>
<td>2.80 (0.71)</td>
<td>2.41 (0.66)</td>
<td>2.49 (0.97)</td>
</tr>
<tr>
<td>$P$</td>
<td>0.07</td>
<td>0.25</td>
<td>0.25</td>
</tr>
</tbody>
</table>
Discussion

The serious consequence of mosquito-borne dengue infection has become a major international health concern is well-known worldwide. The pathophysiology of dengue haemorrhagic fever in human is complex and the clinical symptoms of immune response also involve endothelial cell activation leading to plasma leakage and triggering the activation of the haemostatic system. It may also be responsible for dengue shock syndrome (6). Bleeding manifestation and plasma leakage are complications seen in dengue fever and bleeding in adults may occur in the absence of plasma leakage

In our study of Grade-1 DHF endothelial activation at febrile, defervescence and convalescence was evident by the elevation of VWF and VEGF levels and increased F1+2 levels indicating activation of coagulation and thrombin generation with fibrinolysis evident by elevated D-dimer split products from enhanced fibrinolysis. Plasma fibrinogen levels were observed to decrease at defervescence ($P = 0.07$) and at convalescence ($P = 0.25$) despite it being within the normal range. It is the substrate for coagulation and conversion to fibrin and fibrin-lysis. No mortality was recorded in this study. Activation of coagulation was reported earlier in critical Indonesian DHF patients and contrary to this, Orsi

Figure 1. The mean distribution of VWF, VEGF, F1+2, D-dimer and Fibrinogen levels at febrile, defervescence and convalescence phases of Grade-1 dengue haemorrhagic fever
and co-workers \(^2\) reported reduced thrombin generation and enhanced fibrinolysis contributing to bleeding episodes in Brazilian patients. Dengue virus binding directly to prothrombin inhibiting the conversion to thrombin could reduce thrombin generation had been suggested \(^2\). However, the association between dengue and activation of coagulation remains controversial \(^2\). Demographic differences and genetic make-up may contribute to these differences. Activation of coagulation and elevated D-dimer levels suggests hypercoagulability and enhanced fibrinolysis. Endothelial activation evident by elevated VWF and VEGF suggest plasma leakage triggering the activation of the coagulation system, thrombin generation evident by prothrombin fragment 1+2 and fibrinogen creating a hypercoagulable and fibrinolytic state with enhanced fibrin-lysis evident by D-dimer in Grade-1 DHF. Patients are discharged when they are afebrile and in good clinical condition during the convalescence phase but our study showed the endothelium is still in an ‘activation state’ and that further investigations need to determine when the endothelium reverts to normal function. At present there is no specific treatment for DHF but identifying the mechanisms affecting DHF would improve diagnosis and management therapy limiting morbidity and mortality.

**Conclusion**

In Grade-1 dengue hemorrhagic fever, activated vascular endothelium evident by elevated VWF and VEGF and plasma leakage triggering the activation of coagulation creating a hypercoagulable and fibrinolytic state with enhanced fibrin-lysis.

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**Conflict of Interest:** The authors declared that they have no Conflict of Interest

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Developing Sbar Effective Communication Instrument in Emergency Handover at Emergency Department of Hajj Hospital in Surabaya

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Abstract

Introduction: The implementation of SBAR in an emergency handover must be in accordance with the standard. Evaluation of 150 present status documents in medical record documents shows that the indicators of present status instruments in the emergency room of the Hajj Hospital have not been in accordance with the Standar Akreditasi Nasional Rumah Sakit (SNARS) and have not been well documented. The aim of this study was to develop the SBAR instrument in emergency handover.

Method: The research design used research and development carried out in 2 stages. The sample stage 1 is 150 DRM, stage 2 is 28 respondents and the FGD activities are 15 respondents used purposive sampling. Data analysis used descriptive analysis, pearson correlation product moment to test the validity and crobach alpha for reliability test.

Results: The SBAR instrument in emergency handover based on the standard, FGD activities were declared valid and reliable, the results of the socialization of training on incremental filling (100%) of nurses had good ability and the instrument was good stated by all nurses (100%). The application of SBAR instruments in emergency handovers in the emergency room of Surabaya Hajj Hospital showed that all respondents had good ability for the SBAR instrument documentation and all respondents thought that the SBAR instrument was in a good category.

Discussion and conclusion: The SBAR instrument in handover emergency was recommended for the emergency room at Haji Hospital, Surabaya.

Keywords: Effective communication, SBAR, emergency handover.
taken between nurses and clients is action initiated by the nurse, client reaction response, interaction where nurses and clients examine client needs and goals, transactions where reciprocal relationships are ultimately built to achieve the relationship goals. The conditions faced by clients are determinants of the role of nurses in clients.

Communication that occurs in the health sector is often ineffective, limited to sending or receiving calls and leaving messages between health workers and as a result many messages are not delivered optimally. The relationship of collaborative and communicative work between officers is the key to the success of patient-focused services. Communication between health workers (Handover) is communication that is carried out accurately, completely, understood, not duplicated and appropriate to the recipient of information to reduce errors and improve patient safety\(^3\). The patient’s handover process is a complex interaction between medical personnel who will directly affect patient care. The effectiveness and completeness of this handover process will bring continuity to further patient care\(^1\).

In implementing the form handover emergency between the emergency room and the room, there were many obstacles. In addition to carrying out their main tasks and functions, nurses were also faced with the overwhelming task of doctors, administrative tasks, data entry, handling patient complaints and other documentation tasks. Failure to communicate is one of the root problems that most often causes incidents of patient safety. With the existence of values and beliefs related to optimal communication problems, each nurse will know what should be done in applying the quality of nursing services. Thus, these behaviors eventually become a culture that is embedded in each nurse in the form of a patient safety culture\(^5\) states that the importance of good communication in handovers can be reflected in the work culture an organization, and currently the trending topic is about the culture of patient safety when handover / handover between nurse shifts. The aim of research is compiled the development of the SBAR effective communication instrument in emergency handovers on the accuracy of identification of emergency patients in Haji Hospital, Surabaya.

**Material and Method**

This research used Research and Development carried out in 2 stages. Phase 1 samples are 150 DRM, stage 2 is 28 respondents and FGD activities are 15 respondents using purposive sampling. Analysis of data used descriptive analysis, Pearson correlation product moment to test the validity and crobach alpha for reliability test. Phase 1 consists of evaluation, and FGD followed by stage 2 consists of socialization and trial of SBAR instruments.

**Ethical Consideration:** The participants were recruited on the basis of the Ethical Approval of Faculty of Nursing, Airlangga University with the number 073/16/KOM.ETIK/2019.

**Result**

The results showed that: 1) the form of effective communication (current status) on the delivery of ED patients to hospitalization was a lot of duplication of documentation, SBAR had not been published and had not met the National Standards for Hospital Accreditation (SNARS); 2) development of SBAR’s effective communication instruments at the time of handover of power through FGD activities and expert discussions. In the FGD activities most respondents received 46-55 years, had undergraduate nursing education, sex of women, with 21-30 years of work experience and employment status as civil servants; 3) the results of the validity test with the average r count on the situation item instrument (0.766), background (0.615), assessment (0.691), recommendation (0.708) based on the overall value > r table (0.482) then validity and reliability testing with the average r count on the instrument averages above 0.6 so it is stated to be reliable: 4) socialization and trials of filling the SBAR effective communication instruments on the emergency handover are well implemented; 5) all nurses (100%) have good abilities; 6) discussion of the development of SBAR effective communication at the time of emergency submission by compiling guidelines for effective SBAR communication instruments at the time of emergency submission, training was held supported to improve the quality and knowledge of ED nurses and managerial staff who were very accepting of these instruments and could be used at ED Surabaya Hajj to improve the quality of nursing services.

**Discussion**

Emergency Handover used the new form, namely the SBAR instrument in the emergency room in accordance with the standards will be safer, and with a very good design it will be easier to apply according to existing clinical standards, the handover process can
also increase accountability and nurse’s responsibility\(^1\). This allows nurses in the emergency room of the Hajj Hospital to work more safely because they can fill SBAR’s instruments according to the standards, let alone the situation in the emergency room that is busy so that it requires effectiveness and speed so that patients can be saved from the emergency situation. The sense of security felt by nurses because they have carried out standardized documentation tasks will increase nurses' self-confidence in carrying out nursing care to patients in the emergency so that patients get optimal care while in the emergency room of the Surabaya Hajj Hospital.

Effective communication among health professionals is the key to ensuring quality care in clinical practice. One form of ensuring quality care in clinical practice in the form of communication, clinical handover has been defined as the transfer of responsibility and accountability for patient care from one provider or another provider team\(^6\).

SBAR instruments in the emergency room have an important role in nursing service strategies. SBAR Document Writing has a problem oriented format, which is simple clear, logical and written in accordance with\(^7\), so it is very necessary for a complete SBAR document that can inform the patient’s condition up to recommendations for actions to be carried out according to the patient’s illness to improve service quality and patient safety.

Every doctor or dentist in carrying out medical practice must make medical records\(^8\). Medical records must be made immediately and completed after the patient receives service. Making medical records is carried out through recording and documenting the results of examinations, treatments, actions and other services that have been carried out to patients. Complete recording includes recording in the handover format on the ED. status evaluation is not optimal and not according to standard because the present status documentation does not describe the condition and development of patients in accordance with SNARS (2017), namely using the SBAR format.

The preparation of the development of SBAR’s effective communication instrument on Emergency Handover through FGD (Focus Group Discussion) was carried out after the researcher conducted an audit of the patient’s medical record. Most of the respondents who conducted FGD were educated in Nursing with a long work experience. The results of the study in Table 1 illustrate that nurses’ understanding of the importance of giving identity labels is still lacking, while\(^7\) requires that in 6 patient safety goals in patient safety, the first point is the accuracy of patient identity. Emergency Room conditions with a full number of patients on each shift and the patient’s emergency caused nurses to not prioritize documentation in their present status especially the patient’s identity, nurses only included their names and ages without completing other data. This causes the completeness of the documentation of the present status status of the instrument not optimal or incomplete.

The second result of the FGD illustrates that effective communication instruments in present status are not yet in line with the standards and there are no clear filling guidelines available\(^10\) in their study stated that handoff of patients in the emergency room was very easy to implement even though initially it was very difficult because of the large workload of nurses when taking action in the emergency room. However, considering the importance of handovers with SBAR when changing the shift to shift will minimize the number of unexpected events, the SBAR instrument becomes an important thing to do. ER nurses with high work rhythms have difficulty in documenting present status, it is possible because there are no clear SOP and filling instructions that are easily accessible to nurses in the emergency room and inpatient nurses.

The expert discussion was carried out to obtain input from the results of field studies, FGDs, and research journal studies and implemented into SBAR’s effective communication instruments in emergency handovers. Experts convey input on item situations to add nursing diagnoses that appear to patients. Situation contains about the patient’s identity and the main problems of nursing and medical including the nursing diagnoses that appear. The researcher added several choices of nursing diagnoses in accordance with the SDKI (Standard of Indonesian Nursing Diagnosis) by considering the choice of nursing diagnoses of the 5 largest cases that often occur in emergency patients in Surabaya Hajj Hospital. The researcher considered the time needed by the nurse in carrying out a brief assessment including in formulating the nursing diagnosis that emerged so that the intervention could be immediately made according to the patient’s condition.

Experts also provide input on the Recommendation form to add about nursing interventions according to
SIKI (Indonesian Nursing Intervention Standard) in accordance with the chosen nursing diagnosis. Researchers describe to recommend nursing interventions that have been and need to be continued for intervention, including discharge planning and education of patients and families.

The results of the study in table 3, namely all respondents argue that the quality of the instrument according to the user overview when tested shows that the quality of the instrument is good, judging from the aspects of functionality, efficiency, usability. Evaluation has clear objectives according to the objectives set out in the program. Evaluation of the dissemination and trial of the practice of filling the SBAR instrument in the emergency room and the room on the Emergency Handover based on nurses’ opinions can be concluded that the SBAR instrument developed by researchers can be easily carried out by nurses and efficiently carried out related to the condition of the emergency department that describes the work conditions of nurses who must work fast in serving the emergency in patients who need a fast response time.

Effective SBAR communication was developed through socialization and testing of filling evaluation instruments for effective SBAR communication on emergency handovers in the emergency room in Surabaya Hajj Hospital. Participants were very enthusiastic about the socialization material presented and some nurses said that the previous present status was not fully documented because there was no filling guide available. The findings of the researcher show that the delivery of patients in the ER at first did not follow the SBAR standard guidelines.

**Conclusion**

Effective communication of the present status of emergency handovers in the emergency room of the Surabaya Hajj Hospital is equipped and developed into SBAR instruments (Situation, Background, Assessment, and Recommendation). Situation Points have a choice of nursing diagnoses based on SDKI (Standard of Indonesian Nursing Diagnosis). Nursing interventions developed in the SBAR instrument in the Recommendation point are prepared based on SIKI (Indonesian Nursing Intervention Standards).  

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Effect of Time Management Training Program on Nursing Mangers’ Performance

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Abstract

Time management behaviors are considered as determinant of success, and the position of obtaining such skills by managers has been defined more than before.

Aim: this study was conducted to examine the effect of time management training program on the nursing managers’ performance. Research design; Quasi-experimental design utilized to conduct the training program for nursing managers.

Research setting: This study conducted at private hospital affiliated to a University. The study sample; composed of all nursing managers (n = 27) who were actually in the active workforce during the time of data collection.

Data collection tools: Two tools used for data.

Collection: Time management questionnaire, and time management observational checklist. Data was collected after explanation of the aim of the study; also an official administrative approval was obtained. The study was conducted on five phases: preparatory, assessment, planning, implementation, and evaluation phase.

Result: The study results revealed that nursing managers’ knowledge and skills total mean score post program (15.05±1.70) (125±2.45) was higher than pre program(14.00±.00)(109±8.47), and nursing managers’ time management performance total mean score post program (86.65±6.81) was higher than pre program(49.55±16.25). Conclusion; based on the study findings the research hypotheses were approved.

Recommendations: Time management training should be offered to all hospital personnel, especially nurses who tolerate more problems.

Keywords: Time management, Nurse Manager, Performance.

Introduction

Time is an essential resource every manager needs to achieve the goals and objectives of an organization. The challenges that every one facing that time cannot be saved but can only be spent and once misused it can never be regained. Therefore time management can be defined as a period, either short or long, which involves how people use it wisely to produce result or is the act or process of exercising conscious control over the amount of time spent on specific activities, especially to increase efficiency or productivity.

Time management may be aided by a range of skills, tools, and techniques used to accomplish specific tasks, projects and goals. This process encompasses a wide scope of activities, including: setting goals, prioritizing, planning, organizing, delegating, scheduling, analysis of time spent and monitoring, time management in the area of health and for nurse managers has vital importance because it is directly related to the people’s health. Time wasting and lack of time management in the domain of nurse managers cause a reduction in efficiency. So, Control and containment of time and improve the ability of managing, retaining human resources, decreasing...
stress and increasing job satisfaction among head nurses\textsuperscript{5}.

A study by Marquis and Huston (2009)\textsuperscript{6} demonstrated that the leadership qualities of the unit manager have been shown to have measurable impact on the efficiency, safety and quality of care. Furthermore, it has been suggested that leadership and management skills is key to personal and operational effectiveness. Internationally, this has led to a call for nurse manager’s development \textsuperscript{7, 8}.

Management training programs have been shown to be an effective way to enhance nurse manager leadership and management behaviors and performance. The development efforts of the programs need to focus on those management competencies most often associated with successful nurse managers’ outcomes \textsuperscript{9}. So, it is important to design such program to raise these management behaviors and performance.

**Significance of the Study:** It is certain that consequences of time management will benefit both individual and society .Time management is the means into which the individual will develop his time with the best way to attain the best results.

Managing time effectively is an area for nursing managers’ education and training to achieve the organizations’ missions. From this perspective in Egypt where the nurse managers are promoted to their managerial positions without adequate management program preparation, thus they become overwhelmed with organizational and administrative tasks as they are not well equipped with the basic managerial skill and one of these skills is time management, resulted in modest level of unit management.

Ebrahim’s study (2015)\textsuperscript{10}, revealed statistically significant improvement regarding head nurses performance after attending head nurses’ managerial competencies program also a number of studies demonstrate a positive effect of training programs on subjects’ knowledge and performance\textsuperscript{11,12,13,14}. So, it is important to design such program to raise these management behaviors and performance.

Among the offered management training program, time management program was limited, a study conducted by El-Daly (2006)\textsuperscript{15}, who assessed how nurse managers’ use their time. The study concluded that increasing time wasters and their perception to time management concepts was better than time management skills. Thus designing this program will be important to develop the nurse managers’ time management skills which consequently reflect on their performance.

**Aim:** This study was conducted to examine the effect of time management training program on the nursing managers’ performance

**Research hypotheses:** To fulfill the aim of the study the following hypotheses will be formulated:

H\textsubscript{0} (1): There will be higher total mean score of nurse managers’ time management knowledge and skills after attending time management training program than before.

H\textsubscript{0} (2): Nurse managers’ time management performance total mean score will increase after attending time management training program compared to pre-program performance total mean score.

**Operational definition:** Nurse Manager Performance: is defined as nurse manager’s time management behaviors in terms of planning, setting goals and priorities, being disciplined, delegation, preference way for the organization, controlling interruption, negotiating demands, perceiving control of time, and balancing life style.

**Materials and Method**

**Design:** Quasi-experimental design was used.

**Study sample:** The study sample composed of all nursing managers (n = 27) who were actually in the active workforce during the time of data collection and who met the inclusion criteria but during the program 7 nurse managers withdrew from the program.

**Inclusion criteria:** Educational background: Baccalaureate nursing degree

**Years of experience:** minimum one year as a nurse manager.

**Tools of data collection:** The data was collected using two tools:

Tool I. Time management questionnaire. It was modified by the researcher based on Time Management Behavior Scale (TMBS) by Macan\textsuperscript{16} 1996, which used to assess the participants’ time management knowledge and skills.
Tool 2 Time management observational checklist. It was modified by the researcher based on Time Management Behavior Scale (TMBS) by Macan\textsuperscript{16} 1996, which used to assess the participants’ time management performance.

Procedure was carried out after explanation of the aim of the study also an official administrative approval was obtained from the General Director of the selected hospital. The participants’ performance was assessed by the investigator four times which are: pre, immediate, after one month and after three months of the program implementation using the observation checklist and the observation was done at different days and different time at the work day. Time management knowledge and skills questionnaire was used three times during the study. Which are: pre, immediate, and after three months of the program implementation.

**Result and Discussion**

Figure (1): frequency distribution of participants’ work specialty (N = 20)

Figure (1) shows that 29.6\% of the participants were working at I.C.Us while 3.7\% were working at renal, orthopedic, ENT and hematology units.

Figure (2): Frequency distribution of study participants’ age (N = 20)

Figure (2) shows that more than half of the participants’ age (59.3\%) ranged from (30-40 yrs) while (3.7\%) ranged from 50 years and more.

Figure (3): Frequency distribution of study participants’ experience (N = 20)

Figure (3) shows that (44.4\%) of the participants’ experience ranged from 15-20 yrs. while 14.8\% their experience ranged from 5-10 yrs.

Figure (4): Frequency distribution of study participants’ education (N = 20)

Figure (4) shows that (70.4\%) of the participants hold Bachelor degree in nursing while 11.1\% holds master degree in nursing.

Table (1) mean difference among nursing managers’ time management knowledge and skills through program phases (N = 20)

Table (1) shows that there was highly statistical significant difference in all participants’ time management skills dimension through program phases (P = 0.000) but there was not statistical significant difference in their time management knowledge (P = 0.012).

<table>
<thead>
<tr>
<th>Questionnaire</th>
<th>Mean</th>
<th>SD</th>
<th>F (repeated measures)</th>
<th>p</th>
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</thead>
<tbody>
<tr>
<td>Time management</td>
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<td>Knowledge</td>
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<tr>
<td>pre</td>
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<td>0.00</td>
<td>7.624</td>
<td>.012</td>
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<tr>
<td>immediately</td>
<td>15.05</td>
<td>1.70</td>
<td></td>
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<tr>
<td>after 3mon</td>
<td>14.00</td>
<td>0.00</td>
<td></td>
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<tr>
<td>Time management</td>
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<tr>
<td>Skills</td>
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<tr>
<td>pre</td>
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<td>8.47</td>
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<td></td>
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<tr>
<td>immediately</td>
<td>125.65</td>
<td>2.45</td>
<td>68.696</td>
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</tr>
<tr>
<td>after 3mon</td>
<td>123.25</td>
<td>2.917</td>
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</tr>
</tbody>
</table>

* Statistically significant difference at p≤ 0.05
Table (2) mean difference among nursing managers’ time management performance through program phases (N = 20)

Table (2) shows that there was highly statistical significant difference in all time management performance dimension through program phases (P = 0.000).

<table>
<thead>
<tr>
<th>Observation</th>
<th>Mean</th>
<th>SD</th>
<th>F (repeated measures)</th>
<th>p</th>
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</thead>
<tbody>
<tr>
<td>Planning</td>
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<tr>
<td>pre</td>
<td>3.74</td>
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<tr>
<td>immediately</td>
<td>25.75</td>
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<td></td>
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<tr>
<td>after 1mon</td>
<td>24.50</td>
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<td></td>
<td></td>
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<tr>
<td>after 3mon</td>
<td>23.35</td>
<td>2.00</td>
<td>229.722</td>
<td>.000</td>
</tr>
<tr>
<td>Setting goals</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>pre</td>
<td>.62</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>immediately</td>
<td>5.20</td>
<td>.83</td>
<td></td>
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<tr>
<td>after 1mon</td>
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<td>.87</td>
<td></td>
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<tr>
<td>after 3mon</td>
<td>4.05</td>
<td>.82</td>
<td>140.716</td>
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<tr>
<td>Setting priorities</td>
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<td></td>
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</tr>
<tr>
<td>pre</td>
<td>2.92</td>
<td>2.21</td>
<td></td>
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<tr>
<td>immediately</td>
<td>7.55</td>
<td>1.09</td>
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<tr>
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<td>6.35</td>
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<td>Being disciplined</td>
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<tr>
<td>pre</td>
<td>6.25</td>
<td>3.90</td>
<td></td>
<td></td>
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<tr>
<td>immediately</td>
<td>5.05</td>
<td>2.54</td>
<td></td>
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<td>after 1mon</td>
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<td>1.27</td>
<td>5.676</td>
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<tr>
<td>pre</td>
<td>3.96</td>
<td>3.22</td>
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<tr>
<td>immediately</td>
<td>6.40</td>
<td>.99</td>
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<tr>
<td>after 1mon</td>
<td>6.40</td>
<td>.50</td>
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<tr>
<td>after 3mon</td>
<td>6.00</td>
<td>.00</td>
<td>9.482</td>
<td>.000</td>
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<tr>
<td>Preference ways for organization</td>
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<td>4.51</td>
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<td>9.00</td>
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<tr>
<td>after 1mon</td>
<td>8.05</td>
<td>1.23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>after 3mon</td>
<td>6.95</td>
<td>.82</td>
<td>49.183</td>
<td>.000</td>
</tr>
</tbody>
</table>

Table (2) (continued) shows that there was highly statistical significant difference in all time management performance dimension and also in the total observed time management performance through program phases (P = 0.000) except controlling interruptions and negotiating demands.

Discussion

It is mentioned in the Arab heritage” Time likes a sword, if you do not cut it, it will tear you apart” as if it passed, it can’t be ever regained. So Nurse Managers often find themselves overburdened with ever increasing workloads and responsibilities and this may not be the ideal time to provide intensive management training. As today the use of time or managing time is a critical issue both for individuals and organizations as part of structured succession planning activities, enabling ward managers to enter their position with knowledge and confidence17.

From this approach, the present study has approved that time management training program can be considered as an effective tool in improving nursing managers’ time management performance as an educational program. As time management training cause individual’s better recognition for working condition and provide situations which enable them to organize the work by proper planning and prioritizing the related work tasks. Time management enables people to overcome the stressful situation in working and life18.
In relation to time management knowledge the present study revealed that the nursing mangers knowledge slightly improved after program while remarkable improving was in time management skills in all time management skills dimensions. This improving may be due to that the nursing mangers were working without planning, setting tasks prioritization, response to any interruption they face during the work day, and didn’t use effective delegation techniques to save their time.

The previous mentioned result come in accordance with Elsabahy, Sleem, and El Atroush who mentioned in their research entitled as “Effect of Time Management Program on Job Satisfaction for Head Nurses” that all head nurses reported that their response to time management is high (100% response). Those knowledgeable nurse leaders will be able to face the change in health care which has become constant, and sustainability is the major importance. Broad knowledge base and systems thinking knowledgeable nurse leaders who can enable this transformation for a sustainable future approach and opportunities for innovation in healthcare.

In addition to El-Shaer showed, in his research entitled as “Impact of time management program on time wasters of head nurses and their perception toward effective organizational performance” that there were statistical significant positive correlation post program between head nurses level of knowledge, current use of time management skills and their perception of effective organizational performance.

The current study also found that there was highly statistical significant difference in all time management performance dimension and also in the total observed time management performance through program phases and this improving still present after 1 month of program implementation and after 3 month of program implementation but slightly decreased except controlling interruptions and negotiating demands. This improving means that the nursing managers started in using different time management strategies during the day.

This results consistent with Ebrahim’s, who showed in his research entitled as “Developing Head Nurses’ managerial Competencies: an intervention study” that the head nurses time management behaviors improved after the training program through applying different time management skills. In addition there is also a strong relationship between Job performance and time management tactics and strategies in study conducted by Njagi.

Finally the present study showed that the participants of the study were nurse managers and all of participants were highly educated bachelor females this may be due to the majority of the hospital managers and nursing staff are females in the nursing profession in general, as well as the male nurses are relatively new in nursing career especially at baccalaureate level in Egypt and their numbers is still definitely little if it compared to females.

**Ethical Clearance:** A written approval was obtained from the ethics and research committee of the Faculty of Nursing - Cairo University. Written informed consent was obtained from each participants after explaining the nature & purpose of the study. Participants were informed that participation in the study was entirely voluntary, anonymity and confidentiality of the data were assured.

**Conflict of Interest:** The authors declare that there is no conflict of interest.

**Source of Funding:** Self-funding.

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11. Safey El-Din DA. Effect of a comprehensive nursing documentation training program to staff nurses on their documentation skills at Cairo University hospitals(Doctoral thesis /Cairo University) 2012.
A Descriptive Study of the Proportion of Gang Rape in Mthatha, South Africa

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Abstract

Background: Gang rape is one of the most egregious forms of violence and has reached epidemic proportions in South Africa. It is prevalent in all spheres of society and all women are potential victims.

Objectives: To determine the proportion of gang rapes reported in the Mthatha region of South Africa.

Method: This was a retrospective cross-sectional review of all cases of gang rape cases reported by complainants 16 years of age and older, between January 2008 to December 2008, at Sinawe Rape Crisis Center in Umtata General Hospital. Recorded variables included age, number of perpetrators and relation of victim to perpetrator.

Result: Three hundred and seventy cases of rape were recorded of these, 63 (16.6%) were gang rapes. Two perpetrators were involved in 74.6% of rapes, 10 (15.8%) involved three perpetrators, and in 3 (4.8%) cases four perpetrators were identified. Most of the perpetrators 44(69.8%) were not know to the victims.

Conclusion: There is a high incidence of gang rape in Mthatha area of South Africa.

Keywords: Gang rapes, sexual assaults, perpetrators, victims.

Introduction

A considerable number of young people experience non-consensual sex across the world. The brutal and horrific gang rape and murder of a young Indian student on a bus in Delhi brought into focus the magnitude of multiple perpetrator rapes worldwide. Gang rape or group rape is defined as: “a rape in which one or more victims are subjected against their consent to sexual intercourse with two or more offenders.” The incidence of rape in South Africa is extremely high with 28-37% of men admitting, in various studies, to have raped at least once and 7-13% having participated in gang rape. These figures are well summarized in Jewekes et al (2009). During the 2012/2013 financial year 66 000 rapes were reported to the police. However it is believed that if all rapes were reported more than 120 000 women would have been raped annually in South Africa.

Little research has been carried out on gang rape, despite the fact that it occurs frequently. Vetten suggests rates of multiple perpetrator rape as high as 12-27% in South Africa. According to Ullman, gang rape is associated with alcohol and drug involvement, less frequent use of weapons, more nocturnal attacks, less victim resistance, and has more serious bio-psychosocial consequences for the victims than those of single perpetrator victim rapes. Gang rape victims reported to police and sought healthcare more often than single offender victims, and were treated more negatively by their communities.

In South Africa, “jackrolling” or gang rape is reportedly used by young men to ‘punish’ their girlfriends for perceived infidelity or as a way of ending a relationship in which they are no longer interested. Gang rape also occurs in non-intimate
Partners such as drunken women in bars or girls thought to be virgins. Opportunistic and alcohol-driven motives have also been cited as risk factors for gang rape and women who refuse sexual advances by one or more of a group of men may become victims of the violent crime. In other contexts, gang rape is a common occurrence during wartime and it is a practice carried out on women who prefer to have sex with women, as a “corrective” measure.7,8

A study from 2009 (the data from our study was from 2008 so the 2009 data was time-appropriate) found that 19.6% of men who had committed rape were HIV positive, suggesting that rape may be a significant factor in the spread of HIV.9 Injuries to genital tract resulting from the violence associated with rape, further increases the victim’s likelihood of contracting HIV. In multi-perpetrator rapes, there is a high probability of at least one of the offenders being HIV positive. In addition, the victim is exposed to the virus to a greater degree if more than one offender is HIV positive, and the victim suffers greater genital trauma due to repeated penetration from multiple assailants.10 Likewise if the victim is HIV positive, one or more uninfected offenders put themselves at risk. Inequalities in male-female relationships as well as in the social, economic and political structures in South Africa place make women vulnerable to sexual assault as shall be explained later.11 The objective of this study was to determine the proportion of gang rape in Mthatha region of South Africa and to describe the relationship of the victim to their rapists.

Method

This was a descriptive study of all cases of gang rapes reported by complainants over 16 years of age at Sinawe Rape Crisis Center in Umtata General Hospital from 1st January 2008 to 31st December 2008. Sinawe center is the only center in this region which services a population of approximately 400,000. Most cases were brought to the centre by the police services. Some women were referred from the hospital and health centers and therefore approached the staff directly at the center. The name, age, number of perpetrators and details of the incident were retrieved from the patient’s records. These records are kept confidential and are only divulged for the purposes of the court. The ethical approval has been granted under project No. 99/4114 by the ethical committee of the university.

Results

There were 379 cases of rape recorded of these, 63 (16.6%) were gang rapes (Figure 1).

Thirty women were between the age of 16 and 20 years (Figure 2). In 47 (74.6%) cases of gang rape there were two perpetrators, 10 (15.8%) victims were raped by three perpetrators, and three (4.8%) women were sexually assaulted by four perpetrators. (Figure 3) Most of the perpetrators (69.8%) were not known to the victims (Figure 4) whilst 17 (27%) perpetrators were known to their victims. Cousins and ex-boyfriends and their friends each comprised 1.6% of the perpetrators known to the victim. The highest number of gang rapes was recorded in the summer months (January to May) which constituted 60.3% of the total offences (Figure 5).

Discussion

This is a first study of the proportion of gang rape in this region of South Africa. There were 16.6% cases of gang rape over period of 12-months in the year 2008 in this region (Figure 1).

In comparison, Statistics South Africa’s national Victims of Crime survey estimated that 12% of rapes involved two or more perpetrators.12 A study of 1401 rapes registered between 1996-1998 at Hillbrow Hospital, Lenasia South Hospital and Chris Hani Baragwanath Hospital, in the metropolis of Johannesburg, also in South Africa, found 27% of cases to have involved two or more perpetrators.13 Mthatha is a former capital of the Transkei homeland, a settlement that existed under the apartheid government of South Africa and has now been incorporated into the Eastern Cape Province. The majority of the population is unemployed and poverty is
Mthatha is only major city in this region to a population of about 4 million. A large number of people, especially young adults migrate to city for their livelihood. Gangs are an example of a subculture in which violence is particularly pronounced especially in the townships and former black homelands. The legacy of apartheid resulted in the emasculation of young black men. It has been suggested that gang-rape may be an act of exerting power over a defenseless victim. It has also may be viewed as a means proving one man’s virility to his friends or acquaintances. Mokena’s study has highlighted how some gangs may engage in a range of criminal activities but changed their actions over time in order to focus on rape. The perpetrators are loosely affiliated to one another in committing this crime.

In our study the victims of gang rape incidents were younger and more likely to be unemployed. Thirty (47.7%) victims of gang rape were between 16 and 20 years of age (Figure 2).

Most of the rapes occurred in the summer (Figure 5). The greatest number 9 (14.3%) of gang rapes reported in the month of May of the year, followed by April 8 (12.7%). This is in line with reported by Vetten et al in 2005, where the highest number of incidents of gang rape was also observed in the summer months i.e. May (12%) and October (12%), followed by December (11%). In the context of our study this phenomenon may be explained by groups of people, both men and women, being out till later in the evening and indulging in drug or alcohol use. The widespread incidence of gang rapes noted in this study is a serious social and health issue. The literature has shown that there is a high rate of non-reporting of this crime. The survivors live with severe bio-psychosocial sequelae including the injuries to the genital tract and other injuries she may have experienced during the attack. Psychological and social consequences include depression, post-traumatic stress and social isolation.
Our study is limited by important missing data. We do not have access to the ages of the offenders, their HIV status, history of previous rape or whether or not the accused were under the influence of drugs or alcohol at the time of the attack. These details may not have been taken by the examiner at the time of presentation of the woman to the healthcare facility while some of the information would have been taken by the police and is not available to us. However those variables did not form part of our objectives. Further our study only looked at female victims of gang rape and did not investigate attacks on males.

**Conclusion**

There is a high incidence of gang rape in Mthatha area of South Africa. If we fail to engender a culture of respect toward women by boys and men in this area, then women need to be educated as to how to avoid becoming victims of this barbaric crime. Society at large needs to make an effort to embrace instead of ostracize the victims traumatised by gang rape. Pro-active law enforcement and harsher jail sentences for violent crimes against women and children may also assist in lowering the rates of multiple perpetrator rapes.

**Acknowledgment:** The author would like to thank all staff of the Sinawe Thuthuzela centre for helping to collect data and providing information on police stations in this region.

**Ethical Issue:** The author has ethical permission for collecting data and publication (approved project No. 4114/1999) from the Ethical Committee of the University of Transkei, South Africa.

**Conflict of Interest:** None

**Source of Funding:** It is self-funded.

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**References**

Topical Approach Versus Systemic Antimicrobial Therapy for Treating Diabetic Foot Infection in Ninevah

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Abstract
Infection may be a common character of advanced diabetic foot unwellness and therefore the commonest reason for diabetes-related hospitalizations and lower extremity amputations. The topical (local) treatment has the benefits of avoiding systemic adverse effects, providing an enhanced target area concentration, and permitting the utilization of agents not offered for systemic treatment. The aim of this study is to show the effect of topical antimicrobial approach versus systemic antimicrobial therapy for treating diabetic foot infection in Ninevah. We included randomized controlled trial that allocated people individually as a two-group patient, parallel (topical and systemic) studies involving patients with an infected diabetic foot. The results were expressed in a reduction in risk (efficacy) 91% and the relative risk 0.09 with 95% confidence intervals (0.011- 0.696). The results suggest that topical infiltration treatment, when accompanied by appropriate wound care, can provide a therapeutic alternative to a broad-spectrum systemic antibiotic agent.

Keywords: Diabetic foot infection, efficacy, relative risk.

Introduction
Foot infections, a frequent and serious complication of diabetes⁴,⁵, are among the most common diabetes related causes of hospitalization and the leading cause of non-traumatic lower limb amputation⁶. The antibiotic(s) selected must cover the often-poly-microbial organisms that cause these infections. Clinical trials have demonstrated the effectiveness of various systemic antibiotics in treating diabetic foot infection (DFI)⁷-⁹. According to the internationally accepted and verified DFI classification, wound depth is an important determinant of severity²,10,11. Thus, a mild wound infection can be amenable to treatment with a locally administered anti-infective agent. Topical treatment has the benefits of avoiding general adverse effects, providing an increased target site concentration, and allowing the use of agents not available for systemic therapy¹². An acceptable topical anti-infective agent would demand to demonstrate activity against the spectrum of microorganism that are best known to cause DFI, and it would need to avoid serious adverse effects, interference with wound healing, or induction of drug resistance. To date, no topical anti-infective agent has been well-tried to be effective for treating DFI¹³. We, therefore, undertook a randomized clinical trial to compare the efficacy of topical treatment with systemic treatment.

Aim of the study: The aim is to show the outcome of topical intralesional antimicrobial approach versus systemic antimicrobial therapy for treating diabetic foot infection in Ninevah.

Objectives:
1. To look out the demographic characteristics and the type of treatment in the patients under study.
2. To study the clinical presentation of the DFI, in the patients under study.
3. To assess the effects of intensive topical antimicrobial approach compared with systemic antimicrobial therapy on the outcome of foot infection in people with diabetes.
4. Measure the association between the treatment duration, the severity of the infection and the frequency of the recurrence according to the type of treatment.

Material and Method
Study Design: We included randomized controlled trial (RCT) that allocated people individually. We
conducted 2 group patient, parallel (topical and systemic) studies involving patients with an infected diabetic foot.

**Patients:** Men or women aged ≥18 years who had diabetes mellitus (according to American Diabetes Association definitions) could potentially be enrolled if they had an infected wound below the malleoli. Infection was defined by the presence of purulent drainage or ≥2 of the following: erythema, warmth, pain or tenderness, or edema or induration\(^{14}\).

Patients randomized to treatment with systemic approach (parentally), and those randomized to apply locally infiltrated, directly on the wound and to dress the wound.

During the survey, we categorize the types of lesions, in addition to the results of outcomes, according to the preformed formula.

Investigators used a wound scoring system, based on the system of (Knighton et al.)\(^ {15}\) as modified by (Pecoraro et al.)\(^ {16}\). The minimum treatment course was ≤7 days, but investigators could extend it for up to 28 days or more.

**Description of the intervention:** Since DFIs can progress rapidly and infection is defined clinically rather than microbiologically, there is no reason to delay starting antibiotic therapy if infection is suspected. The selection of an antibiotic regimen should take into consideration the particular needs and other morbidities of the patient as well as the proven or suspected pathogens and their antibiotic susceptibilities. Then, the clinician can decide which specific drug or combination is needed, including the optimal route of administration. This was done after taking a swab for culture and sensitivity, then, according to the results the investigator starting local infiltration of the highly sensitive drug in the wound. This was done after dissolving the vial of selected antibiotic with four ml of distal water and infiltrate only one ml of the dissolving drug at many sites of the infected wound once daily up to healthy granulation tissue perform and then repeat the culture, until the results of culture become negative. The selected antibiotic therapy should always cover Staphylococcus aureus and Pseudomonas aeruginosa, as they are the most frequent and virulent pathogens isolated in DFI of these the three most frequently used antibiotic drug classes were; (Meropenine, Cefipen and Amikacin). However, rarely, in the case of culture results still positive, another antibiotic should be used.

While all DFI in a person with diabetes requires antibiotic therapy, it is often not sufficient. Appropriate surgical procedures (particularly incision and drainage, debridement and excision of infected tissues) and wound care are always needed.

**Analysis of study**

**Clinical outcome:** At each visit, we graded the clinical response as (1) “infection resolved or cured” (all signs and symptoms of infection resolved), (2) “infection improving” (most, but not all, signs and symptoms of infection improved or resolved), (3) “treatment failure” ≥1 signs or symptoms of infection substantially worsening), (4) “recurrence” (a previously cured or improved infection showing worsening of signs or symptoms of infection)\(^ {17}\).

**Wound assessments:** Investigators compiled a “total wound score” that included ratings of signs and symptoms of infection, wound measurements (maximum length, width, and depth), and assessment of granulation tissue. Investigators measured wound area by planimetry of wound tracings\(^ {17}\) and measured the wound depth with a probe.

**Expressing the Results of Randomized Trials:** The results can be expressed in a number of ways. The risks of developing a disease or complication in each group can be calculated, and the reduction in risk (efficacy) can then be calculated\(^ {18,19}\).

Another approach is to calculate the ratio of the risks in the two treatment groups (the relative risk)\(^ {18}\). The relative risk (RR) is the ratio of the risk of the event for treating subjects to the risk for controls\(^ {20,21}\).

However, to consider the absolute benefit, the absolute risk reduction (ARR), is calculated as the difference in risks. ARR measures how much the local treatment reduces risk compared to the systemic treatment\(^ {22}\).

Another method, is to estimate the number of patients who would need to be treated (NNT) to prevent one adverse outcome\(^ {18,23}\).

**Statistical Analyses:** 95% confidence intervals (CI), of all randomized trials measures were calculated.

Chi-square test (\(\chi^2\)) between the 2 treatment groups for the difference in the portion of patients with either resolved or improving infection versus those who
experienced treatment failure, was used and P-value of ≤ 0.05 was considered to denote statistical significance. Micro Soft Excel 2010 was used for statistical analysis.

Bar chart was used to present continuous variables and tables used for categorical data.

**Results**

A total of 60 patients was included in this study, as was seen in Table 1.

**Table 1. Distribution of patients with DFI according to the demographic characteristics and type of treatment.**

<table>
<thead>
<tr>
<th>Demographic characteristics</th>
<th>Topical</th>
<th>Systemic</th>
<th>Total No. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>18</td>
<td>13</td>
<td>31 (52%)</td>
</tr>
<tr>
<td>Female</td>
<td>21</td>
<td>8</td>
<td>29 (48%)</td>
</tr>
<tr>
<td>Age (year)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 45</td>
<td>14</td>
<td>8</td>
<td>22 (37%)</td>
</tr>
<tr>
<td>45-60</td>
<td>13</td>
<td>6</td>
<td>19 (32%)</td>
</tr>
<tr>
<td>≥61</td>
<td>12</td>
<td>7</td>
<td>19 (32%)</td>
</tr>
<tr>
<td>Residence</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>26</td>
<td>8</td>
<td>34 (57%)</td>
</tr>
<tr>
<td>Rural</td>
<td>13</td>
<td>13</td>
<td>26 (43%)</td>
</tr>
<tr>
<td>Setting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inpatient</td>
<td>3</td>
<td>8</td>
<td>11 (18%)</td>
</tr>
<tr>
<td>Outpatient</td>
<td>36</td>
<td>13</td>
<td>49 (82%)</td>
</tr>
</tbody>
</table>

According to the clinical presentation of the DFI, the results were seen in table 2.

**Table 2. Clinical presentation of the DFI, in the patients under study.**

<table>
<thead>
<tr>
<th>Total No. (60)</th>
<th>Clinical presentation</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Types of lesion</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cellulites</td>
<td></td>
<td>40</td>
<td>67</td>
</tr>
<tr>
<td>Paronychia</td>
<td></td>
<td>29</td>
<td>48</td>
</tr>
<tr>
<td>Abscesses</td>
<td></td>
<td>34</td>
<td>57</td>
</tr>
<tr>
<td>Tendonitis</td>
<td></td>
<td>22</td>
<td>37</td>
</tr>
<tr>
<td>Foot ulceration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ve</td>
<td></td>
<td>38</td>
<td>63</td>
</tr>
<tr>
<td>-ve</td>
<td></td>
<td>22</td>
<td>37</td>
</tr>
<tr>
<td>Traumatic lesion</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ve</td>
<td></td>
<td>44</td>
<td>73</td>
</tr>
<tr>
<td>-ve</td>
<td></td>
<td>16</td>
<td>27</td>
</tr>
<tr>
<td>Signs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Purulent secretions</td>
<td></td>
<td>45</td>
<td>75</td>
</tr>
<tr>
<td>Redness</td>
<td></td>
<td>54</td>
<td>90</td>
</tr>
<tr>
<td>Warmth</td>
<td></td>
<td>47</td>
<td>78</td>
</tr>
<tr>
<td>Pain or tenderness</td>
<td></td>
<td>24</td>
<td>40</td>
</tr>
<tr>
<td>Tissue hardening</td>
<td></td>
<td>13</td>
<td>22</td>
</tr>
<tr>
<td>Severity of the infection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mild</td>
<td></td>
<td>11</td>
<td>18</td>
</tr>
<tr>
<td>Moderate</td>
<td></td>
<td>28</td>
<td>47</td>
</tr>
<tr>
<td>Severe</td>
<td></td>
<td>21</td>
<td>35</td>
</tr>
</tbody>
</table>

The results show the pathogens that have been isolated more frequently from wound samples in the intention to treat populations under study, 45.0% (27) are having the pathogens Staphylococcus aureus, while 30.0% (18) of patients are having Pseudomonas aeruginosa as the pathogens of causing the DFI.

Also the study shows that 65% (39) of patients were given topical treatment and 35% (21) of them systemic treatment.

Figure 1, present the use of other treatment needed by the patients.

Concerning the treatment duration, 50% (26.7% of systemic and 23.3% of topical treatment) of the study sample was needed ≥28 days, and 25% of patients were treated for a period 8-14 days (3.3% of systemic and 21.7% for topical treatment).

The duration of antibiotic therapy (with either topical or systemic) was not similar in the 2 treatment groups, and there was statistically significantly different between the 2 treatment arms. The chi-square statistic is 9.4349. The result is significant and p = 0.02403

Table 3 expressing the results of randomized trials, was within the 95% CI and the $\chi^2$ test for discrete data p = 0.00276, was statistically significant at p ≤ 0.05.

**Table 3. The distribution of individuals who demonstrated a clinical resolution, according to the type of treatment and calculating measures of treatment effect**

<table>
<thead>
<tr>
<th>Type of treatment</th>
<th>Clinical resolution</th>
<th>Measures of treatment effect with (95%CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topical</td>
<td>-ve</td>
<td>ARR 0.2601 CI (0.0783-0.4750)</td>
</tr>
<tr>
<td></td>
<td>+ve</td>
<td>NNT 4 CI (2-13)</td>
</tr>
<tr>
<td>Systemic</td>
<td>-ve</td>
<td>RR 0.0897 CI (0.0116-0.6967)</td>
</tr>
<tr>
<td></td>
<td>+ve</td>
<td>Efficacy 0.9103 CI (0.3033-0.9884)</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
According to the severity of the infection, among those getting resolution, the results were statistically significant by the use of chi-square test \((p \leq 0.05)\), as seen in table 4.

Table 4: The distribution of individuals who demonstrated a clinical resolution, according to the severity of the infection and type of treatment.

<table>
<thead>
<tr>
<th>Type of treatment</th>
<th>Severity of the infection</th>
<th>Total (No. 53)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mild</td>
<td>Moderate</td>
<td>Severe</td>
</tr>
<tr>
<td>Topical</td>
<td>9</td>
<td>22</td>
<td>7</td>
</tr>
<tr>
<td>Systemic</td>
<td>2</td>
<td>5</td>
<td>8</td>
</tr>
</tbody>
</table>

The table 5 shows only 16% and 53% of patient developed recurrence during the course of topical and systemic treatment, respectively.

Table 5: The frequency of the recurrence, according to the type of treatment.

<table>
<thead>
<tr>
<th>Type of treatment</th>
<th>Recurrence</th>
<th>RR (95%CI)</th>
<th>p-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. +ve</td>
<td>No. -ve</td>
<td></td>
</tr>
<tr>
<td>Topical</td>
<td>6</td>
<td>32</td>
<td>38</td>
</tr>
<tr>
<td>Systemic</td>
<td>8</td>
<td>7</td>
<td>15</td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
<td>39</td>
<td>53</td>
</tr>
</tbody>
</table>

*The chi-square statistic is 7.7989 and the result is significant at \(p \leq 0.05\).

Discussion

The results support the potential of topical infiltration as a therapeutic alternative to a systemically parental administered antibiotic for treating infected diabetic foot lesions.

We found no differences in population demographic characteristics, except in the residence, the urban patients were 57% of the study sample. This may be those patients are more aware and seeking early medical advice than of the rural population.

The primary endpoint of the studies was a clinical resolution (cure or improvement) of wound infection. The difference in the relative rate (RR) 0.089 (9%) of clinical resolution or improvement, that is, the treated subjects with local infiltration are subject to only a (9%) of the risk to that of systemic treatment in the study sample, as smaller values of (RR) reflect greater treatment benefit. The efficacy of topical treatment is 91% in the study group. This translates that topical treatment is effective in treating 91% of DFI in people with a reasonable problem. However, antibiotic therapy must usually be combined with one or more surgical procedures and should always include Staphylococcus aureus\(^{24}\).

According to the severity of the infection, our results demonstrate that, for severely infected diabetic foot ulcers, topical treatment was clinically comparable to a systemic antibiotic. These data suggest that, for severely infected ulcers, topical infiltration treatment, when accompanied by appropriate wound care, can provide a therapeutic alternative to a broad-spectrum systemic antibiotic agent. In addition, topical infiltration treatment appears to be safe and may avoid the selection of resistant bacteria that can develop after oral and (parenteral route) systemic antibiotic therapy.

About the recurrence outcome among those getting resolution, the result is significant at \(p \leq 0.05\). Which means that the topical infiltration antimicrobial route of the drugs used is worthy in that the randomized comparisons of antibiotic\(^{25}\). Early resolution of the signs of infection also reduces the need for hospitalization and potential morbidity and hastens the healing of the wound\(^{26}\).

Conclusion

The results of randomized trials were expressed in a reduction in the relative risk and larger value of efficacy is associated with greater treatment benefit. These suggest that topical infiltration treatment, when accompanied by appropriate wound care, can provide a therapeutic alternative to a broad-spectrum systemic antibiotic agent.

Conflict of Interest: No conflict of interest.

Source of Funding: Self

Ethical Clearance: From Ethical Committee, Medical College, University of Ninevah

References


Histological Evaluation of Apical Closure After Autotransplantation of Immature Permanent Dog Teeth Treated with Regenerative Endodontic

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Abstract

Objective: The aim of this study was to evaluates histologically apical closure of autogenously transplanted immature permanent dog teeth treated with 3 different revascularization protocols

Study design: Sixty single-rooted maxillary incisor teeth from ten healthy Mongrel dogs aged 5 months were randomly divided into 3 experimental groups of 20 teeth each. Group I: Autotransplantation without regenerative endodontic procedures. Group II: Autotransplantation with regenerative endodontic procedures after removal of their pulps coronally one week past transplantation. Group III: Autotransplantation after removing pulp tissue from the apical side and treated with regenerative endodontic procedure one week past transplantation. The animals were sacrificed, histologic sections were prepared and three groups were evaluated for apical closure.

Results: Only 37.9% of teeth of all groups showed histological apical closure, with significant differences between the three groups (p = 0.008). Group I showed the maximal percentage (66.7 %) and group II the minimum (20%). When the experimental groups were compared, there were significant differences between groups I and II (p = 0.004), and groups I and III (p = 0.024). While with group II and III; no statistical significant difference was found (p = 0.465).

Conclusion: These results suggest that autotransplantation procedures better done without removal of the original pulp tissue or further regenerative endodontic procedures.

Keywords: Apical Closure, Autotransplantation, Regenerative Endodontic.

Introduction

Surgical movement of a tooth from its original location in the mouth to another site referred as autogenous tooth transplantation¹. Early eruption of the lower six makes it highly susceptible to dental caries so; autotransplantation of a third molar to occupy the site of an unrestorable first molar, also autotransplantation including of tooth agenesis to replace other pathological condition would be a good solution for such situations³-⁵.

Success of autotransplantation commonly depending on the pulp reaction ⁶, autotransplantation, which maintains the PDL and the possibility for pulp regeneration, revascularization, and re-innervation will considered as the best solution for replacing missing tooth⁷-⁹.

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It has been demonstrated in earlier that teeth can revascularize after autotransplantation if the original pulp tissue is removed at the moment of extraction, this procedure offers the possibility of tooth cryopreservation and to auto-transplanted in a later stage expecting the pulp chamber will be filled with new vital tissue.

Teeth with non-vital pulps may achieve apexogenisis using a technique termed “revascularization” the canal is disinfected with an antibiotic paste, and bleeding is stimulated to form a blood clot that allows generation of live tissues in the canal space, according to the current hypothesis maturation of the root is probably induced by remnant Hertwig’s epithelial root sheath cells, or differentiation of adult stem cells from the remnant apical papilla or circulating stem cells that differentiate and aid maturation.

Revascularization is the process of restoration of blood supply, while regeneration is the process of renewal and growth of an organ or tissue. For this reason, the term “regenerative endodontic” more accurately describes the physiologic process used in this treatment protocol.

This study comparing apical closure in autogenously transplanted immature permanent dog teeth treated regenerative endodontic technique and to find out if the apical closure is influenced by the removal of the original pulp tissue.

**Materials and Method**

Sixty single-rooted maxillary incisor teeth from ten healthy mongrel dogs aged 5 months were randomly divided into 3 experimental groups of 20 teeth each. Before any interventions, dogs were kept under the same nutritional and environmental conditions at the animal house, Faculty of veterinary - Cairo University. Antibiotics (Ampicillin 25 mg/kg body weight) were administered 2 days prior to procedures. The involved teeth were radiographically throughout using radiograph paralleling devices to confirm incomplete root formation and open apices as shown in Figure 1.

**Figure 1. Open Apices**

**Group I**, ten non-carious, periodontally sound maxillary right first incisors and ten non-carious, periodontally sound maxillary left first incisors were extracted and autotransplanted alternatively for comparison with Group II and III. The teeth were stored in sterile isotonic saline solution at room temperature till being replanted and after transplantation the teeth were splinted with vycril 3/0.

**Group II**, ten non-carious, periodontally sound maxillary right second incisors and ten non-carious, periodontally sound maxillary left second incisors were subjected to the same autotransplantation procedures. One week past transplantation, under general anesthesia and rubber dam isolation, the access cavities for the maxillary second incisors in the left and right side explored and complete pulpectomy confirmed. Apex locator used to confirm the actual working length and minimal instrumentation done with k-type files. Irrigation done with 5% NaOCl. Then, intracanal medication with antimicrobial agents of equal parts of metronidazole, minocycline and ciprofloxacin in a paste form in the concentration of 20mg/ml prepared. The paste placed carefully into the canals, using a Lentulo-spiral. The access cavities sealed with Cavit. The animal reviewed after two weeks. Under rubber dam, access re-opened and irrigation done with 5% NaOCl and final irrigation made by saline. Using a sterile #45 K-file, periapical over instrumentation done in both teeth to induce bleeding into the canals until the CEJ. Clotting allowed for 15 min and mineral trioxide aggregate placed against the clot. Then access cavities sealed with glass ionomer filling.
In Group III, ten non-curious, periodontally sound maxillary right third incisors and ten non-curious, periodontally sound maxillary left third incisors were autotransplanted after removing their pulp tissue from the apical side with the use of a suitable size nerve broach (Figure 2), and treated with regenerative endodontic procedure one week past transplantation same like group II.

Statistical analysis: The data were analyzed using chi square test, with the level of significance set at p < 0.05.

Results

Unfortunately, one incisor was lost during the extraction procedure due to root fracture resulting in a sample of 58 teeth as we losing contralateral site as well. This tooth and its contralateral were excluded in the final analysis.

Histologic evidence of apical closure was seen in roots from all experimental groups. In group I, teeth after autotransplantation were allowed to develop normally and apical closure has been found as shown in Figure 3. This was due to deposition of bone-like or cementum-like tissues in the pulp space into the canal walls which lead to increase of thickness of the apical third of some roots as shown in Figure 4a, b. In contrast, teeth in groups II, III showed different grades of arrested dentin and open apex as shown in Figure 5.

Statistical Analysis: Data was tabulated and analyzed using IBM Statistical Package for Social Sciences (SPSS) version 20 for windows. Qualitative data for apex closure was displayed in frequency and percentage. Apex closure comparisons between different study groups was done using chi-square test at significance level p < 0.05 is presented in Table 1. Only 37.9% of teeth of all groups showed histological apical closure, with significant differences between the three groups (p = 0.008). Group I showed the maximal percentage of histological apical closure (66.7 %) and group II the minimum (20%). When the experimental groups were compared with each other for histological apical closure, there were significant differences between groups I and II (p = 0.004), and groups I and III (p = 0.024). While with comparing group II and III; no statistical significant difference was found (p = 0.465).
Figure 3. Regenerated soft connective tissue containing a regenerated blood vessel. (Trichromex100)

Figure 4a. Higher magnification Apex closure is indicated by the presence of apical deltas formed of dentin along with regenerated apical periodontal ligament fibers. (Trichromex200)

Figure 4b. Coronal section for the apical one third Apical area shown in showing apical closure achieved by a layer of cells producing a dentin/osteoid-like tissue. (Trichromex100)

Figure 5. Open apex with a thin layer of granulation tissue (GT) is observed to bridge the apex. Degeneration of the inter-radicular and inter-dental bone is observed. (Trichromex100)

Table 1: Comparison of Apex closure among the study groups

<table>
<thead>
<tr>
<th>Apex Closure</th>
<th>Group I (N1 = 18)</th>
<th>Group II (N2 = 20)</th>
<th>Group III (N3 = 20)</th>
<th>Total (N = 58)</th>
<th>X² (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Yes</td>
<td>12</td>
<td>66.7%</td>
<td>4</td>
<td>20.0%</td>
<td>6</td>
</tr>
<tr>
<td>No</td>
<td>6</td>
<td>33.3%</td>
<td>16</td>
<td>80.0%</td>
<td>14</td>
</tr>
</tbody>
</table>

X²: chi square test, *: significant at p < 0.05
Discussion

Mongrel dogs were selected as an experimental models for studying As the dental anatomy of larger species of animals resembles human dentoalveolar architecture as it is similar in radicular structure to immature human teeth in their open apex characteristics, beside short experimental periods because of the high rate of growth, so results are obtained in shorter experimental periods. This was in agreement with the most of old and new experimental researches considered dogs as the major in-vivo testing system for new regenerative devices or techniques.

Only 37.9% of teeth of all groups showed histological apical closure. Group I showed the maximal percentage of histological apical closure (66.7%) This percentage may be explained as a result of stimulus of the necrotic pulp tissue on the cellular activity.

Pulp necrosis occurs a result of autotransplantation of immature teeth is a possible stimulating factor in the repair process of the Pulp, as a result of retro migration of cells from the periodontium into the apical pulp in immature teeth, which act as a periodontal precursor cells can differentiate into odontoblasts, leading to completion of the root growth.

Group II and group III show least percentages of apical closure (20–30%) This result could be consider low percentage of histological apical closure on compartment with other researches have been made regarding regenerative endodontic producers and apical closure of immature permanent tooth in dogs, this may be due to autotransplantation producers in our experiment as a new variable doesn’t been included in other experiments.

Also the disagreement between radiological and histological apical closure results may be explained by the higher accuracy of the histological study compared to radiographic study in assessing apical closure. Which may lead to a high percentage in apical closure. Similar results have been reported by Wang et al. who found 78% of radiographic apical closure, but only 69% of histological apical closure.

Using animal blood clot as a scaffold for hard tissue formation in revascularization procedures may also explain low percentage of apical closure in our study for group II and group III, Thibodeau et al. (2007), who found 59% of roots with histological evidence of apical closure when a blood clot was used, while Zhang et al. (2014), who reported a higher percentage of histological apical closure when Plasma Rich Platelet was used (75%) in comparison with blood clot. In a previous study with the same experimental sample (Rodriguez-Benitez et al., 2016), 43.8% of radiographic apical closure and 34.4% of histological apical closure were found.

In all groups apical closure and thickening of the roots have been found to be a result of formation of two types of tissue that have been found in the pulp space along the dentinal walls. Bone-like tissue and cementum like tissue. Similar findings have been reported by Wang et al. These findings are in agreement with the results reported by Zhu et al who, found no pulp tissues but mainly bone, cementum and periodontal tissues after regenerative endodontic procedures.

Although there were no statistical differences between group II and group III experimental groups for apical closure, group III has shown slight higher percentage of apical closure, which may be due to wide apical foramen of maxillary third incisor more than the apical foramen of maxillary 2nd incisor. While in a previous study on immature permanent dog teeth made to record the influence of removal of the original pulp tissue before autotransplantation in the growth of new tissue in the pulp chamber, the group with the original pulp tissue left in situ comprised (80%) with the pulp chamber totally filled or for at least 1/3 to 2/3 with viable tissue, in contrast the group with the pulp tissue removed before (79%) had no or little vital tissue in the pulp chamber assuming that the revascularization and ingrowth of new tissue is more difficult if the original pulp tissue is removed before transplantation, while this did not make regenerative endodontic producers for the autotransplanted tooth.

Conclusion

Apical closure of the immature permanent teeth with open apex after autotransplantation was possible, and it’s better done without removal of the original pulp tissue or further regenerative endodontic procedures, also the removal of original pulp tissue through the apical foramen before in the autotransplantation procedures before regenerative endodontic treatment has no significant effect in apical closure and completion.

Research Ethical Approval: This study was made with the approval of the Ethical Committee of the faculty of dentistry, Minia University. The institutional and national guide for the care and use of laboratory animals was followed.
Conflict of Interest Statement: The authors declare that there is no conflict of interest. Source of Funding: This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

References
Assessment of Radiation Risks During Brain CT Procedures in Moroccan Hospitals

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Abstract

Ct scans or Computed Tomography use X-rays to make detailed pictures of the area inside the body. CT brain examinations are used to diagnose the skull, brain, paranasal sinuses, eye sockets and other various head conditions. In the other side, if patients are exposed to greater radiation doses, it is more likely that they develop a cancer or biological effect. This study aims to measure the patient radiation dose during a brain CT procedure and to assess the radiation dose and biological effects.

Six radiology departments in different medical centers were object to this study. These departments are equipped with various CT machines adjusted as stated by international protocols. A number of 180 patients underwent brain CT scans. Effective radiation dose, cancer and biological risks were estimated using the International Commission on Radiological Protection (ICRP) conversion coefficients.

The effective dose for Brain CT procedure in Moroccan hospital varied between (0,80± 0,12) and (5,47± 1,51) mSv with an average value of (2,96± 0,67) mSv. The cancer risk per Brain procedure ranged between 44 and 301 with an average value of 163 per 1 million procedures. The hereditary risk per Brain procedure ranged between 2 and 11 with an average value of 6 per 1 million procedures. The effective dose and risk factors for brain CT scan examination are higher than the national averages for one third of our hospitals.

Patient radiation risks are serious during multiple image acquisition. The current study shows that 66% of the examinations with normal results. Nevertheless, staff ought to optimize the radiation dose during Brain procedures.

Keywords: CT scan, Radiation Risks, Doses. Local DRL Assessment.

Introduction

Since its emergence in 1971, Computed tomography (CT) played a part in a great advancement in the imaging field [1]. CT is a non-invasive medical test that helps physicians diagnose and treat medical conditions. CT images can reveal bones as well as soft tissue and organs. A CT scanner uses a motorized x-ray source that shoots narrow beams of x-rays as it rotates around the patient there are special digital x-rays detectors located directly opposite the x-ray source. As the x-rays pass through the patient, they are picked up by the detectors and transmitted to a computer.

CT is still widely used for skull pathologies, paranasal sinuses, and eye sockets. It is the first option for people with traumatic brain injury to detect bleeding or edema. New indications for CT are reported daily like CT colonography, coronary CT angiography [2], abscess drainage and much more [3]. However, like all other imaging procedures that use x-ray radiations, CT procedures may generate biological effects[4, 5]. High
exposure causes immediate effects on living organisms, like severe radiation burns or radiation sickness that can actually lead to death. These immediate effects are called deterministic, they occur shortly after irradiation, from a few hours to a few months [6, 7]. Exposure to more or less high radiation doses can have long-term effects such as cancer or leukemia, or other hereditary diseases. Stochastic effects occur randomly, unlike deterministic effects, they are not related to a threshold [8]. Ionizing radiation can affect directly the DNA within the nucleus of cells, or indirectly through free radicals, causing cell degradation. Faulty DNA repair can lead to cell mutation. Cancer appears if the mutated cells are not eliminated by the immune system. Hereditary abnormalities occurs when the genetic character of the cells is modified [9]. To estimate the nominal coefficients of risk, the International Commission on Radiation Protection (ICRP) adjusted nominal radiation detriment coefficients for cancer and hereditary effects as follows: $5.5 \times 10^{-2}$ and $0.2 \times 10^{-2}$ Sv for the whole population [10]. Effective dose is the best parameter to assess the health risk from ionizing radiation [11]. Effective dose to patients can be calculated through dose length product (DLP) [12]. Diagnostic reference level (DRL) can be established as the patient has no dose limit [13]. DRLs are used to identify unusually high radiation doses for common diagnostic medical X-ray imaging procedures [14, 15]. DRLs have been set at approximately the third quartile of measured patient data. A conversion factor for brain CT procedures is used to get to the effective dose to patients through DRLs of dose length product (DLP). Morocco has more than 800 Radiology facilities with 1100 devices-RX including CT equipment [16]. Sometimes, patients receive unnecessary doses during brain CT procedures [12, 17, 18]. The scarce studies on the assessment of effective dose during brain CT procedures in Morocco [12, 17, 18] and the lack of previous studies on biological effects that can be resulted from such procedures prompted us to undertake this study. The objectives of this study were to measure the patient radiation dose during a brain CT procedure and to estimate the radiation dose and biological effects.

**Material and Method**

The data come from six radiology department of different medical center in the republic. The machines are routinely controled for quality mesurments and all the measure parameters were inside satisfactory range.

**Patient data:** A number of 180 patients who have undergone a CT brain scan were considered in this study in six different medical centers in Morocco at the rate of 30 patients per hospital. Patient factors (age, gender, examination aim, body region, use of contrast media) and patient dose were taken in. Furthermore, other exposure factors were considered such as gantry tilt, tension (kV), tube current (mA), exposure time, slice thickness, table increment, number of slices, and the positions of scans on patient dose, the visualised CT dose index (CTDIvol) and the dose length product (DLP).

**Effective dose calculation:** Effective dose to patients after a CT brain scan is obtained by multiplying dose length product (DLP) by a conversion factor:

$$E_{eff} = DLP \times F_{DLP} \quad (1)$$

For CT brain examinations, the conversion factor taken into account is that of the head and which is $F_{DLP} = 0.0021 \text{mSv.mGy}^{-1}.\text{m}^{-1}$ [10].

**Cancer risks estimation:** A risk coefficient $F_{CR}$ is used to assess the overall cancer risk $R_{CR}$ per procedure like follows:

$$R_{CR} = F_{CR} \times E_{eff} \quad (2)$$

The overall cancer risk $R_{CR}$ is $F_{CR} = 5.5 \times 10^{-2} \text{Sv}^{-1}$ presented by ICRP in ICRP 103 [10].

**Hereditary risks evaluation:** Another risk factor coefficient is used this time to estimate the risk of genetic effects $R_{GE}$ in future generations like follows:

$$R_{GE} = F_{GE} \times E_{eff} \quad (3)$$

The considered risk factor coefficient is $F_{GE} = 0.2 \times 10^{-2} \text{Sv}^{-1}$ presented by ICRP in ICRP 103 [10].

**Statistical analysis:** The data were analyzed using Statistical Package for the Microsoft Office Excel 2007. DLP (mGy.cm) and CTDIvol (mGy) were considered to get the third quartile value as a reference value for DRL for each hospital and the overall average.

**Results**

A total of 180 CT brain procedures were performed during the data collection period in six different hospitals [12]. TABLE I presents the calculated DRLs of PDL and effective dose during brain CT in each hospital. Effective dose was also analyzed to get the third quartile value as reference value for DRL for each hospital.
Table I: Dose diagnostic levels for PDL and effective dose per hospital

<table>
<thead>
<tr>
<th>Hospital Reference</th>
<th>Mean DLP (mGy/cm)</th>
<th>Std.Deviation</th>
<th>3rd Quartile</th>
<th>Dose eff (mGy/cm)</th>
<th>Dose eff (mSv)</th>
<th>Eff. dose (mSv)</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1-OUJ-HF</td>
<td>715.5</td>
<td>1.50</td>
<td>178.73</td>
<td>0.38</td>
<td>860.72</td>
<td>1.81</td>
</tr>
<tr>
<td>H2-RAB-CNRNS</td>
<td>2434</td>
<td>5.11</td>
<td>719.82</td>
<td>1.51</td>
<td>2602.96</td>
<td>5.47</td>
</tr>
<tr>
<td>H3-AGA-HM</td>
<td>1135.76</td>
<td>2.39</td>
<td>607.88</td>
<td>1.28</td>
<td>1305.29</td>
<td>2.74</td>
</tr>
<tr>
<td>H4-AGA-CNSS</td>
<td>1211.49</td>
<td>2.54</td>
<td>186.98</td>
<td>0.39</td>
<td>294.3</td>
<td>2.72</td>
</tr>
<tr>
<td>H5-RAB-INO</td>
<td>1854</td>
<td>3.89</td>
<td>178.59</td>
<td>0.38</td>
<td>2009.5</td>
<td>4.22</td>
</tr>
<tr>
<td>H6-AGA-HII</td>
<td>339</td>
<td>0.71</td>
<td>56</td>
<td>0.12</td>
<td>379.4</td>
<td>0.80</td>
</tr>
</tbody>
</table>

Table II presents the risk factors (carcinogenic and hereditary) per brain CT procedure for each hospital.

Table II: Risks per brain CT procedure per hospital

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Cancer</th>
<th>Hereditary effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1-OUJ-HF</td>
<td>9.94×10^-5</td>
<td>3.62×10^-6</td>
</tr>
<tr>
<td>H2-RAB-CNRNS</td>
<td>3.01×10^-4</td>
<td>1.09×10^-5</td>
</tr>
<tr>
<td>H3-AGA-HM</td>
<td>1.51×10^-4</td>
<td>5.48×10^-6</td>
</tr>
<tr>
<td>H4-AGA-CNSS</td>
<td>1.49×10^-4</td>
<td>5.44×10^-6</td>
</tr>
<tr>
<td>H5-RAB-INO</td>
<td>2.32×10^-4</td>
<td>8.44×10^-6</td>
</tr>
<tr>
<td>H6-AGA-HII</td>
<td>4.38×10^-5</td>
<td>1.59×10^-6</td>
</tr>
<tr>
<td>Mean</td>
<td>1.63×10^-4</td>
<td>5.92×10^-6</td>
</tr>
</tbody>
</table>

Figure 1 shows tube current charge Q(mAs) variation per each medical center included in the current study.

Fig. 1: Tube current charge Q(mAs) per hospital.

Figure 2 shows tube voltage U(kV) variation per each medical center included in the current study.

Fig. 2: Tube current voltage U(kV) per hospital.

Discussion

The tube current charge Q(mAs) differs from one medical center to another (Figure 1). It varies between 130 and 320 mAs for H6-AGA-HII and H5-RAB-INO respectively. Since there is no significant distinction of most of patients’ conditions, the use of diverse tube current charge for each hospital deems unjustified. Patients then may had been subject to unnecessary radiations. The dose is directly depending on the tube current charge. H4-AGA-CNSS and H5-RAB-INO patients were therefore more exposed because of doses due to more than 200 mAs.

The applied tube voltage U(kV) varies between 118 and 140 kV for H3-AGA-HM and H2-RAB-CNRNS respectively (Figure 2). Two third of the studied hospitals used a tube voltage of 120 kV. A high tube voltage generates x-rays of bigger energy so a beam of bigger penetration strength and it raises the signal/dose ratio. An increase of 120 to 135 kV increases the dose by about 33% [12].

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Table I presents diagnostic reference levels for PDL and effective dose per hospital. The effective dose for Brain CT procedure in Moroccan hospital varied between (0.80± 0.12) and (5.47± 1.51) mSv with an average value of (2.96± 0.67) mSv.

Figure 4 shows a comparison between dose diagnostic levels of effective dose in each studied hospital and the average effective dose level for brain CT. The effective dose for brain CT scan examination is higher than the national averages for one third of our hospitals. The highest exposures are recorded respectively at national center of rehabilitation and neurosciences (CNRNS) and national Institute of oncology (INO) both in Rabat.

According to the calculation made on risk factors based on effective doses, as presented in TABLE II, the cancer risk per Brain CT procedure ranged between 44 and 301 with an average value of 163 per 1 million procedures. The hereditary risk per Brain CT procedure ranged between 2 and 11 with an average value of 6 per 1 million procedures.

Figure 6 shows a comparison of carcinogenic and hereditary risk factors per brain CT procedure between the six hospitals in the current study. The risk factors for brain CT scan examination is higher than the national averages for one third of our hospitals. National center of rehabilitation and neurosciences (CNRNS) and national Institute of oncology (INO) remains respectively of the highest risk per Brain CT procedure because of their high-recorded effective doses.
Figure 7 shows a comparison of carcinogenic and hereditary risk factors per brain CT procedure between the present study and others in some countries around the world. Risks per brain CT procedure in the African region are the highest including the present study.

**Fig. 6: Carcinogenic and hereditary risks per brain CT procedure per country [19-25].**

**Conclusion**

This study aimed to measure the patient radiation dose during a brain CT procedure and to estimate the radiation dose and biological effects. The effective dose for Moroccan hospitals is \((2.96 \pm 0.67)\) mSv. It corresponds to 1408 mGy.cm the first Moroccan DRL for CT brain procedure for adults [12]. The effective dose and risk factors for brain CT scan examination are higher than the national averages for one third of our hospitals. The cancer risk per Brain CT procedure ranged between 44 and 301 with an average value of 163 per 1 million procedures. The hereditary risk per Brain CT procedure ranged between 2 and 11 with an average value of 6 per 1 million procedures. These risks are significant during multiple image acquisition. The study revealed that 66% of the procedures with normal findings. However, staff should optimize the radiation dose during Brain CT procedures. Careful handling of radiation and all associated devices is necessary to prevent or minimize potential unwanted effects.

**Ethical Clearance:** All authors hereby declare that all experiments been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki.

**Source of Funding:** Self-funded by the authors.

**Conflict of Interest:** Nil.

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Chemo Preventive Efficacy of Aspirin in Colorectal Cancer: A Narrative Review Approach

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Abstract

Objectives: Our review is focused on aspirin efficacy as a chemo-preventive agent in colorectal cancer (CRC).

Method: We have searched related articles in the following data base through Pub Med, Science Direct, Cochrane Library, Scopus and Google Scholar, restricted to the studies from the year 2000 to 2015. This review focuses on the therapeutic efficacy of aspirin in CRC chemo-prevention. We provide an overview of the association of aspirin treatment with reduction of CRC incidence, recurrence, and CRC-related mortality.

Results: Regular use of aspirin was associated with significant reduction in the incidence and recurrence of colorectal cancer (p = 0.004), lower number of adenomas (p = 0.003), prolonged time of the first adenoma detection (p = 0.02) and lower risk of mortality (p > 0.001).

Conclusion: Regular use of aspirin effectively reduces the incidence of colorectal cancer, its recurrence rate, and its specific mortality.

Keywords: Chemo-Preventive, Aspirin, Recurrence, Efficacy, Colorectal Cancer.

Introduction

Colorectal cancer (CRC) is one of the most common types of cancer and the third leading cause of cancer-associated mortality in the US.¹⁻³ This type of cancer originates from the epithelial cells lining the colon or rectum as a result of genetic mutations (generally in intestinal crypt stem cells)⁴, which maybe inherited or acquired. Prevention of these genetic defects and/or their effects on protein expression and function could provide efficient therapeutic strategies. Numerous studies have demonstrated that aspirin has a beneficial effect on several cancer types, including CRC.⁵⁻¹⁰ Administration of aspirin has been associated with a reduction of CRC incidence, recurrence, and CRC-related mortality.¹⁵⁻₂⁰, ²²⁻²₅

This review focuses on the therapeutic efficacy of aspirin in CRC chemo-prevention. we provide an overview of the association of aspirin treatment with reduction of CRC incidence, recurrence, and CRC-related mortality. The main objectives of our present review are focused on aspirin efficacy as a chemo-preventive agent in colorectal cancer.
Materials And Method

We have searched related articles in the following data base through Pub Med, Science Direct, Cochrane Library, Scopus and Google Scholar, restricted to the studies from the year 2000 to 2015. This review focuses on the therapeutic efficacy of aspirin in CRC chemoprevention. We provide an overview of the association of aspirin treatment with reduction of CRC incidence, recurrence, and CRC-related mortality.

Results and Discussion

The chemopreventive effects of aspirin in CRC include reduction of CRC incidence, prevention of adenoma recurrence, and reduction in mortality rate.

Reduction of CRC incidence in different risk groups: Several studies have examined the effect of aspirin in reducing the incidence of developing CRC. In a cohort study of 69810 elderly men and 76303 elderly women who received adult-strength aspirin every day for at least 5 years, the incidence of developing CRC was significantly reduced by 32% (95% CI = 0.52 - 0.90). Another study followed up 14033 participants from five randomized clinical trials over twenty years and measured the ability of aspirin to reduce the incidence of CRC on the basis of the cancer site; regular use of aspirin was found to significantly reduce the incidence of proximal colon cancer (P = 0.001) but not distal colon (P = 0.66) or rectal (P = 0.35) cancer.

In a study examining the effect of aspirin on reducing the incidence of CRC among 301240 participants, some of whom had first-degree relatives with colon cancer, the risk of developing distal colon cancer was found to be significantly reduced by an average of 16% (95% CI = 0.71 – 0.99). In contrast to the previous study, daily aspirin use significantly lowered the incidence of rectal cancer among subjects either with or without a family history of colon cancer by 24% on average (95% CI = 0.64 – 0.90) and 62% (95% CI = 0.19 – 0.78), respectively.

The long-term effect of aspirin on the incidence of cancers was also investigated in two large randomized trials with post-trial follow-up for more than 20 years through a systematic review of relevant published observational studies. Regular long-term use of aspirin was significantly associated with decreased CRC incidence. In a prospective cohort study of 47363 males, regular aspirin use was found to be associated with lower risk of CRC over 18 years of follow-up (RR = 0.79; 95% CI, 0.69 – 0.90). Among 82911 women who joined the US Nurses’ Health Study cohort, regular use of aspirin was found to be associated with a 23% reduced risk of CRC (95% CI, 0.67– 0.88) over 20 years of follow-up. Moreover, some studies have assessed the effectiveness of aspirin use with respect to an individual’s specific risk for CRC development.

Efficacy of aspirin in average-risk population: In the Women’s Health Study, a large US-population-based randomized 2 × 2 factorial trial that compared the efficacy of aspirin to placebo (with/without vitamin E) among 39876 female participants, the use of low dose aspirin every other day for 10 years did not show statistically significant effects on the risk of CRC (P = 0.83).

Efficacy of aspirin in moderate-risk population: The efficacy of aspirin in moderate-risk populations (i.e., individuals with a history of adenomas or colorectal cancer) has been assessed by four multicenter randomized control trials including between 272 and 1121 participants each. Two of the trials have compared the incidence of CRC between aspirin-treated and no-aspirin-treated groups. No significant differences observed in the relative risk and the absolute risk of CRC (meta-analyzed RR, 0.84; 95% CI, 0.15 - 4.74; p = 0.84; RD, 0.00; 95% CI, -0.02 - 0.01; p = 0.82), with moderate-to-high heterogeneity. However, it is important to note that these studies were primarily designed to assess the differences in adenoma recurrence rate rather than the incidence of CRC.

Efficacy of aspirin in high-risk populations (Familial adenomatous polyposis and Lynch syndrome):

Two international multicenter randomized controlled trials have investigated the efficacy of aspirin in high-risk populations: Colorectal Adenoma/ Carcinoma Prevention Programme (CAPP) 1 and 2. In CAPP1, the use of aspirin for more than one year significantly reduced the size (p = 0.02) but not the number of polyps; no data were reported regarding the CRC incidence. In CAPP2, the use of aspirin did not have a statistically significant effect in reducing the risk of developing CRC among carriers of Lynch syndrome (P = 0.33). A study designed to follow-up on the participants of the CAPP2 trial included a longer double-blind, post-intervention follow-up with a re-analysis of cancer incidence performed when the first participants reached a follow-up of 10 years. In this analysis, among
861 participants with a mean follow-up of 56 months, aspirin was associated with lower CRC risk in intent-to-treat analyses (P = 0.05), and the CRC incidence was lower in the aspirin group compared with the non-aspirin group; this difference was significant in a per-specified per-protocol analysis (P = 0.02), but it was not significant in an intent-to-treat analysis (P = 0.12).\(^{(30)}\)

Prevention of adenoma recurrence: In many studies, the daily use of aspirin significantly reduced the incidence of colorectal adenomas among subjects with a history of CRC.\(^{(5, 6, 9, 20, 21)}\) In 2003, a randomized clinical trial examined the effect of daily aspirin use in patients with previous CRC; the rate of adenoma recurrence was found to be 27% in the placebo group and 17% in the aspirin group (P = 0.004).\(^{(20)}\) The number of adenomas was also lower in the aspirin group compared with the placebo group (P = 0.003).\(^{(20)}\) The adjusted relative risk of any recurrent adenoma in the aspirin group, compared with the placebo group, was 0.65 (95% CI, 0.46 - 0.91), and the time of detection of first adenoma was longer in the aspirin group than the placebo group (HR, 0.64; P = 0.022).\(^{(20)}\) A similar finding was reported in the same year by other randomized clinical trials.\(^{(6, 9, 21)}\) The first trial examined the effect of daily aspirin use on the prevention of colorectal adenoma recurrence in patients with a history of histologically documented adenomas.\(^{(21)}\) This trial showed that the incidence of recurrent adenomas was lower in the aspirin groups compared with the placebo group (P = 0.04).\(^{(21)}\) The second randomized clinical trial assessed the effect of daily use of soluble aspirin in preventing the recurrence of colorectal adenoma.\(^{(6)}\) It found daily soluble aspirin to be associated with a reduction in the risk for recurrence of adenomas found at colonoscopy one year after starting treatment (P = 0.01).\(^{(6)}\) In 2008, another randomized trial examined the efficacy of aspirin in preventing recurrent colorectal adenomas; aspirin was found to reduce the risk of colorectal adenoma recurrence (95% CI, 0.63 – 0.99).\(^{(6)}\) A meta-analysis of data from these four randomized clinical trials\(^{(6, 9, 20, 21)}\) demonstrated that regular use of aspirin reduced the risk of recurrence of any colorectal adenoma (RR, 0.83; 95%CI, 0.72 to 0.96) over a median follow-up of 33 months.\(^{(5)}\)

Reduction in mortality rate: In a cohort study examining the effects of aspirin in improving the survival among 2990 CRC patients, the use of aspirin post-diagnosis of CRC significantly lowered the risk of all-cause mortality and CRC-specific mortality (HR = 0.67, P < 0.001).\(^{(8)}\) This beneficial effect of aspirin on survival among patients with established CRC has also been seen in a prospective cohort study of 1279 CRC patients (stage I, II, and III); the regular use of aspirin after the diagnosis of CRC significantly lowered the risk of CRC mortality by 29% (95% CI, 0.53–0.95).\(^{(18)}\) In the Cancer and Leukemia Group B (CALGB) 89803, a randomized, multicenter study designed to compare regimens of adjuvant 5-fluorouracil/leucovorin with or without irinotecan in 830 patients with stage III colon cancer, regular use of aspirin was associated with improved disease-free survival (HR = 0.48, 95% CI, 0.24-0.99) and overall survival (HR = 0.52, 95% CI, 0.19–1.46).\(^{(23)}\)

Another study examined the deaths due to cancer among daily aspirin users versus controls in eight cardiovascular-prevention randomized control trials and showed that the use of aspirin significantly reduced the cancer-associated mortality (pooled OR 0.79, 95% CI 0.68-0.92, P = 0.003).\(^{(17)}\) However, this study included randomized control trials that were originally designed to examine cardiovascular prevention rather than cancer-associated mortality. Some studies have assessed the effects of pre-diagnosis aspirin use on the survival after CRC diagnosis.\(^{(117, 22, 24)}\) In a prospective case-control study of 79439 women enrolled in the Nurses’ Health Study, the long-term regular use of aspirin was associated with significant reduction in the risk of death from CRC (HR = 0.72, 95% CI 0.56–0.92), this benefit was not detected until after 10 years of regular aspirin use.\(^{(17)}\) In 2009, Zell et al. examined the association between pre-diagnosis use of NSAID and the survival after CRC diagnosis among 114243 women in the California Teachers Study (CTS) cohort followed-up for more than 10 years.\(^{(22)}\) This study has reported that regular pre-diagnosis NSAID use is associated with significantly improved CRC-specific survival (HR, 0.58; 95% CI 0.40-0.84) and overall survival (HR, 0.71; 95% CI 0.53-0.95).\(^{(22)}\) In addition, the prolonged pre-diagnosis NSAID use for at least 5 years was associated with 60% reduction in the risk of CRC-specific mortality (95% CI, 0.23-0.71) and overall mortality (HR, 0.55; 95% CI, 0.37-0.84).\(^{(22)}\) However, in this study, the aspirin-only survival effects were consistent with the observed NSAID effects.\(^{(22)}\) In 2011, Coghill et al. assessed the role of pre-diagnosis NSAID use in the colorectal cancer-specific survival among participants of the Seattle Colon Cancer Family Registry.\(^{(24)}\) The use of NSAID prior to CRC diagnosis was associated with lower mortality (HR, 0.79; 95% CI, 0.65-0.97).\(^{(24)}\) Generally, in most of the previous studies,
the beneficial effects of aspirin on survival appeared to be duration-dependent.

**Conclusion:** Regular use of aspirin effectively reduces the incidence of colorectal cancer, its recurrence rate, and its specific mortality.

**Conflict of Interest:** The authors have no conflicts of interest to declare.

**Funding Information:** No financial support for this review that could have influenced its outcome.

**Ethical Clearance:** Our present article is a review article. There is no need to get ethical clearance.

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Relationship between Income and Anxiety on Education, Health Access and the Poverty Level of Rural Communities in Sigi Regency, Central Sulawesi

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Abstract

Introduction: Community and environmental health development are interrelated. This study aims to determine the effect of income and anxiety of rural communities, especially farmers in Sigi Regency, Central Sulawesi on access to education services and access to health services.

Method: This study uses a mixed method between survey and perceptional approaches to obtain qualitative and quantitative data based on the sources. The proportional random sampling uses to assigned 130 farmers. The survey analyzed using statistical package for social sciences (SPSS) software.

Results: Analysis of income and anxiety variables on Education were insignificance with p = 0.531. There was a significance relationship between income and anxiety variable to access to non-health care services with p = 0.00 and Health care facilities p = 0.913. There is a significant relationship between farmer’s income on the poverty level of rural communities (farmers) with p = 0.000.

Conclusion: This study found the relation of income and anxiety on the level of access to non-health care services. Also the relationship between farmer’s income on the poverty level of rural communities in Sigi Regency, Central Sulawesi.

Keywords: Anxiety, Income, Education, Health Facilities, Poverty, Farmers.

Introduction

Community and environmental health development are interrelated [¹]. The social environment and physical environment are components that build interaction and give each other influence so that in handling it must run in parallel [¹,²,³]. Most of the Indonesian population are farmers [⁴]. The most difficulties faced by farmers in all developing countries are optimum health and education services [⁴,⁵,⁶]. This prompted us to research the Effect of Farmers’ Income and Anxiety on Education, Health Access and the Poverty Level of Rural Communities (Farmers) in Sigi Regency, Central Sulawesi.

Materials and Method

Sampling: This study uses a mixed method between survey and perceptional approaches to obtain qualitative and quantitative data based on the sources. The proportional random sampling uses to assigned 150 farmers of the three regencies as the location for sampling respondents, 150 farmers were actively involved in farming, which was proportionally determined by each; Palolo 60 peoples, Dolo 40, and South Dolo 50 peoples.

Data Collection: Data collection techniques were using a questionnaire. Operational definitions and objective criteria of variables are as follows

a. Income (X1) is the amount of income of farmers is the recognition of respondents who on average are obtained in one month even when the acquisition is not bound by time and other work outside of their activities as farmers

b. Anxiety (X2) is an anxious condition experienced
by respondents due to various causes that occur socially because of the socioeconomic conditions experienced by respondents in the community where the concerned person lives his daily life measured using a combination of the Hamilton Rating Scale For Anxiety (HARS) and Psychometric Properties of The Depression Anxiety Stress Scale 42 (DASS).

c. Access to education services (Y1) is determined based on the ability to complete the formal education phase determined by the government until the 12-year compulsory education stage.

d. Health service access (Y2) is determined based on whether the farming community in Sigi regency gets health care services every time they suffer from an illness that requires medical services in both public and private health facilities.

e. Farmer Poverty Rate (Y3) is the amount of per capita income per year divided by the number of family members which is equal to the amount of kg of rice consumed as described by Tangitimbang and Lembongan [7].

1. Very poor if per capita annual income < 240 kilograms of rice,
2. Poor if per capita income is 240 - 320 kg of rice per year
3. Borderline if per capita income is 320 - 480 kg of rice per year
4. Wealth if the annual income per capita is > 480 kg of rice.

Data Analysis: Characteristics every individual tested in a manner correlational between perception individual respondent to involvement in activities socioeconomy as indicator independence economy with analysis correlation Spearman’s Rank. Every difference each partner order squared and calculated the amount, then counted value as \( r_s \). Continued make testing Hypothesis of Spearman Rank (\( r_s \)) with using a T-distribution test (t-test) level real (\( \alpha \)) 0.05.

Questionnaire Validity and Reliability: Instrument Validity Test Results are Valid, obtained with the Value of r-Calculate is higher than the Value of r-Table (0.1723). The instrument reliability test achieved a reliable result with Cronbach’s Alpha value = 0.746.

Results

There were 130 respondents recruited for this study. As shown in table 1, their income was in the range of IDR 600,000 to Rp. 800,000 (73.85 percent) and those below IDR 600,000 (8.46 percent) and those above IDR 800,000 (17.69 percent). those whose income is below IDR 600,000 per month per capita is classified as poor

Table 1. Distribution of Respondents based on Farmer’s Income

<table>
<thead>
<tr>
<th>No.</th>
<th>Income Category (IDR)</th>
<th>Total</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>&lt;600000</td>
<td>11</td>
<td>8.46</td>
</tr>
<tr>
<td>2</td>
<td>600000-800000</td>
<td>96</td>
<td>73.85</td>
</tr>
<tr>
<td>3</td>
<td>&gt;800000</td>
<td>23</td>
<td>17.69</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>130</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Data Results (2019).

The data as shown in Table 20 indicates that the highest average value was in the indicator of sleep disturbance which reached 1.76 followed by feelings of anxiety 1.57. The lowest mean value of the sign of anxiety is feeling depressed at 1.34.

Table 2. Respondents’ Answers to Anxiety

<table>
<thead>
<tr>
<th>No</th>
<th>Indicator</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Very Heavy All Symptoms Exist (4)</td>
</tr>
<tr>
<td>----</td>
<td>----------------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1</td>
<td>Feelings of anxiety</td>
<td>0 0 0 31 93 0 42 84 0 27 27 0 0 0 0 130 204 1.57</td>
</tr>
<tr>
<td>2</td>
<td>Tension</td>
<td>0 0 0 35 105 26.92 32 64 24.61 33 33 25.38 0 0 0 130 202 1.55</td>
</tr>
<tr>
<td>3</td>
<td>Fear</td>
<td>0 0 0 22 66 16.92 40 80 30.76 38 38 29.23 0 0 0 130 184 1.41</td>
</tr>
<tr>
<td>4</td>
<td>Sleep Disorders</td>
<td>10 40 7.69 30 90 23.07 39 78 30 21 21 16.15 0 0 0 130 229 1.76</td>
</tr>
</tbody>
</table>
Data on the education degree of the respondents’ children are generally limited to junior and senior high school, and no respondent can send their children to tertiary education for various reasons, especially distance and also family finances as shown in Table 3 below.

### Table 3. Respondent’s Distribution based on access to Education

<table>
<thead>
<tr>
<th>No.</th>
<th>Children’s Education Level</th>
<th>Amount (Person)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Low (Elementary/Junior HS)</td>
<td>70</td>
<td>53,85</td>
</tr>
<tr>
<td>2.</td>
<td>Medium (Senior High School)</td>
<td>60</td>
<td>46,15</td>
</tr>
<tr>
<td>3.</td>
<td>High (University)</td>
<td>0</td>
<td>0,00</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>130</strong></td>
<td><strong>100,00</strong></td>
</tr>
</tbody>
</table>

Source: Data Results (2019).

This study found 68% of respondents choosing nonhealth facilities (traditional medicine) compared to health facilities (32%).

### Table 4. Respondent’s Distribution based on Level of Poverty

<table>
<thead>
<tr>
<th>No.</th>
<th>Level of Poverty</th>
<th>Amount (Person)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>&lt; 300 Kg</td>
<td>7</td>
<td>5,38</td>
</tr>
<tr>
<td>2.</td>
<td>300 - 480 Kg</td>
<td>81</td>
<td>62,31</td>
</tr>
<tr>
<td>3.</td>
<td>481-600 Kg</td>
<td>14</td>
<td>10,77</td>
</tr>
<tr>
<td>4.</td>
<td>&gt;600 Kg</td>
<td>28</td>
<td>21,54</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>130</strong></td>
<td><strong>100,00</strong></td>
</tr>
</tbody>
</table>

Source: Data Results (2019).

Based on Table 4 there are 88 people who are classified as poor and only 42 borderline people are estimated to have other sources of income outside of farming, such as raising chickens, ducks, and goats.

## Multicollinearity Test

### Table 5. Compilation of Analysis Variance of Independent Variable to Dependent Variable

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Independent Variable</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education ($Y_1$)</td>
<td>$X_1, X_2$</td>
<td>0.531$^b$</td>
</tr>
<tr>
<td>Health Provider Access ($Y_2$)</td>
<td>Non-Health Facilities ($Y_{20}$)</td>
<td>Income ($X_1$)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Anxiety ($X_2$)</td>
</tr>
<tr>
<td>Poverty ($Y_3$)</td>
<td>Health Facilities ($Y_{2a}$)</td>
<td>$X_1, X_2$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Income ($X_1$)</td>
</tr>
</tbody>
</table>

Source: SPPS Test Results (2019)
The test results show that (1) all independent variables on access to education services are not significant. This means that even though income & dynamic anxiety will not affect the children of the respondents’ farmers in obtaining education; (2) significant independent variables on health services in non-health facilities, while health services in health facilities are not significantly different; (3) Independent variables (income) affect the degree of poverty while anxiety is not significant.

Discussion

Access to education for families of respondents is not affected by two variables tested both income and anxiety. The insignificance of the two independent variables means that for children of compulsory education, whomever they are and from any family, have the opportunity to get educational services [8,9]. Law Number 20 of 2003 (National Education System Law, 2003) has arranged for 12 years of compulsory education so that there is no reason for the respondent’s family not to send their children to school [10].


The reluctance of a sufferer to visit a health facility is caused by several factors that are considered by the community, starting from the attitude of the servant, distance range, and also related to financing [12,13]. Beliefs of servants will influence the comfort of the sufferer so that psychological factors determine the decision of a sufferer in obtaining service [12, 14], including financing arising from services received by patients from health facilities. Anxiety due to concerns about the amount of funding is a situation that cannot be avoided by sufferers. A person’s reluctance to visit health facilities is closely related to the financial capacity of low-income families [13,14]. So that poverty can be an obstacle for sufferers to get medical treatment [13,15]. Even in developing countries where many people live in poor rural areas, the most prominent factors and constraints are finance and anxiety in dealing with health care workers [16,17]. Every increase in the illness period of a respondent will experience a frequency of visits of 0.11 to a health facility.

Changing one’s thinking to believe in something better requires hard work [18,19]. Including farmer, respondents to be convinced that health services in health facilities are better than non-health care health services.

The poverty dimension that has been known generally is still at the level of per capita income per year so that its size is always equated with money or rice consumed. This opinion is not wrong even though other factors that cause a person to become poor still exist, including family dependence and family inability to manage between income and expenditure [4,20], both spending for consumption and family daily needs and health costs that are often not taken into account but are essential items of household expenditure [4,20,22].

No significant influence was found between Poverty on the respondents’ Anxiety Level; this was evidenced by the lowest mean value of the indicator of anxiety was feeling depressed at 1.34. This proves that the condition of the respondents, even though they often experience conditions of difficulty sleeping and anxiety, but feelings of depression in facing the severe demands of life are still under control and can live the challenges of life that are in their families. So that it can be said the respondent did not experience significant anxiety which could affect his performance as a farmer to obtain appropriate income. The state of depression can significantly affect one’s performance and independence in achieving an ideal quality of life [23].

Conclusion

This study found the relation of income and anxiety on the level of access to non-health care services. Also the relationship between farmer’s income on the poverty level of rural communities in Sigi Regency, Central Sulawesi.

Ethical Clearance: Taken from Tadulako University Ethical committee

Source of Funding: Self Funding

Conflict of Interest: No conflict of interest to declare

References


Screening of Nutritional Status Based on Mini Nutritional Assessment Short-Form (MNA-SF) among Elderly

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Abstract

The number of older adults is proliferating in this 21st century, reaching as many as 425 million worldwide in 2000 and estimated almost twice in 2025. In Indonesia, the percentage of older adults in 2017 as much as 7.5%. In line with the increasing of live expectancy of the elderly will grow bigger. That causes the nutrition problem in the elderly and require early identification of risk for malnutrition. Proper nutrition and physical activity have an essential role in making sure the elderly can live healthy, active, and independent lives. This study tried to identify the impact of early screening nutrition based on Mini Nutritional Assessment (MNA-SF) of elderly in community. The study relied on the observation that used cross-sectional design and conducted in the elderly community. Results of the study showed that the impact of screening in elderly based on MNA-SF most respondents were able to do activities and do activities well, this could also be attributed to BMI, most respondents were obese. The chi-square test shows that only education level is significant (p < 0.05). An influence between the level of education and risk malnutrition in the elderly is indicated by the value of RR 0.137 (95%CI). The findings in this revised MNA-SF is available for use among the elderly in the community.

Keywords: Elderly, MNA-SF, nutritional status, screening.

Introduction

Success in development can be determined by the increase of life expectancy levels that impact the increase in the number of further residents age (elderly). This condition increased impact also on the decline of infectious diseases and decreased of the disease is not transmitted or called an epidemiologic transition. Interest in optimizing older adults health and promoting successful aging has increasing life expectancy. Populations statistics indicate that we now have more people aged 65 years and that the aged an increasingly of our population.

Aging is considered a biological process characterized by progressive deterioration of physiological functions and metabolic processes. Adequate nutrition and physical activity had to ensure that the elderly can live longer, healthy, active, and independent lives. With the increased risk of illness and accompanied by nutritional disorders in the elderly, it is necessary to identify the risk of malnutrition as early as possible. Assessment of the nutritional status in the elderly is critical because it can describe the current nutritional status and detect the elderly at risk of nutritious.

Anthropometry measurements in assessing nutritional status is a sensitive indicator of community health and nutrition. Anthropometry is an assessment of the direct nutritional status used to see the imbalance of nutrient intake of substances. Nutritional screening is a fast and straightforward and sensitive process to detect the occurrence of malnutrition risk, especially in the elderly. The purpose of screening nutrition to predict outcomes related to nutritional factors. Bodyweight, height, and body mass index constitute a significant component of nutritional screening describing current nutritional conditions.

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A rational strategy for nutritional screening in the elderly population is needed. The nutritional screening method used in elderly is a Mini Nutritional Assessment Short Form (MNA-SF). Shortening the MNA more usefully because MNA-SF is a tool developed to evaluate and identify nutritional status in the elderly to prevent early malnutrition and is useful for early treatment before the risk of malnutrition occurs and more efficiently and need a short time to apply than Subjective Global Assessment Form (more specific for the clinical patient).

MNA-SF had six items instead of 18 eliminates time, and personal items can be administrated in approximately three minutes and used for the elderly in community with sensitivity 97.9% and specificity 100% (after compared to MNA). MNA-SF used a score of 10 or less to indicate undernutrition, a score 11 or more to indicate normal nutrition.

The purpose of the research is to identify the preliminary screening results, based on the MNA-SF method, on the elderly in the community.

**Material and Method**

This type of research is observational research using a cross-sectional design. The study conducted in June 2019. Research using purposive sampling techniques. The research subject amounted to 113 elderly in the community. The criteria of inclusion are willing to be the subject of research evidenced by filling informed consent, aged 58-75 years, can communicate, in a conscious state, can be performed measurements anthropometry (BB (weight loss), TB (height). The screening process conducted with an interview using the MNA-SF taken the elderly in community with the normal category-not risky (points ≥ 12) and risk malnutrition (points ≤ 11). The total score and nutritional classifications of this revised MNA-SF are identical to the original MNA-SF and the full MNA.

The results of measurements MNA-SF screening shown in Table 1. There were from six the complete the screen by filling for point A; that 102 respondents (89.18%) have not food intake declined over the past three months, point B; 85 respondents (75.245) did not have weight loss for less than three months, point C; 113 (100%) respondents could mobility or goes out, point D; 90 respondents (79.65%) had not suffered psychological stress or acute disease in the past three months, point E; 33 respondents (29.2%) had mild dementia and 75 respondents (66.38%) no psychological problems and last point F1; almost 89 respondents (21.22%) had obesity.

In the elderly obesity can exacerbate the age-related decline in physical function. Beside it obesity increasing body mass index, fat mass, and risk with degenerative disease. Nutrition is an essential element of health in the elderly and affects aging process. Although the results of screening using MNA-SF showed that most respondents did not experience appetite disorders and weight loss, in older people who experience impaired appetite and decrease energy requirements due to changes in biological and psychological functions.

The results of screening, most respondents were able to do activities and do activities well; this could also be attributed to BMI; most respondents were obese. A cross-sectional study has shown that body weight and body mass index (BMI) increase with age until approximately 50 to 60 years, besides it with age,
body fat increases, and fat mass decreases. The causes of increased fat are multifactorial, and the distribution of fat is different between older people and younger people. The other study found that a healthy weight improves life satisfaction; an increase in BMI reduces life satisfaction.

Despite the results of screening in this research and total the numbers for the final screening score were normal nutritional status. In the elderly need and necessary to evaluate nutritional status routinely at least every three months, as early monitoring and detection before malnutrition occurs in the elderly.

Table 1. Mini Nutritional Assessment—Short Form screening

<table>
<thead>
<tr>
<th>Elderly Nutritional Screening Aspects</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Has food intake declined over the past three months:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 = severe decrease in food intake</td>
<td>3</td>
<td>3.75</td>
</tr>
<tr>
<td>1 = moderate decrease in food intake</td>
<td>8</td>
<td>7.07</td>
</tr>
<tr>
<td>2 = no decrease in food intake</td>
<td>102</td>
<td>89.18</td>
</tr>
<tr>
<td>B. Weight loss during the last three months:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 = weight loss greater than 3 kg (6.6 lbs)</td>
<td>4</td>
<td>3.53</td>
</tr>
<tr>
<td>1 = does not know</td>
<td>5</td>
<td>4.42</td>
</tr>
<tr>
<td>2 = weight loss between 1 and 3 kg (2.2 and 6.6 lbs)</td>
<td>19</td>
<td>16.81</td>
</tr>
<tr>
<td>3 = no weight loss</td>
<td>85</td>
<td>75.24</td>
</tr>
<tr>
<td>C. Mobility:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 = bed or chair bound</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>1 = able to get out from chair/bed but does not go out</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>2 = goes out</td>
<td>113</td>
<td>100.00</td>
</tr>
<tr>
<td>D. Has suffered psychological stress or acute disease in the past three months:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 = yes</td>
<td>23</td>
<td>20.35</td>
</tr>
<tr>
<td>1 = no</td>
<td>90</td>
<td>79.65</td>
</tr>
<tr>
<td>E. Neuropsychological problems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 = severe dementia or depression</td>
<td>5</td>
<td>4.42</td>
</tr>
<tr>
<td>1 = mild dementia</td>
<td>33</td>
<td>29.20</td>
</tr>
<tr>
<td>2 = no psychological problems</td>
<td>75</td>
<td>66.38</td>
</tr>
<tr>
<td>F1. Body Mass Index (BMI)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 = BMI less than 19</td>
<td>4</td>
<td>3.53</td>
</tr>
<tr>
<td>1 = BMI from 19 to less than 21</td>
<td>7</td>
<td>6.19</td>
</tr>
<tr>
<td>2 = BMI from 21 to less than 23</td>
<td>13</td>
<td>11.50</td>
</tr>
<tr>
<td>3 = BMI 23 or greater</td>
<td>89</td>
<td>21.22</td>
</tr>
</tbody>
</table>

The general characteristics of respondents are presents in Table 2. There were involved 113 the elderly in the community. Based on Table 2, it is known that the subject of malnutrition risk amounted to 31 subjects (27.43%), while not risking malnutrition amounted to 82 subjects (72.57%). By age group, subject aged 58-69 years amounted to 92 subjects (90.27%). According to the gender of 103 female (91.16), for the level of education is mostly with the level of education of the High School of 84 subjects (65.49%) and the history of the disease in the first 59 subjects (52.21%) had a history of type 2 DM. Based on the chi-square test results are known that only education level (p < 0.05) In bivariate test results that based on the level of education is more risk of malnutrition than the history of the disease (p < 0.05). Bivariate analysis results of the screening level of education and past medical history with RR 0.137 (95%CI) (p < 0.05)

Table 2: Characteristics of Respondents based on group risk and not risky

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Risk Groups</th>
<th>Not Risky</th>
<th>n</th>
<th>%</th>
<th>n</th>
<th>%</th>
<th>X²</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;70 years</td>
<td>5</td>
<td>45.45</td>
<td>6</td>
<td>54.55</td>
<td>11</td>
<td>9.73</td>
<td>1.988</td>
<td>0.17</td>
</tr>
<tr>
<td>58-69 years</td>
<td>26</td>
<td>25.49</td>
<td>76</td>
<td>74.51</td>
<td>92</td>
<td>90.27</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>2</td>
<td>20.00</td>
<td>8</td>
<td>80.00</td>
<td>10</td>
<td>8.84</td>
<td>0.305</td>
<td>0.725</td>
</tr>
<tr>
<td>Female</td>
<td>29</td>
<td>28.15</td>
<td>74</td>
<td>71.85</td>
<td>103</td>
<td>91.16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level of education:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diploma</td>
<td>3</td>
<td>7.69</td>
<td>36</td>
<td>92.31</td>
<td>39</td>
<td>34.51</td>
<td>11.659</td>
<td>0.01</td>
</tr>
<tr>
<td>High School</td>
<td>28</td>
<td>37.83</td>
<td>46</td>
<td>62.17</td>
<td>84</td>
<td>65.49</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Past medical history:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type 2 DM</td>
<td>18</td>
<td>30.50</td>
<td>41</td>
<td>69.50</td>
<td>59</td>
<td>52.21</td>
<td>0.586</td>
<td>0.528</td>
</tr>
<tr>
<td>Non-DM</td>
<td>13</td>
<td>24.07</td>
<td>41</td>
<td>75.93</td>
<td>54</td>
<td>47.79</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significant (p < 0.05)

The Ministry of Health of the Republic of Indonesia had states that some factors affecting the status of elderly nutrition are gender, age, lifestyle, education, occupation, marital status, housing, and economic status.

Some study is stating that the prevalence of malnutrition in the elderly is very high. Another possible factor that could to be malnutrition as body composition change occur differently male and female. Malnutrition occurs at least half of the elderly associated with degenerative diseases. Some research that advanced age is a group that is vulnerable to malnutrition. According to health problems faced by the elderly include increased susceptibility to immune dysfunction is the leading cause.
Conclusion

This research concludes that the screening of nutritional status is crucial in the elderly as early detection to prevent malnutrition. There is an influence between the level of education and risk malnutrition in the elderly with the value of RR 0.137 (95%CI).

Acknowledgment: The authors sincerely thanks to local communities in the research area and the enumerators for their valuable efforts. Furthermore, we also thanked the Faculty of Public Health, Universitas Airlangga, for their valuable support during the study.

Conflict of Interest: The authors stated that they have no conflict of interest.

Source of Funding: The author received funding from Dr. Soetomo General Hospital Surabaya East Java Indonesia to support this research.

Ethical Clearance: Ethical feasibility permit issued by the Health Research Ethics Committee of Dr. Soetomo General Hospital Surabaya, East Java, Indonesia. Ethical feasibility standards are based on WHO-2011 and 2017 KEPPKN guidelines and follow the CIOMS 2016 guideline number 1269/KEPK/VI/2019.

References


A Health Facility-Based Study on Utilization of Antenatal Care among Myanmar Migrant Women in Five Border Districts of Tak Province, Thailand

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\textsuperscript{1}Student, Faculty of Public Health, \textsuperscript{2}Faculty of Public Health, Khon Kaen University, Thailand

Abstract

Introduction: Improving utilization of antenatal care is one of the strategies for achieving Millennium Development Goal of decreasing the maternal mortality. Thai Government health facilities provided the same Maternal and Childcare services for migrants as Thai citizens. However, migrants’ utilization of ANC services was still challenged by many factors. There was limited information about Myanmar migrants ANC services utilization in Thailand Myanmar border among all five border districts in Tak province, where thousands of Myanmar migrants are living and working.

Method and Materials: Myanmar migrant women who had been living in the five border districts of Tak province, Thailand and delivered in one of the health facilities in five districts in September 2017 to March 2018 were interviewed face to face with a structured questionnaire during 12 weeks after delivery.

Result: In this study, 73.2\% of migrant women received adequate ANC care (at least four ANC visits), but only 29.9\% received early and adequate ANC care (the first antenatal visit was in first 12 weeks of pregnancy and at least four ANC visits). The study found that women who lived in other districts (AOR = 5.13, 95\% CI = 3.32-7.94), had higher likelihood to get antenatal care than those who lived in Mae Sot district. The women with sufficient health literacy (AOR = 7.46, CI = 4.49-12.42) were also found to have more likelihood to get adequate and early antenatal care.

Discussion: Antenatal care utilization was associated with health literacy level, location of stay, duration of stay, household income, planned pregnancy or not, watched television and having health insurance. The results suggest that, as the vulnerable population at the border area, the migrant women should be targeted for bespoke health education messages on maternal health, especially the importance and necessity of antenatal care visits, especially in Mae Sot District. Promoting health insurance for the migrants would be another effective way to encourage migrant women having adequate and timely antenatal care utilization.

Keywords: Antenatal care, service utilization, Myanmar migrant women, Thailand.

Introduction

The maternal mortality ratio is one of the important indicators for measuring the status of healthcare system. Most causes of maternal deaths were preventable and related to complications in pregnancy and childbirth\textsuperscript{(1)}. Accessing early and adequate antenatal care is found to be associated with reductions in maternal mortality. Promoting effective utilization of antenatal care service is a cost-effective strategy to reduce maternal morbidity and mortality\textsuperscript{(2)}. Utilization of antenatal care is measured in terms of early utilization (i.e., within the first 12 weeks of pregnancy) and adequate utilization (i.e., at least four antenatal visits)\textsuperscript{(3)}.
the basic services like health and educations. According to Heaman et al. (5), many researchers documented that inadequate ANC among migrant women was associated with teen age pregnancy, multiparous, single, having poor or fair language competency, less than 5 years of education, an unplanned pregnancy, and not having health insurance.

In this study, Thailand is a receiving country. Soontornprakasit et al. (6) found in the study at Mahasarakham Province in Thailand that average ANC visits was 8.6 times, 99.6% visited at least one time, 98.6 % visited at least 4 times, 93.5% accessed to ANC at least 5 times. However, only half of them started ANC within 12 weeks of gestation period. Thai citizens early ANC visit was also still need to improve. Thai Government health facilities provided same Maternal and Childcare services for migrants as Thai citizens. However, there is also lack of information about Myanmar migrants ANC services utilization in Thailand Myanmar border among all five border districts in Tak province, where thousands of Myanmar migrants are living and working.

**Methodology**

**Study sites:** The study was conducted in five districts of Tak Province which are bordering with Myanmar; Mae Sot, Tha Song Yang, Mae Ramat, Phop Phra, and Umphang District. The study sites were five Thai Government Hospitals in Mae Sot, Tha Song Yang, Mae Ramat, Phop Phra, Umphang, and a charity organization, Mae Tao Clinic in Mae Sot. All six health facilities offered very low price or free of charge services for ANC and delivery of the pregnant migrant women.

**Study subjects:** The participants in the study were Myanmar migrant women living in the above five districts and gave birth in one of the aforementioned six health facilities between June to December 2017. The sample size was estimated by using the formula of Hsieh, Bloch, & Larsen (7) for a multiple logistic regression analysis that used to identify the associations between multiple independent variables and a dichotomous outcome of women attending Antenatal Care and its contributing factors at Health Facility Based Survey (8). Sample size from each study site was calculated proportionally according to the number of deliveries of migrant women in the previous year among the facilities; Mae Sot 539 (74.6%), Tha Son Yang 47 (6.5%), Phop Pra 50 (6.8%), Mae Ramat 51 (7.1%), Um Phang 36 (5%). The participants were recruited from the health facilities within twelve weeks after delivery.

**Data collection:** A structured questionnaire was used to collect data regarding migrant women’s demographic and socio-economic status, previous pregnancy information, awareness about danger signs in pregnancy and health literacy concerning pregnancy and antenatal care. Face to face interviews were conducted for data collection by the trained interviewers at the health facilities. The timing and number of ANC attendances were verified with ANC record books. A pilot study was conducted in Mae Sot and Phop Pra areas to test the validity and reliability of the questionnaire.

**Data analysis:** The categorical data were described by using frequency and percentage. For Inferential statistics, bivariate analysis was applied to identify the factors associated with Antenatal Care (ANC) utilization (i.e., at least 4 ANC visits and the first ANC visit before 12 weeks of pregnancy). As Hosmer et al stated (9), the factors with p-value < 0.25 were processed into the multivariate analysis using multiple logistic regression. All analyses were performed using Stata version 13.0 (StataCorp, College Station, TX).

**Ethical Approval:** Approval for this research was received from Khon Kean University Ethics Committee in Human research, (Approval number HE12068 2018-02-13 14-26) and the Research Ethic Committee of Mae Sot Hospital (Approval number MSHP 002/2561).

**Results**

**Descriptive analysis:** A total of 723 migrant women were selected in this cross-sectional study. Most of the mothers were in age under 25 years (43.6%) and half of them (53.7%) had stayed in Thailand between 2 to 5 years and nearly three quarters of the women (72.9%) were employed and 55.2% had no health insurance. Regarding legal status, 63.8% had legal stay permit and 77.3% mentioned that the overall incomes were enough for the family. Majority of the study participants (65.3%) lived independently in the communities whereas 16.2% and 18.5% lived in the in the vicinity of agricultural farms and factories where they were working, respectively. Nearly three quarters (74.6%) of the study subjects were from Mae Sot district and the remaining 25.4% lived in other four districts. 230 women (31.8%) received early ANC (i.e., the first antenatal visit was in first 12 weeks of pregnancy) and a total of 529 women (73.2%) had sufficiently took antenatal care (i.e., they made at least four ANC visits). But only 216 subjects (29.9%) utilized early and adequate antenatal care (Table. 1).
Table 1. Summary of Early and /or Adequate Antenatal Care (ANC) visits

<table>
<thead>
<tr>
<th>Description</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early and Adequate AN care (the first antenatal visit was in first 12 weeks of pregnancy and at least four ANC visits)</td>
<td>Yes</td>
<td>216</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>507</td>
</tr>
<tr>
<td>Early AN care (the first antenatal visit was in first 12 weeks of pregnancy)</td>
<td>Yes</td>
<td>230</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>493</td>
</tr>
<tr>
<td>Adequate AN care (at least four ANC visits)</td>
<td>Yes</td>
<td>529</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>194</td>
</tr>
</tbody>
</table>

Among the participants, 70.5% of women got pregnancy as planned and only 13% and 13.6% had at least one problem in the previous pregnancy and difficulties in last delivery. Regarding knowledge about danger signs in pregnancy 31% could answer three or more danger signs. There were three categories in health literacy about antenatal care and the study subjects were almost equally distributed in the three different levels, around 33% each in inadequate, marginal and inadequate level.

Factors associated with utilization of antenatal care: In the simple logistic regressions analysis variables such as migrant women who stayed in Thailand more than 5 years (COR = 1.35, 95% CI = 0.97-1.89), who had health insurance (COR = 1.54, 95% CI = 1.12-2.12), women whose family financial situation was enough (COR = 1.71, 95% CI = 1.13-2.59), and who lived independently in the community (COR = 1.86, 95% CI = 1.14-3.03) were more likely to utilize early and adequate antenatal care. The study also found that women who lived in other districts (COR = 3.14, 95% CI = 2.21-4.46) had higher likelihood to get antenatal than those who lived in Mae Sot district. The women with higher knowledge of danger signs in pregnancy (COR = 1.81, 95% CI = 1.28-2.57) and sufficient health literacy (COR = 4.76, CI = 3.08-7.35) were found to have more likely to have antenatal care. In multivariate logistic regression analysis sufficient health literacy (AOR = 7.49, 95% CI = 4.49-12.42), and living other districts (AOR = 5.13, 95% CI = 3.32-7.94) had significantly associated with higher probability of getting antenatal care.

Discussion

The study conducted by Myo et al. found the rate of ANC utilization in Tak and Samut Sakhon among Myanmar migrants 53% average in both study sites with not mentioned specific site data. In this study, although adequate utilization of ANC was 73.2%, early utilization was only 31.8%. A study in Turkey indicated that antenatal utilization was increasing although the number of early antenatal visits was inadequate (11). The findings of association between ANC and planned pregnancy and health insurance were agreed with other studies (5, 11, 13). Current findings and other scholars’ findings were also similar on family financial situation (12, 13), location of residents (14) and watched TV (15).

The study also revealed that Myanmar migrant mothers who had inadequate level on health literacy in pregnancy, delivery and postpartum and low knowledge about danger signs were more challenging to access quality ANC. Most migrant women in this study had a basic understanding of how to recognize danger signs of pregnancy and danger signs requiring referral to a healthcare facility. However, most of them got inadequate health messages for differentiating between common discomforts of pregnancy and danger signs. The migrant women in our study showed low health literacy for interpreting ANC education even though more than 80% women completed primary education and above. The similar finding about low level knowledge of danger signs in pregnancy was also found to be statistically significant with ANC utilization in Pakistan and in Ecuador studies. (16, 17)

ANC service provision and promotion of utilization should work not only by one sector approach but also multi-stakeholders approach to work together for promoting community health fund pool, health insurance, client cantered approach with simple local languages with many illustrations for mothers to understand easily about danger signs and health promotion information about ANC in low socio economic migrant setting in the Thailand-Myanmar border area to improve health literacy.

Limitation of the Study: This study was conducted as health facilities cross sectional study and the study subject were representative of migrant women who delivered in Thai health facilities or Mae Tao Clinic. But then the migrant women who gave birth at home, not at hospitals or clinic and those who returned to Myanmar for delivery were not represented in this study.

Conclusion

The study found 73.2%, of the migrant women received adequate antenatal care, but only 31.8% initiated antenatal care in the optimal first 12 weeks of
pregnancy. Antenatal care utilization was associated with health insurance status, financial situation, planned pregnancy, knowledge of danger signs in pregnancy, women’s levels of health literacy and location of residents. The results suggest that as the vulnerable population at the Thailand-Myanmar border area, the migrant women should be targeted for bespoke health education on maternal health, especially the importance and necessity of antenatal care visits and introduce affordable community-based health insurance.

Conflicting Interest

The authors declare that there is no conflict of interest in this research.

Source of Funding: Khon Kaen University, Faculty of Public Health

Reference


The Influence of Ginger (Zingiber Officinale Roscoe) to Protect Cholinesterase Enzyme Activities of Mice that Exposed to Pesticide

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Abstract

Pesticide is a bioactive chemical ingredients that contain toxic material to kill pest organisms. Pesticides that is widely used in Indonesia were organophosphate and carbamate. These pesticides was known as inhibitor for the cholinesterase enzyme. The decreasing activity of cholinesterase enzyme can be solved by eat some food which contain antioxidant especially phytochemicals acid (vitamin C) and some others phytochemicals. To increase cholinesterase enzym level in farmers which exposed with pesticide we need to find a natural ingredients that is cheap, easy to find, easy to be processed, and untoxic. Ginger (Zingiber officinale Roscoe) was a plant that have lots of active ingredients and untoxic. The aim of this study was to analyse the influence of ginger extract as antioxidant to the cholinesterase enzyme activity of mice that exposed to pesticide. This study was quasi experimental study using post test only control group design. Samples were Swiss Webster male white mice with 20-25 mg of weight, age 3-4 months, healty, and have a normal feces. There were 7 mice in every groups, all samples were 28 mice. Ginger (Zingiber officinale Roscoe) extract (0.001 mg/liter and 0.005 mg/liter) was given using feeding tube to every mice that have been exposed by 0.006 mg/liter of pesticide everyday. The results of cholinesterase enzyme test in mice which exposed by pesticide in control groups were 84%. Treatment groups with 0.005 mg/liter of pesticide exposing, the cholinesterase enzyme level were 26%, treatment groups with 0.005 mg/liter of pesticide exposing and 0.001 mg/liter, their cholinesterase enzyme were 77%. The K3 groups with 0.005 mg/liter of pesticides and 0.005 mg/liter ginger extract have the average level of cholinesterase enzym were 57%. We can conclude that ginger (Zingiber officinale Roscoe) extract can influence the cholinesterase enzyme due to pesticide expose.

Keywords: Pesticides, cholinesterase, ginger (Zingiber officinale Roscoe).

Introduction

Indonesian farmers used to protect their agriculture product from pest using pesticides. Pesticide is an bioactive chemicals which is contain toxic material to kill pests. Pesticide works by inhibit cholinesterase enzyme. The most popular pesticide which is used in Indonesia were organophospat and carbamat. These pesticides were also inhibit cholinesterase enzyme. Liver was an pesticides targeted organ due to its function as a toxin neutralizer, central place of protein, fat, and carbohydrate metabolism, protein plasma and heparin (blood anticoagulant) producer.¹

The decreasing of cholinesterase enzyme level can be overcome by consume antioxidant especially phytochemicals acid (vitamin C) and others phytochemicals compound.² Researches have been found that ginger has some antioxidant such as gingerdiol, gingerol, caffenic acid, camphene, capsaicin, chlorogenic acid, curcumin, delphinidin, eugenol, ferulic acid, gamma terpinene, isoeugenol, melatonin, myrcene, vanilla acid, vanillin dan zingerone.³

A study by Anam (2008) prove that the case of farmers which are poisoned by pesticides still exist. All farmers in Batu Mediri, Karang Pule did not use

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personal protective equipment which lead to 90% of them experienced mild poisoning and 10% of them experienced moderate poisoning. (4)

The results of previous research by Rachmaniyah et al. (2017) found that antioxidant in *Psidium guajava L* extract can be used to protect liver cells membrane from cigarette smokes. It can be seen by identify cirrhosis in mice liver’s cell after it was inducted by cigarette smokes. (5) A research about the influence of ginger extract to protect pesticide exposing have been not found yet. By these we want to analyse the potential of ginger to increase cholinesterase level for the farmers who are exposed by pesticides.

**Method**

This research was a quasi experimental study using post test only control group design. This design was chosen due to it was the most simple design to devide subject into two groups or more randomly.

**Sample Preparation:** Samples were Swiss Webster Mice which was adapted in cages for seven days in Biochemical Laboratory of Airlangga University. There were seven mice in every group therefore this study used 28 mice. Samples were devided into 4 groups randomly. Sampels were devided using simple random sampling way by lottery. All mice must have 20-25 grams of weight, agile in movements, shiny hair, and glowing eyes.

**Pesticide Exposing:** All mice were exposed to pesticide everyday within a month. Exposing were done using 60 mL syringe with yellow tip. Pesticides fog then were sprayed and transfered to the cages using nebulizer. This process were done until all the pesticide becomes fog completely.

**Ginger Extract:** Ginger Extract were given to the mice by feed tube everyday. This extract were powder, it must be dissolved in warm water first. We use 0.005 mg ginger extract powder for 1000 mL of warm water. Sugar was added as it was needed to give taste. This dosage were given to the mice only 1 mL per day within 30 days. The dosage were chosen based on Donatus et al. (1987) in Anam (2015) about Cholinesterase Enzyme level in Farmer’s blood that exposed by pesticide after they take *Curcuma zanthorrhiza*. (4)

**Cholinesterase Enzyme Level Test:** This test were done using tintometer test kit. All these tests were done in Biochemical Laboratory of Airlangga University. The results of cholinesterase enzyme level will be categorized below:

1. Normal Poisoning: > 75%-100%
2. Mild Poisoning: > 50%-75%
3. Moderate Poisoning: > 25%-50%
4. Heavy Poisoning: 0%-25%

**Cholinesterase Enzyme test has 4 stages, it was:**

- **Reagent Test:** Indicator and substrate solution were tested with control blood (blood from a person who did not exposed to pesticide or pesticide free).
- **Blood taking:** A tube with indicator solution were prepared for control and blood samples. The mice were anesthetized and killed. 1 mL of blood were taken from heart vein using sterile syringe. 0.01 mL of blood samples were put in the tube to be homogenized.
- **Substrate Solution Adding:** All tube in seconds stage would be added by 0.5 mL of substrate solution started from control tube, in this time we noted the time as zero. Substrate then was added to every tubes with a minutes interval from zero.
- **Color comparison and results:** All tubes will form some colors from green to yellow. These color then compared to the comparator in the tintometer test kit. Every color will be read as percentage of cholinesterase enzyme.

**Findings:** The results of cholinesterase enzyme level in mice in every groups can be seen in table below.

**Table 1. Cholinesterase enzyme concentration in mice groups**

<table>
<thead>
<tr>
<th>Number</th>
<th>$K_0$</th>
<th>$K_1$</th>
<th>$K_2$</th>
<th>$K_3$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>90</td>
<td>30</td>
<td>80</td>
<td>50</td>
</tr>
<tr>
<td>2</td>
<td>90</td>
<td>30</td>
<td>80</td>
<td>60</td>
</tr>
<tr>
<td>3</td>
<td>80</td>
<td>20</td>
<td>80</td>
<td>60</td>
</tr>
<tr>
<td>4</td>
<td>80</td>
<td>20</td>
<td>70</td>
<td>60</td>
</tr>
<tr>
<td>5</td>
<td>80</td>
<td>20</td>
<td>70</td>
<td>60</td>
</tr>
<tr>
<td>6</td>
<td>80</td>
<td>30</td>
<td>80</td>
<td>60</td>
</tr>
<tr>
<td>7</td>
<td>90</td>
<td>30</td>
<td>80</td>
<td>50</td>
</tr>
<tr>
<td>Average</td>
<td>84</td>
<td>26</td>
<td>77</td>
<td>57</td>
</tr>
</tbody>
</table>

The table shows that the average level of cholinesterase enzyme of K0 (Control Groups) was
84%, this result was categorized as normal poisoning (>75%-100%). The average level of K1 groups (exposed by 0.005 mg/liter of pesticide without ginger extract treatment) was 26%, this result was categorized as heavy poisoning. The average level of cholinesterase enzyme of K2 groups (exposed by 0.005 mg/liter of pesticide with 0.001 mg/liter of ginger extract treatment within a month) was 77%, this result was normal. The last groups K3 (exposed by 0.005 mg/liter of pesticide with 0.005 mg/liter of ginger extract treatment within a month) have 57% of average level of cholinesterase enzyme, this result was categorized as moderate poisoning.

The difference of Cholinesterase enzym level in every groups can be seen below.

![Figure 1. The Difference of K0 Groups and K1 Groups](image)

![Figure 2. The Difference of Cholinesterase Enzym Level of K1 and K2 Group](image)

![Figure 3. The Difference of Cholinesterase Enzym Level of K1, K2, and K3 Group](image)

Discussion

The cholinesterase enzyme level in K0 group (control group) and K1 group (exposed by 0.005 mg/liter of pesticide without ginger extract treatment) was different. The lowest level of cholinesterase enzyme in K0 group was 80% while the highest was 90%. All these results in K0 group was categorized normal. While in K1 group, the average level of cholinesterase enzyme was 26%. This result categorized as moderate poisoning.

This result showed that the exposing of pesticide can affect cholinesterase enzyme level. The decreasing of cholinesterase enzyme level can be indicated that organophosphate compound was entering the body by inhalation. It distributes in the blood and inhibit the cholinesterase enzyme activity. This condition can be normal after 2 weeks. Organophosphate was anticholinesterase. It was irreversible to inhibit enzyme by aging mechanism due to dealkalation from dialkylyphosphorylated enzyme intermediates.

The exposing of pesticide make the cholinesterase enzyme activity in central and autonomous nerve system decrease. In a long time period this will make massive stimulate in cholinergig nerve and central nerve system due to acetilcholin stimulating which usually function to continue nerve stimulation to the receptors of muscle cells and glands. The accumulation of acetilcholin stimulate the sympathetic and parasympathetic central nervous system, so that muscle contraction increases.

The comparation of K1 group (exposed by 0.005 mg/liter of pesticide without ginger extract treatment) result and K2 group (exposed by 0.005 mg/liter of pesticide with 0.001 mg/liter of ginger extract treatment within a month) result showed that K1 has a lower cholinesterase enzyme level than K2. It means that there was an influence after 0.001 mg/liter ginger extract treatment within a month to the cholinesterase enzyme level. All the results in K2 group was normal. So that ginger extract can fix cholinesterase enzyme activity in blood.

K1 group (exposed by 0.005 mg/liter of pesticide without ginger extract treatment) the average level of
cholinesterase enzyme was 26% and K3 group which was exposed by 0.005 mg/liter of pesticide with 0.005 mg/liter of ginger extract treatment within a month, their cholinesterase was increase to 57%.

Cholinesterase enzyme level in K1 group which was exposed to pesticides decreasing to 26% (moderate poisoning), while in K2 group which was exposed by 0.005 mg/liter of pesticide with 0.001 mg/liter of ginger extract treatment within a month their cholinesterase enzyme level was increasing to 77% and becomes normal. However when we increase the dosage of ginger to 0.005 mg/liter, their cholinesterase enzyme level was decreasing to 57% or becomes mild poisoning.

Based on Aisyah (2002), tocopherol in ginger extract will inhibit malondialdehyde (MDA) formation in mice so that ginger can help to fix cholinesterase enzyme activity in mice only in small dosage (0.001 mg/liter). This happen due to in higher dosage ginger extract can be toxic and kill the mice. (7)

**Conclusion**

1. Ginger (*Zingiber officinale Roscoe*) extract can influence cholinesterase enzyme due to pesticide exposing in mice. The exposing of 0.005 mg/liter organophosphat pesticides influence cholinesterase enzyme level to 26%.

2. The consumption of 0.001 mg/liter of ginger extract in mice influence cholinesterase enzyme level to 77%.

3. The consumption of 0.005 mg/liter of ginger extract in mice influence cholinesterase enzyme level to 57%.

**Additional Informations**

**Ethical Clearance:** taken from Ethics Committe of Health Polytechnic of Surabaya on April 23, 2018.

**Source of Funding:** Health Polytechnic of Surabaya

**Conflict of Interest:** No

**References**

4. Anam H. Cholinesterase Enzyme Level in Farmer’s Blood that is Exposed with Pesticide after They were Given Curcuma xanthorhiza Roxb. JKP. 2008;9(2).
Introduction

Cancer is the second leading cause of death worldwide\(^1\). Globocan estimated that the global cancer cases in 2018 were 18 million cases and the number of deaths from cancer was 9.6 million cases. The incidence rate in Egypt was 314.8 per 100,000\(^2\). Many treatment regimens were developed to treat cancer such as surgery, radiotherapy, chemotherapy, and others. Those treatments have many serious side effects\(^3\). Patients with cancer use many methods to overcome these side-effects; one of these methods is complementary and alternative therapy.

Complementary therapy (CT) is a group of diverse medical and health care systems, practices, and products that are not generally considered part of conventional medicine but used alongside with it\(^4\). The prevalence of CT use in cancer is 35-90\% in Middle Eastern countries\(^5\). Moreover National Center for Complementary and Alternative Medicine [NCCAM] divided CT into five main categories including: (a) Biologically based practices as herbal products and nutritional therapy, (b) Energy medicine as therapeutic and healing touch (c) Manipulative and body-based practices as therapeutic massage and chiropractic, (d) Mind-body medicines as meditation and biofeedback and (e) Whole medical systems as ayurveda and traditional Chinese medicine\(^6\).

Many of CT practices are assumed to be safe. However some natural products may be harmful; some antioxidant herbs such as the herb turmeric, which could be used for reducing inflammation, may inhibit the action of certain chemotherapeutic drugs\(^7\)-\(^8\). Furthermore, some dietary supplements may cause skin sensitivity and severe reactions when taken during radiotherapy treatment\(^9\).

Although that, a study\(^10\)-\(^11\) found that many oncology patients used CT without informing their health care providers believing that if they are “natural, they must be safe”. So oncology patients use CT depending on their knowledge which is mostly gained from people around

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**Solicitude toward Complementary Therapy among Oncology Patients**

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**Abstract**

Many oncology patients use complementary therapy (CT) to overcome the side-effects of conventional treatment without informing health care providers. Many studies were done to assess the knowledge and attitudes of health care providers toward CT, but little studies discussed the knowledge and attitudes of oncology patients toward it. The aim of the present study was to assess solicitude (including knowledge and attitudes) toward CT among oncology patients. A descriptive design was utilized to collect the data from a convenient sample of 300 adult oncology patients through a period of consecutive six months. The main findings revealed that 89.7\% of the oncology patients used CT, however, 95\% had an unsatisfactory level of knowledge about CT; 87.7\% of the patients had a positive attitude toward CT. It can be concluded that although oncology patients had a positive attitude toward CT, they had a lack of knowledge about it. Accordingly, it is recommended to include comprehensive patient assessment and professional guidance for CT use.

**Keywords:** Solicitude, Knowledge and attitude, Complementary therapy, Oncology patients.

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them and media rather than medical professionals\textsuperscript{12-13}, and the potential adverse effects of these therapies are minimized or nearly ignored in these sources which increase the risk of those patients\textsuperscript{7}.

However, there are scanty researches to assess oncology patients’ knowledge and attitudes toward CT and most of them were carried out in the developed countries and focused on natural products only. Most studies about attitudes concluded that there was a positive attitude toward CT\textsuperscript{14}. While most studies about knowledge concluded that there is a lack of knowledge regarding natural products\textsuperscript{15-16}. So hopefully the study results might expand the body of knowledge regarding patients’ solicitude of CT including knowledge and attitudes. It also might reveal about their sources of knowledge to evaluate whatever those sources are trusted or not. Therefore the aim of the current study was to assess solicitude toward complementary therapy among oncology patients.

**Research Questions:**

**Q1:** What is the level of knowledge of the oncology patients about CT?

**Q2:** What are the sources of patients’ knowledge about CT?

**Q2:** What is the attitude of the oncology patients toward CT?

**Method**

**Selection and Description of the study sample:**
A convenient sample consisting of 300 adult male and female patients with a confirmed cancer diagnosis and able to communicate constituted the study sample through a consecutive six months. The study was conducted at Oncology setting affiliated to Cairo University.

**Tools for Data Collection:** Data was collected using the following tools which were developed by the investigators.

**First tool, Personal and Medical Background Questionnaire (PMBQ):** which included demographic and medical data and knowledge background.

**Second tool, Patients’ Knowledge about Complementary Therapy Use Questionnaire (PKCTUQ):** it included 19 multiple choice questions. Each question had a score of one if the answer was right and zero if the answer was wrong with a total score ranged from zero to 19 and 60% was adopted as the minimum satisfactory level of knowledge.

**Third tool, Patients’ Attitudes toward Complementary Therapy Use Questionnaire (PACTUQ):** it consisted of 18 statements with three responses which were no with one score, undecided with two scores, and yes with three scores with a total score ranged from 18 to 54. The total scores of the scale were transformed into three intervals as a negative, neutral or positive attitude.

**Tools Validity and Reliability:** The tools were reviewed by a jury of five experts in the field of Medical-Surgical Nursing to evaluate their content validity and Modifications were carried out. Reliability was tested using Cronbach’s Alpha as follow (PKCTUQ; PACTUQ; 0.72 & 0.89, respectively).

**Procedure:** Patients were approached individually to conduct a structured interview for 15 to 30 minutes to fill the tool and to record patients’ responses.

**Statistical Analysis:** Data were coded and analyzed using SPSS version 20. Descriptive statistics were used.

**Results**

**Demographic characteristics and background:** More than one third of the study sample cannot read and write and aged between 50≤60 years old with a mean of 43.89±12.02 years. The majority was females, married and lives in an urban area.

**Table 1: Frequency and Percentage Distribution of patients According to Medical Data (N=300)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cancer diagnosis</td>
<td>Breast</td>
<td>49</td>
<td>16.3</td>
</tr>
<tr>
<td></td>
<td>Respiratory</td>
<td>33</td>
<td>11.0</td>
</tr>
<tr>
<td></td>
<td>Gastrointestinal</td>
<td>107</td>
<td>35.7</td>
</tr>
<tr>
<td></td>
<td>Genitourinary</td>
<td>20</td>
<td>6.70</td>
</tr>
<tr>
<td></td>
<td>Hematopoietic</td>
<td>49</td>
<td>16.3</td>
</tr>
<tr>
<td></td>
<td>Bone</td>
<td>17</td>
<td>5.70</td>
</tr>
<tr>
<td></td>
<td>Head and neck</td>
<td>24</td>
<td>8.00</td>
</tr>
<tr>
<td></td>
<td>Melanoma</td>
<td>1</td>
<td>0.30</td>
</tr>
<tr>
<td>Types of Cancer TreatmentReceived by patients</td>
<td>Chemotherapy</td>
<td>251</td>
<td>83.7</td>
</tr>
<tr>
<td></td>
<td>Radiotherapy</td>
<td>17</td>
<td>5.70</td>
</tr>
<tr>
<td></td>
<td>Surgical treatment</td>
<td>5</td>
<td>1.70</td>
</tr>
<tr>
<td></td>
<td>Hormonal therapy</td>
<td>8</td>
<td>2.70</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>19</td>
<td>6.20</td>
</tr>
</tbody>
</table>
As shown in table (1), more than one third of patients had gastrointestinal cancer. And the majority was receiving chemotherapy.

Table 2: Frequency and Percentage Distribution of patients Regarding CT Use and Knowledge Background (N=300)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT use</td>
<td>Yes</td>
<td>269</td>
<td>89.7</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>31</td>
<td>10.3</td>
</tr>
<tr>
<td>Types of used CT*</td>
<td>Herbs</td>
<td>244</td>
<td>90.7</td>
</tr>
<tr>
<td></td>
<td>Nutritional therapy</td>
<td>153</td>
<td>56.9</td>
</tr>
<tr>
<td></td>
<td>Dietary supplements</td>
<td>36</td>
<td>13.4</td>
</tr>
<tr>
<td></td>
<td>Aromatherapy</td>
<td>24</td>
<td>8.90</td>
</tr>
<tr>
<td></td>
<td>Acupuncture</td>
<td>4</td>
<td>1.50</td>
</tr>
<tr>
<td></td>
<td>Acupressure</td>
<td>1</td>
<td>0.40</td>
</tr>
<tr>
<td></td>
<td>Massage</td>
<td>30</td>
<td>11.20</td>
</tr>
<tr>
<td></td>
<td>Breathing exercise</td>
<td>4</td>
<td>1.50</td>
</tr>
<tr>
<td></td>
<td>Yoga</td>
<td>1</td>
<td>0.40</td>
</tr>
<tr>
<td></td>
<td>Chiropractic</td>
<td>11</td>
<td>4.10</td>
</tr>
<tr>
<td></td>
<td>Cupping</td>
<td>16</td>
<td>5.90</td>
</tr>
<tr>
<td></td>
<td>Bee bites</td>
<td>5</td>
<td>1.90</td>
</tr>
</tbody>
</table>

*Total number is >98 because each patient could have more than one comorbid disease.

Table (2) revealed that the vast majority of patients used CT and natural products including herbs are the most common used category, such as; anise (feverfew), peppermint, fenugreek, ginger and black seeds. In addition more than half of them reported that the main sources for information about CT were media followed by relatives and friends. Additionally, less than half of them thought that there were no available sources for information with a mean of 3.06±3.3 out of 10.

Level of knowledge about CT

Table 3: Frequency and Percentage Distribution of patients According to Knowledge Scores about CT (N=300)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>General information</td>
<td>Satisfactory (2-3)</td>
<td>40</td>
<td>13.3</td>
</tr>
<tr>
<td></td>
<td>Unsatisfactory (0&lt;2)</td>
<td>260</td>
<td>86.7</td>
</tr>
<tr>
<td>Uses of CT in cancer</td>
<td>Satisfactory (6-10)</td>
<td>41</td>
<td>13.7</td>
</tr>
<tr>
<td></td>
<td>Unsatisfactory (0&lt;6)</td>
<td>259</td>
<td>86.3</td>
</tr>
<tr>
<td>Side effects and contraindications</td>
<td>Satisfactory (4-6)</td>
<td>61</td>
<td>20.3</td>
</tr>
<tr>
<td></td>
<td>Unsatisfactory (0&lt;4)</td>
<td>239</td>
<td>79.7</td>
</tr>
</tbody>
</table>

Table (3) shows that the majority of patients had an unsatisfactory level of knowledge for the general information about CT with a mean of 0.66±0.75 out of 3, its uses with a mean of 3.53±1.78 out of 10 and side effects and contraindications with a mean of 2.18±1.41 out of 6. Furthermore, figure (1) clarifies that the vast majority of patients had an unsatisfactory level of knowledge about complementary therapy with a mean of 6.38±2.98 out of 19.
**Attitude toward CT**

Table 4: Frequency and Percentage Distribution of patients regarding Attitudes Scores toward CT (N=300)

<table>
<thead>
<tr>
<th>Statements</th>
<th>Negative (30% ≤ 55%)</th>
<th>Neutral (&gt;55% &lt; 80%)</th>
<th>Positive (≥80%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Patients’ opinion</td>
<td>14</td>
<td>4.70</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>253</td>
</tr>
<tr>
<td>Health care system</td>
<td>4</td>
<td>1.30</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>258</td>
</tr>
<tr>
<td>Treatment perspective</td>
<td>3</td>
<td>1.00</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>227</td>
</tr>
</tbody>
</table>

In reference to table (4), the majority of patients had a positive attitude in their opinion about CT with a mean of 10.65±1.75 out of 12, health care system with a mean of 16.65±2.14 out of 18 and treatment perspective with a mean of 20.77±2.60 out of 24. Additionally, figure (2) confirms that the vast majority had a positive attitude toward CT with a mean of 48.01±5.61 out of 54.

**Discussion**

**Background about CT:** The study delineated that the vast majority of patients used CT and herbs are the most common used category as a natural product. These results are supported by a study\(^\text{17}\) which reported that more than half of patients used CT before cancer diagnosis and the majority used it after diagnosis, also natural products are the most commonly used category. Despite, Sait\(^\text{18}\) reported that less than quarter of patients used CT, Sait\(^\text{18}\) supported that herbs are the most commonly used type. While Gonzalez\(^\text{13}\) reported that the top five used herbs by oncology patients were cinnamon, chamomile, Aloe Vera, garlic and arnica. These differences could be interpreted that there is a difference of the popularity and the availability of plants in countries.

The current study illustrated that more than two thirds of CT users used it for promoting health. This finding was contradicted by Bockover\(^\text{11}\) who highlighted that the primary reason for CT use was to relieve treatment side-effects. This contradiction could be interpreted by the variation of culture and level of knowledge between the subjects of the two studies.

The current study depicted that more than half of patients reported that the main sources for information were media (television, internet and radio) followed by relatives and friends. From the investigator point of view, this could be attributed, in part, to the widespread, availability and accessibility of the internet and on the other hand to the faith of patient in the family and friends’ opinions. These results are approximately in harmony with a study\(^\text{12}\) which stated that about three quarters of oncology patients reported that their sources of information were media, friends and other patients.

**Level of Knowledge about CT:** The current study denoted that the vast majority of patients had an unsatisfactory level of knowledge. This finding is approximately near from a study\(^\text{16}\) which concluded that the mean of the total knowledge scores was 45.9%±2. However, this result is contradicted with Prince\(^\text{15}\) who reported that the majority of patients had average and above average levels of knowledge. This incongruity could be explained by the difference of used tools and methodology in both studies.

The current study revealed that the majority of patients had an unsatisfactory level of knowledge for the general information, uses, side effects and
contraindications. However, these results are incongruent with the study\textsuperscript{12} which reported that more than one quarter of patients were aware of the general information about CT, more than one third were aware of its benefits, while about one eighth were aware of the side effects. This discrepancy could be explained by the difference of used tools.

**Attitude Toward CT:** The current study depicted that the vast majority of patients had a positive attitude toward CT. This result is in agreement with Cobb\textsuperscript{18} who reported that the majority of the general population had a positive attitude toward CT with a mean of 55.48±9.83 out of 76.

Moreover, the current study delineated that the majority of patients had the highest scores in the health care system related statements and the lowest were in the treatment perspective related statements. These results are congruent with a study\textsuperscript{19} which concluded that the highest mean score was observed for health care system reported statement, while the lowest was observed for treatment perspective related statement.

**Conclusion and Implications**

The results of the current study revealed that the majority of patients use CT and natural products are the most common used category. The main purpose for CT use was for promoting health. Although the study denoted that the vast majority of patients had an unsatisfactory level of knowledge, most of patients had a positive attitude toward CT. The main sources of information were media followed by relatives and friends.

The study suggested the following implications and recommendations;

- Include patients’ assessment for CT use as a part of general assessment.
- Accurate documentations of CT use
- Establish a clinic in oncology settings for instructing patients about CT.
- Prepare brochures with scientific information about CT for patients.
- Replications of the study using a larger probability sample selected from different geographical areas in Egypt.
- Conduct further studies to evaluate the impact of educational program regarding CT on patients’ outcome.

**Ethical Clearance:** The research approval was obtained from the Research and Ethics Committee at Faculty of nursing, Cairo University and an official permission was obtained from the administrators at study setting. Written informed consent was obtained from each patient.

**Conflict of Interest:** The authors declare that there is no conflict of interest.

**Source of Funding:** Self-funding.

**References**


The Relationship of Childbirth Preparation Based on Childbirth Preparation Card with Maternal Morbidity and Fetal Outcomes

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Abstract

This research aims to determine the level of primigravida childbirth preparation through childbirth preparation card (CPC) and its relationship with maternal morbidity, including postpartum hemorrhage and ruptured perineum, and fetal outcomes (APGAR score, Down score and infant mortality). The researcher used a descriptive-analytical method with a cross-sectional approach. Childbirth preparation is assessed using CPC. The research begins from January to April 2019. The sample in this study were mothers who gave birth in Ulin General Hospital of Banjarmasin, which was 100 respondents when the researchers conducted a study with sampling using a purposive sampling technique. There were 76 respondents (76%) stated that they were ready for the childbirth preparation, and 24 respondents (24%) were not ready for preparation. From 76 ready respondents, as many as 73 respondents were not bleeding (93.6%), 47 respondents did not experience perineal rupture (87.0%), 70 respondents with good APGAR score (97.2%), 70 respondents with good Down score (70%) and 74 respondents did not die (80.4%). Childbirth preparation was associated with the rate of postpartum hemorrhage (p<0.0001; OR 92.4), perineal rupture (p=0.005; OR 3.93), APGAR score (p<0.0001; OR 128.33), Down scores (p<0.0001; OR 128.33) and infant mortality (p=0.002; OR 12.33). Childbirth preparation is related to the incidence of postpartum hemorrhage, perineal rupture, APGAR score, Down score, and infant mortality.

Keywords: Childbirth preparation, postpartum hemorrhage, perineal rupture, APGAR score, Down score, infant mortality.

Introduction

Pregnancy is a susceptible period in women’s lives, which is vulnerable to the onset of physical and mental disorders. Maternal health care during pregnancy has been carried out for approximately 100 years. Maternal care during pregnancy is an essential part of the health system that aims to maintain maternal health during pregnancy and childbirth so that the health of the mother and baby are maintained.¹

Based on observations of the World Health Organization (WHO) in 2015, the maternal mortality rate (MMR) during pregnancy, childbirth, and childbed amounted to 303,000 people and the infant mortality rate (IMR) was 10,000,000 (WHO, 2015). The MMR in Indonesia is still very high compared to the Association Southeast Asia (ASEAN), wherein 2012 the MMR was 359 per 100,000 live births. ²³

Relationship between attitudes of pregnant women and pregnancy care as stated by Jenifer et al. who reported that poor maternal attitudes towards pregnancy care including pregnancy examinations had an impact on the emergence of negative health status in mothers and infants after childbirth.⁴

Materials and Method

In this study, researchers used a descriptive-analytic method with a cross-sectional approach, namely
by collecting data from the number of respondents in a particular time to determine the preparation of primigravida mothers about childbirth and assess outcomes in the mother and baby (fetal). The research instrument is the CPC questionnaire that has been tested for validity and reliability.5

The time of research begins from January to April 2019. This research was conducted at Ulin General Hospital Banjarmasin. The sample in this study were mothers who gave birth in Ulin General Hospital Banjarmasin, which was 100 people with a purposive sampling technique. Inclusion criteria were available to be respondents and Trimester III of primigravida. Exclusion criteria were incomplete history and domicile.

Findings and Discussion

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>Frequency (n)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Ready</td>
<td>Not ready</td>
</tr>
<tr>
<td>Postpartum Hemorrhage</td>
<td>Yes</td>
<td>3</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>73</td>
<td>5</td>
</tr>
<tr>
<td>Perineal Rupture</td>
<td>Yes</td>
<td>29</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>47</td>
<td>7</td>
</tr>
<tr>
<td>APGAR score</td>
<td>Good</td>
<td>70</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Poor</td>
<td>6</td>
<td>22</td>
</tr>
<tr>
<td>Down Score</td>
<td>Good</td>
<td>70</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Poor</td>
<td>6</td>
<td>22</td>
</tr>
<tr>
<td>Infant Mortality</td>
<td>Yes</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>74</td>
<td>18</td>
</tr>
</tbody>
</table>

Figure 1. Childbirth Preparation Card
Childbirth preparation was associated with the rate of postpartum hemorrhage (p<0.0001 adjusted OR 92.4), perineal rupture (p=0.005 adjusted OR 3.93), APGAR score (p<0.0001 adjusted OR 128.33), Down scores (p<0.0001 adjusted 128,33) and infant mortality (p=0.002 adjusted OR 12.33).

Clinical features of postpartum hemorrhage in the form of bleeding continues-constantly and the patient’s condition gradually become more ugly. Pulse rate so fast and weak, decreased blood pressure, the patient turned pale and cold, and his breathing became congested, breathing-breath, sweating, and eventually coma and death. A dangerous situation is that the pulse and blood pressure only show slight changes for a few moments due to the vascular compensation mechanism. Then this compensation function cannot be maintained anymore, the pulse increases rapidly, blood pressure suddenly drops, and the patient is in a state of shock. The uterus can fill up with enough blood even if it looks just from the outside.5,7

Table 2. The Relationship of Childbirth Preparation with Postpartum Hemorrhage, Perineal Rupture, APGAR Score, Down Score, and Infant Mortality

<table>
<thead>
<tr>
<th>Variable</th>
<th>Readiness</th>
<th>P-value</th>
<th>OR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ready</td>
<td>Not</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Bleeding (Hemorrhage)</td>
<td>Not</td>
<td>73</td>
<td>93.6</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>3</td>
<td>13.6</td>
</tr>
<tr>
<td>Rupture</td>
<td>Not</td>
<td>47</td>
<td>87.0</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>29</td>
<td>63.0</td>
</tr>
<tr>
<td>Apgar</td>
<td>Good</td>
<td>70</td>
<td>97.2</td>
</tr>
<tr>
<td></td>
<td>Bad</td>
<td>6</td>
<td>21.4</td>
</tr>
<tr>
<td>Down</td>
<td>Good</td>
<td>70</td>
<td>97.2</td>
</tr>
<tr>
<td></td>
<td>Bad</td>
<td>6</td>
<td>21.4</td>
</tr>
<tr>
<td>Dead</td>
<td>Not</td>
<td>74</td>
<td>80.4</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>2</td>
<td>25.0</td>
</tr>
</tbody>
</table>

Childbirth preparation was associated with postpartum hemorrhage rates (p<0.0001; OR 92.4). Clinical features of postpartum hemorrhage in the form of bleeding continues-constantly and the patient’s condition gradually become more ugly. Pulse rate so fast and weak, decreased blood pressure, the patient turned pale and cold, and his breathing became congested, breathing-breath, sweating, and eventually coma and death. A dangerous situation is that the pulse and blood pressure only show slight changes for a few moments due to the vascular compensation mechanism. Then this compensation function cannot be maintained anymore, the pulse increases rapidly, blood pressure suddenly drops, and the patient is in a state of shock. The uterus can fill up with enough blood even if it looks just from the outside.5,7

Risk of postpartum hemorrhage can be minimized so that the incidence of maternal mortality due to labor and childbirth can be reduced. Therefore, it is expected that couples of childbearing age can prepare childbirth well.

Childbirth preparation was associated with perineal rupture (p=0.005 adjusted OR 3.93). Perineal rupture is a tear that occurs when the baby is born, either spontaneously or by using a tool or action. Perineal rupture is divided into four levels, namely degrees I, II, III, and IV rupture. Perineal rupture generally also occurs in labor if the fetal head is born too quickly, labor is not led properly, scarring of the perineum, and shoulder dystocia.10,11,12

Straining techniques can affect the occurrence of perineal rupture in spontaneous maternity. At the time of delivery, the midwife can provide care by teaching the mother to do the correct straining technique and the existence of exercises that cause the perineum, not to stiffen.11,12,13

Based on the results of the study showed that between childbirth preparation and the incidence of bleeding in the mother had a relationship. For women who are ready to give birth, most did not experience postpartum hemorrhage. It is because the physical and psychological readiness of the mother is getting better because the knowledge of childbirth that has been previously possessed, the experience for mothers can ultimately improve the psychological readiness of the mother. The better the preparation for maternity, the risk of postpartum hemorrhage can be minimized so that the incidence of maternal mortality due to labor and childbirth can be reduced. Therefore, it is expected that couples of childbearing age can prepare childbirth well.
the anus open, followed by labia minor and major, then the fetal head that appears on the vulva. It is at this time that perineal rupture can occur especially in primigravida labor and to do the wrong straining technique.\(^{14,15,16}\)

Maternal preparation was associated with APGAR scores (\(p<0.0001; \text{OR} \ 128.33\)). Based on Apgar score interpretation, if Apgar scores between 4-6, so the baby has not covered asphyxia. If Apgar scores 7-10, baby included in normal childbirth and have adaptations, which is very good with the outside environment. The lower scores on the first-minute test can show that the newborn baby needs medical attention continuously but not necessarily indicate the long term problems, especially if there is increasing scores on the fifth-minute test. If the Apgar score remains under 3 on the next tests (10, 15, or 30 minutes), then there is a risk that the child can experience long-term nerve damage. There is also a small but significant risk of brain damage. However, the purpose of the Apgar test is to determine quickly whether the newborn baby needs immediate medical treatment; and not designed to provide long-term predictions of the health of the baby.\(^{17,18,19,20}\)

Women who received assistance in childbirth gave a good outcome to infant health with a first-minute APGAR score indicator. The research conducted by Liu J (2014) concluded that there were differences in labor with mentoring and without assistance with the baby’s Apgar value in the first minute.\(^{20,21,22}\)

Maternal delivery was associated with a Down score (\(p<0.0001; \text{OR} \ 128.33\)) and infant mortality (\(p=0.002; \text{OR} \ 12.33\)). Respiratory Distress Syndrome (RDS) is the difficulty or occurrence of respiratory dysfunction in neonates due to several reasons. Fetal period such as a baby born prematurely and multiple births; labor such as excessive blood loss, postmaturity, sectio); and the neonatal period due to neonatorum infection and asphyxia.\(^{20,22,23}\)

It is because the unprepared mother has stiffness from the muscle or cervix that will provide a much larger prisoner and can extend labor while the mother who is ready to give birth is a setback of the flexural power (elasticity) of the tissue that has been repeatedly stretched through practice and exercise. Correlation of childbirth preparations with the complication of pregnancy and birth, namely in gestational age, body weight, premature, respiratory distress syndrome, fetal distress, and asphyxia. The risk of emergency breathing occurs in mothers who are not prepared more than ready mothers. There is a relationship between maternal parity and knowledge of childbirth readiness with the incidence of respiratory distress syndrome in Bari General Hospital Palembang with a value of \(p=0.028\) \(^{8,15,17,23,24}\)

The companion or presence of the second person in childbirth which is to find that mothers who are accompanied by a friend or close relative (especially husband) during labor take place, have a lower risk of complications that require medical action than those without assistance. Mothers with companions in undergoing labor take place faster and easier. In the study, it was also found that the presence of a husband or close relative would bring calm and keep the mother away from stress and anxiety that could complicate the birth and delivery process, the presence of the husband would bring positive psychological effects and had a positive impact on the mother’s physical readiness.\(^{15,25,26,27}\)

**Conclusion**

Primigravida mother who gave birth at Ulin General Hospital Banjarmasin was 76% ready to give birth. As many as 73 respondents who did not experience bleeding (93.6%), 47 respondents (87.0%) did not experience perineal rupture, 70 respondents (97.2%) with good APGAR score, 70 respondents (70%) with good Down scores and 74 respondents (80.4%) have not died. Childbirth preparation is related to the rate of postpartum hemorrhage, perineal rupture, APGAR score, Down score, and infant mortality.

**Ethical Clearance:** This research has gone ethical feasibility testing by the Ethical Research Commission of the Faculty of Medicine, University of Lambung Mangkurat.

**Source Funding:** This study was done by self-funding from the authors.

**Conflict of Interest:** The authors declare that they have no conflict interests.

**References**


Exploring Social Capital for Helping People with Severe Mental Disorders: A Preliminary Study

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Abstract

Background: Social capital is a predictor of overall well-being and mental health. Social capital in a collective perspective can affect health outcomes of community members through its shared social norms, collective action and coping. Evidence on the relevance of social capital and people with mental disorders is limited as previous studies discussed social capital aspects mainly at natural-environment level. This paper aimed to explore social capital aspects and social support in community level for people with severe mental disorders in Indonesia.

Method: This study combined a descriptive quantitative and qualitative approach. A sample of 225 health cadres, health care professionals, local public figures and neighbours with a proportional stratified random sampling was used. The data gathering tools consisted of demographic characteristics, Measuring Social Capital in Five Communities in NSW and Social Provisions Scale and analyzed using descriptive statistics. Semi-structured interviews were conducted among 8 participants and analyzed with a qualitative content analysis method.

Result: The results showed that there was a significance relationship between social capital and social support (P=0.000, r=0.605). Three themes emerged from the data: trust them, feels like relatives and need support for improvement.

Discussion and Conclusion: Participants considered that social trust, social network and social support were three factors contribute to mental well-being. Social capital was described as resources to provide social support for people with severe mental disorders in community.

Keywords: Social capital, severe mental disorders, preliminary study, social network, social support.

Introduction

Globally, the prevalence of people with mental disorders increased by 46.4 million and it creates burden to family, community and government. Based on the results of Basic Health Resources in 2018, the prevalence of severe mental disorders in Indonesia has increased fourfold since 2013 from 1.7 per mil to 7.0 per mil.¹ Mistreatment of people with severe mental disorders (PWSMD) still happens in Indonesia, even today. Various efforts related to the management of PWSMD that have been carried out by the government include providing national health insurance for the treatment and “pasung” eradication programs that require enormous costs. Pasung is a physical restraint and confinement of PWSMD in the community.² If patient relapses, families...
felt helpless and frustrated with the situation. They also felt saddened and embarrassed with patients’ condition because of stigma about PWSMD. The existence of stigma and discrimination can cause more difficulties and poor recovery as PWSMSD cannot engage in activities independently.\(^3\)

Community has an important role in creating social support and broad opportunities for people with mental disorders to be fully involved in daily activities. Community groups were formed to provide continuous support and maintain therapeutic environments for them.\(^4\) Social capital is one of community resources that could be used to help managing PWSMD. It is a collection of social resources that are inherent and develop in community. It is also a resource that is created by the existence of social relations with other people. It can be used to gain access to certain knowledge and expertise. There are three types of social capital, namely social capital bonding, bridging social capital and linking social capital. Social capital bonding creates a connection between individuals who have emotional closeness, between friends and family. This is found in environments that have the same characteristics. Stronger social ties provide social support and personal assistance for PWSMD. Bridging social capital is a bond formed within a particular social group, which is collided because of differences in demographics and resources in the community. Linking social capital is a network connection that enables community members to interact and share ideas with the local government.\(^6\)\(^-\)\(^9\)

The component of social capital delivers a positive stimulus for community members to trust and involve PWSMD to work and fulfill their needs independently. There are six components of social capital: trust, participation, reciprocity, social norms, values and proactive activities. The aspects of trust, norms of reciprocity and regulations are essentials for fostering mental well-being of community members. Interaction with other community members can raise a sense of belonging, build trust and improve social reciprocal. In addition, lack of trust or social cohesion is associated with higher mortality rates.\(^10\)\(^-\)\(^12\) However, other factors such as geographical limitation in rural areas, financial issues and family problems may also inhibit people with mental disorders to engage in social activities. Improving social capital and social support in rural areas could promote patients’ wellbeing and independence.

In response to limited studies on social capital for helping people with severe mental disorders, this paper aimed to explore social capital aspects and social support in community level for people with severe mental disorders in Indonesia. The findings are expected to shed insight into how to view social capital as vital resources in community, which will extend the horizon of care for people living with severe mental disorders.

**Material and Method**

Over 120 people with severe mental disorders are living in Bantur, Malang, East Java, Indonesia. Community mental health services provide health care for out of hospital mental disorders patients. However, a relapse rate of 50% still remains high, especially when treatment is discontinued. Bantur is located in rural area and most people with severe mental disorders live in near land forest, they have problems with access to health care.

**Instrument Development:** The instruments used in this study were modification of the social capital questionnaire, “Measuring Social Capital in Five Communities in NSW” according to Bullen and Onyx.\(^13\) Eight components of social capital were developed in this questionnaire: (1) Participation in the community in handling PSWMD, (2) Proactive in social activities, (3) Mutual trust and security, (4) Relationships between neighbours, (5) Relationship between family and friends, (6) Tolerance with diversity, (7) Life values and (8) Relationships with work.

In addition, a questionnaire of “Social Provisions Scale” by Weiss (1974) was modified according to the relevance of study. There are six aspects of social support: (1) Social integrity, (2) Attachment, (3) Nurturance, (4) Reliable Alliance, (5) Guidance and (6) Reassurance of worth.

**Data Collection:** A descriptive quantitative study was conducted among 225 respondents consisting of health cadres, health care professionals, local public figures and neighbours through a proportionate stratified random sampling technique. Ethical approval was gained from the Ethical Board of University of Muhammadiyah Malang (Reg.No: E.5.a/002/KEPK-UMM/1/2019). Additional qualitative interviews were conducted among 8 participants to reveal social capital and social support which are important to help people with severe mental disorders. For the in-home interview, the sample included member of societies, health cadres,
health care professionals and local public figures who did not participate in questionnaire. In-depth interviews lasted about 45 minutes and were semi-directed and tape-recorded. All interviews were fully transcribed and analyzed for content. The text was systematically examined, themes were identified and grouped, and categories were coded, classified and developed.

**Data Analysis:** Data was analysed using SPSS v.24. Kolmogorov-Smirnov sig value on social capital and social support variables was > 0.05, so it can be concluded that the data used was normally distributed. Qualitative interview results were content analysed and categorized by researchers. To enhance trustworthiness, data was checked by all researchers.

**Findings**

Based on demographic data (Table 1) from 225 respondents, it can be seen that the majority of the population is between 36-50 years old (40%), female (71.6%), private employment (52%) and has a senior high school education level (51.1%).

### Table 1. Demographic Data

<table>
<thead>
<tr>
<th>Category</th>
<th>Frequency (n)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-35</td>
<td>60</td>
<td>26.7</td>
</tr>
<tr>
<td>36-50</td>
<td>90</td>
<td>40.0</td>
</tr>
<tr>
<td>&gt; 50</td>
<td>75</td>
<td>33.3</td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>64</td>
<td>28.4</td>
</tr>
<tr>
<td>Female</td>
<td>161</td>
<td>71.6</td>
</tr>
<tr>
<td><strong>Educational attainment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elementary</td>
<td>30</td>
<td>13.3</td>
</tr>
<tr>
<td>Junior High School</td>
<td>21</td>
<td>9.3</td>
</tr>
<tr>
<td>Senior High School</td>
<td>115</td>
<td>51.1</td>
</tr>
<tr>
<td>College</td>
<td>59</td>
<td>26.2</td>
</tr>
<tr>
<td><strong>Occupation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private sector</td>
<td>117</td>
<td>52.0</td>
</tr>
<tr>
<td>Civil servant</td>
<td>41</td>
<td>18.2</td>
</tr>
<tr>
<td>Health professional</td>
<td>67</td>
<td>29.8</td>
</tr>
</tbody>
</table>

### Table 2. Elements of Social Capital Variables Between Respondents

<table>
<thead>
<tr>
<th>Elements of social capital</th>
<th>Neighbours M (SD)</th>
<th>Local Public Figures M (SD)</th>
<th>Health care professionals M (SD)</th>
<th>Health cadres M (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participation in handling PWSMD</td>
<td>5.00 (0.93)</td>
<td>5.00 (1.07)</td>
<td>8.20 (0.941)</td>
<td>8.73 (1.28)</td>
</tr>
<tr>
<td>Proactive in social activities</td>
<td>4.93 (1.10)</td>
<td>5.40 (1.35)</td>
<td>8.47 (1.34)</td>
<td>8.93 (1.16)</td>
</tr>
<tr>
<td>Mutual trust and security</td>
<td>6.87 (1.30)</td>
<td>7.00 (1.65)</td>
<td>9.60 (1.45)</td>
<td>10.07 (1.33)</td>
</tr>
<tr>
<td>Relations between neighbours</td>
<td>4.73 (1.16)</td>
<td>5.07 (1.33)</td>
<td>8.33 (1.67)</td>
<td>8.47 (1.06)</td>
</tr>
<tr>
<td>Relationships between family and friends</td>
<td>6.00 (1.41)</td>
<td>6.00 (1.73)</td>
<td>8.27 (1.53)</td>
<td>8.20 (1.08)</td>
</tr>
<tr>
<td>Tolerance with diversity</td>
<td>4.40 (0.83)</td>
<td>5.07 (1.10)</td>
<td>8.20 (1.66)</td>
<td>7.80 (1.01)</td>
</tr>
<tr>
<td>Life values</td>
<td>5.60 (0.99)</td>
<td>6.27 (1.22)</td>
<td>8.27 (1.58)</td>
<td>7.93 (1.03)</td>
</tr>
<tr>
<td>Relationship with work</td>
<td>4.73 (1.03)</td>
<td>5.80 (1.08)</td>
<td>7.60 (1.35)</td>
<td>7.60 (1.24)</td>
</tr>
</tbody>
</table>

This study showed that mutual trust and security reached higher mean score compare to other social capital aspects. Health cadres had higher mutual trust and security (10.07±1.33) and proactive in social activities (8.93±1.16). Health cadres found to be more active in motivating PWSMD to gain more activities in community.

### Table 3. Correlation between Social Capital and Social Support among Community Members

<table>
<thead>
<tr>
<th>Variables</th>
<th>Min</th>
<th>Max</th>
<th>Mean±SD</th>
<th>r</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Capital</td>
<td>50</td>
<td>60</td>
<td>55.63±2.41</td>
<td>0.605</td>
<td>0.000</td>
</tr>
<tr>
<td>Social Support</td>
<td>54</td>
<td>89</td>
<td>66.93±9.28</td>
<td>0.605</td>
<td>0.000</td>
</tr>
</tbody>
</table>

This study showed that there was a significance relationship between social capital and social support (P=0.000, r= 0.605). The mean scores of social capital among community members was 55.63±2.41 and social capital mean scores was 66.93±9.28.

**Qualitative Results:** Semi-structured interviews were conducted in 8 participants who lived in rural area together with 120 people suffered from severe mental disorders. Among 8 participants, 6 (75%) of them were female. The mean age of participants was 41.25 years (range 27 to 60 years). The education level of the sample was one third having attended college. The interview questions were related to social capital and social
support in managing PSWMD in society: how do you handle PSWMD in community?; how do you feel when you live close to PSWMD?; what will you do when you meet PSWMD?. There were three themes emerged from the data: trust them, feels like relatives and need support for improvement.

**Table 4. Themes and sub-themes**

<table>
<thead>
<tr>
<th>Themes</th>
<th>Sub-Themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trust Them</td>
<td>Have to communicate</td>
</tr>
<tr>
<td>Need to trust</td>
<td></td>
</tr>
<tr>
<td>Feels Like Relatives</td>
<td>Feeling empathy</td>
</tr>
<tr>
<td>Feeling close</td>
<td></td>
</tr>
<tr>
<td>Need Support for Improvement</td>
<td>Have to support</td>
</tr>
<tr>
<td>Deal with stigma</td>
<td></td>
</tr>
</tbody>
</table>

**Trust Them:** This theme extracted from two sub-themes: have to communicate, need to trust. Communication is the key in delivering and getting responses to mental disorder patients. Communication process is built on the foundation of trust with PSWMD and their families. Effective communication is essential in creating strong relationships and improves social capital. A nurse said, ‘My technique in communication with family is that, only one, which is trust, it fosters our relationships’. Health cadres, ‘This is my key in embracing families to be involved, trust them’. Community members, ‘If we want to help them, we have to talk and communicate with them, we need to know what they need, so we can help them’.

**Feels Like Relatives:** The theme was developed by three sub-themes: feeling empathy, feeling close, help them as relatives. An empathetic attitude is needed in PSWMD care, because with being empathetic they will feel they are getting help. By considering them as relatives, they will be more open with health care professionals. Community members, ‘There is an emotional bond if we live in the same region, in rural, we feel like relatives, we will help, take and give and give each other’. Nurses said, ‘When we see them, we know that we will feel empathy, we just have to help them so they can live like other people’.

**Need Support for Improvement:** This theme was developed from two sub-themes: have to support, deal with stigma. Stigma and discrimination are the biggest barrier to adequate mental health care. The results of the study indicate that there is a strong social stigma attached to PSWMD, this is influenced by the attitude of neighbours who tend to avoid them. Community members, ‘I don’t know about mental health programs for them, we do really need support as we also afraid to talk to them’. ‘Feeling afraid of approaching them but we have to help them as they are also our relatives who live in here’. Health cadres, ‘We still have to help them, giving them support so they can live like us, independent’.

Attitudes and beliefs of most community members who live in rural areas about mental disorders are shaped by personal knowledge, experiences when interact with people with mental disorders and also cultural stereotypes. Besides that, there are various factors influencing attitudes such as mass media, educational and religious institutions, and individual emotional factors as well.

Social capital exists when it is shared between individuals. There is strong relationship between members of societies and PSWMD. Interactions with family, friends, relatives and neighbors enhance emotional or informational social support. Social capital also referred as the strength and density of social ties between society members, as well as other network characteristics such as trust, social reciprocity and shared norms.14

**Conclusion**

This study addresses the potential of social capital as a fundamental resource for people with severe mental disorders living in the community. Significant development of social support can improve the welfare and stability of mental health.

**Conflict of Interest:** None.

**Source of Finding:** Not required.

**Ethical Clearance:** Self-funded.

**References**


Background

Based on the rate incidence of patients fall every year in all hospitals found in the United States reported data of 700,000 to 1,000,000 people have experience falls every year in the hospital. Reports from hospitals and mental health units in the UK in 2011 were 282,000 patients fall each year, there which 840 had hip fractures, 550 patients had fractures, and 30 had an intra cranial injury (1). In the book “Preventing Fall In Hospital, A Toolkit For Improving Quality of Care” (2013) suggests in the UK about 152,000 falls are reported in acute hospitals each year, with more than 26,000 reported from mental health units and 28,000 from community hospitals (2). Based on survey conducted by the Hospital Comitee in Indonesian about incidence of patient fallsin January-April (2011) reported cases of unexpected events (KTD) and near-accident events (KNC) caused by the patient falls were 5.15% (3). Based on the congress XII report of the Indonesian Hospital Association showed that the incidence of patients falling was included in the three major hospital medical incidents and was secondgrade after the medicine error. Data from the report shows that as many as 34 cases (14%) incident falls occurred in hospitals in Indonesian. Based on the data that got from Private Hospital in Medan about reduce the risk patient falls from January to June 2017 there were 9.2% nurses didn’t do risk assessment patient fall on inpatients, there were 14.2% nurse’s didn’t perform risk management patients fall after doing assessment. This proves that the incidence of patients fall is still high and is still far from the accreditation standard which suggest for the incidence of patient fall is not expected to occur in hospital or 0% incidence. Nurses must be knowledgeable because every intervention to be applied must be based on knowledge.

Method:

This study design was descriptive quantitative with Proportional random sampling technique. Research purposes to determine the level of nurses knowledge about prevention the risk of patients fall. An instrument used in this study is a questionnaire. The Population in this study were nurse workers in inpatient ward of Private Hospital in Medan. Samples were 150 nurse workers. The result showed that 57.3% respondents belong to the category of good level knowledge. The results of this study can be an input for the hospital to improving nurse knowledge through the procurement of seminars on prevention of risk patients fall.

Results and Discussion

Table 1. Distribution frequency and percentage characteristics respondents in inpatient wards

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Frequency (n)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-29</td>
<td>28</td>
<td>25.3</td>
</tr>
<tr>
<td>30-39</td>
<td>74</td>
<td>49.3</td>
</tr>
<tr>
<td>40-49</td>
<td>30</td>
<td>20.1</td>
</tr>
<tr>
<td>50-59</td>
<td>18</td>
<td>5.3</td>
</tr>
</tbody>
</table>

Knowledge of Nurses about Prevention of Patient Fall Risk in Inpatient Room of Private Hospital in Medan

Roymond H. Simamora¹, Nurmaini², Cholina Trisa Siregar¹

¹Faculty of Nurses Universitas Sumatera Utara, ²Faculty Comunity of Health Universitas Sumatera Utara

Abstract

Fall risk is an increase in susceptibility to falls, it can cause physical harm. Falls is an incident that causes a person suddenly lie down or accidentally sprawl on the floor. Providing safety to the patient is very important, and to realize patient’s safety especially to reduce injury from the effect of fall risk, the first step required is prevention based of knowledge. The study design was descriptive with Proportional random sampling technique. Research purposes to determine the level of nurses knowledge about prevention the risk of patients fall. An instrument used in this study is a questionnaire. The Population in this study were nurse workers in inpatient ward of Private Hospital in Medan. Samples were 150 nurse workers. The result showed that 57.3% respondents belong to the category of good level knowledge. The results of this study can be an input for the hospital to improving nurse knowledge through the procurement of seminars on prevention of risk patients fall.

Keywords: Identification, Fall Risk, Knowledge, Nurses, patient.
The results of the study, it is found that most respondent characteristics in the age range 30-39 years is 49.3%, with gender most women that is 93.3%, most have the last education Diploma nursing is 76%, and most has experience working in nursing service for > 3 years is 85.3%.

Table 2. Distribution Frequency and Percentage Identity Knowledge of Nurse in Inpatient Room of Private Hospital in Medan

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Frequency (n)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>10</td>
<td>6.7</td>
</tr>
<tr>
<td>Women</td>
<td>140</td>
<td>93.3</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High School</td>
<td>4</td>
<td>2.7</td>
</tr>
<tr>
<td>Diploma</td>
<td>114</td>
<td>76</td>
</tr>
<tr>
<td>Bachelor</td>
<td>32</td>
<td>21.3</td>
</tr>
<tr>
<td>Experience of working</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;1 Years</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>1-3 Years</td>
<td>16</td>
<td>10.7</td>
</tr>
<tr>
<td>&gt;3 Years</td>
<td>128</td>
<td>85.3</td>
</tr>
</tbody>
</table>

The results of the study, it is found that more respondents answered correctly on question 17, at most wrong in question number 2.

Based on the results of the study, it is found that the knowledge of nurses about the Prevention of Risk Patients Fall in Inpatient Room Private hospital in Medan is in good category.
Table 4: Distribution and Frequency of Nurses Knowledge Component on Prevention of Risk Patient Fall in Inpatient Room Private hospital in Medan

<table>
<thead>
<tr>
<th>No</th>
<th>Component</th>
<th>Good F</th>
<th>Good %</th>
<th>Not good F</th>
<th>Not good %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>the meaning of patients falls incidence</td>
<td>58</td>
<td>38.7</td>
<td>92</td>
<td>61.3</td>
</tr>
<tr>
<td>2</td>
<td>Risk factors for fall</td>
<td>106</td>
<td>77.3</td>
<td>34</td>
<td>22.7</td>
</tr>
<tr>
<td>3</td>
<td>Elements of Fall Risk Assessment</td>
<td>86</td>
<td>57.3</td>
<td>64</td>
<td>42.7</td>
</tr>
<tr>
<td>4</td>
<td>Prevention of Patients Falls Risk</td>
<td>68</td>
<td>45.3</td>
<td>82</td>
<td>54.7</td>
</tr>
<tr>
<td>5</td>
<td>The scale of falls risk assessment</td>
<td>76</td>
<td>50.7</td>
<td>74</td>
<td>49.3</td>
</tr>
</tbody>
</table>

Based on the results of the study, it is found that the knowledge component of nurses on Prevention of Risk Patient Falls at the most at risk factors falling ie 58 people (77.3%).

**Discussion**

Respondents shows that the knowledge of nurses about prevention of patients fall risk is in good category. The result of this study same with study conducted by (4), there were 96% nurses have level of knowledge about patient safety with good category, The same thing was presented obtained 76.4% nurses have a good level of knowledge (5). This study obtained that knowledge will greatly affect to prevent patient risk of fall. Differential with Enie: 82% of respondents are included in the low knowledge level category (6). This can happen because nurses who workers have low awareness to explore the science of prevention of risk patients fall and this can also be caused by lack of training organized by the hospital which is very affect on the increase of nursing knowledge.

Based on the components of nurses’ knowledge, it was found that the lowest knowledge was falling risk definition, namely 29 respondents (38.7%). This can happen because nurses who work lack a clear understanding of the risk of falling. Understanding is a person’s ability to understand the knowledge he receives. Understanding of knowledge is a cognitive aspect of a person (7). Based on Budiono research, to increase the knowledge of health workers, especially nurses, what needs to be done is socialization and training (8). Based on the results of the study, 77.3% of nurses had good knowledge. The researcher assumes that to carry out the initial assessment of the risk of falling patients, the first thing a nurse must know is the risk factor of falling, so that the nurse does not give a wrong score during the patient’s initial assessment.

In consistent with the theory in JCI (9), Hospitals apply the assessment process to all inpatients who are at falls of risk and use appropriate assessment tools / method with the patient provided by the service. In the component of risk fall assessment element, it was found that the knowledge of the nurse was in good category that is as many as 43 people (57.3%). This indicates that there are still nurses who do not know about the element of risk risk assessment that is as much as 32 people (42.7%), errors in risk assessment fall can be caused by lack of accuracy nurses in terms of scoring the assessment of risk falls, whereas the impact of risk assessment mistakes fall very affect the implementation or intervention to be provided. errors in this judgment can be fatal, resulting in falling patients affecting the quality and image issues of a hospital (10).

The results of the study showed that nurses’ knowledge about the risk prevention component of risk was still in the low category of 45.3%. Knowledge of nurses can not be caused by education. Notoatmodjo: states that the higher the level of one’s knowledge, the better the person’s knowledge (11). According to Simamora: education will affect a person in making decisions so that the higher the level of education a person increasingly understands and understands about a science and will affect their behavior, so that the behavior will be higher compliance (11). This is in line with the research conducted by Kilateng: where it was found that the relationship between nurse knowledge about patient safety and risk prevention measures fell (12). The age range is early adulthood. Early adulthood is a productive age range, where in this range one is usually considered more able to complete social tasks, be more responsible, think rationally, have life experience and adequate education. According to Budiman: age affects the capability and mindset of a person. Increasing age will develop the ability to catch and the mindset of a person so that knowledge gained better. This is in accordance with the results of this study where the results obtained as many as 20 people (54.1%) nurses are in the age range 30-39 years have knowledge in both categories. Another thing that influence the research is gender, in this study it was found that more respondents have female gender that is as much 70 people (93.3%), responder who is good knowledge is female gender that is as much as.
42 people (60%). Budiman: states that the individual variables of sex can affect performance, essentially more diligent women than men.

In line with research conducted by Prasetyo: stated that more nurses have female gender that is (83,3%), in this research is explained that woman better in patient safety than men, because nursing is still identical with work that fits the nature of women who are more patient, gentle and caring to the patient being treated (3). The results showed that more than half of respondents had the last education background of Diploma nursing that is as many as 57 people (76.5%). Nurses who have a level of knowledge in both categories more respondents who have a Ners educational background that is as many as 15 people (93.8%). The process of education is an experience that serves to develop the ability and quality of one’s personality. According to Budiman, the higher the education of a person is expected also the more extensive knowledge. But that does not mean people who have low education have absolute low knowledge. Increased knowledge is not absolutely obtained from formal education (13). Based on the results of this study, it is found that more nurses have experience> 3 years work is 64 people (85.3%), with knowledge level in good category more owned by nurse with experience 1-3 years work as many as 7 people (87, 5%). As one gets older, one’s experience also involves the senses that affect knowledge. Experience as a source of knowledge is a way to gain the truth of knowledge by repeating the knowledge gained in solving problems encountered in the past. experience of learning in work developed to provide knowledge and professional skills and experience will be able to develop the ability to make decisions (14). The longer the nurse works the more things you can learn through what you hear, see, and feel at work.

Conclusions

The results showed that 57.3% of respondents belonged to the category of good level knowledge. Improvements need to be made that lead to increased knowledge by conducting activities: socialization, workshops and risk prevention training for falling patients, and also developing supervision and mentoring for nurses.

Conflict of Interest: The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article

Source of Finding: Directorate of Research and Community Service Directorate General of Strengthening Research and Development of the Republic of Indonesia Ministry of Research, Technology and Higher Education in accordance with the Research and Service Funding Agreement for the Budgetary Community 2018

Ethical Consideration: the study was approved by the central ethics commite of Fakultas keperawatan Universitas Sumatera Utara. Persmission was also obtained from the head Nurse in Hospital Medan. Informed consent was taken from the Nurses individually after explaining the objectives and purpose of the study.

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Introduction

Stunting refers to shortness that is deficit or linear growth that has failed to reach genetic potential as the result of poor nutrition in-utero and early childhood. It is estimated that 22.2% or 150 million children under five in the world are affected by stunting in 2017. Stunting is the best overall indicator of children well-being and an accurate reflection of social inequalities as well as human capital index indicator. Stunting is closely related to the lower human capital index since the impact is tend to be permanent such as short adult height, poor cognitive and educational performance in children, and low economic productivity in adulthood. Children who are undernourished in the first two years of life and who increase weight rapidly later in childhood and in adolescence are at high risk of chronic diseases related nutrition.

Does Stunting Randomly Occurred in Indonesia: Spatial Analysis of Indonesia’s Basic Health Survey 2018

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Abstract

Background: Indonesia is still facing stunting in children under five. Although in 2018 stunting prevalence decreased but it remains high (30.8%). The vastness of Indonesian Country which consists of 34 provinces and 514 districts resulted the difference in population characteristics between province, districts and sub district as well as differences in health issues in each region are important to consider in reducing stunting in addition to the funding requirements needed. Therefore, Indonesian government needs to determine the priority area for stunting intervention. This study is intended to find the relationship between location and stunting prevalence and “hotspot” areas in Indonesia.

Method: the study used aggregate data analysis of Indonesia Basic Health Survey 2018. Moran’s I used to identify the correlation between location and stunting prevalence. Local Indicators of Spatial Association (LISA) was used to define the hotspot area of stunting. We used R software to process the data.

Results: there was a significant relationship between location and stunting prevalence with Moran’s I= 0.143 (p-value 0.027). We found that Bangka-Belitung, South Sulawesi, West Sulawesi, Yogyakarta and East Nusa Tenggara were the hotspot areas for stunting in Indonesia.

Conclusion: There was a significant relationship between location and stunting prevalence in Indonesia; it means that stunting is not randomly occurred in Indonesia. Bangka-Belitung, South Sulawesi, West Sulawesi, Yogyakarta and East Nusa Tenggara that defined as the hotspot areas of stunting in Indonesia must be prioritized for intervention.

Keywords: Stunting; spatial analysis; Indonesia; stunting hotspot.

Introduction

Stunting refers to shortness that is deficit or linear growth that has failed to reach genetic potential as the result of poor nutrition in-utero and early childhood. It is estimated that 22.2% or 150 million children under five in the world are affected by stunting in 2017 and Indonesia is the fourth largest stunting prevalence in the world with 30.8% in 2018.

Stunting is the best overall indicator of children well-being and an accurate reflection of social inequalities as well as human capital index indicator. Stunting is closely related to the lower human capital index since the impact is tend to be permanent such as short adult height, poor cognitive and educational performance in children, and low economic productivity in adulthood. Children who are undernourished in the first two years of life and who increase weight rapidly later in childhood and in adolescence are at high risk of chronic diseases related nutrition.

It is a challenge to reduce stunting prevalence in Indonesia given the vastness of the Indonesian state with 17,504 islands, 34 provinces and 514 districts / cities.
and different characteristics of regions and populations between regions. Some studies showed that stunting is related to geographical differences and grouped by region. Using spatial analyses allows stakeholders to understand that the nutrition burden is different across Indonesia. It could help the decision makers in all region in Indonesia to find out who are living with stunting, what are the causes, where are the hot spots and what kind of intervention should be addressed in particular regions. So, the intervention in certain areas could be different according to the location. Some countries with high level of stunting prevalence used spatial analysis to help them making a decision and policy, setting priority area for intervention as well as monitoring nutrition program and as an affirmation, the suggestion to use spatial analysis was also called in Global Nutrition Report 2018 as a part of five critical steps to accelerate stunting reduction.

This study is intended to find the relationship between location and stunting prevalence and “hotspot” province in Indonesia. Even if it uses province as a unit of analysis (not the smallest unit of territory in Indonesia), however, the method of determining the hotspot area can be replicated at the district / city level in Indonesia. It is expected that the study will provide a picture of stunting in Indonesia and how it is spatially occurred across Indonesia.

Material and Method

This is an ecological study that used aggregate data (percentage) listed in Indonesia Basic Health Survey 2018 report. Data was collected according to nutrition indicators used in Indonesia Basic Health Survey 2018. The data then entered using excel template that was produced by Geospatial Information Agency.

Ecological study is study that used aggregate data. In epidemiology, ecological study particularly useful to generate a hypothesis or as a descriptive study since the researcher can use the available data as the data often incomplete and lacking information on the multiple factors that contribute to the disease occurrence. Ecological study has a risk of ecological fallacy means that an association seen in the aggregate (group) level holds true for individual when in fact it does not. Thus, it is recommended to conduct another analysis for further conclusion such as multilevel analysis or ecological fallacy could be viewed as a form of confounding. This study will only describe hotspot stunting areas as a hypothesis for further study; however with large number of data, ecological study may develop modelling of cause-effect relationship using both spatial and non-spatial data sources to explain or predict spatial pattern.

Data analysis was carried out using R software. In order to find the relationship between location and stunting prevalence, we use Moran Index to measure autocorrelation. Steps taken prior to this analysis were choosing a neighborhood criterion and assigning weight to the areas that are linked. For neighborhood criterion, we used k-nearest neighbors’ method to define neighbor (k=5) while regarding weight, we use row standardized weights matrix method. Local Indicators of Spatial Association (LISA) Statistic was used to define the hotspot province of stunting in Indonesia.

Findings

According to WHO prevalence ranges, Indonesia classified into four areas of stunting prevalence; low (<20%), medium (20-29%), high (30-39) and very high (≥ 40). We found that only 1 province with low stunting prevalence, 12 provinces classified as medium of stunting prevalence, 17 provinces with high prevalence and 2 provinces with high of stunting prevalence. Indonesia is still dominated with high stunting prevalence areas (56% of Indonesia’s provinces).

In term of the relationship between location and stunting prevalence, the statistic hypothesis was \( H_0: I = 0 \) vs \( H_1: I > 0 \) with k=5 (k-nearest neighbor). We found that Moran’s Index was 0.143 (p-value = 0.027). The Moran’s Index was statistically significant which means that there was a significant autocorrelation between location and stunting prevalence.

Based on Local Indicators of Spatial Association (LISA) Statistic, we found some hotspot areas as described in the table 1:

Table 1. Local Indicators of Spatial Association of 34 Provinces in Indonesia 2018

<table>
<thead>
<tr>
<th>No.</th>
<th>Province</th>
<th>Li</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Aceh</td>
<td>-0.090</td>
<td>0.635</td>
</tr>
<tr>
<td>2</td>
<td>Bali</td>
<td>0.315</td>
<td>0.517</td>
</tr>
<tr>
<td>3</td>
<td>Bangka Belitung</td>
<td>0.141</td>
<td><strong>0.016</strong></td>
</tr>
<tr>
<td>4</td>
<td>Banten</td>
<td>0.661</td>
<td>0.184</td>
</tr>
<tr>
<td>5</td>
<td>Bengkulu</td>
<td>0.046</td>
<td>0.330</td>
</tr>
</tbody>
</table>
We found five hotspots provinces in Indonesia, they are Bangka-Belitung, South Sulawesi, West Sulawesi, Yogyakarta and East Nusa Tenggara. In this analysis, DKI Jakarta also recognized as hotspot area but we decided not to include it since it has the lowest stunting prevalence which means that they do not have stunting problem at all. The high correlation value resulted in this area was probably related with the high prevalence of neighbors which we already specified as k=5 while this area itself has low prevalence of stunting.

**Discussion**

In 2018, Indonesia has made a great progress of decreasing stunting from 37.2% in 2013 to 30.8% in 2018. Indeed, this is a great achievement but there are still many home works for Indonesia government. First, the reducing of stunting prevalence has not brought Indonesia into a conclusion that Indonesia has low prevalence of stunting yet. The uniqueness of Indonesia as an archipelago country has brought it with large diversity across the country. There are huge variations regarding geographical characteristics, social culture and demography across all provinces, districts and even within and between all areas in Indonesia. Hence, the government of Indonesia should consider of using spatial data analysis to accelerate efforts in reducing stunting rather than merely generalizing interventions in all areas.

The significant value of Moran I from spatial analysis confirmed that stunting in province in Indonesia are related to the stunting level of the province neighbor (stunting is related with location). Thus, this study confirmed that stunting is clustered in Indonesia (province as unit analysis). Some studies showed the same result in India, Ethiopia, Mexico, Africa and Papua New Guinea.

The analysis of LISA indicated that the hotspot areas are South and West Sulawesi, East Nusa Tenggara, Bangka-Belitung and Yogyakarta. These provinces are highly needed areas where interventions or nutrition program should be strengthened. However, since province is also divided into several districts; it is suggested to carry out spatial analysis and put district as unit analysis.

The spatial analysis already indicated that stunting in Indonesia’s provinces are clustered and affected by neighbor (location) with five hotspot areas in Sulawesi, East Nusa Tenggara, Bangka-Belitung and Yogyakarta. However, since this study used province as unit analysis while in the other, province is still divided into several districts that might be varies as well. Henceforward, it needs further study using spatial analysis with district as unit analysis. By doing this, the analysis result might support the government of Indonesia to determine the priority areas to accelerate reducing stunting in Indonesia in district level and also, mapping the pattern and hotspot areas of stunting in district level can help in improving intervention due to limited resources.

**Conclusion**

We found that stunting in Indonesia is not randomly occurred. The prevalence of stunting is affected by other provinces. The provinces of West Sulawesi, South Sulawesi, East Nusa Tenggara, Bangka-Belitung, and Yogyakarta are highlighted as the hotspot areas of stunting in Indonesia. It is strongly recommended to
carry out spatial analysis using district level data to help the government prioritizing intervention area in term of accelerating stunting reduction in Indonesia.

**Ethical of Clearance:** The study was based on data available in public domain; therefore, no ethical issue is involved.

**Conflict of Interest:** There is no conflict of intrest in the subject matter or materials discussed in this manuscript.

**Source of Funding:** The research was supported by personal funding.

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Background

Stroke is one of the non-communicable diseases that can cause second death and disability after heart disease\(^1\). In Indonesia it is the largest stroke country in Asia, while in America 700,000 people experience strokes and cause around 150,000 deaths. In Indonesia, stroke is the number three deadly disease experienced by people after heart disease and cancer\(^2\). The prevalence of stroke in Indonesia in 2007 was 8.3 per 1,000 and increased to 12.1 per 1,000. Whereas in 2020 an estimated 7.6 million people will die from strokes\(^3\).

World stroke organizations have conducted research that says that 85% of people are at risk for stroke, but that can be avoided if the trigger factors for a stroke can be controlled from the start\(^4\). Stroke consists of 2 types, namely ischemic stroke and hemorrhagic stroke, in Asia ischemic stroke is greater (70%) than hemorrhagic stroke (30%)\(^5\).

Material and Methods

This study was an observational analytic study with a case control design. In the case group was a patient with a diagnosis of ischemic stroke who had received a diagnosis from a doctor by showing the results of a doctor’s examination, while for the control group was a patient with a diagnosis other than ischemic...
stroke treated in Ngimbang Regional Public Hospital of Lamongan. This study was conducted in August to December 2016 at Ngimbang Regional Public Hospital of Lamongan. The population in this study were all patients diagnosed with ischemic stroke and all patients hospitalized in Ngimbang Regional Public Hospital with a diagnosis other than ischemic stroke. The sample in the study was a portion of patients suffering from ischemic stroke and non-ischemic stroke. The sample size in this study was 88 patients who were obtained after calculating the Lemeshow formula. The sampling technique using simple random sampling. This research has passed the ethical review at the Faculty of Public Health at Airlangga University.

Data analysis was performed using univariable analysis using frequency distribution tests to see the characteristics of patients, bivariable tests using Chi-Square test to filter out variables that met the requirements to construct predictive models of ischemic stroke and multivariable models using logistic regression tests used to construct predictive models.

Findings

The Correlation of Characteristics, Abdominal Obesity and Hypertension with Ischemic Stroke in Ngimbang Lamongan Regional Public Hospital

The results of the analysis in Table 1 show that the age variable with a value of p<0.25 (p = 0.015), which means that the age variable fulfills the requirements to prepare a predictive model of ischemic stroke. Gender variables indicate that the value of p<0.25 (p = 0.001), which means the sex variable fulfills the requirements for preparing a predictive model of ischemic stroke.

Job status variables indicate that the value of p<0.05 (p = 0.001), which means that there is a correlation between work variables and ischemic stroke in Ngimbang Regional Public Hospital of Lamongan 2016.

The results of the study regarding the correlation between abdominal obesity and the incidence of ischemic stroke in Ngimbang Regional Public Hospital of Lamongan in 2016 can be seen in Table 2 below:

Table 2: Correlation Distribution of Abdominal Obesity with Incidence of Ischemic Stroke in Ngimbang Regional Public Hospital of Lamongan in 2016.

<table>
<thead>
<tr>
<th>Obesity</th>
<th>Incidence of Ischemic Stroke</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cases</td>
<td>Controls</td>
</tr>
<tr>
<td>Obesity</td>
<td>40</td>
<td>15</td>
</tr>
<tr>
<td>Non-Obesity</td>
<td>4</td>
<td>29</td>
</tr>
<tr>
<td>Total</td>
<td>44</td>
<td>44</td>
</tr>
</tbody>
</table>

The results of the analysis in Table 2 show that the value of p<0.25 (p = 0.000), which means the abdominal obesity variable meets the requirements to compile a predictive model of ischemic stroke.

The results of the study on the correlation between diabetes mellitus and the incidence of ischemic stroke in Ngimbang Lamongan Regional Public Hospital in 2016 can be seen in Table 3 below:

Table 3: Distribution of Correlation between Diabetes Mellitus with Incidence of Ischemic Stroke in Ngimbang Regional Public Hospital of Lamongan in 2016.

<table>
<thead>
<tr>
<th>Diabetes Mellitus</th>
<th>Incidence of Ischemic Stroke</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cases</td>
<td>Controls</td>
</tr>
<tr>
<td>Diabetes Mellitus</td>
<td>36</td>
<td>6</td>
</tr>
<tr>
<td>Non-Diabetes Mellitus</td>
<td>8</td>
<td>38</td>
</tr>
<tr>
<td>Total</td>
<td>44</td>
<td>44</td>
</tr>
</tbody>
</table>
The results of the analysis in Table 3 show that the value of \( p <0.25 \) \((p = 0.001)\), which means that the variable of diabetes mellitus meets the requirements to prepare a predictive model of ischemic stroke.

The results of the study regarding the correlation between hypertension and the incidence of ischemic stroke in Ngimbang Regional Public Hospital of Lamongan in 2016 can be seen in Table 4 as follows:

**Table 4. Distribution of the Correlation between Hypertension with Incidence of Ischemic Stroke in Ngimbang Regional Public Hospital of Lamongan in 2016**

<table>
<thead>
<tr>
<th>Hypertension</th>
<th>Incidence of Ischemic Stroke</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cases</td>
<td>Controls</td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Hypertension</td>
<td>43</td>
<td>97.7</td>
</tr>
<tr>
<td>Non-Hypertension</td>
<td>1</td>
<td>2.3</td>
</tr>
<tr>
<td>Total</td>
<td>44</td>
<td>100.0</td>
</tr>
</tbody>
</table>

In Table 4 shows that the value of \( p<0.25 \) \((p = 0.000)\), which means that the hypertension variable meets the requirements to prepare a predictive model of ischemic stroke.

Predictive Model of Ischemic Stroke in Ngimbang Regional Public Hospital of Lamongan

After a variable bivariate analysis test that fulfills the requirements for a multivariable statistical analysis test can be seen in Table 5 below:

**Table 5. Recapitulation of the Correlation of Variables of Potential Factors with Incidence of Ischemic Stroke in Ngimbang Regional Public Hospital of Lamongan in 2016.**

<table>
<thead>
<tr>
<th>No.</th>
<th>Variable</th>
<th>OR</th>
<th>95% CI</th>
<th>p-value</th>
<th>Conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Age</td>
<td>3.286</td>
<td>1.332-8.107</td>
<td>0.015</td>
<td>Qualify</td>
</tr>
<tr>
<td>2.</td>
<td>Sex</td>
<td>4.765</td>
<td>1.912-11.875</td>
<td>0.001</td>
<td>Qualify</td>
</tr>
<tr>
<td>3.</td>
<td>Employment</td>
<td>4.667</td>
<td>1.890-11.526</td>
<td>0.001</td>
<td>Qualify</td>
</tr>
<tr>
<td>4.</td>
<td>Abdominal Obesity</td>
<td>19.333</td>
<td>5.811-64.322</td>
<td>0.000</td>
<td>Qualify</td>
</tr>
<tr>
<td>5.</td>
<td>Hypertension</td>
<td>129.000</td>
<td>15.848-1050.034</td>
<td>0.000</td>
<td>Qualify</td>
</tr>
<tr>
<td>6.</td>
<td>Diabetes Mellitus</td>
<td>28.500</td>
<td>9.002-90.233</td>
<td>0.000</td>
<td>Qualify</td>
</tr>
</tbody>
</table>

The results of bivariate analysis in Table 5 show that all variables have a value of \( p<0.25 \) which means that all variables in this study qualify to be included in the multivariable statistical analysis test. The variables that will be tested by multivariable statistical analysis are age, gender, abdominal obesity, diabetes mellitus, and hypertension.

Based on the results of the multivariable statistical analysis test in Table 5 the most dominant variable is the variable hypertension followed by the variable abdominal obesity.

**Table 6. Summary of Multivariable Analysis Results that Mean Statistically**

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>Wald</th>
<th>p-value</th>
<th>OR</th>
<th>95% CI for OR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (≥55 years)</td>
<td>3.218</td>
<td>3.926</td>
<td>0.038</td>
<td>24.973</td>
<td>1.035-602.312</td>
</tr>
<tr>
<td>Sex (Male)</td>
<td>3.072</td>
<td>3.593</td>
<td>0.045</td>
<td>21.581</td>
<td>1.901-516.968</td>
</tr>
<tr>
<td>Abdominal Obesity (female ≥ 80 cm, male ≥ 90 cm)</td>
<td>3.325</td>
<td>3.888</td>
<td>0.036</td>
<td>27.789</td>
<td>1.020-757.089</td>
</tr>
<tr>
<td>Hypertension</td>
<td>4.094</td>
<td>6.359</td>
<td>0.012</td>
<td>59.975</td>
<td>2.489-1445E3</td>
</tr>
<tr>
<td>Diabetes Mellitus</td>
<td>2.369</td>
<td>1.477</td>
<td>0.029</td>
<td>17.628</td>
<td>1.974-318.939</td>
</tr>
<tr>
<td>Constant</td>
<td>-11.273</td>
<td>3.687</td>
<td>0.002</td>
<td>0.000</td>
<td></td>
</tr>
</tbody>
</table>
Discussion

The Correlation of Characteristics, Abdominal Obesity and Hypertension with Ischemic Stroke in Ngimbang Regional Public Hospital of Lamongan

Based on Table 1 shows that there is an association of age factors with ischemic stroke incidence in hospitalized patients in Ngimbang Regional Public Hospital of Lamongan in 2016. People who have age <55 years also have a greater risk of stroke. Ages >55 years will be twice the risk of every 10 years of age. Two thirds of stroke cases are 65 years old. Stroke mortality rates are more common in elderly cases. Table 1 shows that there is a sex correlation with the incidence of ischemic stroke in hospitalized patients in Ngimbang Regional Public Hospital of Lamongan in 2016. The results of other studies indicate that the risk of stroke in hypertensive patients male sex 23.07 times greater stroke compared to women, this shows that in terms of gender the incidence of stroke is more common in men. Based on employment status variables (Table 1) shows that there is a correlation between work and incidence of ischemic stroke in hospitalized patients in Ngimbang Regional Public Hospital of Lamongan in 2016. This is because people who do not work will tend to live more relaxed, irregular eating patterns, lazy to exercise and higher stress levels than people who work. If the stress is too large so that it can cause a decrease in endurance, symptoms will arise such as headaches, irritability, insomnia which will stimulate the adrenal gland (cortex) to release hormones adrenaline and will accelerate the heart rate so that blood pressure rises and blood flow to the brain and peripheral muscles increases.

Respondents with abdominal obesity status had a greater risk than respondents with no abdominal obesity (Table 2). Abdominal obesity as measured by waist circumference is said to be the main risk factor for developing insulin resistance in type 2 diabetes, about 50% of obese patients experience glucose tolerance. In accordance with the research that has been carried out that people with type 2 diabetes mellitus will increase the risk for ischemic stroke.

Respondents with diabetes mellitus had a greater risk than respondents who did not have diabetes mellitus. Respondents with diabetes mellitus had a 28.500 risk of ischemic stroke when compared to respondents who did not have diabetes mellitus (Table 3). Diabetes mellitus will cause the vascular constriction phase and damage to blood vessels through the glycosylation process. Meanwhile, if there is a change in the two blood vessels, it will cause a reduction or even cause a blockage of blood flow to the brain which will cause ischemic stroke.

Respondents with hypertension status had a greater risk than respondents with non-hypertensive status. Respondents with hypertension had a risk of 129.000 times having an ischemic stroke when compared to respondents without hypertension (Table 4). Other studies have shown that patients with hypertension have a 20 times greater risk of stroke compared to patients without hypertension. Other studies show that individuals who have a diastolic blood pressure of ≥90 mmHg have a risk of 3.10 times more likely to experience an ischemic stroke.

Predictive Model of Ischemic Stroke in Ngimbang Regional Public Hospital of Lamongan

Through multiple logistic regression test results, it can be arranged formula predictive index for the incidence of ischemic stroke in Ngimbang Regional Public Hospital of Lamongan 2016. The logistic regression equation is as follows:

\[ P = \frac{1}{1 + e^{-Z}} \]

\[ Z = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 \]

So that the model of equations that are formed for the incidence of ischemic stroke is obtained as below:

\[ Z = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 \]

\[ = -11.273 + 4.094 \times \text{Hypertension} + 3.325 \times \text{Abdominal Obesity} + 3.218 \times \text{Age} + 3.072 \times \text{Sex} + 2.369 \times \text{Diabetes Mellitus} \]

\[ = 4.805 \]

From the calculation of the predictive index, the value of \( Z = 4.805 \) is obtained. With a history of hypertension = yes (1), abdominal obesity = yes (1), age = ≥55 years (1), gender = male (1), history of diabetes mellitus = yes (1).

Based on the 5 variables (age ≥55 years, male sex, abdominal obesity, history of hypertension and history of diabetes mellitus) if calculated based on probability events the results are as follows:

\[ P = \frac{1}{1 + e^{-(\beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5)}} \]
Based on the logistic regression equation, it can be seen that 98% of the probability of ischemic stroke caused by age ≥ 55 years, male sex, abdominal obesity ≥ 80 cm (female) and ≥ 90 cm (male), history of hypertension and history of diabetes mellitus, while 2% is influenced by other factors that are not measurable.

**Conclusion**

The incidence of ischemic stroke in hospitalized patients in Ngimbang Regional Public Hospital of Lamongan in 2016 it can be concluded that 98% of the likelihood of ischemic stroke caused by age ≥ 55 years, male sex, abdominal obesity ≥ 80 cm (female) and ≥ 90 cm (male), history of hypertension and history of diabetes mellitus, while 2% is influenced by other factors that are not measurable.

**Suggestion:** Further researchers are expected to examine more risk factors that can be changed to explain more specifically the occurrence of ischemic stroke, such as the risk of diabetes mellitus which types are more at risk for ischemic stroke, comparing abdominal obesity and BMI to the risk of ischemic stroke and other factors.

**Conflict of Interest:** None

**Source of Funding:** Independent

**Ethical Clearance:** This Study was approved by Health Research Ethics Committee of Public Health, Airlangga University.

**References**

Enhancing Family Medicine Practice in Developing Countries through a Holistic-Comprehensive Care Model: A Review

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Abstract

Background: The family medicine practice is a model for delivery of health care to the entire population, enhancing a patient focused and integrated primary health care systems. Unlike other medical specialties, family medicine practice includes biological, psychological, socio-spiritual, and all disease entities. Although considerable researches have been devoted to explain the concept of family medicine, rather less attention has been paid to its practice in developing countries. This study aims to review the empirical literature on a holistic-comprehensive care model implemented in family medicine practice particularly in developing countries.

Method: This study reviews alternative approaches to understand what “best practice” in family medicine is. The authors searched ‘family medicine practice’, or ‘family medicine’, ‘primary health care’ and ‘developing countries’ and ‘holistic’, and ‘comprehensive’ in address field from Google Scholars, Proquest and ScienceDirect dating from 2003 to 2019. Sixteen articles were included in the study out of 171 articles reviewed.

Result: A holistic-comprehensive care model consists of four primary concepts of care: clinical care, professional behavior in clinical practice, family medicine practice management and clinical practice facilities and equipment.

Discussion and Conclusion: The future studies of family medicine practice could focus on the promotion of a more sustainable delivery of healthcare. This study concludes by synthesizing concepts for a new family medicine practice, and suggests how a holistic-comprehensive model might contribute to thinking about the future of family medicine practice in developing countries.

Keywords: Family Medicine, Family Medicine Practice, Developing Countries, Holistic-Comprehensive Care Model, Review

Introduction

The family medicine practice is a model for delivery of health care to the entire population, enhancing a patient focused and integrated primary health care systems. Unlike other medical specialties, family medicine practice includes biological, psychological, socio-spiritual, and all disease entities. Most primary health care in developing countries are provided by health care
team include doctors and nurses but still small number of qualified doctors who are willing to work in rural areas, not as much as in developed countries. While the variety of people concentrated in urban areas, family doctors and health facilities are heavily concentrated in big cities. Currently in Africa, there is about one family physician for every 50,000 people in the country. However, in rural areas, often interventions are conducted by nurses or other clinical support services rather than family physician. As we can see that health systems struggle to adequately prepare health professionals to practice more in rural areas. In the countries such as South Africa, Nigeria, Uganda, the Democratic Republic of the Congo, Sudan, Ghana, Tanzania, Kenya, Lesotho, and Botswana, and most recently in Somaliland, Ethiopia, Mali, and Malawi, currently they are preparing for family medicine training program to support the needs of family physician in rural areas. Other issue that also needs to be addressed is “preventive care” as the first priority for family medicine practice. As the number of patients with chronic conditions arise, providing preventive treatment, such as lifestyle modification and coping skills have been identified as factors that could reduce future complications. Family physician should overcome the challenges to understand the biological, psychological, social, spiritual and cultural dimensions of health and diseases. Family doctors provide more primary care services than any other medical specialty and it is considered as the best choice of doctors.1-3

A holistic-comprehensive approach was developed to provide promotive, preventive, curative and rehabilitative treatment. In holistic approach, family doctors should consider psychosocial aspects, culture, spiritual and beliefs. In addition, comprehensive care is a challenge for family doctors to provide a broad range of health services in and their appropriate provision types of patient needs. Through comprehensive care, patients receive a continuum of health services: promotion, prevention, treatment and rehabilitation within the collaboration with health insurance system.4-6

Although considerable researches have been devoted to explain the concept of family medicine, rather less attention has been paid to its practice in developing countries. Primary health care should consider ways to ensure that community receive their priority health needs which are more affordable, accessible and available.7 This study aims to review the empirical literature on a holistic-comprehensive care model implemented in family medicine practice particularly in developing countries.

Material and Method

This study reviews alternative approaches to understand what “best practice” in family medicine is. More specifically, the paper explores how a holistic-comprehensive care model contributes to a more sustainable health care and patients’ wellbeing. The authors searched ‘family medicine practice’, or ‘family medicine’, ‘primary health care’ and ‘developing countries’ and ‘holistic’, and ‘comprehensive’ in address field from Google Scholars, Proquest and ScienceDirect dating from 2003 to 2019. The inclusion criteria employed were: 1) Review articles included in this study come in the forms of research articles, editorials, comments, literature reviews in quantitative, qualitative or mixed-method research. The study results might include papers in which family medicine practice applied in other countries exploring holistic-comprehensive care; 2) Papers must be written in English. These review papers were manually screened out by authors with previous experience of family medicine practice. A total number of 16 articles were identified.

Findings

A holistic-comprehensive model consists of four primary concepts of care based on four standards of family medicine practice: 1) clinical care (holistic care, comprehensive care); 2) professional behavior in clinical practice (doctor-patient relationship, partners in the healthcare team, working with colleagues, knowledge-skill development, community leader); 3) family medicine practice management (human resources, financial management, clinical practice management); and 4) clinical practice facilities and equipment (clinical practice facilities, clinical practice equipment, clinical support services).8

Holistic care considers patient as whole human being: physical, emotional, social and spiritual aspects.4-5 In addition to treating all diseases, primary doctors provide alternative therapies using local resources which are integrated in the primary health services and delivered continuity of care.9-14 In a comprehensive care, doctors must provide primary care to the entire population, all ages and sexes, promote health, prevent illness, do the early screening, treat diseases, perform medical-social rehabilitation and improve family social function.15-17

Several strategies to maintain family doctors’ professionalism through doctor-patient relationship: providing comprehensive health information, managing
effective and efficient length of consultation, delivering effective communication, and respecting rules and obligations between doctor-patient. A strong partnership in health care team has the potential to help support patients by improving professional relationship and teamwork clinic leadership. While working with colleagues, family doctors build their interprofessional relationships, relationship with other doctors and family doctors’ association.18-21

To support a lifelong learning for family doctors when providing holistic and comprehensive care, it is important to engage them in a continuing medical education, participate in advancing medical education, and collaborate in research and scientific writing. Quality assurance programs are essential to maintain high quality of care by constantly measuring the effectiveness of the family doctors’ organizations that provide it. As a community leader, doctors engage in social group association, participate in health and society program, as well as encourage communities in disaster program.22-30

Properly implementing quality improvement of family medicine is a key to a well-functioning practice.

A multidisciplinary health care team comprises people with wide ranging-skills: family doctors, nurses, midwifery and clinical administrator. In addition, doctors have a responsibility to be in charge of clinical examination fees, and maximize the benefits for their patients regarding use of alternative resources from health-care systems. Managing a comprehensive clinical practice efficiently requires evaluation and planning of staff and occupational health and safety procedures. Further, clinical practice facilities and equipment must be prepared to the most up-to-date and standardized medical and non-medical equipment to ensure health care team is able to provide the highest standards of clinical and patient care.31-32 Family doctors have a professional and legal duty to respect patient’s privacy and confidentiality with regards to their medical information, and manage the records appropriately as standards of continuity of care. Applying both conventional and local or alternative resources, family doctors delivered both basic medical care and common health services at a low cost.33 Good quality of a holistic and comprehensive in family medicine practice is essential to the proper ongoing care of patients.

Conclusion

The future studies of family medicine practice could focus on the promotion of a more sustainable delivery of healthcare. This study concludes by synthesizing concepts for a new family medicine practice, and suggests how a holistic-comprehensive model might contribute to thinking about the future of family medicine practice in developing countries.

Conflict of Interest: None.

Source of Finding: Not required.

Ethical Clearance: Self-funded.

References


Introduction

Dental trauma is one of the accidents that can be experienced in daily life, sports and leisure\(^1\). Even though modern people are frequently injured, they are not aware of the necessity of appropriate treatment and hence, the teeth that can be preserved due to delayed post-traumatic treatment are damaged and left unattended\(^2\). In particular, juvenile adolescence is a period of rapid growth and very active, and the risk of dental trauma is higher than ever\(^3\). However, the importance of dental trauma in oral health education in children and adolescents has not been highlighted. Over the years, dental trauma has gradually increased and the incidence of dental caries and periodontal disease in children and adolescents is expected to increase\(^4\). Traumatic teeth are classified into WHO classification into odontoclasis (fracture) and displacement damage. Odontoclasis injuries are largely classified into crown fractures that are exposed outside the gums, root fractures inside the gums, and crown fractures where the fracture line invades both sites. Displacement injuries are damages in which teeth are separated from the alveolar without fracture lines, such as shaking, subluxation, dislocation, fixation, and infiltration\(^5\). The main causes were reported by the Ministry of Health and Welfare as falling, exercising/playing, fighting and traffic accidents\(^6\). According to the 2003, 2006 and 2010 National Oral Health Survey of the Ministry of Health and Welfare, the proportion of patients with maxillofacial trauma was 9.42% (male 11.89%, female 6.96%) in 2003, 16.4% (male 22.4%, female 10.7%) in 2006 and 18.19% (male 20.41%, female 15.73%) in 2010 survey which have been increasing in recent years\(^6-8\), compared to those who experienced traumatic facial injuries\(^9\). Trauma is a factor that can affect treatment, including ages, type and extent of injury, and elapsed time before post-traumatic...
treatment. Although it is necessary, there is a lack of public awareness and education data on prevention and coping method for dental trauma compared to educational materials on two major oral diseases such as dental caries and periodontal disease. Accordingly, this study is to identify the level of trauma and perception of citizens in Busan in age of 20s, and the present the necessity and education on how to deal with trauma through trauma survey.

**Material and Method**

**Research Subject:** The survey was conducted on residents in their 20s in the B region, and 456 in their 20s responded to the survey. A total of 456 survey copies were collected, of which 441 were statistically included, except for 15 that were inaccurately answered.

**Research Method:** The questionnaire was distributed and self-written to answer the survey. First, a preliminary questionnaire was conducted to 30 subjects, and the incomplete contents were corrected and supplemented, and the final survey was conducted. The survey was conducted from October 16 to November 20, 2018.

**Survey tool:** The questionnaire was revised and supplemented according to Lee’s questionnaire, and the questionnaire was divided into the level of dental trauma experience and the recognition level of first aid. A total of 8 questions were examined in which items related to the actual condition of traumatic experiences: the presence of the experience, the timing of the experience, the site of the trauma, the cause of the trauma, the location of the trauma, the presence of a companion in case of trauma, the first aid to deal with the trauma, and the change in interest in the oral cavity after trauma. For the recognition level of first aid, the knowledge level of first aid and prevention incase of trauma was investigated through a questionnaire asking how to deal with the situation of dental trauma.

**Analysis method:** In order to examine the general characteristics of the respondents and their trauma status, the chi-square test was used for the frequency analysis and the recognition level according to the presence or absence of education. The significance level was p-value<0.05. The statistical program used for the study analysis was SPSS 22.0 (IBM SPSS Statistics).

**Research Results**

**General characteristics of the subjects:** The general characteristics of the subjects were 278 males (63%) and 163 females (37%). The ages were 289 (65.5%) for 20-22 years old, 114 (25.9%) for 23-24 years old, 32 (7.3%) for 25-27 years old, and 6 (1.4%) for 28-29 years old. Occupations were distributed in the order of 420 students (95.2%), 6 civil servants (1.4%), 4 self-employed workers (0.9%), 3 employees (0.7%), and 8 others (1.8%) (Table 1).

<table>
<thead>
<tr>
<th>Table 1: General characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sort</strong></td>
</tr>
<tr>
<td>Gender</td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td>Age</td>
</tr>
<tr>
<td>20-22</td>
</tr>
<tr>
<td>23-24</td>
</tr>
<tr>
<td>25-27</td>
</tr>
<tr>
<td>28-29</td>
</tr>
<tr>
<td>Over 30</td>
</tr>
<tr>
<td>Occupation</td>
</tr>
<tr>
<td>Self-employed</td>
</tr>
<tr>
<td>Civil servant</td>
</tr>
<tr>
<td>Employee</td>
</tr>
<tr>
<td>Student</td>
</tr>
<tr>
<td>Other</td>
</tr>
<tr>
<td>Education status</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td>Dental health interest</td>
</tr>
<tr>
<td>Affects very much.</td>
</tr>
<tr>
<td>Affects somehow</td>
</tr>
<tr>
<td>Normal</td>
</tr>
<tr>
<td>Doesn’t affect much</td>
</tr>
<tr>
<td>Doesn’t affect at all</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

**Dental Trauma of subjects:** 148 (33.6%) had a dental trauma and 293 (66.4%) had no trauma. Trauma teeth were the highest in 93 (62.8%) respondents, followed by 49 molars (33.1%), 5 gums (3.4%), and 1 jaw (0.7%). The most common cause of trauma was collision with objects with 59 people (39.3%), followed by 41 hard foods (27.7%), 15 fights (10.1%), 12 sports injuries (8.1%), 3 traffic accidents (2.0%), and 18 others (12.2%) (Table 2).
Table 2: Dental Trauma Status

<table>
<thead>
<tr>
<th>Sort</th>
<th>No. of people</th>
<th>Percentile (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Trauma age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kindergarten</td>
<td>12</td>
<td>8.1</td>
</tr>
<tr>
<td>Elementary school</td>
<td>47</td>
<td>31.8</td>
</tr>
<tr>
<td>Middle school</td>
<td>25</td>
<td>16.9</td>
</tr>
<tr>
<td>High school</td>
<td>33</td>
<td>22.3</td>
</tr>
<tr>
<td>University</td>
<td>31</td>
<td>20.9</td>
</tr>
<tr>
<td><strong>Trauma part</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Front tooth</td>
<td>93</td>
<td>62.8</td>
</tr>
<tr>
<td>Molar</td>
<td>49</td>
<td>33.1</td>
</tr>
<tr>
<td>Gum</td>
<td>5</td>
<td>3.4</td>
</tr>
<tr>
<td>Jaw</td>
<td>1</td>
<td>0.7</td>
</tr>
<tr>
<td><strong>Cause of trauma</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collide with an object</td>
<td>59</td>
<td>39.3</td>
</tr>
<tr>
<td>Traffic accident</td>
<td>3</td>
<td>2.0</td>
</tr>
<tr>
<td>Hard food</td>
<td>41</td>
<td>22.7</td>
</tr>
<tr>
<td>Injury during exercise</td>
<td>12</td>
<td>8.1</td>
</tr>
<tr>
<td>Fight</td>
<td>15</td>
<td>10.1</td>
</tr>
<tr>
<td>Others</td>
<td>18</td>
<td>12.2</td>
</tr>
<tr>
<td><strong>Trauma place</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>School</td>
<td>42</td>
<td>28.4</td>
</tr>
<tr>
<td>Playground</td>
<td>19</td>
<td>12.8</td>
</tr>
<tr>
<td>Troops</td>
<td>6</td>
<td>4.1</td>
</tr>
<tr>
<td>Roadside</td>
<td>28</td>
<td>18.9</td>
</tr>
<tr>
<td>Others</td>
<td>53</td>
<td>35.8</td>
</tr>
</tbody>
</table>

Table 3: Dental trauma awareness survey results

<table>
<thead>
<tr>
<th>Sort</th>
<th>No. of people</th>
<th>Percentile (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Damaged tooth type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Milk tooth</td>
<td>161</td>
<td>36.5</td>
</tr>
<tr>
<td>Permanent tooth</td>
<td>280</td>
<td>63.5</td>
</tr>
<tr>
<td>First aid for dental fracture</td>
<td></td>
<td></td>
</tr>
<tr>
<td>proper answer</td>
<td>269</td>
<td>61.0</td>
</tr>
<tr>
<td>Tooth dislocation about first aid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>proper answer</td>
<td>371</td>
<td>84.1</td>
</tr>
<tr>
<td>Complete dislocation about teeth planting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>agree</td>
<td>140</td>
<td>31.7</td>
</tr>
<tr>
<td>Pre-plant treatment for complete dislocated teeth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>proper answer</td>
<td>34</td>
<td>7.7</td>
</tr>
<tr>
<td>Treatment except complete planting for dislocation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>proper answer</td>
<td>132</td>
<td>29.9</td>
</tr>
</tbody>
</table>

Tooth Trauma Awareness Survey: In the questionnaire about tooth fractures of 8-year-old girls, 161 (36.5%) correctly answered that they were permanent teeth, and 280 (63.5%) answered that they were milk tooth. In addition, 269 (61.0%) of cognitive, 172 (39.0%) of erroneous. In the questionnaire on appropriate measures for dislocation of 11-year-old boys, 371 (84.1%) were cognitive whereas 70 (15.6%) were erroneous (Table 3).

Investigation of transport and cleaning solutions for dislocated teeth: The following cleaning solutions were used when the tooth was completely dislocated: 145 (32.9%) with the saline solution, 114 (25.9%) used milk, and 83 (18.8%) used tap water. The transport solution for dislocated tooth was as follows: 167 (37.9%) carried milk, 103 (23.4%) carried saline and 63 (14.3%) carried tap water (Table 4).

Table 4: Transport and cleaning solution for dislocated teeth Sort N(%)
In the recognition level according to the educational status, 35 people (47.3%) answered ‘correctly’ to the question of discrimination between milk tooth and permanent tooth which was a significant difference \((p=0.020)\). There was a significant difference in the level of cognition according to the presence or absence of education on planting \((p<0.001)\) that 37 (50%) were educated and 103 (23.4%) people were not educated. There was a significant difference on recognition level according to the presence or absence of education except on planting treatment \((p<0.001)\) that 37 (50%) were educated but 95 (25.9%) people did not receive education (Table 6).

### Table 6: Dental trauma recognition level N(%)  

<table>
<thead>
<tr>
<th>Sort</th>
<th>Yes</th>
<th>No</th>
<th>p-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Damaged tooth type</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Milk tooth</td>
<td>39(52.7)</td>
<td>245(66.8)</td>
<td>0.020</td>
</tr>
<tr>
<td>Permanent tooth</td>
<td>35(47.3)</td>
<td>122(33.2)</td>
<td></td>
</tr>
<tr>
<td>First aid for tooth fracture</td>
<td>proper answer</td>
<td>44(59.5)</td>
<td>225(61.3)</td>
</tr>
<tr>
<td>First aid for tooth dislocation</td>
<td>proper answer</td>
<td>64(86.5)</td>
<td>307(83.7)</td>
</tr>
<tr>
<td>Whether to plant for fully dislocated teeth</td>
<td>agree</td>
<td>37(50)</td>
<td>103(23.4)</td>
</tr>
<tr>
<td>Pre-plant treatment for complete dislocated teeth</td>
<td>proper answer</td>
<td>9(12.2)</td>
<td>25(6.8)</td>
</tr>
<tr>
<td>Treatment except complete planting for dislocation</td>
<td>proper answer</td>
<td>37(50)</td>
<td>95(25.9)</td>
</tr>
</tbody>
</table>

*Chi-square test

### Consideration

The most representative oral diseases of oral lesions are dental caries and periodontal disease\(^{11}\). Modern people often have access to dental caries and periodontal diseases through education, media, and practical experience. In addition, dental caries and periodontal diseases is a bilateral oral disease designated by the WHO, and people’s attention is focused on this possibility\(^{12-13}\). Therefore, this study investigates the current state of dental trauma and the level of first aid for dental trauma to identify the level of perception and to contribute to the preparation of education to the improvement of oral health level.

Among the age of 20s respondents in Busan, 357 (80.9%) answered that dental health affects their lives, and 74 (16.8%) have experienced education on dental trauma.

According to the dental trauma survey, 148 (33.6%) of 441 respondents have experienced ‘tooth trauma’, indicating that dental trauma is frequently occurring of the 148 respondents (33.6%) who received a dental trauma, only 79 (53.4%) went directly to the dentist and 45 respondents (30.4%). Therefore, first aid and oral health education should be provided for dental trauma. The time of trauma was 105 patients (71%) who had the largest number of dental trauma in childhood and 42 respondents (28.4%) answered the most common sites was in schools which showed similar results to the studies of Lee \(^{10}\) and Park\(^{14}\). This proves the need for early education on dental trauma. Among the trauma victims, 93 (62.8%) experienced the most trauma to their incisors, 59 people (39.3%) had a colliding with the object accidents which was the most common cause, and according to the report, 47% of anterior crown fractures occur most frequent\(^{15-18}\).

There was also a significant difference in the comparison of the group with and without the education of dental trauma \((p=0.020)\). In case of complete dislocated teeth, immediate replanting is ideal, but if it is not feasible, efforts should be made to minimize damage to the periodontal ligament of the damaged tooth\(^{19-20}\). However, only 140 (31.7%) respondents said they would replant, and only 34 (7.7%) responded...
correctly to pre-plant treatment, saying that they took no action on their teeth. Ideally, fully dislocated teeth should be replanted within 30 minutes\footnote{20}, with 364 respondents (82.6\%) were aware of the correct planting time. Lastly, 376 respondents (85.3\%) thought that ‘the need for professional education on the prevention and treatment of dental trauma’ was high. Although it was found necessary, the educated group was more aware of the need for education (p=0.034).

As a result of analyzing the survey responses of age of 20s in Busan region, this survey lacked accurate information due to lack of oral knowledge and lack of surveyors to understand the purpose of each survey. In the future, a survey should be made to supplement these problems, and if appropriate education and educational materials on dental trauma are provided, the prevention of dental trauma and the flexible responses after trauma will help to preserve the teeth and improve the oral health level of the public which seems to be a significant contribution.

Conclusions

The purpose of this study is to investigate the status of oral trauma and the level of oral trauma awareness to increase oral trauma education with 456 ordinary citizens living in Busan. The survey was conducted with the following results:

1. The proportion of respondents with an education experience was significantly lower, with 74 (16.8\%) and 357 (80.9\%) responding that teeth affected their lives.
2. 148 (33.6\%) of them had a traumatic experience, and 105 (71\%) of them had trauma in childhood and 93 (62.8\%) had front teeth trauma which was the highest.
3. In the case of carrying out and cleaning of teeth due to dental trauma, 167 (37.9\%) responded milk for cleaning and 145 (32.9\%) responded saline for carrying.
4. In the recognition level according to the educational status, 35 people (47.3\%) answered ‘correctly’ to the question of discrimination between milk tooth and permanent tooth (p=0.020).
5. There was a significant difference on the awareness level according to the presence or absence of education on replanting recognition with complete dislocation teeth, 37 (50\%) respondents had been educated where 103 (23.4\%) did not have education (p<0.001).
6. There was a significant difference in the level of awareness depending on the presence or absence of education in the treatment except for the replanting of complete dislocation teeth, 37 (50\%) were educated and 95 (25.9\%) were not educated (p<0.001).

The state of trauma was relatively high and the oral trauma education was significantly lower. The level of cognition differs significantly between the educated and uneducated groups, which suggests that more education and educational materials on how to cope with oral trauma and how to behave are needed.

Conflict of Interest: The authors declare no conflict of interest.

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Ethical Clearance: There was no ethical clearance

References


Relationship between Satisfaction with Nurse Work Performance in Health Services in Hospitals

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Abstract
Background of the current era of globalization suggests that market mechanisms will be increasingly dominated by business organizations that provide services or produce superior products that have good competitiveness and take advantage of market opportunities. Providing quality service is inseparable from human resources that produce good performance and achievement. One of the factors that correlates nurses’ performance or work performance is the lack of a person’s satisfaction with their work. Method descriptive analytic research with cross sectional approach. Information and data in this study were collected through a questionnaire on all nurses who worked at the hospital. After the data is obtained then an analysis is carried out to find whether there is a relationship between job satisfaction and the work performance of implementing nurses. Results, show that nurses who have good job satisfaction are 15 people (57.7%), showing good job performance. This shows that nurses who have good job satisfaction will have the desire to provide more energy and responsibility in supporting the success and welfare of the hospital. Multivariate analysis shows that the independent variables are related to the dependent variable. The results of the analysis obtained job satisfaction of 0.50 then it can be stated to have a significant relationship to work performance. Conclusion there is a relationship between satisfaction with nurse work performance. There is a significant relationship between job satisfaction with work performance working in a hospital treatment room. In providing good and quality health services, both in terms of service, care and also good facilities for patients. Job satisfaction is proven to provide a relatively good relationship to the improvement of work performance, it also does not rule out the possibility for companies to consider other factors that can provide convenience in the field of health services.

Keywords: Satisfaction, Achievement, Nurse.

Introduction
The current era of globalization suggests that market mechanisms will be increasingly dominated by business organizations that provide services or produce superior products that have good competitiveness and take advantage of market opportunities. Providing quality service is inseparable from human resources that produce good performance and achievement. Job performance is something that is done or a product or service produced by a person or group, how the quality of work, accuracy and neatness of the work, assignments and fields of work, use and maintenance of equipment, initiative and creativity, discipline, and work spirit (honesty, loyalty, a sense of oneness and responsibility and interpersonal relationships).

Employee performance appraisal is included in one of the activities of human resource development (Human Resources Development) in every company organization, both in service industry organizations and in the manufacturing industry. Human resources, which are also a factor of production, are never free from appreciation, either because of their ability to do any work, or because of their work achievements in the form of promotion, promotion, salary increase, incentives and so forth. Giving awards, besides rewarding for an

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achievement, it is also a motivation for employees who have not performed well, so that in the future, their achievements can be improved.

Job satisfaction can be identified as an accumulation of the results of interactions that occur continuously between the person and the work and environment where he works in a certain period of time. Therefore, job characteristics and organizational climate are factors that are very closely related to job satisfaction and commitment and will ultimately have an impact on work performance or achievement.

Lack of individual factors (commitment, motivation, and work ethic) and organizational factors (compensation, human resource development, leadership, supervision, and working conditions) will relate to nurse performance as measured by measuring RATER (Reliability; Assurance, Tangible, Emphaty, Responsiveness) which is an indicator of nurse performance that will directly relate to hospital performance.

**Job Satisfaction:** The first person provides an understanding of the concept of job satisfaction. They assume that job satisfaction can be suspected from a person’s attitude towards his job. Job satisfaction depends on what a person wants from his job and what is obtained. The people who are least satisfied are those who have the most desires, but get the least. While the most satisfied are people who want a lot and get it.

At the most basic mind, job satisfaction is a positive emotional state from evaluating one’s work experience. Dissatisfaction arises when these expectations are not met. Job satisfaction has many dimensions. In general, the observed stages are satisfaction in the work itself, salary, recognition, the relationship between supervisors and workforce, and opportunities for advancement. Each dimension produces feelings that are satisfied overall with the work itself, but work also has a different definition for others.

**Work Performance:** Job performance is also called performance or in English it is called performance. In principle, there is another term that better describes achievement in English, the word “achievement”. But because the word comes from the word “to achieve” which means to achieve, then in Indonesian it is often interpreted as achievement or what is achieved. Based on the understanding of work performance is the result of one’s work, we need a system of measuring work performance or what is called work performance appraisal. Almost all ways of measuring work performance take into account quantity, quality and timeliness.

Job performance shows the work achieved by someone. said that work performance is a result of work achieved by a person in carrying out the tasks assigned to him based on skill, experience, and earnestness of time. In other words that tangible work performance in a situation achieved by employees with better results increases than before.

Performance appraisals are carried out to obtain information that is useful in decision making related to other human resource management (HR) activities, such as planning and career development, compensation programs, promotions, transfers, pensions, and dismissals. Performance appraisal in the context of the development of human resources is very important. This reminds us that in organizational life we want to get respect and fair treatment from the leaders of the organizations concerned. In the life of an organization there are several assumptions about human behavior as human resources that underlie the importance of assessing work performance.

**Nurse:** A nurse is someone who has completed a nursing education program both domestically and abroad that is recognized by the Government of the Republic of Indonesia, is registered and given the authority to carry out nursing practice in accordance with statutory regulations.

Nursing is one of the professions in hospitals that plays an important role in the implementation of efforts to maintain the quality of health services in hospitals. The standard on evaluation and quality control explains that nursing services guarantee high quality nursing care by continually engaging in quality control programs in hospitals. The role of nurses is very important because as the spearhead of good or not the quality of health services provided to patients. Nurses are one of the professions in the hospital with the most dominant number and the longest contact or contact (interact) with patients in inpatient services for 24 hours.

**Materials and Methods**

The research design is analytic descriptive research with cross sectional approach. Information and data in this study were collected through a questionnaire on nurses working in hospitals. Human resources, which are also
a factor of production, are never free from appreciation, either because of their ability to do any work, or because of their work achievements in the form of promotion, promotion, salary increase, incentives and so forth. The awarding, besides rewarding for an achievement, is at the same time a motivation for employees who have not performed well, so that in the future, their achievements can be improved. Job satisfaction can be identified as the accumulation of the results of interactions that occur continuously between the person with the work and the environment in which he works in a certain period of time. Job characteristics, and organizational climate are factors that are very closely related to job satisfaction and will ultimately have an impact on job performance or performance 12 14.

Findings

Table 1. Analysis of the Relationship between Job Satisfaction and Work Achievement of Nurses in the Nursing Room

<table>
<thead>
<tr>
<th>Job satisfaction</th>
<th>Work performance</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Well</td>
<td>%</td>
</tr>
<tr>
<td>Well</td>
<td>5</td>
<td>38.5</td>
</tr>
<tr>
<td>Less</td>
<td>10</td>
<td>19.2</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>57.7</td>
</tr>
</tbody>
</table>

α = 0.05 p= 0.003

Table 2. Multivariate Analysis of Job Satisfaction with Work Performance of Implementing Nurses in the Treatment Room

<table>
<thead>
<tr>
<th>Step 1</th>
<th>B</th>
<th>Exp (B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Job satisfaction</td>
<td>-2.996</td>
<td>.050</td>
</tr>
<tr>
<td>Constant</td>
<td>.693</td>
<td>2.000</td>
</tr>
</tbody>
</table>

Discussion

Distribution of respondents based on job satisfaction of nurses implementing in treatment room II shows the number of respondents 15 people (57.7%) who have good work performance. This shows that nurses have loyalty and feel attracted to the values, goals and objectives of the hospital where they work. The discovery of 5 people (19.2%) of respondents had less job satisfaction. This shows that nurses and hospitals lack the same goals, values and targets or nurses do not want to involve themselves more closely with hospitals. Based on the results of bivariate analysis, it showed that nurses who had good job satisfaction 15 people (57.7%), showed good work performance. This shows that nurses who have good job satisfaction will have the desire to provide more energy and responsibility, in supporting the success and welfare of the hospital.

Nurses who have good job satisfaction will have little reason to leave the hospital for a long time. This job satisfaction will have an impact on nurse performance, where the better job satisfaction is, the better work performance. This is evident through the willingness to work beyond what is expected so that the hospital can develop. Primary data shows that most nurses feel that working at the hospital is their best choice in making decisions about the workplace. The similarity of values and goals between nurses and the hospital allows no difficulties experienced by the implementing nurse in every decision determined. from the hospital. Executing nurses who lack job satisfaction will have underachievement because the effort or the resulting performance is not optimal due to the lack of a sense of shared interest in the hospital15 16.

Beta value is the value indicating the independent variable associated with the dependent variable. The results of the analysis obtained job satisfaction of 0.50 then it can be stated to have a significant relationship to work performance.

Conclusion

Based on the results of research on the relationship of job satisfaction with the work performance of implementing nurses in hospital treatment rooms; There is a relationship between job satisfaction and work performance of nurses in hospital treatment rooms. There is a significant relationship between nurse job satisfaction with work performance in hospital treatment rooms. In providing good and quality health services, both in terms of service, care and also good facilities for patients, the company must maintain employee work performance.

Conflict of Interest: None

Source of Funding: Self Funding

Ethical Clearance: Obtained from Research and Community Service Institute Nursing Academy of Sandi Karsa.

References

Introduction

The urogenital schistosomiasis (UGS) is extremely widespread around the world, taking the second position after malaria\(^1\). Out of 243 million people with the proved UGS, more than a half of the cases are caused by infection of *Schistosoma haematobium* (SH), – the parasite, that lives in water sources on the territory of Africa and the Middle East countries: he gets into bodies of an urinogenital system of the person with infection, that leads to development of a disease\(^2\).

The chronical effect of SH eggs on tissue of an urothelium causes the development of the specific schistosoma-associated bladder cancer (SA-BC), that is considered as “squamous cell carcinoma of the bladder” by pathologists in most cases\(^3\). The data of world scientific literature demonstrate that SA-BC is often diagnosed in the neglected disease stages, with a low stage of a differentiation of a tumor\(^4\).

The treatment conditions of the population living in the provinces with SA-bladder cancer are significantly different from those of urban residents. At the same time, residents of small towns and rural areas make up 55.18% of the total population of Angola. The results of medical care in bladder cancer are determined not only by the causes of the ecological, geographical, social and domestic plan, but to a considerable degree by medical and organizational factors. Unfortunately, specialized medical algorithm and postoperative care for many patients with SA-BC are not available. Study of the

### The Organization of Medical and Diagnostic Aids for Patients with Schistosoma Haematobium Invasion of Urinary System


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### Abstract

**Background and Purpose:** The aim of the study was to improve the diagnostic and treatment approach in the provision of medical care for patients with Schistosoma-associated bladder cancer (SA-BC).

**Material and Method:** The survey results of 56 patients with gross hematuria in medical institutions of the province Benguela (Angola) since 2007 to 2012 has been studied. Group A (n=35) included patients before applying the standardized diagnostic algorithm. Group B (n=21) included patients using the new organizational format, which included using hospital outpatient care structures.

**Results:** The progression to locally advanced stage of SA-BC was verified at significantly higher rate (80%). In patients from group A, while verified locally advanced SA-BC stays at low level (66,7%) in group B.

**Conclusions:** The combined usage of urine cytology test, ultrasonography and cystoscopy at the increased proliferative process caused by Schistosoma Hematobium (SH) allows to reveal diagnose SA-BC in early stages, subject to on condition of patients admission in hospital outpatient care structures of specialized medical institutions.

**Keywords:** Schistosoma haematobium, Schistosoma-associated bladder cancer, radical cystectomy, hospital outpatient care, short-term hospital.
opportunities of improvement the quality of diagnostics and medical care in UGS patients, which are a risk factor for evolution of SA-BC, remains a relevant cross-disciplinary task.

**Background and Purpose:** The aim of the study was to improve the diagnostic and treatment approach of medical care for patients with Schistosoma-associated bladder cancer (SA-BC).

**Material and Method**

The survey results of 56 patients with gross hematuria attended in medical institutions of the province Benguela (Republic Angola) since 2007 to 2012. Most of the patients were from rural areas - 49 (87.5%), the number of citizens was 7 (12.5%). All patients participating in the study reported episodes of the use of crude fresh water in everyday life (drinking, cooking, washing, etc.). Patients are distributed in 2 groups A and B. Group A included 35 patients before applying the standardized diagnostic algorithm, (observation period from 2007 to 2009): 5 (14,3%) patients with tumor pathology not related to UGS and 30 (85,7%) SA-BC patients. Group B included 21 patients using the new organizational format (follow-up from 2009 to 2012): UGS and SA-BC was detected in 4 (19,1%) and in 14 (66,7%) cases respectively, 3 (14,3%) cases gross hematuria was not associated with UGS. All our diagnostic and therapeutic actions, including new ones, were approved by the members of the local ethics committee.

**Findings:** Observation results of A group patients (n=35; 19 women and 16 men, middle age 35.4±4.2 years) estimated retrospectively. The duration of hematuria in patients of this group ranged from 3 weeks to 12 months. The standard approach adopted in the region included treatment UGS patients in primary medical institutions, where a urologist was not always available. In case of unsuccessful treatment, the patient was sent to a specialized urological department, where the urologist appointed an examination including: standard monitoring of urine cytology, ultrasound examination of the abdominal cavity and lower pelvis, cystoscopy with an “random” biopsy (in the presence of changes of a wall of a bladder according to ultrasonography). The excretory urography and the computer tomography of abdominal organs, lower pelvis and urinary tract have been carried out according to indications. When a bladder tumor was detected, the patient was sent to the hospital for performing the surgical treatment.

In 5 (14.3%) cases, hematuria was not associated with UGS. We verified SA-BC after surgical treatment: a case (2.9%) of non-muscle-invasive SA-BC in stage pT1NOM0 (an open resection of the bladder), 28 (80%) cases of locally-spread SA-BC in stages pT3-4N0-3M0-1 (radical cystectomy with various types of urine derivation in 23 cases or an ureterocutaneostomy). One (2.9%) patient came to a hospital from a maternity home, at 37 weeks of pregnancy. Squamous-cell bladder cancer (BC) confirmed histologically in all cases, *Schistosoma* eggs were revealed.

There were 21 persons (13 women and 8 men at the age of 30±3.4 years) in group B, with gross hematuria lasting from 1 week up to 2 months. The plan of observation has been corrected: patients with the first time revealed gross hematuria have been directed to the urologist of the short-term hospital (STH), the structural division of regional level hospital. Standard examination was supplemented by obligatory cystoscopy and/or transurethral resection of the bladder wall (TURB) all of patients UGS. The organization of specialized observation of the patient in STH of regional hospital, with participation of the qualified doctor-urologist is an advantage of this method.

In 3 (14.3%) cases, hematuria was not associated with UGS. An severe proliferative changes of a wall of a bladder caused by UGS have been verified at 4 patients (19.04%) and TURB was executed. UGS confirmed by results of a histologic research – schistosoma eggs were found in the biopsy specimen, malignant cells were not found. The diagnosis established as “SA-BC pT1-2N0M0” at 14 patients (66.7%): TURB has been carried out to 5 patients, an partial cystectomy has been executed to 9 patients (including three pregnant women in the third trimester of pregnancy).

The existence of schistosoma eggs confirmed in 28.2% of cases during urine test. Specific changes for SA-BC and UGS, by results of ultrasonography and cystoscopy, revealed in all cases: it has been proliferative exophytic formations of a bladder (the size> of 1.5 cm). The combination of beam and endoscopic method has allowed to diagnose a disease for patients of B group and define indications for endoscopic (TURB) or open surgical interventions.

Indicators of the general status of SA-BC lesions (Karnowsky scale and ECOG Performance Status) has not differ significantly: all patients are at working-age,
with a minimum list of associated diseases. Therefore, the general status of patients is not defining for choosing a method of treatment: Karnowsky index was 90 ± 8.5 and 80 ± 4.7, respectively, and the ECOG index – 0-1 and 1-3 (p > 0.05) at the patients transferred endoscopic treatment or cystectomies. Duration of hospital staying of patients, taking to account the choice of organ-preserving operation is in the Table 1.

**Table 1. Duration of stationary stay of patients with SA-BC**

<table>
<thead>
<tr>
<th>Operation option</th>
<th>Number of SA-BC cases</th>
<th>Duration of hospital stay (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TURB</td>
<td>5</td>
<td>4,3 ± 1,5</td>
</tr>
<tr>
<td>Open operations</td>
<td>10</td>
<td>18 ± 2,1</td>
</tr>
<tr>
<td>Probability</td>
<td></td>
<td>&lt; 0,01</td>
</tr>
</tbody>
</table>

Indications of duration for hospitalization at SA-BC lesions have been significantly less after TURB, comparing with indications after “open” operations, that corresponds to results of similar researches in this direction. The nature of an operative intervention has been lower after organ-preserving interventions (Tab. 2).

**Table 2. Duration of hospital stay of patients, depending on the volume of the performed operation**

<table>
<thead>
<tr>
<th>Operation option</th>
<th>Number of SA-BC cases</th>
<th>Duration of hospital stay (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TURB</td>
<td>5</td>
<td>4,3 ± 1,5</td>
</tr>
<tr>
<td>Partial resection of the bladder</td>
<td>1</td>
<td>17,5 ± 2,1</td>
</tr>
<tr>
<td>Radical cystectomy</td>
<td>23</td>
<td>31,6 ± 2,3</td>
</tr>
<tr>
<td>A</td>
<td>5</td>
<td>18 ± 2,1</td>
</tr>
<tr>
<td>B</td>
<td>9</td>
<td>10,1 ± 1,5</td>
</tr>
<tr>
<td>Probability</td>
<td></td>
<td>&lt; 0,01</td>
</tr>
</tbody>
</table>

The duration of the bed stay has been lower at patients of B group after organ-preserving operations, comparing with similar measure for A group (Tab. 2). Probably, it is explained by usage of endoscopic surgery in STH, reduction of time expenditure by carrying out primary diagnostics and centralization of medical care in STH of a regional hospital.

Average duration of bed stay at patients after performance of radical surgical treatment (radical cystectomy) has been lower (for 9.5 bed days) after usage of a Mainz Pouch II technique.

**Discussion**

According to A.M. Bronstein et al., gross hematuria indicates on UGS infection, and also as one of early clinical manifestations of a malignant new growth. Microscopic detection of SH eggs remains “the gold standard” for diagnostics of UGS in concentrated urine by centrifugal ultrafiltration method. However, this method as well as modern diagnostic method (PCR, molecular markers for SH verification etc.) require qualified laboratory specialists.

Complex diagnostics of early lesions of an urothelium at UGS with usage of beam and endoscopic method allows to verify SA-BC promptly in at patients of young age that has important social value. Cystoscopic picture of UGS is very specific. Inflammatory, polyp-like and erythematic bilharzial lesions most often are located in the field of a dome and on a bladder sidewall, and specific “sandy patches” of an urothelium – around a neck of a bladder and ureteral isthmus. The “random” biopsy of chronic ulcers of a bladder conducts after light cystoscopy, which coagulate or resect during a transurethral resection. Conducting the TURB allows to reduce expressiveness of the irritable symptoms and to stop a gross hematuria. Malignant regeneration of an urothelium at UGS often appears in a late stage at which as method of the choice serves only operation – a radical cystectomy.

The frequency of verification of bladder malignant damages in a locally-spread stage in B group has been significantly higher, than in A group, that is reflection of opportunities of active medical and diagnostic tactics. It has allowed to execute only organ-preserving operations by all patients of B group, thereby having improved the forecast and the further prospects of treatment of these patients. The combined usage of urine cytology, ultrasonography and cystoscopy at the expressed proliferative process caused by UGS allows to reveal SA-BC in early stages, subject to patients admission in STH of specialized medical institutions.

We have used the recommendations of the European association of urologists (EAU) for development of uniform indications to performance of TURB, according to which operation is admissible in cases:

1. Endovesical proliferative inflammatory formations.
2. Ulcerous lesions (performance of coagulation and a biopsy is allowed).
3. Tumor new growth (without through perforation of a wall of a bladder, in cases of the planned radical cystectomy).
4. “Sandy patches” can be subjected only to a biopsy.
The usage of endoscopic surgical interventions is applicable at identification of proliferative changes of an urothelium at UGS lesions, taking into account reliable decrease in number of complications and duration of patients staying in a hospital is expedient. The usage of endoscopic surgery at UGS defeated and at patients with early stages of SA-BC allows to verify most fully and low-invasive localization and volume of damage of a bladder that promotes the maintaining quality of patients’ life. Minimization of complications of the postoperative period after low-invasive interventions allows avoiding performance of “open” operative measures.

The quantity of complications at endoscopic operations at SA-BC lesions is defined by surgeon’s experience and, in a small number of cases, depends on a stage and the sizes of a new lesion. Endoscopic urological equipment of the day hospital base located in an endemic zone of *Schistosoma* – is an important component of work of a urological hospital which employees provide medical care by the patient from the confirmed urinary system invasion of SH.

According to the accepted indications, the medical and diagnostic algorithm used on the basis of STH (Fig. 1) is created.

**Figure 1. The algorithm used at delivery of health care by UGS lesions and SA-BC on the basis of short-term hospital**

In our opinion, the medical and diagnostic actions can be conditionally divided into three stages for optimization of identification of cases of SA-BC:

- **Pre-hospital inspection.** Taking into account residence of most of patients in remote areas, the organization of laboratory and functional inspections and medical examination by specialists in the adopted standard is carried out in municipal hospitals. The patient is conducted the specialized examination in STH of regional hospital at the emergence of a gross hematuria;
- hospital stage. Specialized medical care in urology departments of regional hospital;
- rehabilitation stage. Dynamic observation and dispensary control of SA-BC lesions in medical institution at the place of residence. The algorithm of delivery of health care at pre-hospital and hospital stages is represented for UGS and SA-BC defeated in Figure 2.

Conclusion

The absence of due consideration to a problem of UGS and uniform tactics of observation and treatment of UGS lesions at all stages may become the reason of late detection of a bladder malignant tumors. Preventive oral treatment by the Praziquantel does not solve a problem of diagnosing of SA-BC in an early stage.

The continuous sorting of the patients with a gross hematuria living in endemic regions, consisting in redistribution of patients in the medical institutions.
equipped with the necessary diagnostic equipment and the endoscopic operational equipment and also staffed with the qualified specialists urologists that will allow to diagnose and treat in due time proliferative changes of a urothelium is expedient.

The cytological analysis of urine sediment for detection of SH eggs is the most available diagnostic method, but it does not correspond to high diagnostic criteria. The medical and diagnostic algorithm at patients with UGS has to include carrying out cystoscopy and, according to indications, perform the TURB. The similar approach in treatment tactics of UGS allows to verify SA-BC in early stages. It improves the forecast of a disease, keeps high quality of life for the young able-bodied citizen and solves a problem of prevention of the development of complications in malignant tumor cases. Considering the probability of development of SA-BC during 10-15 from the moment of SH infection, stages of further observation and medical examination of this group of patients have to be standardized.

The improvement of diagnostic method of a tumor, in combination with modern medical approach at SA-BC lesions, plus introduction of observation system of patients at a stage of rehabilitation – will allow to make manageable of the oncological growth, caused by the development of an urinogenital schistosomiasis. Conducting the TURB allows to reduce expressiveness of the irritable symptoms and to stop a gross hematuria schistosomiasis.

Conflict of Interest: No

Source of Funding: No

Ethical Clearance: All patients signed informed consent. Study approved by Local Ethics Committee.

References
1. IARC Monographs on the evaluation of carcinogenic risks to humans. Biological Agents. 2012;100B:35-44.
2. WHO World Health Assembly Resolution WHA 54.19 Elimination of Schistosomiasis. (accessed on 23 April 2018).
Introduction

Breastfeeding is an action taken by the mother in giving mother’s milk (ASI) directly to the baby. Early breastfeeding means if the baby breastfed immediately right after born. The rate of early breastfeeding in Indonesia is only 51.9%, of which 42.7% is done in the first 1 hour of birth while 9.2% is more than one hour after birth(1). This figure is low compared to other developing countries and opposes Indonesia, such as Timor Leste (75%)(2).

It adressed that 3 out of 5 babies are not breastfed in the first 1 hour after a baby is born to occur in a developing country(1). Though breastfeeding in the first 1 hour after the baby is born is a critical period for the survival of the baby. If the baby is not breastfed in the first 1 hour after birth, it is likely that the mother not give high milk quality to the baby which has an impact on the baby’s health like susceptible to disease even to death. Likewise with mothers, by breastfeeding the baby, the mother will avoid various diseases that even end in death such as the risk of breast cancer.

Advantages of breastfeeding and early breastfeeding are not accompanied by high rates of breastfeeding. In the city of Padang, the exclusive ASI rate for 2017 is 72.5%. This figure decreased compared to 10 years ago, namely in 2010 where the coverage of Exclusive Breastfeeding was 84.8%(2). While the rate of early breastfeeding at 0 months is only 39.8% and decreased to 15.3% in the next five months. This description shows that the potential failure of breastfeeding is very large. Therefore, researchers want to get an idea of how early breastfeeding is carried out in the city of Padang.

Method

The methodology used in this study is descriptive with a total number of 213 respondents postpartum mothers who are in the area of Padang City. Data collection was conducted from May to October 2018. Data was taken by purposive sampling with the number of respondents 213 postpartum mothers in the city of Padang. Data is analyzed univariately.

Results: It showed that the majority of respondents breastfed their babies within 1 day after giving birth which is 80% and within 1 hour after giving birth that is 14%, almost 100% of respondents gave colostrum to babies and more than half (53%) of respondents had motivation in early breastfeeding.

Conclusion: The success of early breastfeeding is due to the strong motivation of the mother to be able to carry it out.

Keywords: Early breastfeeding, Colostrum, Motivation.
retrieval is done by purposive sampling for 6 months starting from May-October 2018. Data was taken using a questionnaire. The data that has been collected analyzed by univariate analysis.

**Result**

**Table 1. Respondent’s Characteristic in Early Breastfeeding Practice in Padang**

<table>
<thead>
<tr>
<th>Respondent’s Characteristic</th>
<th>F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 – 35 years old</td>
<td>181</td>
<td>85</td>
</tr>
<tr>
<td>&lt; 20 or &gt; 35 years old</td>
<td>32</td>
<td>15</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>167</td>
<td>79</td>
</tr>
<tr>
<td>Not High</td>
<td>46</td>
<td>21</td>
</tr>
<tr>
<td><strong>Job</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Get Sallary</td>
<td>142</td>
<td>67</td>
</tr>
<tr>
<td>Not Get Sallary</td>
<td>71</td>
<td>33</td>
</tr>
<tr>
<td><strong>Mother’s Status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primiparous</td>
<td>66</td>
<td>31</td>
</tr>
<tr>
<td>Multiparous</td>
<td>147</td>
<td>69</td>
</tr>
</tbody>
</table>

Table 1 describes the characteristics of the respondents. Most of the respondents (85%) were in the age range of 20-35 years, higher education (79%), have jobs that make money (67%) and had multipara obstetric status (69%).

**Table 2. Early Breastfeeding Practice in Padang**

<table>
<thead>
<tr>
<th>Early Breastfeeding Practice</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 1 hour after delivery baby</td>
<td>30</td>
<td>14</td>
</tr>
<tr>
<td>&lt; 1 day after delivery baby</td>
<td>171</td>
<td>80</td>
</tr>
<tr>
<td>&gt; 1 day after delivery baby</td>
<td>12</td>
<td>6</td>
</tr>
</tbody>
</table>

Table 2 above shows that the majority of respondents breastfeed their babies within 1 day after giving birth which is 80% and within 1 hour after giving birth which is 14%. The percentage of respondents who breastfeed their first baby after 1 hour gave birth was greater than the percentage of early breastfeeding for less than 1 hour of delivery. Though the success of breastfeeding within 1 hour after the baby born has the potential for the success of subsequent breastfeeding.

**Table 3. Overview of Colostrum in Newborns in Padang**

<table>
<thead>
<tr>
<th>Giving Colostrum in Newborn</th>
<th>F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>198</td>
<td>93</td>
</tr>
<tr>
<td>No</td>
<td>15</td>
<td>7</td>
</tr>
</tbody>
</table>

Table 3 illustrates that almost 100% of respondents give baby colostrum and it was only 7% newborn did not get colostrum.

**Table 4. Post Partum Motivation on Early Breastfeeding Practice in Padang**

<table>
<thead>
<tr>
<th>Early Breastfeeding Motivation</th>
<th>F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal</td>
<td>112</td>
<td>53</td>
</tr>
<tr>
<td>External</td>
<td>101</td>
<td>47</td>
</tr>
</tbody>
</table>

Table 4 shows that more than half (53%) of respondents have internal motivation in early breastfeeding practice compare to those who were got external motivation for early breastfeeding practice.

**Discussion**

**Respondent’s Characteristic in Early Breastfeeding Practice in Padang:** The result of this study shows that most of the respondents (85%) were in the age range of 20-35 years, higher education (79%), have jobs that make money (67%) and had multipara obstetric status (69%). The status of primipara, and the low level of education are associated as a factor that causes breastfeeding problems (3,4).

**Early Breastfeeding Practice in Padang:** Table 2 above shows that the majority of respondents breastfeed their babies within 1 day after giving birth which is 80% and within 1 hour after giving birth which is 14%. The percentage of respondents who breastfeed their first baby after 1 hour gave birth was greater than the percentage of early breastfeeding for less than 1 hour of delivery. Though the success of breastfeeding within 1 hour after the baby born has the potential for the success of subsequent breastfeeding (5).

Breastfeeding within 1 hour after the baby born in the delivery room. All respondents taken in this study gave birth to vaginal delivery. Skin to skin contact between mother and baby occurs at this time because the baby feeds directly on the mother after birth. Skin-to-skin contact that occurs in the mother and baby while breastfeeding can prevent the baby from hypothermia. Skin to skin contact is very easy to implement and is an appropriate and affordable alternative technology action for everyone (4,5).

Breastfeeding provides an excellent opportunity to enhance a true symbiotic bond between mother and baby. If the mother succeed in breastfeed the baby at this time and carried out routinely and maintained by the process, the success of the breastfeeding for mother is high (3).
The success of give breastfeeding after delivery is also related to mothers self-efficacy which make mothers confidence about it. Factors related to mothers self-efficacy are age and previous pregnant experience. Maternal age less than 20 years affects early breastfeeding. Mrs. Cendrung has not had a breastfeeding experience because at this age the mother is generally a primipara. The status of primipara especially those who are under 20 years old can result in the withdrawal of early breastfeeding to infants.

Almost all of primiparous mother were not ready to face the reality of breastfeed. Mothers had an idea that breastfeeding would be natural without difficulties. When problems occurred, they perceived this to breastfeeding problem and choose to give artificial milk.

The problem of breastfeeding often occurs early in the postpartum period because mother feels pain. This situation is more experienced by primipara, namely the mother who first gave birth. The impact of the mother tends to delay breastfeeding. Because breastfeeding increased cramping pain after delivery. The increase in cramping pain is most likely due to the breastfeeding-associated oxytocin surge increasing uterine tone.

Despite of that condition, in Ethiopia, breastfeeding is one strategy to reduce the high infant mortality rate. Breastfeeding is a very simple action and does not require a lot of money.

**Overview of Giving Colostrum for Newborns in Padang:** Table 3 above illustrates that almost 100% of respondents give baby colostrum. Babies get colostrum in early breastfeeding. Colostrum is the milk that first comes out of the mother’s breast and is yellow and thick. Duration of breastfeeding and administration of colostrum are closely related to IQ. Early breastfeeding can also prevent hypoglycemia in newborns and contribute 45% to the success of exclusive breastfeeding. Therefore, breastfeeding should be given as soon as the baby born.

**Post Partum Motivation on Early Breastfeeding Practice in Padang:** Table 4 illustrates that more than half (53%) of respondents have motivation in early breastfeeding. Motivation for mothers to breastfeed the babies should have been implanted since pregnancy. Implementation of early breastfeeding on one’s own desires because mothers know the advantages of breastfeeding. So that the mother can be motivated to breastfeed as soon as the baby born. Health education about breastfeeding, a positive attitude from the mother and a comfortable environment while breastfeeding is very important to note so that the mother is able to breastfeed the baby early. Providing information on breastfeeding must be in accordance with the needs of the mother.

Information can also be gained through social media and peer group support. Nowadays almost all of mothers use social media. Mothers are using online social support groups in their thousands to seek information from people in similar situations so that they can support and motivate each others. Support from other people can motivate mothers to breastfeed babies. Support provided can be in the form of teaching how to breastfeed properly, and controlling emotions while breastfeeding. Supporting the new breastfeeding mother should include facilitate the motherhood transition, learn to read the baby’s cues, developing the right attachment at the breast, and build up the mother’s confidence in her capability to care for the baby and produce milk supply.

Moreover, the problem of breastfeeding often occurs early in the postpartum period. Health workers as professional health workers must help mothers overcome breastfeeding problems at the beginning of the postpartum period, especially for first-time mothers and those who give birth at a young age. In addition, mothers who clarified their doubts and discussed their problems with health care provider and breastfeeding support networks were more likely to breastfeed for a longer duration compared to those who did not.

**Conclusions**

Early breastfeeding is important for postpartum mothers because it is very beneficial not only for babies but also mothers. The first milk that comes out is colostrum which contains a lot of antibodies. The implementation of early breastfeeding should be done in the first 1 hour after the baby is born because the baby’s suction reflex is strong. The success of early breastfeeding is due to the strong motivation of the mother to be able to carry it out.

**Conflict of Interest:** There were no conflict interested on this study

**Source of Funding:** This study was conducted using a source of fund from Faculty of Nursing Universitas Andalas

**Ethical Clearance:** This research has passed from the Research Ethic of Medical Faculty of Universitas Andalas Padang Indonesia.
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The Effectiveness of Treatment of Giant Gastric and Duodenal Ulcers with Endonasal Electrophoresis Dalargin (Tyrosyl-D-Alanyl-Glycyl-Phenylalan-I-Leucyl-Arginine Diacetate)

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Abstract

Peptic ulcer disease (PUD) results from an imbalance between stomach acid-pepsin and mucosal defense barriers. It affects 4 million people worldwide annually. The incidence of PUD has been estimated at around 1.5% to 3%. **Purpose of our research** is to study the effect of dalargin on the course of giant gastric ulcer (GU) and duodenal ulcer (DU).

**Materials and Method** - The study and treatment was carried out in 80 people suffering from PU, with the presence of an ulcer defect ranging in size from 2 to 7 cm in diameter. Group 1 - 41 people received the drug from the group of proton pump inhibitors (PPIs) - omeprazole 20 mg 2 times per day + amoxicillin 500 mg 4 times per day + metronidazole 500 mg 3 times per day - 7 days, i.e. standard triple therapy. Group II, 39 people received along with standard therapy, dalargin-endonasal electrophoresis No. 12 according to the standard technique. **Results** - Patients with PU in both groups, who received standard therapy and standard therapy + endonasal electrophoresis of dalargin, already for 2-3 days from the moment of the start of treatment, showed significant improvement. **Conclusion** - It is advisable to combine standard therapy in the treatment of giant ulcers with the use of reparants, in particular, with dalargin endonasal electrophoresis

**Keywords:** Peptic ulcer diseases, Giant ulcer, Gastric ulcer, duodenal ulcer, Dalargin, Gastroenterology.

Introduction

The problem of complete cure for peptic ulcer (PU) still remains today. Undoubtedly, Helicobacter pylori infection (Hp) is one of the leading factors in the onset of peptic ulcer, and its presence leads to an increase in proliferative processes in the gastric mucosa, supports chronization of the process, occasionally creating a risk of relapse. Therefore, the main task is to eradicate Hp. The presence of “triple” and “quadrotherapy” for the successful eradication of Hp (according to the Maastricht Consensus 2000), can significantly reduce the frequency of recurrences and, accordingly, increase the remission period [1,5,6,7]. Recently, a number of features have been noted during peptic ulcer, in particular, change in the seasonality of the disease (for the first time and recurrence of the disease in 30% of cases are observed in the summer period, the latent forms of the disease have become more severe), an increase in the number of...
ulcers of the stomach and duodenum, measuring from 2 cm and more, the so-called “giant ulcers” (GU) has been noted. “Giant ulcers” (more than 2.0 cm in diameter with a duodenal ulcer and more than 2.5 cm with a stomach ulcer), attributed to the most severe forms of PU. The latter are poorly amenable to drug therapy, often (40-50%) are complicated by gastrointestinal bleeding and penetration (40-70%) into neighboring organs. Often with “giant ulcers” of the stomach there are perforations and gastrointestinal fistulas. The frequency of “giant ulcers” (GU) of the stomach according to endoscopic examination is 8.6% \cite{2, 3}. During the examination of patients suffering from giant-sized ulcers from 2.5 cm to 7 cm in diabetic patients. According to our data, there were a history of stressful situations, uncontrolled intake of NSAIDs, eating disorders, abuse of smoking and alcoholic beverages.

In the course of the study, we analyzed 853 case histories of patients with PU who were treated in the specialized gastroenterological department of the Republican Clinical Hospital named after O. N. Semashko, Simferopol. It turned out that the proportion of GU in 1995 accounted for 258 of the patients with ulcer cancer - 31 of them had GU (12%), in 1999 of 323 - 30 with them had GU (9%), in 2000 - out of 272 - 33 of them had GU (12%), i.e., every hundred patients with peptic ulcer of stomach and duodenum have a giant ulcer. In connection with the above data there is a necessity to add drugs with reparative properties in particular dalargin along with standard traditional treatment regimens for patients with ulcer.

Dalargin (tyrosyl-D-alanyl-glycyl-phenylalanyl-leucyl-arginine diacetate) is a drug with cytoprotective, antisecretory, anti-inflammatory and immunomodulatory effects (Dudar, 1993). As a reparant, in the treatment of ulcer it has been used for more than ten years, equal in efficiency to the H2-histamine receptor blockers \cite{4}. Its protective effect was proved by V.T. Smagin and co-authors (1986). The development of a non-parenteral route of administration (endonasal electrophoresis) for peptic ulcer disease belongs to the staff of the Department of Therapy and Gastroenterology, FPO, together with the Department of Physiotherapy and Balneology (Buglak N. P. et al., 1988). The following works are devoted to the study of the effectiveness of dalargin in the treatment of ulcer disease: Bulgakov SA, 1988, MV Levchenko, 1991. etc., but in these papers the effect of dalargin on the course of “normal” ulcers was studied. In our case, we are dealing with “giant ulcers” that possess the above flow features.

**Purpose of the study:** The aim of our research is to study the effect of dalargin on the course of giant gastric ulcer (GU) and duodenal ulcer (DU).

**Materials and Method**

The study and treatment was carried out in 80 people suffering from PU, with the presence of an ulcer defect ranging in size from 2 to 7 cm in diameter of these, 46 patients (34 men and 12 women) suffered from duodenal ulcer and 34 patients (22 men and 12 women) had gastric ulcer. The age of patients ranged from 26 to 70 years, of which Hp-positive - 89%. All of them complained of pain and heaviness in the epigastric region, nausea, belching, recurrent heartburn.

The diagnosis of ulcer was verified by clinical, instrumental (Fibro gastroduodenoscopy (FGDS) before and after treatment with the obligatory determination of the possibility of helicobacter infection and morphological study) method. The presence of Helicobacter pylori (Hp) infection was confirmed by cytological method (detection of Hp in a smear imprint).

Depending on the treatment regimen used, all patients were divided into 2 groups.

Group 1 - 41 people (23 with DU and 18 with GU) received the drug from the group of proton pump inhibitors (PPIs) - omeprazole 20 mg 2 times per day + amoxicillin 500 mg 4 times per day + metronidazole 500 mg 3 times per day - 7 days, i.e. standard triple therapy.

Group II, 39 people (23 with DU and 16 with GU) received along with standard therapy, dalargin-endonasal electrophoresis No. 12 according to the standard technique.

Monitoring the effectiveness of treatment was carried out using the assessment of the objective status of patients (the disappearance of pain and dyspeptic syndromes), control by FGDS every 2-4 weeks after the course of treatment.

**Research results:** Patients with PU in both groups, who received standard therapy and standard therapy + endonasal electrophoresis of dalargin, already for 2-3 days from the moment of the start of treatment, showed significant improvement (the intensity of pain and dyspeptic syndromes decreased significantly, Table 1).

...
Tab. 1. The average timing of the clinical manifestations of ulcer after the start of treatment.

<table>
<thead>
<tr>
<th>Clinical manifestations</th>
<th>Decrease I group (n=41)</th>
<th>Disappearance I group (n=41)</th>
<th>Decrease II group (n=39)</th>
<th>Disappearance II group (n=39)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain syndrome (in days)</td>
<td>2.9</td>
<td>13.2</td>
<td>2.6</td>
<td>11.0</td>
</tr>
<tr>
<td>Dyspeptic syndrome (in days)</td>
<td>3.0</td>
<td>11.9</td>
<td>3.0</td>
<td>9.3</td>
</tr>
</tbody>
</table>

The complete disappearance of pain from the start of treatment in the first group of patients with PU was observed on day 13.2 (in patients with DU, on day 12 and in patients with GU, on day 16); In the second group, on day 11.0 (in patients with DU, on day 11, from GU, for 13 days). Disappearance of dyspeptic syndrome in groups I and II, on average, on days 12 and 9, respectively. In the I group in patients with DU, 11.2 days; with GU 13 days. In the second group - with DU - for 8.8 days, with GU - for 10 days.

Full scarring on the background of the treatment came in the I group on the 30.6 day; in the II group - for 27.8 days. (tab. 2).

Table 2. The average time of scarring ulcers

<table>
<thead>
<tr>
<th>Groups</th>
<th>All PU (in days)</th>
<th>DU (in days)</th>
<th>GU (in days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I group</td>
<td>30.6</td>
<td>28</td>
<td>34</td>
</tr>
<tr>
<td>II group</td>
<td>27.8</td>
<td>23.7</td>
<td>34</td>
</tr>
</tbody>
</table>

Discussion

Peptic ulcer disease (PUD) results from an imbalance between stomach acid-pepsin and mucosal defense barriers. It affects 4 million people worldwide annually [8]. The incidence of PUD has been estimated at around 1.5% to 3% [9]. A systematic review of seven studies from developed countries estimated that the annual incidence rates of PUD were 0.10%-0.19% for physician-diagnosed PUD and 0.03%-0.17% when based on hospitalization data [10]. Although 10%-20% of patients with PUD will experience complications, only 2%-14% of the ulcers will perforate causing an acute illness [11,12]. Perforation is a serious complication of PUD and patients with perforated PU often present with acute abdomen that carries high risk for morbidity and mortality [13]. The lifetime prevalence of perforation in patients with PUD is about 5% [14]. PPU carries a mortality ranging from 1.3% to 20% [15,16,17]. Thirty-day mortality rate reaching 20% and 90-d mortality rate of up to 30% have been reported [18,19]. In developing world, patients tend to be young male smokers while in developed countries; patients tend to be elderly with multiple co-morbidities and associated use of NSAIDs or steroid [20,21]. NSAIDs, Helicobacter pylori, physiological stress, smoking, corticosteroids and previous history of PUD are risks factors for PPU [8,22-30].

In 1843 Edward Crisp stated that “the symptoms are so typical, I hardly believe that it is possible that anyone can fail in making a diagnosis” [31]. Symptoms of PUD include abdominal pain, upper abdominal discomfort, bloatedness and feeling of fullness. The classic triad of sudden onset of abdominal pain, tachycardia and abdominal rigidity is the golden signs of PPU.

The clinical manifestation can be divided into three phases [32]. In the initial phase within 2 h of onset, epigastric pain, tachycardia and cool extremities are characteristic. In the second phase, pain becomes generalized and is worse on movement. Typical signs such as abdominal rigidity and right lower quadrant tenderness may be seen. In the third phase, abdominal distension, pyrexia and hypotension with acute circulatory collapse may be evident.

PPU is a surgical emergency associated with high mortality if left untreated. In general, all patients with PPU require prompt resuscitation, intravenous antibiotics, analgesia, proton pump inhibitory medications, nasogastric tube, urinary catheter and surgical source control. Even though these standard therapy has effectiveness towards the complete cure of giant peptic ulcer, the use of dalargin proves to be more effective and more faster, which has been explained in our research.

Previously the authors showed that several endogenous opioid peptides and their synthetic analogs have marked antiulcerative activity in rats with an experimental model of cysteamine-induced duodenal ulcer [33, 34]. The substance with the strongest antiulcerative potential was found to be a hexapeptide, which was synthesized in Institute of Experimental Cardiology, All-Union Cardiologic Scientific Center, Academy of Medical Sciences of the USSR (Director M. I. Titov), and called as dalargin. It differs from the N-terminal fragment of dinorphine in replacement of Gly by D-Ala in position 2. Dalargin has now been...
successfully used for the treatment of peptic ulcer in humans [35].

**Conclusion**

1. The use of dalargin promoted an earlier improvement in the subjective status of patients (the disappearance of pain and dyspeptic syndromes occurred 1-3 days earlier).

2. Complete scarring in a group of patients with PUD who received endonasal electrophoresis of dalargin occurred 4 days faster than in the group who received only standard therapy.

3. In patients with PU, the duration of cicatrization did not have a significant effect on dalargin, which can probably be explained by the difference in the etiopathogenetic factors in the formation of DU and GU.

4. It is advisable to combine standard therapy in the treatment of giant ulcers with the use of reparants, in particular, with dalargin endonasal electrophoresis.

**Conflict of interests:** None declared.

**Source of Funding:** Self funding by authors

**Ethical Clearance:** In our study involving all human participants were in accordance with ethical standards of the responsible committee on human experimentation and with the Helsinki Declaration of 1964 and later amendments.

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Effect of Education about LGBT on Student of Faculty of Nursing Andalas University

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¹Faculty of Nursing Andalas University Campus Limau Manis, Pauh District, West Sumatra, Indonesia

Abstract

Lack of knowledge about LGBT in Nursing students will hinder the process of nursing care given to LGBT patients when practicing in health care settings. Therefore the knowledge of students must be improved, so that the implementation of nursing care can be maximized. This type of research is quasi-experimental with a one-group pretest-posttest approach with control group design. The sample amounted to 119 people, taken by proportional random sampling technique. The study was conducted from January to July 2017. Analysis of the data using a paired sample t-test. The results showed that there was an increase in the average knowledge and attitudes of respondents after being given an intervention. From the results of the test, analysis shows that there is an influence of education on the knowledge and attitudes of respondents ($p = 0.000$). It is expected that all respondents can always increase their knowledge about LGBT so that nursing care can improve the health of these patients.

Keywords: Students, nursing, education, LGBT

Introduction

Nurses as one of the health workers have some roles in carrying out their duties following their rights and authority. In nursing care to patients, a nurse has a role, namely: as a nursing care provider, advocate, educator, coordinator, collaborator, consultant, and as a reformer. One of the roles of nurses to improve the knowledge of patients and their families is the role of educators, namely helping patients improve their health through providing knowledge about care and medical actions they receive.

Low knowledge will make nursing care received by patients not optimal. This makes fear and lack of interest from nursing staff to treat patients, especially LGBT patients. Therefore a nurse must always increase her knowledge about health problems, especially about health care for LGBT patients, so that the nursing care provided can be optimal and help accelerate the recovery of patients, especially LGBT patients.

Increasing knowledge about LGB can be started from nursing students as prospective professional nurses so that nursing care given after becoming a professional nurse will be of higher quality. The results of several studies that have been carried out show that the attitudes of poor health workers can negatively affect the quality of nursing care received by LGBT individuals.

Method

This type of research is a quasi-experimental type of pretest-posttest control group design. This research was conducted from January to July 2017 with a total sample of 119 people. The statistical test used in this study was a paired sample t-test.

The intervention group was given health education about LGBT (definition, cause, impact, and prevention), using various media: pre-presentation with power points, small group discussions, videos, and leaflets. Whereas the control group did not carry out any intervention, but after completion of the study the control group would receive the same intervention as had been done in the intervention group.
Procedure for implementing intervention:
1. Sample selection of proportional stratified random sampling techniques.
2. Health education interventions; causes, effects and prevention of LGBT using media: presentations using power points, small group discussions, videos, and leaflets.
3. Health education interventions about LGBT are carried out in the classroom.
4. The intervention is carried out for 30 minutes.
5. Evaluation is carried out before and after the intervention

Results
The number of respondents in the intervention group was 59 which consisted of 4 men and 53 women. While the control group amounted to 60 people, consisting of 3 men and 57 women. The results of the statistical tests show that in the intervention group there was a significant increase in the knowledge and attitudes of the respondents after being given the intervention, as shown in table 1 and table 2, below.

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>Group</th>
<th>Mean</th>
<th>Differences</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean</td>
<td>Standar Deviasi</td>
</tr>
<tr>
<td>Before intervention</td>
<td>Eksperimen</td>
<td>8,61</td>
<td>2,729</td>
<td>1,883</td>
</tr>
<tr>
<td>After intervention</td>
<td></td>
<td>11,34</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before intervention</td>
<td>Control</td>
<td>8,50</td>
<td>0,183</td>
<td>0,983</td>
</tr>
<tr>
<td>After intervention</td>
<td></td>
<td>8,52</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2. Average Differences in Respondents’ Attitudes Before and After Education About LGBT

<table>
<thead>
<tr>
<th>Attitudes</th>
<th>Group</th>
<th>Mean</th>
<th>Differences</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean</td>
<td>Standar Deviasi</td>
</tr>
<tr>
<td>Before intervention</td>
<td>Eksperimen</td>
<td>48,69</td>
<td>4,186</td>
<td>4,045</td>
</tr>
<tr>
<td>After intervention</td>
<td></td>
<td>52,88</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before intervention</td>
<td>Control</td>
<td>47,30</td>
<td>0,367</td>
<td>5,295</td>
</tr>
<tr>
<td>After intervention</td>
<td></td>
<td>47,67</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

From tables 1 and 2 it appears that the average knowledge and attitude of the intervention group has a significant increase with a value of p = 0,000.

The results showed that there was an effect of education about LGBT on the respondents knowledge and attitudes (p value = 0,000). The average knowledge before being given education in the intervention group was 8.61 and the attitude before the intervention was given was 48.69. The average knowledge after being given education in the intervention group was 11.34 and the attitude before being given education in the experimental group was 52.88. For more details, see the following table.

Discussion
After conducting health education interventions about LGBT there was an increase in the average knowledge and attitudes of the respondents. By the theory that knowledge is the result of knowing something that happens after someone senses an object. Sensing can be through vision, illumination, smell, touch, and taste. The formation of one’s actions is strongly influenced by the knowledge they have. Therefore nurses must always improve their knowledge so that care services provided to patients, especially LGBT patients, can be more optimal (5).

Increasing the average knowledge of respondents after being intervened with knowledge about LGBT is also caused by the use of diverse learning media so that students’ understanding becomes better and students learn easily. The media used are: presentations, small group education or SGD (Small Group Discussion) with several groups of 4-5 people and brainstorming. With a variety of learning media that make respondents easier to absorb the material delivered can be well received (6-8).
The results showed that the average knowledge score after education was increased, from 8.61 to 11.34 with a difference of 2.73 points from before intervention. The results of statistical tests obtained $p = 0.000$ ($p \leq 0.05$), meaning that there were differences in the average knowledge before and after education about LGBT respondents. The increase in knowledge is influenced by various factors, including the use of instructional media that varies during the intervention. To make the learning atmosphere more enjoyable so that the absorbency of the given knowledge is better when compared to just one learning media $(9, 10)$.

Knowledge of cognitive is a very important domain for the formation of one’s actions (overt behavior). Likewise, the results of intervention research to improve nursing students’ knowledge about LGBT will greatly influence the attitudes and actions of implementing nursing care that will be provided by prospective nurse students to LGBT patients. So that LGBT patients can get good care without any prejudice that will hinder the provision of nursing care $(11, 12)$.

From the results of the interventions that have been given, it turns out that the intervention group experienced an increase in average knowledge far better than the control group. This is caused by many factors, one of which is the learning media used. In intervention research to improve knowledge and attitudes of prospective nurse students in providing nursing care to LGBT patients using a variety of media so that the atmosphere during the intervention is not boring and the material provided is easily absorbed by participants $(7,12)$.

Another advantage of increasing the average knowledge of respondents can also be seen from the results of the average attitude of respondents who increased intervention a lot compared to the control group. The attitude after being given education shows that the average score of respondents before the intervention was 48.69 increasing to 52.88. Whereas in the control group there was no increase. Attitudes need to explore beliefs about LGBT sexuality that may be related to attitudes towards LGBT. This is very necessary to reduce or eliminate negative prejudice against LGBT patients. So that the care provided by nurses will be more optimal which of course will benefit patients by shortening the day of care for LGBT patients $(6,11)$.

This research shows that health education interventions have the power to increase positive attitudes about LGBT. From the results obtained, it can be seen that the need for continuous improvement in the curriculum and the development of validated evaluation tools for health professional curriculum is one of them is nursing staff. The findings of this study indicate that respondents acknowledged that there was still a lack of knowledge they had to treat an LGBT patient, both in the formal and informal curriculum associated with the LGBT population. Thus there is a need for professional efforts to improve LGBT health training for all nursing staff. Professional approaches are especially valuable in their capacity to utilize existing resources to increase knowledge that has the effect of long-term change, both individually and in groups $(5, 12)$.

**Conclusion**

The conclusions that can be taken based on the results of the study are: There is an educational effect on LGBT on the knowledge and attitudes of respondents ($p$-value $= 0.000$). Suggestion: It is expected that all nursing staff can always improve their knowledge and understanding of LGBT so that nursing care given to suspected LGBT patients can be optimal.

**Conflict of Interest:** No conflict of interest arose in this study. Source of Finding: This study was conducted using a source of funds derived from the researcher himself

**Ethical Clearance:** This Study Has Passed of the Medical Research Ethics of the Andalas Padang Indonesian.

**Reference**


Mental Health and Social Capital among B40 Groups in East Coast of Peninsular Malaysia

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¹Student, ²Professor, Faculty of Applied Social Sciences, Universiti Sultan Zainal Abidin

Abstract
The purpose of this study was to evaluate the effect of social capital towards mental health among low income group. Malaysia Department of Statistics recorded 2.7 million of the low income group known as B40 in year 2016. This is a very serious situation because mental health can affect quality of life. To wear out this issue, communities are urged to utilize social capital as a device to improve mental health. This study involved respondents among low income group in Kota Bharu district and a set of 120 questionnaires was formulated to collect data. Statistical Package for Social Science (SPSS) was used to analyze the data. The result shows the elements of social capital contribute positively to the mental health. The government can utilize this finding as a foundation to create a better policies, procedures and programs for the communities and also significant in enhancing the level quality of life.

Keywords: Mental health, social capital, peninsular Malaysia.

Introduction
Mental health is a developing general wellbeing concern and has been evaluated to move up to 450 million individuals over the world. In nations with highly populations, to excess of 33% of the populace will meet the standards for some type of psychological instability among their life.¹ State of mind and tension issue have a tendency to have the most high extensiveness rates and it has been expected that real depressive issue will be the second driving infection load universal by 2020.² Psychological neurosis frequently has endless impacts that can last a life-time and harmfully influences people’s personal satisfaction at home, school, work, and in social settings.³ This problem is being discussed among current social researchers because it can affects quality of life. This issue also is closely related to economic and income factors. Department of Statistics 2015 found 2.7 million B40 groups with 63 percent living in the urban areas and the remaining 37 percent were rural.⁴ Mental health is generally connected with social capital dimensions, for example, gatherings, trust and solidarity, aggregate activity and social attachment. There were a few studies that show the role of communities in order to develop the country.⁵ ⁶ Nahapusit et al., said that social capital is in a general wisdom and there is still no identical understanding, neither correct meaning for instance.⁷ Burt described social capital as the structure of relationship frameworks and facts available to an individual,⁸ while Coleman even just described social capital as a sort of capital, and can be made when the association between individuals is used to support their exercises.⁹ Nevertheless, there is still no correct and completely recognized meaning, for example, Bourdieu described social capital as the addition of genuine and potential resources inside a precise framework, where the framework is made out of associations that incorporate shared partner and basic verification.⁰ while Adler and Kwon described it as the arrangement of associations which builds the estimation of the general population framework characters by getting to the assets fixed in the framework.¹¹ Amin and Zolkifeli has conducted research about analysis dimensions of social capital among poverty group in suburbs and the results shows that social capital is still relevant in communities.¹²

A universal researcher of the social capital and mental health writing demonstrate that investigations of depression have a main piece of the writing. The high pervasiveness rates of depression and the ease of estimating depression through short polls likely give to a limited extent to noticeable quality of research on unhappiness and social capital. Most investigations of social capital and unhappiness have utilized communitarian scopes of social capital, for example, trust and support. A few examinations have demonstrated
individual-level summed up trust to be identified with depressive side effects. In thinks about estimating obvious neighborhood trust, higher trust in neighbors has additionally been looked to be a defensive factor of sadness. Studies utilizing indicators of network interest and charitable effort to gauge social capital have not demonstrated social money to be identified with sadness. While singular level considers have loaned some help for the connection among discouragement and social capital, the scopes of social capital utilized in these investigations are tricky since they have a tendency to incorporate just communitarian estimates, for example, trust and interest. To overcome this problem, the researchers had proposed to apply social capital in order to get a better mental health. Besides, low income group are need to change their role and be a part of social capital.

Hypothesis Model

<table>
<thead>
<tr>
<th>Social Capital</th>
<th>Mental Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Network and communication</td>
<td></td>
</tr>
<tr>
<td>• Trust</td>
<td></td>
</tr>
<tr>
<td>• Value, norms &amp; habits</td>
<td></td>
</tr>
<tr>
<td>• Social rules</td>
<td></td>
</tr>
<tr>
<td>• Ability or capability</td>
<td></td>
</tr>
<tr>
<td>• Religious needs</td>
<td></td>
</tr>
</tbody>
</table>

The determination of this study is to know how social capital among low income group will influence mental health. The hypothesis model of this study was developed based on a few theories that relates to important dimensions of social capital incorporate instruction, wellbeing, shared help additionally is related with independent financial advancement without requirement for government mediation.

Based on previous study, six dimensions of social capital were recommended. The dimensions are networks & communications, trust, value, norms & habits, social rules, ability or capability and religious needs. All the dimensions were predicted to influence the mental health.

Measures: The study was applied a survey by quantitative method. The study individuals were low income group households in Kota Bharu. The questionnaire used five point Likert scale, ranging from “Strongly disagree” to “Strongly agree”. The questionnaire contains of six dimensions that were to evaluate the research variables that is social capital. A collection of 120 respondents had addressed the poll. Statistical Package for Social Science (SPSS) was used to analyze the data. The interaction between variables was tested using regression weight, while the amount of prediction was calculated by R squared.

Results

Findings prove that the dimensions of social capital and mental health among low income group are at a high level as appeared Table 1. All the variables dimensions of social capital indicate a min greater than 3. This shows the level of social capital is high because the median scale for this scale is 3. If the value is greater than 3, it is considered as good as it is closer to the value 5. Instead, if the mean value of the score is lower than 3, the variable’s level is reflected low because it is approaching the minimum value 1. The scale of this measurement refers to the study conducted by Mohd Shaladdin et al. Hence, all the variables of social capital and mental health were at high levels.

<table>
<thead>
<tr>
<th>Construct</th>
<th>Mean</th>
<th>Sd</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
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<tr>
<td>Networks &amp; Communications</td>
<td>3.1759</td>
<td>.37134</td>
<td>.162</td>
<td>-.216</td>
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<tr>
<td>Trust</td>
<td>3.3150</td>
<td>.37900</td>
<td>.070</td>
<td>-.760</td>
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<tr>
<td>Value, Norms &amp; Habits</td>
<td>3.3008</td>
<td>.33368</td>
<td>.234</td>
<td>-.091</td>
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<td>Social rules</td>
<td>3.3050</td>
<td>.37346</td>
<td>.284</td>
<td>-.701</td>
</tr>
<tr>
<td>Ability or capability</td>
<td>3.3350</td>
<td>.37855</td>
<td>.290</td>
<td>-.719</td>
</tr>
<tr>
<td>Religious needs</td>
<td>3.5033</td>
<td>.37639</td>
<td>-.276</td>
<td>-.937</td>
</tr>
<tr>
<td>Mental Health</td>
<td>3.9917</td>
<td>.58101</td>
<td>-.247</td>
<td>-.541</td>
</tr>
</tbody>
</table>
Table 2 displays the descriptive measurements of social capital among low income group in Kota Bharu. The statistics shows these dimensions, network and communication (mean=3.2747, std. dev.=0.39099); trust (mean=3.3458, std. dev.=0.36566); value, norms & habits (mean=3.3580, std. dev.=0.37538); social rules (mean=3.3347, std. dev.=0.37432); ability or capability (mean=3.4125, std. dev.=0.39321) and religious needs (mean=3.5743, std. dev.=0.37902). The level of social capital among low income group was at a high level as shown.

By hypothesis testing, the findings show all dimensions of social capital contributing significantly to mental health. The findings also show that all dimensions of social capital contribute 10.8 percent to mental health. Testing of regression social capital contributing positively to the mental health low income group. All the results were concluded in final model as shown in Figure 2.

**Conclusion**

This study is also applicable to a wide range of social studies in Malaysia. Based on the result shows that social capital was played an important role by contribute positive percentage of regression to mental health among low income group in Kota Bharu. Social capital can be a profitable resource for associations and managements should attempt to encourage it by empowering social connections between workers, specialty units and even with colleagues. Therefore, government can utilize this finding as a foundation to create better policies, procedures and programs for the communities.

In future, this study can be extending by looking at others aspects of influence mental health such as quality of life. It is because quality of life seems to be very important element in community development through the studies that has been conducted by a few researchers.24, 25, 26, 27

**Acknowledgement:** The authors acknowledge to Faculty of Applied Social Sciences, Sultan Zainal Abidin University for supporting in this research.

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Sultan Zainal Abidin University

**Ethical Clearance:** The current study was approved by the Faculty of Applied Social Sciences, Sultan Zainal Abidin University. All participants were informed about the study.

**References**


The Influence of Nurse’s Knowledge Level on Behaviour Changes, Attitude and 5 Moments of Hand Hygiene Compliance

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Abstract

Introduction: The five moments of handwashing, established by the World Health Organisation (WHO), are important to break the chain of transmission of disease. Human behaviour is influenced by two factors, namely behavioural factors and factors related to outside behaviour. Behaviour is formed from three factors: predisposing factors (knowledge, attitudes, beliefs and values), supporting factors (physical environment, availability or absence of health facilities) and reinforcing factors (in the form of the nurses’ attitude and behaviour). This study aims to determine the effect of the level of knowledge of nurses in nursing homes on their attitude, behaviour and adherence related to the 5 moments of hand hygiene.

Method: This study used a questionnaire to measure the level of knowledge, attitude, behaviour and level of adherence of the nurses concerning the 5 moments of hand hygiene. The research design used a analytic cross-sectional approach. The respondents were all nurses at Panti Werdha Surya, and the sampling technique used was purposive sampling. The study was conducted between January and April 2018.

Results and Analysis: The data was analysed using a multinomial regression test. The results showed the influence of nurses’ level of knowledge on attitudinal changes (p = 0.000). There was an influence from the nurses’ level of knowledge on behavioural change and there was influence from the nurses’ level of knowledge on compliance with the 5 moments of hand hygiene (p = 0.000) in an effort to prevent the transmission of shingles in nursing homes.

Conclusion: The level of knowledge of nurses needs to be improved continuously, so then changes in attitude, behaviour and adherence take place concerning the 5 moments of hand hygiene. This is as well as providing hand washing and rubbing facilities at each door within the nursing home.

Keywords: Level of Knowledge, Attitudes, Behaviour, Compliance, Nursing home.

Background

An elderly individual, according to Article 1 number 2-3 Law Number 13 Year 1998 about the Prosperity of the Elderly, is a person who has reached the age of 60. Community groups including the elderly mostly now live in nursing homes, and there is a trend that society is continuously increasing in relation to life expectancy. The elderly who live in a nursing home are susceptible to contracting infectious disease. This can be caused by the prevalence of organ function decline, the existence of dementia and incontinence, poor oral hygiene, and trouble swallowing1.

Infectious diseases that commonly affect the elderly in nursing homes include pneumonia, urinary tract infections and skin and soft tissue infections. Pneumonia is still the main cause of morbidity and mortality in adults.

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who are older, and, with an increase in age, it becomes the cause of almost half of all hospitalisations and related deaths. A population census from a statistics agency in 2010 showed that the elderly in Indonesia were counted as being 18,043,712; in other words, 7.68% of 237 million Indonesian citizens were elderly. Hand hygiene is a main and important factor related to preventing the spread of pathogens and antibiotic resistance, whether in hospitals or in nursing homes, because the number of infections that can be transmitted through the hands of a caretaker is vast. Hand hygiene can prevent Health Care Associated Infections (HAIs) and increase the health of the elderly. Hand hygiene is a part of standard care that can decrease infections in the health team and also in the patients. Washing of the hands is one of the effective steps undertaken to break the chain of infection transmission, hence the number of incidences of nosocomial infections and Health Care Associated Infections can be reduced. Research results shows that effective education programs can increase knowledge, positive behaviour, the right practices when conducting prevention policies and infection control. Non-compliance when concerning hand hygiene is a bad behaviour and one that can be controlled during training. Health workers need more information and education on the prevention and control of infection, especially in relation to hand hygiene to increase the quality of the offered health services. There is a relationship between the knowledge of a nurse regarding nosocomial infection with washing of the hands, as observed at the Inpatient installation in Dharmais Cancer Hospital in Jakarta. Knowledge and behaviour are factors that relate to nursing practices and the prevention of nosocomial infections in phlebitis events in RSUD, Semarang.

The knowledge of a nurse about the 5 moments of handwashing is very influential and related directly the practice of handwashing. In the previous research, the knowledge of nurses on hand washing was still categorised as not good according to the results (70.5%)%. The five moments of handwashing are not implemented well by nurses. This is supported by the research of Koeswo dan Pratama (2015), where it was shown that nurses do not wash their hands in the first moment by 52%, 50% in the second moment, 75% in the third moment, 69% in the fourth moment and 78% in the fifth moment. Previous research done by Pateda dan Rabbani (2013) showed the results that 16.7% of hand washing behaviour was in the good category, 24.4% was in the less good category and 59% was in the bad category. Supporting factors including physical environment and the available health facilities for hand washing that, when realised optimally, can ease the realisation of the positive attitude and behaviour of the health worker when it comes to doing the 5 moments hand Hygiene. The purpose of this research in general was to acknowledge the impact of the level of education of nurses on the attitude, behaviour and obedience of nurses in Surya Surabaya nursing home concerning the practice of the 5 moments of Hand Hygiene.

Method

The research design used was analytical and observational, using a cross-sectional approach. The population in this research included all executive nurse in Surya Nursing Home who had worked there for at least 2 years. The technique used to take samples was saturated sampling, where all the available population became the sample of the research. This research was conducted between January and April 2018. The data was taken using a research instrument in the form of a questionnaire about the characteristics of the nurse, and their level of knowledge, attitude, behaviour and obedience using a Likert scale model (5). Before we did the main body of the research itself, we conducted a validity test and questionnaire about the reliability beforehand. We then analysed the data obtained using a multinomial logistic regression test.

Result

Table 1. Characteristics of the respondents and the related variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Female</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21-30 years old</td>
<td>3</td>
<td>13,64</td>
</tr>
<tr>
<td>31-40 years old</td>
<td>18</td>
<td>81,82</td>
</tr>
<tr>
<td>41-50 years old</td>
<td>1</td>
<td>4,55</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High School</td>
<td>17</td>
<td>77,27</td>
</tr>
<tr>
<td>Diploma 3</td>
<td>5</td>
<td>22,73</td>
</tr>
<tr>
<td>Working Time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-2 years</td>
<td>2</td>
<td>9,09</td>
</tr>
<tr>
<td>3-5 years</td>
<td>6</td>
<td>27,27</td>
</tr>
<tr>
<td>6-8 years</td>
<td>12</td>
<td>54,55</td>
</tr>
<tr>
<td>9-10 years</td>
<td>2</td>
<td>9,09</td>
</tr>
</tbody>
</table>
In Table 1, the respondents were categorised based on their sex, age, level of education and working time (n = 22). All of the respondents were female (100%), and almost all of the executive nurses were aged between 31 years old – 40 years old (81.82%). The level of knowledge of almost all of the executive nurses was that of high school (77.27%) and most of the executive nurse had worked for 6-8 years.

Based on Table 1, we can see that almost all of the nurse’s had a level of knowledge about the 5 moments of hand hygiene in the bad category (86.36%), and that only a few of the executive nurses had good knowledge (4.55%). Meanwhile the attitude of the nurses about hand hygiene being able to prevent the transmission of disease showed that most of them stated Agree (72.73%), and only a few of the executive nurses stated Strongly Agree (4.55%). The behaviour of the executive nurses in the context of supporting hand hygiene to prevent the transmission of disease showed that almost all of them stated Average (77.72%), and only a few stated Very Supportive (9.09%). The level of Obedience of the nurses in doing the 5 moments of hand hygiene found that most of them stated Disobedient (54.55%), and only a few stated Obedient (4.55%). This research shows that there is a meaningful and positive correlation between the level of knowledge of the nurse about the 5 moments of hand hygiene and the obedience of physically doing the 5 moments of hand hygiene, with a strong level of correlation (r=0.701; p=0.021). This means that the lower the knowledge of the nurse about the 5 moments of hand hygiene, the worse the obedience of the nurse when it comes to doing the 5 moments of hand hygiene. The results of the multinomial logistic regression test showed that the level of knowledge of the nurses about the 5 moments of hand hygiene can only explain the quality change in the level of obedience but also that the impact of knowledge level is significant (p=0.000). Regarding the attitude of the executive nurses, there is a meaningful correlation between the attitude of the nurse about the 5 moments of hand hygiene and obedience when it comes to physically doing the 5 moments of hand hygiene, and it was shown that the power of the correlation is weak (r=0.190; p=0.031). This means that the better the attitude of the nurse about the 5 moments of hand hygiene, the better the level of obedience when physically doing the 5 moments of hand hygiene. The results of the multinomial logistic regression showed that the attitude of the nurses about the 5 moments of hand hygiene can be used to explain the impact of the attitude of the nurse about the 5 moments of hand hygiene by 10.7% and that the impact of the attitude of the nurse related to obedience is significant (p=0.000). Regarding the behaviour of the executive nurse and obedience when doing the 5 moments of hand hygiene, there was a meaningful correlation between the behaviour of the nurse and obedience, and the correlation was strong (r=0.690; p=0.001). This means that the more supporting behaviour that there is from the nurse regarding the 5 moments of hand hygiene, the better the level of obedience. The results of the multinomial logistics regression test showed that the behaviour of the nurses concerning the 5 moments of hand hygiene react with the obedience of the nurse and the 5 moments of hand hygiene by 13.8% and that the impact is significant (p=0.000).

**Discussion**

The respondent’s knowledge regarding the 5 moments of hand hygiene is linked to their associated level of obedience (p=0.000). The higher the respondent’s knowledge about the 5 moments of hand hygiene, the more obedient the nurses were when it came to practising the 5 moments of hand hygiene (r=0.701). The impact of the level of knowledge had a big impact on the obedience of the nurse by 10.1%. This shows that the impact on obedience comes from a different factor other than knowledge (89.9%). The finding of
this research supports the previous research done by Al-Khawaldeh, Al-Hussami and Darawad (2015), who stated that education on hand hygiene will affect the knowledge, attitude and behaviour of paediatric nurses and NICUs in Zanjan hospitals\textsuperscript{14}. Other than that, the awareness of nurses about the right way to wash their hands is a process that pushes them to adhere to hand hygiene situations. Hence, the quality of nursing care is affected by the knowledge, attitude and behaviour of the executive nurses who provide health care. Only a little part of this research was specially related with the nurses, although there is evidence that shows that the obedience of nurses related to doing the 5 moments of hand hygiene can be improved by the application of audits and increased knowledge and supervision, which will cause a change in the culture of the working environment and obedience to promote doing the 5 moments of hygiene the correct way\textsuperscript{15}.

The research findings show that there is a gap in the level of knowledge of the nurses, which can be overcome with a short and more frequent training system, especially in hospitals. The guidelines on the 5 moments of hand hygiene are well known by nurses and well-promoted in hospitals. This is reflected by the positive attitude of the nurse and non-medical staff. Improving the compliance of the nurses can be done by training continuously\textsuperscript{16}. The nurses needs to remember the lessons from their study experience, because this will be effective at increasing their knowledge and understanding that this will also affect their behavior in a positive way. This means that the importance of the individual’s experience has a bigger impact than formal teaching methodology\textsuperscript{17}.

**Conclusion**

The knowledge, attitude and behaviour of executive nurses has a significant effect on the obedience of executive nurses concerning the 5 moments of hand hygiene. Other than the level of knowledge, attitude and behaviour of the individual nurse, it is suspected that age and working time also affects the obedience of the executive nurse. Training and the periodic delivery of information is needed whether by electronic media or via practice to increase the level of knowledge of nurse is important, so then nurses will be more obedient at adhering to the 5 moments of hand hygiene. Other things that can increase the obedience of the nurse concerning their adherence to the 5 moments of hand hygiene is by supplying all doors with hand rub to ease the implementation of the 5 moments of hand hygiene.

**Ethical Clearance:** This study had passed ethical clearance issued by Ethical Committee of the Faculty of Public Health, Universitas Airlangga, Surabaya, Indonesia.

**Source of Funding:** This study is self funded research project.

**Conflict of Interest:** None.

**References**


Feeding Care Patterns of Mothers Working as Shellfish Peelers on Children’s Nutritional Status at Integrated Health Posts in Coastal Areas

Meiana Harfika¹, Zhakiyah Saraswati¹, Dya Sustrami¹, Lela Nurlela¹

¹School of Health Sciences Hang Tuah, Surabaya, Indonesia, Jl. Gadung No.1, Surabaya, Indonesia

Abstract

Introduction: Working mothers can influence the nutritional status of their children. Nutritional status is a condition that is influenced by the intake of nutrients in food needed by the body. Nutritional status is very important for the process of growth and development in children. The nutritional status of a toddler is influenced by several factors such as parenting.

Method: The research design used an analytical observation with a cross-sectional approach. Samples were taken using a simple random sampling technique obtained as many as 40 respondents in the mother group, where they all worked as shellfish peelers. The instruments of this study were the Feeding Pattern questionnaire and Nutrition Status assessment using the Anthropometry observation sheet. The data was analysed using the Spearman Rho test.

Results: The results showed that there was a relationship between feeding, the parent working as a shellfish peeler and the nutritional status of the child. The Spearman Rho test results were \( \rho = 0.000 \) (\( \rho < 0.05 \)).

Discussion: The implication of this research is that there is a relationship between the parenting style of the mother working as a shellfish peeler on the nutritional status of the toddler. It is expected that the research respondents can improve the provision of feeding by paying attention to the nutritional needs of their toddlers.

Keywords: Toddler Nutritional Status, Eating Pattern, Working Mother.

Introduction

Regarding nutritional status prevalence according to the WHO in 2013, globally it was estimated that in 101 million children under the age of five (toddlers), 15.7% are underweight and 6.6% are overweight¹. Nationally, in 2013, the underweight prevalence was that 19.6% were severely malnourished and 13.9% were undernourished². Based on the Millennium Development Goals (MDGs) indicator, the number of severely malnourished children that an area of city must achieve by 2015 is 15.5%³. The East Java Province is still categorised as an area with one of the highest severely malnourished percentages, at 4.8%⁴. In the 2013, the severely malnourished percentage was 19.6%. In 2014, there was a significant increase, up to 14.8%. Sidoarjo Regency’s children under five showed a percentage of severely malnourished children with weight in accordance to age being under the red line weight as much as 1.02% (1.072). This is less than what was 1.22% (1,298 children) in 2013. Based on the weighing of children under five done throughout 2013, the number of malnourished or underweight children was 5.25% (weight according to the age Z-score between > -3 year primary school to < 2 year primary school as per the Kartu Menuju Sehat a card used in Indonesia to keep track of a child’s growth monthly), which is on the yellow stream above the red line. The results showed that 91.54% were well-nourished (normal weight), 1.98% were over-nourished (overweight) and 1.22%
were severely malnourished (very underweight). For the
malnourished percentage, 2014 showed a percentage of
4.92% which was less than 2013, which was 5.25%².
The researcher’s interview with the nutritional staff on
the 22nd January 2018 at Sedati Sidoarjo’s Integrated
Health Post revealed that there were 84 Children Under
Five Integrated Health Posts in 16 villages, where 3
children under five suffered from severe malnutrition
with comorbidities. There were malnourished children
in several other villages. From the interview with
the Village Midwife (Bidan Desa) in Gisik Cemandi
Village, there were 11 children under five (7.3%) out
of 150 children under five that were malnourished.
The interview with Belanak and Dorang Gisik Cemandi
village Integrated Health Posts group revealed that the
total number of mother’s working as shellfish peelers
and stay at home mothers who had children under five
were as many as 88 people, separated into 44 (50%)
mothers working as shellfish peelers and 44 (50%) stay
at home mothers.

The interaction between being malnourished and
infection may cause deadly disease cycles and a worsened
nutritional status⁶. One of the ways to increase children
under five’s nutritional status is by giving supplementary
feeding. Supplementary feeding may be given to children
under five from 6 months up to 23 months and 29 days
with a skinny nutritional status, which is measured
based on the weight index according to their height and
a minus 3 deviation standard (-3DS) to less than minus 2
deviation standard (<-2DS), for 90 days. Supplementary
feeding of skinny children under five may be local
supplementary feeding and even factory supplementary
feeding in the form of breastfeeding companion biscuits
(biscuit MP-ASI). Once their weight has reached normal
or in accordance to their height, supplementary feeding
will be discontinued. Hereinafter, the children may
consume the family’s balanced nutrition, which will
be done under weight monitoring to avoid the chance
of children under five falling back into the skinny
nutritional status⁷.

A mother’s working status certainly affects their
children’s growth and development. Mothers who work
have many options. There are mothers who choose to
work at home and there are mothers who choose to work
outside or far from home. The latter must be able to
manage their time for their family because a mother’s
main task is to manage household affairs including
looking after, managing and guiding children⁸.

Nutrition in children under five must be fulfilled,
because nutrition will affect the toddler’s growth in
future. Stay at home mothers have more time for their
toddlers than working mothers. This is because working
mothers must split their time to play the role of a
working mother and a housewife. The solution given
by the researcher was to give counselling to mothers
working as shellfish peelers and stay at home mothers
on the correct feeding care patterns to avoid malnutrition
in children under five.

Based on the background description and supported
by the preliminary studies which have been done, the
writer is interested in doing research on the relationship
between the feeding care patterns of mothers working
as shellfish peelers on children under-five’s nutritional
status at integrated health posts in coastal areas.

Method

The research design used in this research was an
analytical observation that looked for a relationship
between the variables with a cross-sectional approach.
This kind of research emphasises on the independent and
dependent data measurements one at a time.

The population in this research was mothers working
as shellfish peelers with children under five at Belanak
and Dorang Gisik Cemandi village Integrated Health
Posts. The sampling technique used in this research
was sampling randomly sampled mothers working as
shellfish peelers with children under five, thus fulfilling
the inclusion criteria of 40 respondents.

The tools used to collect the data were questionnaires
for the demographic data and feeding care patterns
along with nutritional status observation focused on
children between the ages of 12-60 months using an
anthropometrical table. Bivariate data analysis was used
to find out the relationship between the feeding care
patterns of mothers working as shellfish peelers and the
children under five nutritional status. This research used
a Spearman Rho statistical test.

Results

Table 1. Demographics of the respondents

<table>
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<tr>
<th>Mother’s Age</th>
<th>Frequency (f)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;20 years old</td>
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<td>0</td>
</tr>
<tr>
<td>20-30 years old</td>
<td>24</td>
<td>60.0</td>
</tr>
<tr>
<td>&gt;30-40 years old</td>
<td>14</td>
<td>35.0</td>
</tr>
<tr>
<td>&gt;40 years old</td>
<td>2</td>
<td>5.0</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>100.0</td>
</tr>
<tr>
<td>Last Education</td>
<td>Frequency (f)</td>
<td>Percentage (%)</td>
</tr>
<tr>
<td>-------------------------</td>
<td>---------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Tidak Sekolah</td>
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<td>0</td>
</tr>
<tr>
<td>Primary School</td>
<td>1</td>
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</tr>
<tr>
<td>Junior High School</td>
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<td>21</td>
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<tr>
<td>Graduate</td>
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<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40</strong></td>
<td><strong>100.0</strong></td>
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</table>

<table>
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<th>Family Income</th>
<th>Frequency (f)</th>
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<tbody>
<tr>
<td>&lt;Rp1.000.000</td>
<td>3</td>
<td>7.5</td>
</tr>
<tr>
<td>&gt;Rp1.000.000-2.000.000</td>
<td>17</td>
<td>42.5</td>
</tr>
<tr>
<td>&gt;Rp2.000.000-3.000.000</td>
<td>17</td>
<td>42.5</td>
</tr>
<tr>
<td>&gt;Rp3.000.000</td>
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</tr>
<tr>
<td><strong>Total</strong></td>
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<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of Children</th>
<th>Frequency (f)</th>
<th>Percentage (%)</th>
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<tbody>
<tr>
<td>1</td>
<td>19</td>
<td>47.5</td>
</tr>
<tr>
<td>2</td>
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<tr>
<td>3</td>
<td>4</td>
<td>10.0</td>
</tr>
<tr>
<td>&gt;4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mother’s Job</th>
<th>Frequency (f)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shellfish Peeler</td>
<td>40</td>
<td>50.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Toddlers Age</th>
<th>Frequency (f)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12-18 months old</td>
<td>6</td>
<td>15.0</td>
</tr>
<tr>
<td>19-25 months old</td>
<td>8</td>
<td>20.0</td>
</tr>
<tr>
<td>26-32 months old</td>
<td>9</td>
<td>22.5</td>
</tr>
<tr>
<td>33-39 months old</td>
<td>8</td>
<td>20.0</td>
</tr>
<tr>
<td>40-46 months old</td>
<td>3</td>
<td>7.5</td>
</tr>
<tr>
<td>47-53 months old</td>
<td>2</td>
<td>5.0</td>
</tr>
<tr>
<td>54-60 months old</td>
<td>4</td>
<td>10.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency (f)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>18</td>
<td>45.0</td>
</tr>
<tr>
<td>Female</td>
<td>22</td>
<td>55.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Birth Order in Family</th>
<th>Frequency (f)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Born</td>
<td>19</td>
<td>47.5</td>
</tr>
<tr>
<td>Second Born</td>
<td>17</td>
<td>42.5</td>
</tr>
<tr>
<td>Third Born</td>
<td>4</td>
<td>10.0</td>
</tr>
<tr>
<td>Fourth Born</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Fifth Born</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Weight</th>
<th>Frequency (f)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-5 kg</td>
<td>6</td>
<td>15.0</td>
</tr>
<tr>
<td>6-10 kg</td>
<td>8</td>
<td>20.0</td>
</tr>
<tr>
<td>11-15 kg</td>
<td>9</td>
<td>22.5</td>
</tr>
<tr>
<td>16-20 kg</td>
<td>8</td>
<td>20.0</td>
</tr>
<tr>
<td>21-25 kg</td>
<td>3</td>
<td>7.5</td>
</tr>
<tr>
<td>26-30 kg</td>
<td>2</td>
<td>5.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40</strong></td>
<td><strong>100.0</strong></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Height</th>
<th>Frequency (f)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>65-74 cm</td>
<td>1</td>
<td>2.5</td>
</tr>
<tr>
<td>75-84 cm</td>
<td>10</td>
<td>25.0</td>
</tr>
<tr>
<td>85-94 cm</td>
<td>15</td>
<td>37.5</td>
</tr>
<tr>
<td>95-104 cm</td>
<td>10</td>
<td>25.0</td>
</tr>
<tr>
<td>105-114 cm</td>
<td>4</td>
<td>10.0</td>
</tr>
<tr>
<td>115-114 cm</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Children’s Health History</th>
<th>Frequency (f)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuberculosis</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Measles</td>
<td>4</td>
<td>10.0</td>
</tr>
<tr>
<td>Malaria</td>
<td>1</td>
<td>2.5</td>
</tr>
<tr>
<td>Others</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>None</td>
<td>35</td>
<td>87.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Table 2. The Relationship between the Feeding Care Pattern of Mother’s working as Shellfish Peeler on their Toddler’s Nutritional Status at Gisik Cemandi Sedati Sidoarjo Village Coastal Area Integrated Health Post.

<table>
<thead>
<tr>
<th>Toddlers Feeding Care Patterns of Working Mother’s</th>
<th>Less or Deficient (&lt;60%)</th>
<th>Enough (60-80%)</th>
<th>Good (&gt;80%)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malnourished</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Nourished</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Over-Nourished</td>
<td>0</td>
<td>100.0</td>
<td>0</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>5</strong></td>
<td><strong>34</strong></td>
<td><strong>1</strong></td>
<td><strong>40</strong></td>
</tr>
</tbody>
</table>

Spearman Rho Value Statistic Test 0.000 (ρ = 0.05)
**Discussion**

Based on the data on the feeding care patterns of mothers working as shellfish peelers related to their children’s under-five nutritional status at Gisik Cemandik Sedati Sidoarjo Village Coastal Area Integrated Health Posts, as shown in the table above, there were 5 respondents (100.0%) that did not conduct good feeding care patterns, resulting in malnutrition in the respondent’s toddler. A further 3 respondents (100.0%) that did enough in relation to the feeding care pattern had well-nourished toddlers, and 1 respondent (3.1%) had a good feeding care pattern that resulted in over-nutrition. Nutritional status is a condition that is caused by a balanced status between nutrient intake and the number of nutrients required by the body for the running of its biological functions such as physical growth, development, activities, health care etc. A toddler’s nutritional status is affected by many factors, both direct and indirect. Direct causes that affect nutritional status are nutrient intake and any infections suffered by the toddler. Indirect causes include food availability, while keeping in mind the parent’s job and income, parenting and care patterns, the available health services and environmental health. The three indirect causes are related to the level of education, knowledge, and family skill. The researcher argues that a working mother must be wise in relation to time management, because her time will be divided between work, childcare and domestic chores. This case is proven by the research results as shown above, on how the mother’s that were working as shellfish peelers had toddlers who were malnourished. The mothers in coastal areas stated that there is difficulty when their role as shellfish peelers made them unable to feed their children on time.

The link between the feeding care pattern of mother’s working as shellfish peelers on children under five (toddlers), is as shown in the Spearman Rho statistic test result in Table 13; ρ = 0.000 < α = 0.05 as a comparison. The coefficient correlation between the variables gained from the statistics test was 0.771, which means that there is a strong correlation. H1 was therefore accepted, statistically showing that there is a relationship between the feeding care patterns of mothers working as shellfish peelers on their toddler’s nutritional status at Gisik Cemandik Sedati Sidoarjo Village Coastal Area’s Integrated Health Post.

**Conclusion**

Based on the results of this research, the outcome is that regarding nutritional status, the mothers working as shellfish peelers with toddlers did not do well at taking care of their child’s nutrition and they lacked a proper feeding care pattern. The toddlers of mothers working as shellfish peelers suffered from malnutrition because the mother’s activities were more important than looking after and paying attention to their toddler’s nutritional intake.

**Ethical Clearance:** This study had passed ethical clearance issued by Ethical Committee of the Sekolah Tinggi Ilmu Kesehatan Hang Tuah Surabaya, Indonesia.

**Source of Funding:** This study is self-funded research project.

**Conflict of Interest:** None.

**References**


6. UNICEF. Undernutrition contributes to nearly half of all deaths in children under 5 and is widespread in Asia and Africa. UNICEF. 2016.


Determination the Role of Interleukin 31 (IL-31) Levels in Three Real Allergic Diseases (Asthma, Rhinitis, Urticaria)

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Abstract

Interleukin-31 is a proinflammatory cytokine, has multiple physiological functions, including regulation of immune response, blood formation (hematopoiesis), and causing many diseases including dermatitis and airway hypersensitivity. The relationship between IL-31 and three types of allergic diseases (asthma, rhinitis, urticaria) are not quite described in the research, consequently, this study was done to demonstrate the levels of IL-31 in Baghdad population /Iraq. This study compared IL-31 levels in these three types who were positive for total and specific IgE in patients and compared with healthy controls were negative for total and specific IgE.

A total of 148 allergic patients included in the present study with different allergic diseases (asthma, rhinitis, and urticaria) who diagnosed by the physician through clinical profiles and by lab investigation through total IgE and specific IgE, with the control group which was excluded the subjects who have a high level of the total IgE. The patients were recruited from Allergic Specialized Center/Baghdad-Resafa, Iraq. The level of interleukin 31 was measured in sera of 52 asthmatic patients, 48 rhinitis patients, 48 urticaria patients, and 28 control. The level of total IgE increases significantly in patients with allergy compared with control, and the levels of IL-31 in patients’ sera were significant increases in comparative with control; the present study provides new knowledge about the role of IL-31 into the underlying pathogenesis of allergic diseases.

Keywords: Asthma, rhinitis, urticaria, interleukin-31, total IgE.

Introduction

Cytokines play a major and important role in regulating the immune system (adaptive and innate), because of its importance in pro-inflammatory processes (¹), cytokines have been used to understand disease mechanism and as biomarkers in many diseases (eg allergic inflammatory disease, atopic dermatitis, rheumatoid arthritis, asthmatics, skin diseases and cancer(²,³,⁴,⁵).

Interleukin-31 is a proinflammatory cytokine, 24 kDa protein, identified firstly by Dillon and their colleagues in 2004, from glycoprotein 130/IL-6 family coded by a gene located on chromosome 12q24.31 (⁶,⁷,⁸).

IL-31RA and IL-31ligand interaction lead to stimulating the expression of proinflammatory cytokines and chemokines (¹).

Interleukin-31 controls many biological functions by controlling the signals that regulate these functions; it stimulates proinflammatory cytokines, manages cell proliferation and also participates in tissue remodeling (⁸).

IL-31 works on a wide range of cells, whether immune or non-immune, and thus has multiple physiological functions, including regulation of immune response, blood formation (hematopoiesis), and causing many diseases including dermatitis, airway hypersensitivity and inflammatory bowel disease (¹).

Many studies indicated that IL-31 promoting allergic inflammation (⁹,¹⁰,¹¹), between IL-31 levels and three types of allergic diseases (asthma, rhinitis, urticaria) are not quite described in the research, consequently, this study was done to demonstrate the levels of IL-31 in Baghdad population /Iraq. This study compared IL-31 levels in these three types who were positive for total and specific IgE in patients and compared with healthy controls were negative for total and specific IgE.
Material and Method

A total of 148 allergic patients (52 asthma, 48 rhinitis, 48 urticaria) with 28 apparently healthy control group included in the present study. The patients were recruited from Allergic Specialized Center/Baghdad-Resafa. Five ml of peripheral blood was drawn from each subject into plain tubes and left at room temperature for 30 minutes until they coagulated and then centrifuged at 4000 rpm for 5 minutes until sera were obtained, serum samples separated into different tubes and stored at −20°C until the study. Total IgE levels were estimated by Immunoenzymetic Assay using the total IgE ELISA kit (Euroimmun/German) while Specific IgE qualitative assay by using Western Immunoblotting method for (Inhalation and food profile) multi-parameter assay containing 20 of the most common allergens to each profile was used by (Polycheck-Allergy Diagnostic/Germany) kit.

A sandwich Enzyme immunosorbent assay was used to Interleukin-31 determination in human serum by Interleukin-31 ELISA kit from (USCN-China).

Statistical analyses were performed by Minitab version 13 software. All data of the current study were expressed as mean ± SE. The data were analyzed using one-way analysis of variance (ANOVA). Non-parametric data were expressed as a percentage of the total and compared using the binomial test.

Result

The concentration of total IgE (Mean± SE IU/ml) in sera were of the asthmatic patients (336.1 ± 23.0), Rhinitis (258.4 ± 25.8), and urticarial patients (235.9 ± 21.4) while in all allergic group was (282.5 ± 13.5), and in healthy control was (44.9 ± 4.21). There were a highly significant differences P = 0.000 (P>0.01) for the total IgE levels of the all three allergic patients (Asthma, Rhinitis and Urticaria) when compared with apparently healthy control. Also a highly significant difference P= 0.002 (P>0.01) between asthma and urticaria, and a significant difference P = 0.026 (P>0.05) between asthma and rhinitis. While there was no significant difference P= 0.501(P<0.05) between rhinitis and urticarial patients as shown in Table (1).

Table (1) Total IgE level of study groups

<table>
<thead>
<tr>
<th>Study groups</th>
<th>Total IgE (IU/ml) (Mean ± SE)</th>
<th>NO.</th>
<th>ANOVA test</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asthma</td>
<td>336.1 ± 23.0</td>
<td>52</td>
<td>All cases VS H.C = 0.000**</td>
<td></td>
</tr>
<tr>
<td>Rhinitis</td>
<td>258.4 ± 25.8</td>
<td>48</td>
<td>Asthma VS H.C = 0.000**</td>
<td></td>
</tr>
<tr>
<td>Urticaria</td>
<td>235.9 ± 21.4</td>
<td>48</td>
<td>Rhinitis VS H.C = 0.000**</td>
<td></td>
</tr>
<tr>
<td>All cases</td>
<td>282.5 ± 13.5</td>
<td>148</td>
<td>Urticaria VS H.C = 0.000**</td>
<td></td>
</tr>
<tr>
<td>Healthy control</td>
<td>44.9 ± 4.21</td>
<td>28</td>
<td>Asthma VS Rhinitis = 0.026*</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Asthma VS Urticaria = 0.002**</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Rhinitis VS Urticaria = 0.501 NS</td>
<td></td>
</tr>
</tbody>
</table>

NO.: Number, IU/ml: International unit per milliliter, H.C: Healthy control, *: significant difference P>0.05, **: highly significant difference P>0.01

The Table (2) explain the result of specific IgE (sIgE) to 20 inhalant allergens (Inhalation profile) in sera of asthma, rhinitis and urticarial patients. Where the results of this test showed the presence of sIgE against one or more inhalant allergen in the majority of patients in the three groups under study. The results showed the percentage of positive results of sIgE were significantly higher than the negative result for all groups of patients under study, there were (84.6%, 81.3%, and 72.9%) in (asthma, rhinitis, and urticaria) respectively. While those who had a negative test were 8(15.4%) in asthma, 9(18.7%) in rhinitis, and 13(27.1%) in urticaria. There were also highly significant differences p> 0.01 between positive and negative results.

Table (2) Result of specific IgE to inhaled allergens in allergic groups.

<table>
<thead>
<tr>
<th>Study groups</th>
<th>Positive (Inhalation)</th>
<th>Negative (Inhalation)</th>
<th>Binomial (Z) test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NO.</td>
<td>%</td>
<td>NO.</td>
</tr>
<tr>
<td>Asthma n = 52</td>
<td>44</td>
<td>84.6</td>
<td>8</td>
</tr>
<tr>
<td>Rhinitis n = 48</td>
<td>39</td>
<td>81.3</td>
<td>9</td>
</tr>
<tr>
<td>Urticartia n = 48</td>
<td>35</td>
<td>72.9</td>
<td>13</td>
</tr>
</tbody>
</table>

n & No. : Number of patients,% Percentage, **: highly significant differences p> 0.01.
The Table (3) explains the result of specific IgE to 20 food allergens (food profile) in the sera of urticaria patients. From a total of 48 urticarial patients, there were 14 (29.2%) had positive results of sIgE against one or more of food allergens, while the negative results were 34 (70.8%). There were also highly significant differences \( p = 0.003 \) \( p > 0.01 \) between positive and negative results.

### Table (3) Result of specific IgE to food allergens in Urticaria patients

<table>
<thead>
<tr>
<th>Study group</th>
<th>Positive (food)</th>
<th>Negative (food)</th>
<th>Binomial (Z) test P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urticaria n = 48</td>
<td>14 29.2%</td>
<td>34 70.8%</td>
<td>0.003**</td>
</tr>
</tbody>
</table>

\( n \) : number of urticarial patients, **: highly significant differences \( p > 0.01 \), N: Number of positive or negative%, Percentage

The levels of IL-31 (Mean ± SE) in sera were (170.2±20.6Pg/ml) in Asthma group, (156.6±15.5Pg/ml) in Rhinitis group, and (154.5±14.4Pg/ml) in Urticaria group while in healthy control (HC) was (108.62±9.0Pg/ml). The comparative analyses between the study groups showed a significant difference \( P = 0.040 \) \( p > 0.05 \) between Asthma and (HC), and \( P = 0.032 \) \( p > 0.05 \) between Rhinitis and (HC), and also there was a significant difference \( P = 0.029 \) \( p > 0.05 \) between Urticaria and (HC). While there were no significant differences between asthma and rhinitis \( P = 0.605 \) \( p < 0.05 \), between asthma and urticaria \( P = 0.542 \) \( p > 0.05 \) and between rhinitis and urticaria \( P = 0.923 \) \( p < 0.05 \). The Table (4) and Figure (1) explain the results of IL-31 level in the study groups.

### Table (4) Serum concentration of IL-31 in the study groups

<table>
<thead>
<tr>
<th>Study groups –comparative analyses</th>
<th>ANOVA-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>IL-31 (Mean ± SE) Pg/ml</td>
<td>P value ( p &gt; 0.05 )</td>
</tr>
<tr>
<td>H.C 108.62±9.0</td>
<td>Ashma 170.2±20.6</td>
</tr>
<tr>
<td></td>
<td>Rhinitis 156.6±15.5</td>
</tr>
<tr>
<td></td>
<td>Urticaria 154.5±14.4</td>
</tr>
<tr>
<td>Asthma 170.2±20.6</td>
<td>Rhinitis 156.6±15.5</td>
</tr>
<tr>
<td></td>
<td>Urticaria 154.5±14.4</td>
</tr>
<tr>
<td>Rhinitis 156.6±15.5</td>
<td>Urticaria 154.5±14.4</td>
</tr>
</tbody>
</table>

H.C: Healthy control, Pg/ml: Picogram per milliliter, *: significant differences \( p > 0.05 \), N.S.: Non significant differences \( p < 0.05 \)

### Discussion

As Table (1) shows, the level of IgE increases significantly in patients with allergy compared with control, and this is consistent with the results of several studies \((12,13,14)\) who found in their studies high levels of IgE in allergic patients with highly significant differences in comparison with healthy.

Yalcin in Turkey (2014) in his study also pointed to a rise in the level of IgE in urticarial patients compared to control \((12)\).

Brakhas and their colleagues also had a high IgE level in patients with (asthma, allergic rhinitis, and urticaria) with highly significant differences when compared with control \((15)\).

All of the above studies support the primary role of IgE in maintaining symptoms severity and immune response in allergic diseases \((16)\). IgE mediates type 1 hypersensitivity reactions and the association of this antibody by a special receptor (Fc Epsilon RI) with the surface of the basophils and mast cells leads to the release of inflammatory mediators and the effectors of allergic reactions from cells. As a result, allergies appear within minutes to several hours \((17)\).

An allergic reaction occurs after contact with particular allergens within minutes, and lead to type hypersensitivity allergy, which produces Total IgE and sIgE by specific B cells and resulting in anaphylactic asthma, rhinitis, allergic, urticaria \((18)\). Kim et al., (2012) found that 68.39% of all allergic rhinitis patients in his study had a positive sIgE test against one or more allergens \((19)\). The negative results may due to the lack of allergic causatives in the test profile, or the test profile of allergens kits is not suitable for some populations and that requires further research.

The results of the current study show that the number of negative results of sIgE for food allergens in...
patients with urticaria was more than positive against one or more of the most common 20 Iraqi food allergens.

The results of Previous study indicated that food allergy is uncommon in chronic urticaria (20) and this corresponds to our results where we notice that the inhalation allergens are more frequent than food allergens table (3).

In this study, elevated levels of IL-31 were observed in all three groups of allergic diseases (Rhinitis, Urticaria, Asthma) than control, and there were significant differences when compared these three groups with control.

These results are in agreement with many studies which they found there was a higher level of IL-31 in allergic rhinitis patients than control group with significant differences(11, 21, 22), and for urticaria disease many studies found results matching to our study which found significant increases in IL-31 level in comparison with control(6, 23, 24). Also for asthma this result agrees with many studies which refers that IL31 had a significant role in the pathogenicity of allergic disease and there were a higher level and significant differences of IL-31 in asthmatic patients compared to control (7, 22, 25), the study of Saito et al. 2017 found the Th2 immune responses regulation may be dependent on tissue-specific cell types expressing IL-31RA (27).

Interleukin-31 is involved in the pathogenesis of allergic disorders such as rhinitis, asthma, dermatitis, and urticaria (9, 10) another study investigates the Japanese cedar/cypress pollinosis extract could strongly stimulate IL-31 expression (29), while Baumann and his colleagues in 2012 found that IL-31 detected in the nasal secretions derived from Allergic rhinitis patients (11), IL-31 is selectively generated by activated CD4 T cells (6).

Previous studies explained that IL-31RA expression related to the induction of the Th2 immune response (26, 27). Other studies indicated that IL-31 negatively regulates the development of the Th2-type response (27, 28).

Conclusion

In conclusion, we found that IL-31 is increased in the serum of allergic patients (asthma, urticaria, and rhinitis), the present study provides new knowledge about the role of IL-31 into the underlying pathogenesis of allergic diseases.

Conflict of Interest: No Conflict of interest

Source of Funding: Entirely self-funded

Ethical Clearance: In vitro study

References:

8. Singh B, Jegga A G, Shannukhappa K S, et al., IL-31-driven skin remodeling involves epidermal cell proliferation and thickening that lead to impaired skin-barrier function PLoS One (2016); 11, no. 8, article e0161877.
24. Lin W, Zhou Q, Liu C, Ying M, & Xu S. Increased plasma IL-17, IL-31, and IL-33 levels in chronic spontaneous urticaria. Scientific reports, (2017);7(1), 17797. doi:10.1038/s41598-017-18187-z.
The Impact of Learning Technology on Some Motor Skills of Deaf and Mute Students in Comparison with Healthy Students

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²Ministry of Industry and Minerals, Iraq, Najaf

Abstract

The use of learning technology is very important for physical education, and the importance of using learning technology for enhancing motor skills appears when finding the perception of new motor skills is incomplete and thus the need to use learning technology to improve their perception and skills. Learning technology lead to flexibility in the process of education in addition to the importance of using the computer in the field of sports where the computer can be used to learn the activities of motor activities through the analysis of movements and skills contained in the course or training plans and identify the technical skills of these activities and the appropriate learning method, it also contributes to facilitating and simplifying the learning process of motor skills, as well as shortening learning time, which helps to improve learning processes (1). The researchers believe that learning is usually related to the educational method which the teacher use, and which mainly directed to correct the errors resulting from the learner’s motor performance. Knowledge of learning technology represents information about movement. In order to use this knowledge, the learner must recognize the nature of the skill performance. (Deaf and mute), appropriate to their ability and needs and their positive impact on the revitalization and development of their skills and needs, as well as improving their perception of themselves and their self-esteem and self-confidence (2).

Keywords: Learning Technology, Deaf, Healthy students.

Research Problem

Through the previous studies and research for the people with special needs, we find the deaf and mute persons don’t not understand the educational situation, unless after repetition for many times to help him to remember and benefit from the attitudes of learning so it is advisable to invest this positive feature of the deaf and mute persons and training them on motor skills to achieve excellence in performance (3). Also, (4) states that by depriving the individual from that feeling, we find that the deaf differs from the normal student in that the latter hears from his ears and speaks through the language of speech. The deaf student hears through his eyes and speaks through his hands. If we try to compensate the deaf student for losing communication in a way that is consistent with his disability, we must teach him sign language to improve his physical abilities, which will enable him to improve his performance. We could make him a normal person who can overcome disability (4). The researchers believe that the use of learning technology in physical education helps to develop the motor skills of deaf and mute students, the role of computers appears positively in the educational process in the field of sports, especially when designing visual education programs for the deaf and mute students provides them and the teacher great efforts to the learning mechanism also saves time and helps the learner understand the skill to be learned. The deaf and mute student depends on the sense of sight to compensate for his loss of hearing and speech. Within the limits of the researchers’ knowledge, such a study was not discussed in Iraqi society, which prompted the researchers to use the computer when teaching physical education at Al Amal School for Deaf and Mute in Maysan Governorate. Hence, appears the research problem of the effect of learning technology on some motor skills for the deaf and mute students.

Research Objectives:

1. Identify the effect of learning technology on the skills (kicking the fixed ball by foot, hitting the ball with the head, running with rolling ball, controlling the ball).
2. Identify the differences between the two dimensions of the experimental and control groups in the skills (kicking the fixed ball by foot, hitting the ball with the head, running with rolling ball, controlling the ball).

**Research Hypotheses**

1. There are significant differences between the pre- and post-test of each group (experimental and control) in the level of skills (kicking the fixed ball by foot, hitting the ball with the head, running with rolling ball, controlling the ball).

2. There are significant differences between the two dimensions of each group (experimental and control) in the level of skills (kicking the fixed ball by foot, hitting the ball with the head, running with rolling ball, controlling the ball).

**Methodology**

**Research Methodology:** The researcher used the experimental method depending on two groups (experimental and control group) which corresponding to the nature of the research.

**Research Sample & Population:** The sample was chosen randomly from the community of (115) students from Al Amal School for the Deaf and Mute Students in Maysan Governorate for the academic year 2018-2019. 10 students were chosen for the exploratory study. (30) students of the research sample were divided into two groups (control and experimental) (15) students for each.

**Data Collection Tools:** 10 computers, data show, CDs, medical weight scale, stopwatch, football balls (5), equipment (5)

**Basics of Program Development:** Determine the learning skill to be learned in each unit. Identify the programs that apply in deaf and mute schools. Studying and identifying the aids for the skills learning process and the requirements needed during implementation. The process of follow-up for the application and the final evaluation of the program.

**Program content:** Kicking the ball with foot, hit the ball with the head, running with the ball, control the ball.

**Program Development Steps:** Identifying skills. Determine the physical preparation exercises that the learning technology program will contain. Identify the tools used in the learning technology program. Specify the time period for the tutorial (10) weeks. Determining the number of units per week. The researchers combined the unit time of the research group by 45 minutes, divided into 5 minutes warm up, 10 minutes physical preparation, 10 minutes observing the data by computer, 15 minutes of practical activity, The main part, (5) closing minutes.

**Pre-measurement:**

*Table (1): The mean, standard deviation and value (T) between the pre-measures of the experimental and control groups in the motor skills test. (N = 30)*

<table>
<thead>
<tr>
<th>Motor Skills Test</th>
<th>Measurement Tool</th>
<th>Control Group</th>
<th>Experimental Group</th>
<th>Value (T)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>Standard Deviation</td>
<td>Mean</td>
</tr>
<tr>
<td>Kicking fixed ball</td>
<td>M.</td>
<td>15.7</td>
<td>1.50</td>
<td>15.10</td>
</tr>
<tr>
<td>Heating ball with head</td>
<td>M.</td>
<td>3.21</td>
<td>0.55</td>
<td>3.24</td>
</tr>
<tr>
<td>Rolling running with ball</td>
<td>T.</td>
<td>16.52</td>
<td>1.43</td>
<td>16.60</td>
</tr>
<tr>
<td>Controlling ball</td>
<td>T.</td>
<td>22.71</td>
<td>2.22</td>
<td>22.76</td>
</tr>
</tbody>
</table>

Correlation Coefficient at 0.05 = 2.93

The table shows significant differences between the between the pre-measures of the experimental and control groups in the motor skills test. The calculated value (t) is less than the tabular value of 0.05 indicating the parity between the two groups.

**Statistical Processes:** The researchers used SPSS, Pearson correlation, and t-test to find differences between pre and post-standard measurements.
Results

Table (2): The mean, standard deviation and value (v) between the pre and post-tests of the control group in the motor skills test (N = 15)

<table>
<thead>
<tr>
<th>Motor Skills Test</th>
<th>Pre-Test</th>
<th>Post-Test</th>
<th>Value (T)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean Standard Deviation</td>
<td>Mean Standard Deviation</td>
<td></td>
</tr>
<tr>
<td>Kicking fixed ball</td>
<td>15.7 1.50</td>
<td>15.12 1.55</td>
<td>2.13</td>
</tr>
<tr>
<td>Heating ball with head</td>
<td>3.21 0.55</td>
<td>3.28 0.54</td>
<td>1.72</td>
</tr>
<tr>
<td>Rolling running with ball</td>
<td>16.52 1.43</td>
<td>16.66 1.48</td>
<td>1.63</td>
</tr>
<tr>
<td>Controlling ball</td>
<td>22.71 2.22</td>
<td>22.79 2.25</td>
<td>2.51</td>
</tr>
</tbody>
</table>

Tabular value (T) at level 0.05=2.089

The table shows significant differences between the pre and post measurements of the control group in the motor skills test for the post-test. The calculated value (t) is greater than the tabular value at a significant level (0.05).

Table (3): The mean and the standard deviation and the value of (v) between the tribal and remote measures of the experimental group in the motor skills test (N = 15)

<table>
<thead>
<tr>
<th>Motor Skills Test</th>
<th>Pre-Test</th>
<th>Post-Test</th>
<th>Value (T)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean Standard Deviation</td>
<td>Mean Standard Deviation</td>
<td></td>
</tr>
<tr>
<td>Kicking fixed ball</td>
<td>15.2 1.33</td>
<td>15.29 1.50</td>
<td>11.13</td>
</tr>
<tr>
<td>Heating ball with head</td>
<td>3.11 0.51</td>
<td>3.28 0.52</td>
<td>16.70</td>
</tr>
<tr>
<td>Rolling running with ball</td>
<td>16.43 1.40</td>
<td>16.59 1.46</td>
<td>29.65</td>
</tr>
<tr>
<td>Controlling ball</td>
<td>22.65 2.21</td>
<td>22.75 2.28</td>
<td>19.47</td>
</tr>
</tbody>
</table>

Tabular value (T) at level 0.05=2.089

The table shows the significant difference between the pre and post-experimental parameters of the experimental group in the motor skills test for the post test. The calculated value (t) is greater than the tabular value at the level (0.05)

Table (4): The mean and the standard deviation and the value of (v) between the two measures of the experimental and control groups in the motor skills test (n = 15)

<table>
<thead>
<tr>
<th>Motor Skills Test</th>
<th>Control Group</th>
<th>Experimental Group</th>
<th>Value (T)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean Standard Deviation</td>
<td>Mean Standard Deviation</td>
<td></td>
</tr>
<tr>
<td>Kicking fixed ball</td>
<td>15.12 1.55</td>
<td>15.29 1.50</td>
<td>11.13</td>
</tr>
<tr>
<td>Heating ball with head</td>
<td>3.28 0.54</td>
<td>3.28 0.52</td>
<td>16.70</td>
</tr>
<tr>
<td>Rolling running with ball</td>
<td>16.66 1.48</td>
<td>16.59 1.46</td>
<td>29.65</td>
</tr>
<tr>
<td>Controlling ball</td>
<td>22.79 2.25</td>
<td>22.75 2.28</td>
<td>19.47</td>
</tr>
</tbody>
</table>

Tabular value (T) at level 0.05=2.089

The table shows the significant differences between the experimental and control groups in the motor skills test for the experimental group. The calculated value (t) is greater than the tabular value at the level (0.05).
Discussion

It is clear from the above that there is a significant difference between the pre and post-test of the experimental and control groups in the motor skills test according to the post test. The researchers refer these results to the positive effect of the learning technology in improving the motor skills (kicking the ball, hitting the ball with the head, controlling the ball). Computer is an appropriate tool for learning because it is a double-faced communication and interaction tool. The computer enables the learner to interact continuously and transfer it from success to success. This reassures the learner while learning and progressing with the program(6). The researchers attributed this progress to the positive role and effectiveness of the computer in the educational process in the field of sports when designing visual education programs as an educational tool for deaf and mute students that provides them and saves teacher’ time and effort during the learning process and helps the learner to understand and recognize the skills of football to be learned, where the deaf depends on the sense of vision With a great focus on learning to compensate for hearing loss. Computer is able to attract the attention of the learner and greatly stimulate his senses, and makes it in a state of permanent focus and good follow-up of colour images and bright colours and ease of operation and repetition, which makes the computer a typical medium of what is presented to him, and deafness depends on the sense of sight or means of visual communication (7).

Conclusion

1. The use of learning technology has a better positive effect than the way used by teachers for explaining the lessons of physical education for deaf and mute students.

2. The use of learning technology has a positive impact in learning the motor skills of deaf and mute students.

Recommendations:

1. Use of learning technology to teach the motor skills of deaf and mute students.

2. The need to provide preparation of computers and use them in the design of sports education programs before the lesson of physical education in schools deaf and mute students.

3. The need to hold training courses to improve the teachers of physical education in schools of deaf and mute students.

Conflict of Interest: Nil

Source of Funding: Self

Ethical Clearance: Not require

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Associated Factors of Anemia Incidences in Adolescent Girls at Guntung Manggis Public Health Center Working Area Banjarbaru City

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Abstract

The Indonesian government intensifies the prevention and control of anemia in adolescent girls and women of reproductive age by prioritizing the provision of iron folic acid (IFA) at schools. The highest anemia prevalence in Kalimantan Selatan Indonesia is in Banjarbaru City, the highest coverage of IFA administration in Guntung Manggis Public Health Center, many factors can cause anemia in adolescent girls. The purpose of this study was to analyze the relationship between compliance of IFA consumption, eating behavior, parental education, parental occupation, parental income, and counseling information from public health care provider with the incidence of anemia in an adolescent girl. This study used an observational analytic method with a cross-sectional approach. The population of this study is all adolescent girls in the junior high school research location. The sample was 94 respondents taken by proportional stratified random sampling. Data were analyzed based on the chi-square and logistic regression test. The chi-square test showed there was no relationship ($p>0.05$) between compliance of IFA consumption, eating behavior, parental education, parental occupation, parental income with the incidence of anemia in adolescent girls, while there was a relationship ($p<0.05$) between counseling information from public health care provider with the incidence of anemia in adolescent girls. Logistic regression test showed that the biggest variable related to the incidence of anemia in adolescent girls is counseling information from public health care provider ($p<0.05$).

Keywords: Anemia, adolescent girl, factor.

Introduction

The national program to accelerate nutritional improvement in Indonesia is prioritized in the prevention of anemia in adolescent girls and women of reproductive age (WUS). The results of Basic Health Research (Riskesdas) in 2013 showed that the prevalence of anemia in Indonesia reached 21.7%; female adolescents had the highest risk of anemia.¹ Impact of anemia on female adolescents is to reduce body endurance, reduce fitness, and agility thinking (learning achievement). The impact of anemia who carried on until she becomes a pregnant woman results in an increased risk of stunted fetal growth (PJT), premature, low birth weight, stunting, pre, and postpartum bleeding, and increased risk of infant pain and death. The government then programmed the provision of iron folic acid (IFA) through school institutions for female adolescents and WUS which began in 2016.² From 13 regencies/cities in Kalimantan Selatan, the highest number of female adolescents who experienced anemia was in Banjarbaru City, surely 705 female adolescents from 1200 examination samples,³ and the highest percentage of IFA coverage (87.247%). During the two years of IFA administration for female adolescents, there has never been an evaluation of post-consumption IFA so that the prevalence of adolescents with anemia is unknown. The purpose of this study was to analyze the relationship between compliance of IFA consumption, eating behavior, parental education, parental occupation,
parental income, and counseling information from public health care provider with the incidence of anemia in female adolescents in the Guntung Manggis Public Health Center working area, Banjarbaru City.

Materials and Method

This study used an observational analytic method with a cross-sectional approach. The population of this study was all female adolescents in the junior high school research location. The sample was 94 respondents taken by proportional stratified random sampling. Data collection used a questionnaire and measuring blood hemoglobin with univariate, bivariate, and multivariate analysis.

Results and Discussion

Univariate Analysis: A non-compliance of IFA consumption was very high (90.4%), eating behavior classified as sufficient (72.3%), last father’s education was high (58.5%), last maternal education was low (55.3%), respondents had working father (96.8%), unemployed mother (72.3%), low father income (54.3%), low maternal income (90.4%) and counseling information from public health care provider is good (77.7%).

Bivariate analysis: There was no relationship (p > 0.05) between compliance of IFA consumption, eating behavior, parental education, parental occupation, parental income with the incidence of anemia in female adolescents, while there was a relationship (p < 0.05) between counseling information from public health care provider with the incidence of anemia in female adolescents.

Table 1. Crosstab Bivariate Analysis of All Independent Variables

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>p-value</th>
<th>RP</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compliance of IFA consumption</td>
<td>0.371</td>
<td>-</td>
<td>No Relationship</td>
</tr>
<tr>
<td>Eating behavior</td>
<td>0.245</td>
<td>-</td>
<td>No Relationship</td>
</tr>
<tr>
<td>Parental education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Father = 0.539</td>
<td></td>
<td></td>
<td>No Relationship</td>
</tr>
<tr>
<td>Mother = 0.692</td>
<td></td>
<td></td>
<td>No Relationship</td>
</tr>
<tr>
<td>Parental occupation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Father = 0.501</td>
<td></td>
<td></td>
<td>No Relationship</td>
</tr>
<tr>
<td>Mother = 0.825</td>
<td></td>
<td></td>
<td>No Relationship</td>
</tr>
<tr>
<td>Parental income</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Father = 0.349</td>
<td></td>
<td></td>
<td>No Relationship</td>
</tr>
<tr>
<td>Mother = 0.876</td>
<td></td>
<td></td>
<td>No Relationship</td>
</tr>
<tr>
<td>Counseling information from public health care provider</td>
<td>0.014</td>
<td>3.6</td>
<td>There is a relationship</td>
</tr>
</tbody>
</table>

Multivariate Analysis

Table 2. Logistic Regression Test Results of Eating Behavior and Counseling Information from Public Health Care Provider

<table>
<thead>
<tr>
<th>Variable</th>
<th>β</th>
<th>p-value</th>
<th>Exp (B)</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eating behavior</td>
<td>0.570</td>
<td>0.390</td>
<td>1.769</td>
<td>0.482-6.496</td>
</tr>
<tr>
<td>Counseling information from public health care provider</td>
<td>1.431</td>
<td>0.028</td>
<td>4.181</td>
<td>1.167-14.976</td>
</tr>
<tr>
<td>Constanta</td>
<td>-0.422</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Counseling information from the public health care provider: The results of the study showed that counseling information from public health care provider was good (77.7%). Based on the chi-square test, it is known that there is a relationship between counseling information from public health care provider with the incidence of anemia in female adolescents p=0.014 (<0.05). The results of the study showed that the provision of counseling information from the public health care provider of the Guntung Manggis public health center was scheduled regularly every month. The provision of IFA through schools was done every three months when the activity takes place using the lecture method of the public health care provider explaining the procedure for drinking IFA, the impact, and benefits of consuming IFA through drinking instructions printed on the medicine tablet box. The provision of information about health can increase a person’s knowledge for better health behavior, increase knowledge about anemia prevention, so that information dissemination activities are indeed very important to do. Providing information about health can increase one’s knowledge to choose to consume food with balanced nutrition. Knowledge is a very important element for the formation of a person’s behavior, behavior based on knowledge is better than behavior that is not based on knowledge. A public health care provider is one of the driving factors for changes in a person’s behavior, the intensive information is given, the more behavioral changes will occur permanent.

Compliance of IFA consumption: The results showed that compliance of IFA consumption was only 9.6% and non-compliance was very high (90.4%). Based on the Chi-Square test, it is known that there is no correlation between compliance of IFA consumption with the incidence of anemia in female adolescents p=0.371 (>0.05). The administration of IFA was supplied at home resulted in its consumption not being effectively
controlled, besides IFA tablet that had a distinctive odor, taste and color and the appearance of post-consumption side effects such as nausea, dizziness, and black stools caused IFA to be discouraged.\textsuperscript{8,9,10} The results showed there were 9 respondents who regularly consumed IFA, but 2 of them are still experiencing anemia, this is because in addition to consuming IFA respondents also consume other ingredients that inhibit the absorption of iron into the body such as tea, coffee, and milk so that iron absorption is inhibited into the body.\textsuperscript{11} Anemia is also caused by other factors, such as chronic blood loss, inadequate iron absorption and increased iron demand during puberty, pregnancy, and lactation.\textsuperscript{12}

**Eating behavior:** The results showed that eating behavior was sufficient (72.3\%). Based on the Chi-Square test, it is known that there is no relationship between eating behavior with the incidence of anemia in female adolescents \(p=0.245\) (\(>0.05\)). Out of the 68 respondents who had sufficient eating behavior there were 7 respondents (10.3\%) who were anemic, as well as 26 respondents with insufficient eating behavior 5 respondents (19.2\%) were anemic. This is because the absorption of iron in the body is influenced by reinforcing and inhibiting factors. One of the reinforcing factors is the consumption of vitamin C while the inhibiting factor is the habit of consuming ingredients such as phytic acid in cereals, oxalic acid in vegetables, tannins in tea and coffee, calcium in milk.\textsuperscript{11,12} Out of the 94 respondents, there were 85 respondents with the habit of consuming iron absorption in the form of tea, coffee and milk. This habit occurs because these types of food are commonly available both at home and school canteen, their lack of information and knowledge about the intake of substances that can inhibit and encourage the absorption of iron causes them to be unable to choose the right food to consume.

**Parental education:** The results showed that the last education of fathers was high (58.5\%), and the last education of mothers was low (55.3\%). Based on the chi-square test, it is known that the last father’s education is \(p=0.539\) and the last maternal education is \(p=0.692\) which means there is no correlation between parental education with the incidence of anemia in female adolescents \(p>0.05\). Out of the 55 respondents with the last father’s education high, there were 8 respondents (14.5\%) who were anemic, out of 52 respondents with the last maternal education was low there were 6 respondents (11.5\%) who were anemic so it could be concluded that parental education was not the main factor causes of anemia. Higher education will make it easier for someone to absorb health information, especially in the field of nutrition\textsuperscript{14}, but in forming a good health behavior there are many other factors that can influence, cultural factors are one of the strong factors related to the choice of dishes for families. The role of fathers as family leaders has great authority in making decisions relating to health and family.\textsuperscript{15} High levels of education but not accompanied by behavioral changes cannot change the nutritional condition of respondents because even though they receive sufficient information but if not implemented correctly in daily life - days cannot change a person’s health condition.

**Parental occupation:** The results showed that respondents with working fathers (96.8\%) and mothers who did not work (72.3\%). Based on the chi-square test, it is known that working fathers \(p=0.501\) and unemployed mothers \(p=0.825\), which means there is no correlation between parental occupation with the incidence of anemia in female adolescents \(p>0.05\). Out of the 26 respondents with working mothers there were 3 respondents (11.5\%) who were anemic, out of the 68 respondents with unemployed mothers there were 9 respondents (13.2\%) who were anemic, so it could be concluded that the parental occupation was not the main factor causing anemia. Work is closely related to income; if it is limited or uncertain, it affects the consumption of balanced nutrition in family members.\textsuperscript{16} In addition to socio-economic, the level of knowledge of maternal nutrition is also very influential, the higher the mother’s knowledge, the more positive the mother’s attitude towards food nutrition, so the better the consumption of energy, protein, and iron of her family and can avoid anemia.\textsuperscript{17}

**Parental income:** The results showed that respondents with low fathers income (54.3\%) and low mothers income (90.4\%). Based on the chi-square test, it is known that low fathers income \(p=0.349\) and low mothers income \(p=0.876\), which means there is no relationship between parental income with the incidence of anemia in female adolescents \(p>0.05\). Out of the 51 respondents with low fathers income there were 5 respondents (9.8\%) who were anemic, out of 43 respondents with high fathers income there were 7 respondents (16.3\%) who were anemic, so it could be concluded that parental income was not the main factor causing anemia. High and low income can be related to variations in the type of food purchased, but with good knowledge regarding anemia, it can be done in
the selection of iron source foods that are served to the family. Iron food sources do not have to be contained in the expensive food; utilizing local wisdom will be able to cut costs for family food supply.

**Conclusion**

There is no relationship between compliance of IFA consumption, eating behavior, parental education, parental occupation, parental income, with the incidence of anemia in female adolescents. There is a relationship between counseling information from public health care provider with the incidence of anemia in female adolescents.

**Ethical Clearance:** This study approved and received ethical clearance from the Committee of Public Health Research Ethics of Medical Faculty, Lambung Mangkurat University, Indonesia.

**Source Funding:** This study was done by self-funding from the authors.

**Conflict of Interest:** The authors declare that they have no conflict interests.

**References**

The Prevalence of Tension Type Headache among Students of Baghdad College of Medicine in 2018

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Abstract

Objectives: The main goal of this study was to estimate the prevalence of Tension-type headache “TTH” among students of College of Medicine/University of Baghdad “CM/UB”; to compare its prevalence between males and females, and to decide on its relationship with years of study in college; to estimate the relative proportion of episodic to chronic subtypes of TTH; and to identify aggravating/relieving factors of TTH.

Method: A cross-sectional survey study was conducted from the 28th of July 2018 to the 14th of October 2018 on 150 students of CM/UB. The data were collected by using self-administered questionnaire which included demographic data and specific questions on headache based on international Headache Society criteria (ICHD-III) for diagnosis of TTH and other headache types.

Results: Of 150 participant, 86 (57.3%) had TTH: in 78 (52%) it was episodic while in only 8 (5.3%) it was chronic. Neither age nor year of study had a significant relationship with TTH, but there was a significant difference between genders with higher prevalence in females (65.3%) as compared to males (49.3%). Stress, sound and lack of sleep were the most common triggering factors, while rest and sleep are the most effective relieving factors.

Conclusion: TTH is common among students of CM/UB, being more in females, and mainly episodic. Its prevalence was comparable with results from medical schools in nearby countries.

Keywords: Headache, tension type headache, medical students, gender, Baghdad.

Introduction

Tension Type Headache “TTH” is the most common primary headache disorder in all age groups across the globe1. Several epidemiological studies have shown a high prevalence of headache among medical students. The prevalence rates of TTH have been reported in the range of (5.6-40.8%) in different countries2,3.

TTH leads to considerable disability with up to 60% of individuals reporting decreased work effectiveness, increased absenteeism and reduced social engagement4. TTH often begins during the teenage years, affecting three women to every two men5. It is frequent among medical students and shows significant impact on their personal and social lives and the students often claim that their symptoms had worsened since admission to the university6. Some studies showed that particular years of study in medical schools are associated more with TTH7, but this was not consistent among studies8. The relationship of gender with TTH in medical students was also variable across studies, some showed it to be more in females9, but some studies didn’t show that or even showed the opposite7,10.
The term “Tension Type Headache” has been chosen by the International Classification Headache Diagnosis I (ICHD I). International headache society divides TTH into episodic and chronic types based on the frequency of the attacks. Episodic TTH occurring on fewer than 15 days per month, is reported by more than 70% of some populations. It usually lasts a few hours, but can persist for several days. Chronic TTH, occurring on more than 15 days per month, affects 1-3% of adults. It can be unremitting and is much more disabling than episodic TTH.

There are also conflicting reports on aggravating\alleviating factors of TTH, some affirming the role of stressors, others negating it. As the cause of TTH is still unknown, epidemiological studies on specific populations are required to assist clinicians and researchers in finding the origin of pain and the factors influencing the frequency of headache.

**Aim of the study:**
- Estimate life time prevalence of TTH among medical students of CM\UB
- Determine the association of TTH with gender, age and grade
- Estimate the proportion of chronic and episodic types of TTH
- Identify aggravating\relieving factors of TTH.

**Subjects and Method**

A cross sectional study was conducted among medical students of CM\UB from 28th July 2018 to 14th October 2018. The study was conducted in accordance with the Declaration of Helsinki, after approval from Medical Education unit of CM\UB. This study enrolled 150 students who were selected randomly for the purpose of the study. The targeted Medical students were from 2nd, 3rd & 4th grade (year of study), for the age groups 18-23 years from either gender. Data were collected online using self-administered questionnaire. The questionnaire was designed by the researchers according to the international headache standards (IHS), and contained individual’s demographic information such as age, gender, grade and questions to identify the type of headache.

All subjects were classified by using 3rd edition of the International Classification of Headache Disorders “ICHD-3” to make the differential diagnosis between TTH, migraine and cluster headache according to the responses provided by the research subjects. And then we sub-classified TTH to episodic and chronic according to the frequency of the attacks.

**Statistical analysis:** All data were statistically analyzed by using the Statistical Package for the Social Sciences (SPSS) software (version 25) at level of significance (P ≤ 0.05) Descriptive statistics were presented in frequencies, percentages, standard deviations, and 95% confidence intervals.

The differences among groups were analyzed by using logistic regression model for showing the influence of the factors of age, gender, and grade on the type of the headache; and Chi-square method for differences in characteristics of headache, and by using z-test (for proportion) for differences in aggravating/alleviating factors of headache.

**Finding:** There were 75 males and 75 females participating in this study which represent 50% and 50% respectively. The age of participants ranged between 18 and 23 years with a mean equaling 20.59 years ± standard deviation of 1.181 years (95% CI: 18.3-22.9). The mean age for males was 20.67 years +/- 1.277 standard deviation (95% CI: 18.2-23.2), while for females it was 20.51 +/- 1.073 standard deviation (95% CI: 18.4-22.6), both males and females age ranged from 18 to 23. The number of participants at the second stage were 58 (32 F, 26 M), at the third stage 47 (25 F, 22 M), and at the fourth stage 45 (24 F, 21 M).

The study showed that out of 150 students, 114 (76%) had headache, this was distributed as: 57.3% (n=86) had TTH, 16.7% (n=25) had migraine, 2% (n=3) had cluster headache and 24% (n=36) had no headache. The distribution of those per gender and age were calculated and depicted in Fig.(1,2) respectively.

**Figure 1:** Bar chart showing the distribution of headache among medical students of Baghdad medical college.
The descriptive statistics showed that the age of 86 students with TTH was distributed between 18 and 23 years with a mean of 20.52 years and standard deviation of ± 1.193 (95% CI [18.18-22.86]). Those were distributed as follows: 3 (3.6%); 13 (15.7%); 25 (30.1%); 28 (33.7%); 8 (9.6%); 6 (7.2%), per years of age (18 to 23) respectively; with 35 (40.7%); 29 (33.7%); 22 (25.6%) in 2nd, 3rd, and 4th grade respectively.

Of 150 participants, 86 (57.3%) had TTH: 78 (52%) had episodic TTH and only 8 (5.3%) had chronic TTH of all 75 males: 37 (49.3%) had TTH, in 35 (46.7%) it was episodic and just in 2 (2.6%) it was chronic of all 75 females: 49 (65.3%) had TTH, in 43 (57.3%) it was episodic and just in 6 (8%) it was chronic. The percentages of episodic and chronic TTH per age were calculated and are depicted in Fig. (3).

The results also showed that out of 114 participants with headache: 8.8% (n=10) occurred daily, 28.1% (n=32) occurred once a week, 35.1% (n=40) occurred more than once a week and 28.1% (n=32) occurred once a month. Regarding TTH: 8.1% occurred daily, 29.1% occurred once a week, 32.6% occurred more than once a week, and 30.2% occurred once a month.

Logistic regression model had been used to show the influence of age, gender and grade on the type of the headache, and to show the influence of these factors on TTH especially (Tab.1).

Table 1: p-values of influence of age, gender and grade on the type of headache and influence on TTH

<table>
<thead>
<tr>
<th>Factors</th>
<th>Studied sample</th>
<th>Tension headache</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>P-value</td>
</tr>
<tr>
<td>Gender</td>
<td>0.030*</td>
<td>S</td>
</tr>
<tr>
<td>Age</td>
<td>0.121</td>
<td>N.S</td>
</tr>
<tr>
<td>Grade</td>
<td>0.272</td>
<td>N.S</td>
</tr>
</tbody>
</table>

Headache’s type is a dependent variable, *statistically significant, S statistically significant, N.S not significant.

Frequencies and significance of aggravating factors of headache in tension and non-tension groups were calculated (Tab.2). Similarly these were calculated for alleviating factors in those groups (Tab.3).

Table 2: Frequency table of the factors that bring on/aggravate headache

<table>
<thead>
<tr>
<th>Factors</th>
<th>No tension headache (28)</th>
<th>Tension headache (86)</th>
<th>z-test statistic</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stress</td>
<td>8</td>
<td>80</td>
<td>7.0597</td>
<td>&lt;0.00001</td>
</tr>
<tr>
<td>Lack of sleep</td>
<td>25</td>
<td>43</td>
<td>-3.6803</td>
<td>0.0024</td>
</tr>
<tr>
<td>Exercise and physical exertion</td>
<td>13</td>
<td>17</td>
<td>-2.7827</td>
<td>0.00544</td>
</tr>
<tr>
<td>Light</td>
<td>6</td>
<td>15</td>
<td>-0.4727</td>
<td>0.63836</td>
</tr>
<tr>
<td>Sound</td>
<td>7</td>
<td>47</td>
<td>2.7293</td>
<td>0.00634</td>
</tr>
</tbody>
</table>

Table 3: Frequency table of the factors that help the students in relieving their headache

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>No tension headache (28)</th>
<th>TTH (86)</th>
<th>z-test statistic</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rest</td>
<td>8</td>
<td>28.6%</td>
<td>72.1%</td>
<td>4.1088</td>
</tr>
<tr>
<td>Sleep</td>
<td>28</td>
<td>100%</td>
<td>70.9%</td>
<td>3.2289</td>
</tr>
<tr>
<td>Medication</td>
<td>20</td>
<td>71.4%</td>
<td>58.1%</td>
<td>1.2546</td>
</tr>
</tbody>
</table>
Discussion

This is the first study reporting the life time prevalence of headache and particularly TTH in CM/UB. The prevalence of headache in this study was 76% which is higher than what’s found in a study in Iran (58.7%)\(^7\) and much lower than a study conducted in Oman (98.3%)\(^10\), both of which were conducted on medical university students.

In the present study TTH was found to be common in medical students of CM/UB with the overall prevalence of 57.3%, which is in line with a number of studies on medical students that were conducted in Iran (44.2%)\(^7\), Turkey (50.7%)\(^18\) and Saudi Arabia (58%)\(^8\), as well as in Zagreb (57.69%)\(^9\), yet it is much higher than a study conducted in Iraq\(^19\) on the general population (21%), and also higher than the prevalence of TTH reported in the Middle East area (11-39%) \(^10\), \(^20\)-\(^22\), which might signal a possible correlation between TTH and university study of medicine in Iraq.

In our study, TTH was more frequent than migraine (16.7%) and cluster (2%), in agreement with studies done in universities in nearby locations: Isfahan\(^7\) (44.2% TTH versus 14.2% migraine); Jordan\(^23\) (36.9% TTH versus 7.7% migraine); Zagreb\(^9\) (57.69% versus 8.86%); while in Oman\(^10\) both were equal (12.2%). However the last study\(^10\) contained a higher percentage of females in its sample (62.5%).

The generally believed higher prevalence rate of TTH among women, reflected by several studies, was observed in our sample with a prevalence of (65.3%) in females versus (49.3%) in males. This is in agreement with the findings of the study carried out in University of Zagreb Medical School (25.9% male, 70.1% female)\(^9\). However, some studies found no significant difference between male and female students like studies that are conducted in Isfahan\(^7\) (49.2% in males vs. 39.2% in females) and the one conducted in Oman (13.9% in males vs.11.1% in females)\(^10\).

In our study, grade showed no significant relationship with TTH, which comes in conflict with some studies like the study conducted in Isfahan which reported significant relationship with 3rd year study\(^7\).

Several studies have reported the effect of age on different types of headache\(^24\). Considering the limited age range in this study; we did not observe any effect of age among sufferers from TTH, which agrees with the study in Isfahan\(^7\).

Regarding the types of TTH, our study showed that the prevalence of episodic TTH is 52% (46.7% of males; 57.3% of females) and prevalence of chronic TTH is 5.3% (2.6% of males; 8% of females), which comes in agreement with a global report\(^12\).

Among the factors affecting the intensification of tension headache, stress had the highest effect (93%), which conflicts with results of a study in Taibah University in Saudi Arabia on 3rd year female medical students, which reports no relationship with stress\(^8\). However our results agrees with many prior studies on TTH in general\(^13\)-\(^15\). Sound (phonophobia) intensified TTH in (54.7%) in our study and it was significantly different even from migraine group which also had phonophobia, this agrees with results of a prior study on the relationship of phonophobia with TTH\(^25\). Lack of sleep occurred in (50%) of students with TTH in our sample, which agree with prior studies on TTH in general\(^14\),\(^15\), however lack of sleep was significantly found to be more with migraine than TTH, which comes in agreement with prior studies\(^15\). Rest and sleep are the factors found in our study to be with the highest effect on relieving TTH by (72.1%) and (70.9%) respectively, coming in agreement with prior studies\(^13\),\(^14\) which agrees with what’s generally mentioned about TTH in various textbooks\(^26\), though this conflicted with another study\(^15\).

Conclusion

- TTH is common among medical students in CM/UB, being more in females, and mostly episodic.
- There is no significant association between TTH and age or year of study in CM/UB.
- Stress, sound and lack of sleep are the most common triggering factors, while rest and sleep are the most effective relieving factors.

Ethical Clearance: Taken from Medical Education Unit/College of Medicine/University of Baghdad at May 2018.

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Conflict of Interest: Nil.

References


Vasomotor Impact of Perivascular Adipose Tissue on Coronary Circulation

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Abstract

Research during the past decade has highlighted the functional role of perivascular adipose tissue (PVAT) in regulating the contractility of the underlying vascular smooth muscle cell layer. However, the mechanisms underlying these observations are not fully understood. PVAT has a protective role as it could induce vasorelaxation in different anatomical positions. However, there is a considerable evidence that the development and progression of coronary artery disease could be attributed to coronary PVAT. This review provides a comprehensive review of the vasomotor effect of PVAT that identifies the coronary PVAT as a necessary paracrine organ with a significant role in physiology and associated pathologies, and calls for basic cardiovascular research to solve this issue.

Keywords: Perivascular adipose tissue, coronary arteries, vascular tone, vasoconstriction, vasorelaxation.

Perivascular adipose tissue: Perivascular adipose tissue (PVAT) is positioned around blood vessels and is regarded distinct from the adventitia in spite of absence of a barrier between them. For years, it was suggested that the blood vessel has only the well-recognized three layers of the blood vessel (tunica adventitia, tunica media and tunica intima). However, tunica adiposa (or perivascular adipose tissue PVAT) has been recently described as a new fourth layer (Fig. 1) ¹². According to the anatomical origin and vessel calibre, PVAT is distributed with various proportions throughout the body, with coronary perivascular adipose tissue is somewhat detached from the surrounded epicardial fat³. The recent attention concerning perivascular adipose tissue as a paracrine organ has led to several studies investigating the characteristics of various fat depots in the body.

Figure 1: Structure and composition of a blood vessel. The innermost layer is tunica intima (endothelium), followed by the tunica media (vascular smooth muscle), tunica adventitia and then tunica adiposa (PVAT). Figure adapted from ⁴.

It has been traditionally suggested that PVAT can act as a simple connective tissue support to the adjacent vessels, with additional fat storage facility and regulation of blood temperature. However, in recent years this view has been changed as conclusive evidence characterized PVAT as far more than a structural support but as indeed an active secretory organ of several bioactive signalling molecules, which are important in both health and disease ⁵. Indeed, a complex world of physiology resides in PVAT, and PVAT is considered as a source of a growing list of bioactive mediators that are collectively termed

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adipokines. These molecules include hormones (such as adiponectin, leptin and sex steroids), inflammatory cytokines (for example, interleukin-1, interleukin-6, tumour necrosis factor-α (TNF-α)), other proteins (as angiotensinogen) and reactive oxygen species 6–8.

The substantial role of the endothelium in regulating the homeostasis of the underlying smooth muscle cell layer has become clear in recent decades. More recently, the concept of endocrine and paracrine role of the adipocytes is suggested in the vasoregulation as numerous adipokines have been identified to elicit haemodynamic effect 9,10. However, the impact of the adipokines is still obscure as they appear to have both advantageous and deleterious effects on vascular biology and pathophysiology 11.

**PVAT effect in regulation of vascular tone:** Based largely on the assumption that PVAT is an extraneous tissue, PVAT is routinely removed in vascular functional studies as it is supposed that PVAT even could impede the diffusion of exogenous molecules into the vascular tissue. The claim of the PVAT as a mere supportive structure was firstly denied by Soltis and Cassis (1991) who first described that PVAT could significantly attenuate vascular responsiveness of Sprague-Dawley rat aorta to noradrenaline 12. So the claim that the physical presence of PVAT could mechanically impede the diffusion of vasoactive substances, and subsequently the anti-contractile effect, was questioned.

To date, many studies have been performed in this field showed that PVAT has the ability to induce vasorelaxation 13,14. Subsequently, the term perivascular contractile factor was firstly introduced in the literature in 2007 15. In fact, what makes PVAT’s role in body homeostasis unique is the close proximity with the vessels. Although the exact mechanism of different adipose-derived relaxing and constricting factors (ADRFs and ADCFs) is yet to be identified, a number of potential PVAT-derived bioactive substances have been suggested to affect the vascular contractility, for instance, NO, hydrogen sulphide (H₂S), angiotensin 1-7, methyl palmitate, reactive oxygen species (ROS) and angiotensin II 5. Obviously, the majority of these substances are normally produced in physiological conditions and exacerbated during pathological status including inflammatory conditions 16.

**Signalling of coronary PVAT:** Coronary circulation has its own peculiarities, such as blood flow is mainly during cardiac diastole, and its regulation mainly by metabolites and not neural. In addition, coronary arteries are functionally end arteries so blockage of CA results in ischemia and infarction of the cardiac muscles supplied by artery 17.

Payne et al. have presented novel findings that highlight the potential detrimental role of PVAT in regulating vascular tone of coronary arteries. They demonstrated that perivascular adipose tissue could reduce endothelium-dependent dilatation of canine coronary arteries by impairing NO production 18. Then, the same group also published the first report which suggested PVAT-derived leptin as a potential contributor to coronary atherogenesis in metabolic syndrome. An increase in epicardial PVAT leptin aggravated coronary endothelial dysfunction in metabolic syndrome via a PKC-β-dependent pathway 4. Another study of coronary arteries from Ossabaw swine showed that PVAT could induce a contraction via activation of voltage-dependent ion channels, and attenuate H₂O₂-mediated vasorelaxation. In addition, PVAT was responsible for enhanced vasoconstriction of porcine coronary arteries in obesity 19. In line with this study, leptin was demonstrated to enhance coronary vasoconstriction and smooth muscle proliferation via a Rho-kinase-dependent pathway 20. The same group have shown that PVAT can attenuate vasodilation via inhibiting distinct subtypes of K⁺ channels in coronary smooth muscle of lean versus diet-induced obese pigs 21.

Chemerin was an another interesting adipokine identified firstly in PVAT around the rat aorta and superior mesenteric artery, and has the ability to contract the vessels 22. These findings are supported by Kostopoulos et al. (2014) who confirmed the expression of chemerin and its receptor CMKLR1 in human coronary artery, and PVAT. In addition, they found that chemerin is positively correlated with coronary atherosclerosis 23. In line with this study, the atherosclerosis in human aorta and coronary artery is positively correlated with the expression of chemerin in PVAT 24. These findings describe a new potential mechanism of how PVAT can modulate blood pressure and affect cardiovascular pathophysiology. Interestingly, elevated serum levels of chemerin have been reported in different cardiovascular diseases such as coronary artery diseases 25, hypertension 26, and preeclampsia 27. However, other adipokines in PVAT could balance or enhance the vasoconstrictor effects of chemerin, for instance, the chemerin:adiponectin ratio is considered as a predictor of metabolic syndrome 28.
In addition, our study which was conducted on porcine coronary arteries (PCA) showed that fresh PVAT could enhance porcine coronary arterial tone through the release of thromboxane and PGF\textsubscript{2α}. This study, for the first time, identified clear sex differences in the regulation of coronary artery tone by PVAT, with thromboxane has a role in PVAT-dependant vasoconstriction in females while PVAT-derived PGF\textsubscript{2α} plays a role in the contraction of PCAs from males 20.

Reactive oxygen species (ROS) may play a role in bi-directional signaling between coronary artery PVAT and the vascular smooth muscle 30. This study is performed in individuals with type 2 diabetes and proposed this PVAT-vessel interaction as a novel therapeutic target for the prevention of vascular complications of type 2 diabetes. However, it is unknown whether the same signaling interaction is present in normal individuals. We have found that increased NADPH oxidase (Nox) expression and activity in PVAT may also influence the contractile effects on PVAT in the porcine coronary circulation during normal conditions (unpublished data). In addition, another study demonstrated resistin as an adipokine that reduces the endothelium-dependent and endothelium-independent vasorelaxation via increased superoxide radical production and decreased eNOS expression in porcine coronary artery 31.

**Pathophysiology of coronary PVAT:** It became increasingly clear that PVAT has a role in cardiovascular pathophysiology. In addition to its disadvantageous effect on the vascular tone, researches showed that pericoronary fat may act as a local risk factor for other cardiovascular pathologies, for instance, PVAT is associated with atherosclerosis in the coronary arteries 32. Furthermore, an apparent link has been found between an increase in PVAT and coronary artery disease 33. In fact, coronary PVAT exhibits a rather proinflammatory phenotype compared to the visceral and subcutaneous depots. Chatterjee et al. (2009) found that both human coronary PVAT and adipocytes secrete higher proinflammatory cytokines levels compared to visceral or subcutaneous depots 34. Interestingly, a recent study found that the phenotype of PVAT around internal thoracic artery (ITA) is closer to that of subcutaneous adipose tissue than that of PVAT around coronary artery, which may result from inherent variations in adipocytes 35. The authors concluded that the decreased atherosclerotic plaque burden in the internal thoracic artery could be due to the protection of ITA-PVAT from metaflammation and consecutive adipose tissue remodelling.

Additionally, Okamoto et al. (2001) showed that balloon overstretch injury could induce accumulation of neutrophils and macrophages in PVAT of porcine coronary arteries 36. The authors suggested that this accumulation could possibly occur through the release of cytokines and/or reactive oxygen species. This is supported by the findings of a recent study which showed that increased epicardial and PVAT are independent risk factors of cardiovascular diseases 37. The authors suggested evaluating the thickness of epicardial and perivascular adipose tissue (PVAT) and the adipokine-cytokine profile as possible model for the assessment of drug effectiveness in patients with coronary heart disease. Although we are still far from using PVAT as a potential local therapeutic target for controlling coronary artery tone, a recent study showed that a technique of non-invasive imaging for PVAT inflammation could be used to clarify the roles of PVAT in the presence and severity of vasospastic angina and the pathogenesis of coronary artery disease 38. In hypoxia, coronary arteries are relaxed to protect the heart from ischaemic damage via, at least partly, the generation of H\textsubscript{2}S. Interestingly, a recent study showed that PVAT can augment hypoxic relaxation of coronary arteries through a mechanism involving H\textsubscript{2}S and cystathionine-β-synthase 39.

Noteworthy, rodents were utilized commonly to study the function of PVAT in different anatomical positions, apart from coronary arteries due to the absence of PVAT around the coronary arteries of rodents. Conversely, the researches generally that studied coronary arterial PVAT were conducted on human or pigs, which are more representative to human than rodents. Although this is considered as advantageous point to the studies of the coronary arteries, the human studies particularly were conducted in pathological rather than physiological conditions as the human vessels used were from patients with severe coronary artery disease.

**Conclusion**

Whilst many studies showed the ‘good face’ of PVAT in inducing vasorelaxation in different anatomical regions (mainly aorta, mesenteric and internal thoracic arteries), studies on coronary arteries demonstrated the ‘bad face’ of PVAT, as one of the peculiarities of the coronary circulation, in that PVAT caused vasoconstriction. Our current knowledge about PVAT in coronary circulation can be potentially utilized therapeutically to target CAD. Future studies are required to evaluate the vasomotor signalling
substances/pathways that are originated from PVAT and regulate the vascular tone of the coronary arteries in both physiological and pathological conditions.

**Conflict of Interest:** Nil

**Source of Funding:** Self

**Ethical Clearance:** Taken from College of Pharmacy Research Ethics Committee

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Anti-fungal Activity of Ginger Oil Against Aspergillus Fumigatus and Aspergillus Niger Causing Aspergillosis

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Abstract
Aspergillosis is a common infectious disease causing many economic losses, especially poultry. Antibiotic resistance and infection recurrence attracted the researchers to find a safe and alternative anti-fungal substances instead of using the conventional antibiotics. In this work, anti-fungal activity of ginger oil in comparison to ketoconazole were evaluated against *A. fumigatus* and *A. niger* causing aspergillosis. The saxolite was used for extraction of ginger oil using n-hexan as organic solvent. Several treatments were used 5%, 10%, 15%, 20% and 25% in order to determine the minimum inhibitory concentration (MIC) ginger oil using the well diffusion assay. Ginger extract (15%) and ketoconazole (20%) were identified as the (MICs) against *A. fumigatus*. The diameter’s average of the fungal inhibition zones were 1, 3.1 and 5.2 cm when the ginger extract was used at 15%, 20%, and 25%, respectively. In addition, The diameter’s average of the *Aspergillus* inhibition zones were 0, 1.5, and 2.5 cm when 15%, 20%, and 25% of ketoconazole, respectively were applied. In regard to *Aspergillus* niger, our findings showed that 5% ginger extract was identified as the MIC. The diameter’s average of the fungal inhibition zones were 1, 3.2, 4.7, 6.2, and 7.7 cm when ginger extract was used at 5%, 10%, 15%, 20%, and 25%, respectively. Moreover, The diameter’s average of the *Aspergillus* inhibition zones were 0.9, 1.8, 3.3, 4.9, and 6.4 cm when 5%, 10%, 15%, 20%, and 25% ketoconazole, respectively were applied. No fungal inhibition was observed when 0% of antimicrobial agents, as negative control, was used. In comparison to ketoconazol, ginger extract had higher anti-fungal properties against the growth of *Aspergillus fumigatus* and *Aspergillus niger*. Because of its antifungal potential against isolated *Aspergillus* species, the author suggested ginger oil as a safe natural derived antimicrobial for treatment of aspergillosis.

Keywords: Aspergellosis, Aspergillus fumigatus, Aspergillus niger, ginger oil, ketoconazol, anti-fungal.

Introduction

Aspergillosis is one of the most common infectious disease affects both humans and animals, especially poultry, causing many economic losses. *Aspergillus fumigatus* and *Aspergillus niger* are the main causes of the infection\(^1\)-\(^4\). The infectious agents are opportunistic fungi, require only moisture and organic substances to grow. They widespread, almost everywhere; in the soil, water and air. These fungi possess a number of enzymes, which facilitate and maintain the balance of metabolic reactions\(^5,6\). *Aspergillus* species are associated with several health threatening and economic losses, especially when the infection is being an epidemic\(^7\).

The risk factors of *A. fumigatus* and *A. niger* are represented by the production of ergot mycotoxins\(^8,9\). These toxins cause a wide range of diseases ranging from allergic reactions to direct systematic injury\(^10\) such as, respiratory aspergillosis, when the respiratory system is the main portal of the fungi entry\(^11\). After inhalation, a large number of fungal pores are transmitted through the upper respiratory tracts to the lungs\(^12\). Then, the spores are vegetated and the fungal hypha are elongated (grown) as network, and eventually causing tissue destruction what allow the small size spores to penetrate the pulmonary vesicles\(^13\). Several factors have been reported contributing to the development of the aspergillosis including; age, abuse of cortisone\(^14\), HIV infection\(^3,4,15-18\) malnutrition, smoking and high concentration of ammonia\(^1,3,4,6,15,20,21\).

As eukaryotes, controlling of *Aspergillus* infection is still a challenge because of their structure and...
metabolic processes are as same as in human, animal and plant. So, the antimicrobials that influence on the fungi growth could interfere with the normal physiological functions of the host cells. Many of anti-fungal agents are available but very few are without side effects\textsuperscript{10,22,23}. Antibiotic resistance and infection recurrence after treatment are motivating the researchers to find a safe and alternative anti-fungal agents instead of using the synthetic antibiotics which their dangerous side effects are known. Recently, the plant extracts and oils are non-toxic and biologically effective against a wide range of bacterial and fungal pathogens with no side effects on the humans or animals\textsuperscript{24-30}. This study comes to evaluating the anti-fungal activity of ginger oil in comparison to ketoconazole against \textit{A. fumigatus} and \textit{A. niger} causing aspergillosis.

**Material and Method**

**Samples Collection and Fungal Growth Conditions:** The fungi species, \textit{A. fumigatus} and \textit{A. niger} were isolated from infected poultry having aspergillosis. The samples were taken and processed, then fungal isolation at the microbiology Lab., Veterinary Medicine/Diyala University. The czapek Dox agar was used for the isolation and identification of the \textit{Aspergillus} spp. After fungal inoculation into the culture media, the agar plates were incubated aerobically at 37°C for 24 hr. \textit{Aspergillus} isolates were kept into czapek Dox agar slants for spore formation in the refrigerator.

**Preparation of Stock Solutions of Ketoconazole:** The antibiotic, ketoconazole, was prepared in various concentrations. The stock solution 10 mg/ml was prepared by dissolving 50 mg of antibiotic into 5 ml of 100% DMSO and mixed well using the vortex mixer. A second dilution of ketoconazole 1 mg/ml was prepared by transferring 1ml from the first stock solution (10 mg/ml of antibiotic) into 9 ml of 100% DMSO and mixed well using the vortex mixer. All stock solutions were kept in the sealed vials at room temperature until they were used for preparation of other various dilutions.

**Preparation of ginger extract:** The sexolite were used for extraction of the soluble active compounds from ginger. In this work, the n-hexane was used as organic solvent. This assay was performed according to (31) with minor modifications. Briefly, 30 g of crushed ginger’s rhizomes was transferred into the extraction thumb of the sexolite. Then, 300 ml of n-hexane organic solvent were added and mixed with the crused rhizomes and left for 10 hours. The produced extract was kept in the tightly closed tubes and its anti-fungal activity was evaluated against the tested pathogenic fungi; \textit{A. fumigatus} and \textit{A. niger} by antagonistic test.

**Preparation Dilutions of Antimicrobial Agents:** Several concentrations of ginger extracts and ketoconazole were prepared as following; 5%, 10%, 15%, 20%, and 25% in order to evaluate their antimicrobial activity against isolated \textit{Aspergillus} species. The concentrations were prepared based on the following equation:

\[ C_1 \times V_1 = C_2 \times V_2 \]

**Preparation of Fungi Spore Suspension:** Spores suspension was prepared by the addition of 5 ml of distilled water into the fungal spores, which were grown before onto the czapek Dox agar slants. By using a sterile brush, the fungal spores existed on the surface of agar slant were scratched, suspended in the water and collected in the silver glass tubes.

**Antagonestic test:** Antagonistic assay was performed in order to evaluate the antimicrobial activity of ginger extract and ketoconazol against \textit{A. fumigatus} and \textit{A. niger} which were isolated from poultry aspergillosis. Briefly, the czapk Dox agar was prepared, sterilized by autoclave and 50 ml of the culture medium was transferred into 250 ml flasks. Before solidification of Czapk Dox agar, 1 ml of spore suspension was added to 50 ml of the culture medium and shaken well then poured into sterile petri-dishes. After solidification of agar, 8 mm wells were made and the antimicrobial substances with pre-determined concentrations were added. All agar plates were incubated aerobically for 24 hours at 37°C. After incubation, the diameters of the zones of the fungal inhibition were measured in millimeters using a digital caliper.

**Results**

| Table 1. Evaluation of the efficacy of ginger extract against \textit{Aspergillus fumigatus} |
|---------------------------------|-----------|-----------|-----------|-----------|
| **Ginger extract + Aspergillus Fumigatus** | R1 | R2 | R3 | LSD |
| **T1 (Control)** | 0 | 0 | 0 | 0<sup>d</sup> |
| T2 (Ginger extract 5% + Asp. fumigatus) | 0 | 0 | 0 | 0<sup>d</sup> |
| T3 (Ginger extract 10% + Asp. fumigatus) | 0 | 0 | 0 | 0<sup>d</sup> |
| T4 (Ginger extract 15% + Asp. fumigatus) | 1.2 | 1 | 1 | 1<sup>c</sup> 0.40 |
| T5 (Ginger extract 20% + Asp. fumigatus) | 3.1 | 3 | 3.2 | 3.1<sup>b</sup> |
| T6 (Ginger extract 25% + Asp. fumigatus) | 5 | 5 | 5.4 | 5.2<sup>a</sup> |
The letters (a,b,c) vertical compared between variables according to each parameter at a=0.05. Small different letters refer to significant different between variables at 0.05. Duncan test and LSD used to compared between means of variables.

Table 2. Evaluation of the efficacy of ketoconazole against Aspergillus fumigatus

<table>
<thead>
<tr>
<th>Treatments</th>
<th>R1</th>
<th>R2</th>
<th>R3</th>
<th>Mean</th>
<th>LSD</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1 (Control)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>T2 (ketoconazole 5% + Asp. fumigatus)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>T3 (ketoconazole 10% + Asp. fumigatus)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>T4 (ketoconazole 15% + Asp. fumigatus)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>T5 (ketoconazole 20% + Asp. fumigatus)</td>
<td>1.5</td>
<td>1.5</td>
<td>1.6</td>
<td>1.5b</td>
<td>0.72</td>
</tr>
<tr>
<td>T6 (ketoconazole 25% + Asp. fumigatus)</td>
<td>2</td>
<td>3</td>
<td>2.6</td>
<td>2.5a</td>
<td></td>
</tr>
</tbody>
</table>

Table 3. Evaluation of the efficacy of ginger extract against Aspergillus niger

<table>
<thead>
<tr>
<th>Treatments</th>
<th>R1</th>
<th>R2</th>
<th>R3</th>
<th>Mean</th>
<th>LSD</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1 (Control)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>T2 (Ginger extract 5% + fungus)</td>
<td>1.2</td>
<td>0.8</td>
<td>1</td>
<td>1c</td>
<td></td>
</tr>
<tr>
<td>T3 (Ginger extract 10% + fungus)</td>
<td>3.2</td>
<td>3</td>
<td>3.4</td>
<td>3.2b</td>
<td>0.67</td>
</tr>
<tr>
<td>T4 (Ginger extract 15% + fungus)</td>
<td>4.7</td>
<td>4.5</td>
<td>4.9</td>
<td>4.7b</td>
<td></td>
</tr>
<tr>
<td>T5 (Ginger extract 20% + fungus)</td>
<td>6.2</td>
<td>6</td>
<td>6.4</td>
<td>6.2a</td>
<td></td>
</tr>
<tr>
<td>T6 (Ginger extract 25% + fungus)</td>
<td>7.7</td>
<td>7.5</td>
<td>7.9</td>
<td>7.7a</td>
<td></td>
</tr>
</tbody>
</table>

Table 4. Evaluation of the efficacy of ketoconazole against Aspergillus niger

<table>
<thead>
<tr>
<th>Treatments</th>
<th>R1</th>
<th>R2</th>
<th>R3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1 (Control)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>T2 (ketoconazole 5% + Asp. niger)</td>
<td>0.9</td>
<td>1</td>
<td>0.9</td>
<td>0.9d</td>
</tr>
<tr>
<td>T3 (ketoconazole 10% + Asp. niger)</td>
<td>1.8</td>
<td>1.9</td>
<td>1.8</td>
<td>1.8c</td>
</tr>
<tr>
<td>T4 (ketoconazole 15% + Asp. niger)</td>
<td>3.4</td>
<td>3.6</td>
<td>3.1</td>
<td>3.3b</td>
</tr>
<tr>
<td>T5 (ketoconazole 20% + Asp. niger)</td>
<td>5</td>
<td>5.3</td>
<td>4.4</td>
<td>4.9b</td>
</tr>
<tr>
<td>T6 (ketoconazole 25% + Asp. niger)</td>
<td>6.6</td>
<td>7</td>
<td>5.7</td>
<td>6.4a</td>
</tr>
</tbody>
</table>

Table 5. Comparing the efficacy of ginger extract against Aspergillus fumigatus & Aspergillus niger

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Aspergillus fumigatus</th>
<th>Aspergillus niger</th>
<th>LSD</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1 (Control)</td>
<td>0d</td>
<td>0d</td>
<td></td>
</tr>
<tr>
<td>T2 (Ginger 5% + fungus)</td>
<td>0d</td>
<td>1c</td>
<td></td>
</tr>
<tr>
<td>T3 (Ginger 10% + fungus)</td>
<td>0d</td>
<td>3.2b</td>
<td>3.52</td>
</tr>
<tr>
<td>T4 (Ginger 15% + fungus)</td>
<td>1c</td>
<td>4.7b</td>
<td></td>
</tr>
<tr>
<td>T5 (Ginger 20% + fungus)</td>
<td>3.1b</td>
<td>6.2a</td>
<td></td>
</tr>
<tr>
<td>T6 (Ginger 25% + fungus)</td>
<td>5.2a</td>
<td>7.7a</td>
<td></td>
</tr>
</tbody>
</table>

Table 6. Compares the efficacy of ketoconazole against Aspergillus fumigatus & Aspergillus niger

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Aspergillus fumigatus</th>
<th>Aspergillus niger</th>
<th>LSD</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1 (Control)</td>
<td>0g</td>
<td>0g</td>
<td></td>
</tr>
<tr>
<td>T2 (ketoconazole 5% fungus)</td>
<td>0g</td>
<td>0.9d</td>
<td></td>
</tr>
<tr>
<td>T3 (ketoconazole 10% fungus)</td>
<td>0g</td>
<td>1.8c</td>
<td></td>
</tr>
<tr>
<td>T4 (ketoconazole 15% fungus)</td>
<td>0g</td>
<td>3.3b</td>
<td></td>
</tr>
<tr>
<td>T5 (ketoconazole 20% fungus)</td>
<td>1.5b</td>
<td>4.9b</td>
<td></td>
</tr>
<tr>
<td>T6 (ketoconazole 25% fungus)</td>
<td>2.5a</td>
<td>6.4a</td>
<td>0.78</td>
</tr>
</tbody>
</table>
The letters (x, y) horizontal compared between variables according to each parameter at \( a=0.05 \). Small different letters refer to significant different between variables at 0.05. Duncan test and LSD used to compared between means of variables.

**Discussion**

The antimicrobial effect of ginger extract and ketoconazole against the growth of *Aspergillus fumigatus* was illustrated in Tables (1 and 2). Our data showed that 15% (T4) and 20% (T5) of ginger extract and ketoconazole, respectively were identified as the minimum inhibitory concentrations (MICs). The diameter’s average of the inhibition zones were 1, 3.1, and 5.2 cm when ginger extract was used at 15% (T4), 20% (T5), 25% (T6), respectively. In addition, The diameter’s average of the inhibition zones were 0, 1.5, and 2.5 cm when 15% (T4), 20% (T5), 25% (T6) of ketoconazole, respectively were applied. No inhibition zone was observed when the negative control (0% of antimicrobial agents) was used. The best antimicrobial activity of ginger extract and ketoconazole was noticed at 25% (T6) with which, the diameters’ average of the inhibition zones were 5.2 and 2.5 cm, respectively.

In regard to antimicrobial activity of ginger extract and ketoconazole against *Aspergillus niger*, our findings in Tables 3 and 4 showed that 5% (T2) of ginger extract was identified as the MIC. The antimicrobial activity was progressively increased with the concentrations of ginger extract. The highest concentrations were used, the larer anti-fungal activity was noticed. The diameter’s average of the fungal inhibition zones were 1, 3.2, 4.7, 6.2, and 7.7 cm when ginger extract was used at 5% (T2), 10% (T3), 15% (T4), 20% (T5), 25% (T6), respectively. Moreover, The diameter’s average of the inhibition zones were 0.9, 1.8, 3.3, 4.9, and 6.4 cm when 5% (T2), 10% (T3), 15% (T4), 20% (T5), and 25% (T6) of ketoconazole, respectively were applied. No fungal inhibition was observed when 0% of antimicrobial agents, as negative control, was used. The author suggested that the anti-fungal potential of ginger extract against *Aspergillus fumigatus* and *Aspergillus niger* is possibly because of the extract composition of several active compounds specifically, zingiberol, zigiberine, bisabolene, paradole, Gingerol33,34. Gingerol was reported as acidifying agent which responsible for antimicrobial potential of ginger extract35.

In comparison to ketoconazol, the data in tables 5 and 6 showed that ginger extract had higher anti-fungal properties against the growth of *Aspergillus fumigatus* and *Aspergillus niger*. The virulence factors and cell wall properties of *Aspergillus fumigatus* make them more resistant to the tested antimicrobials than *Aspergillus niger*36.

**Ethical Clearance:** Ethical clearance is not needed for present study.

**Source of Funding:** Self

**Conflict of Interest:** Nil

**References**


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Esthetic Utility and Stem Cell Implication with an Innovative Surgical Procedure

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Abstract

Introduction: The classic therapeutic surgical procedure could not follow the upstanding new esthetic demands with the utility of stem cell. The aim is to show the clinical utility of an innovative surgical technique out coming both values, therapeutic and esthetic purposes with the activation and implication of stem cell.

Material and method: Five cases of human adult subjects have been operated with the innovative surgical procedure.

Results: Full coverage of the surgical field with new healthy gingival tissues.

Discussion: Tissue engineering using mesenchymal stem cells (MSCs) is a recent therapeutic modality that has several advantages. MSCs have high proliferation potential and may be manipulated to permit differentiation before being transplanted, suggesting they may be an ideal candidate for regenerative procedures. The regenerative therapy needed a specific regenerative technique that allow the genetic factors to play their roles in finishing the outcome of the surgery

Conclusion: This surgical technique showed to be clinically practicable with ability to activate gingival stem cells to achieve the specialization of the gingival tissues and giving a pleasant healthy protected clinical appearance as well it showed a faster healing process and less postoperative complications when a biologic glue (tissucol) applied as hemostasis and substitution material instead of traditional suture.

Keywords: Stem Cell, Gingiva, Esthetic Surgery, Tissucol, Hung-up suture.
the basic rules: 1- performance of high quality oral hygiene control. 2- To create a helpful dento-gingival relationship. 3- To maintain a healthy, pleasant, esthetic gingival appearance. 4-To eliminate as much as possible the anatomical defects that could be a risk for disease occurrence.

The aim of this study is to realize a clinical feature of the applicability and practicability of our innovative surgical procedure that gathers regeneration, creation of a protective ability and an esthetically acceptable appearance by activating and implicating the local stem cell of the surgical field.

**Material and method**

Young adult subjects have been chosen having a multifactorial gingival problem which could not been matches the indication of any known surgical technique.

**Case one:** Female, young adult, 18 years old, systemically healthy, complaining from gingival enlargement with absence of attached gingiva on lower anterior segment with difficulty on brushing with no bone loss.

**Case two:** Female, adult, 25 years old, systemically healthy, with gingival enlargement involving entire marginal, papillary and the insufficient narrow attached gingiva, extended up to alveolar mucosa and showing the impression of lips no bone loss.

**Case three:** Female, adult, 29 years old, systemically healthy, mal-aligned and malpost teeth, gingival enlargement. Thin, narrow and loose attached gingiva. Shadow of alveolar bone is clinically visible, slight bone loss around the malpost teeth.

**Case four:** Female, 31 years old, healthy, complete loss of attached gingiva, high lip lining attachment up to the gingival groove making a Diasthema-like, incisors diverged and drifted.

**Case five:** Female, 15 years old, healthy, crowded teeth, gingival growth covering half-length of teeth in arches, complete loss of attached gingiva of lower anterior segments, slight horizontal bone loss, high and long maxillary frenal attachment, ugly looking.

**Indications:** Narrow, insufficient or absent attached gingiva accompanied with gingival enlargement and associated with high frenal attachment that interfere or prevent proper oral hygiene control. When there where malty contraindications at once. Narrow attached gingiva, thin delicate attached gingiva, shallow vestibule, high Frenal attachment either all or partly gathered in case. When gingivectomy alone is contra indicated, also the apical replaced flap is contra indicated and frenectomy as well. When there is ugly alveolar buccal bone, visible root eminences, with bone shadow and possibility of future fenestration. When there is 2-3mm horizontal bone loss with gingival enlargement. Horizontal moderate and multiple gum recessions. For esthetic to remove the (Black gum), for creation a protective attached gingiva. And to facilitate personal home care.

**Technical Principles:** Customize the keratinized gingival tissues.

Internal beveled incision with variable angle degree depends on the gingival margin thickness to excise the lining and maintain the outer portion.

Both side vertical or oblique incisions extended deeply toward the base of vestibule.

Reflect Mucoperiosteal flap. The separation of the mucosal tissue must extend deeply up to the vestibular base.

Cut the muscular insertions around the surgical field. Remove the Frenal attachment completely.

Create deep enough horizontal groove in the bony wall (1mm depth) to stabilize the muscular fibers at the level of apical third of the roots. Create few holes perpendicular to the alveolar bone in between the roots to reach the cancellous bone to create bleeding points. Achieve root planning when needed, curate to remove the old attached gingival or periodontal fibers. Make the biological width around the teeth if necessary.
Osteoplastic step if necessary and bone crest remodeling if needed. Plane the expose roots and that of biologic width.

Make to position the old marginal gingiva at the base of the vestibule. Apply the tissueol (if available) by its special applicator to cover the entire surface area of the surgical field, introduce the solution in to the embrasures and to cover the cemento-enamel junction, it will set in minutes and act as hemostasis then apply a periodontal pack.

OR create a hung-up suture, make it loose, suspended around the present teeth.

Apply a suitable periodontal pack to adapt the flap and suture against the alveolar bone at the deepest point of the vestibule.

Results

All cases showed a suitable and healthy new gingival granulation tissue with a complete coverage of surgical field. The gingiva presented the anatomical characters of papillary, marginal and attaché gingiva. The tissueol acted as homeostasis, stopped bleeding in seconds after application, shortened the period of healing and reduces the post-operative complications and pain when compared with the hung-up stiches procedure. Clear and clean granulation tissues are created one week later.

**Case one:**

![Before](image1.png) ![one week later](image2.png) ![2 weeks later](image3.png)

**Case two:**

![Before](image4.png) ![One month after surgery](image5.png)

**Figure (3)**

**Case three:**

![Before](image6.png) ![One week after surgery](image7.png)
Case four:

Before One week after surgery

Figure (4)

Case five:

Two weeks after surgery, upper anterior segments. One week after surgery, lower anterior segment.

Figure (5)

Discussion

Recently the periodontal surgery doesn’t just for therapy of damaged supporting structures, but also for esthetic and to facilitate daily oral hygiene control even the underlying structures is intact.

Some cases are simply treated with routine techniques, other could be more complicated and multifactorial, and a unique indication could not be suitable to realize the basic rules. Any technique has indications and contra-indication, even they have been routinely copied from generations, still adding limitation in use to match the needed result. However, limited success of these applications, along with the morbidity generated by some of them, has led medical science to seek alternatives that use biologic mediators to solve biologic problems.

Wound healing or the regenerative process in a specific tissue requires a combination of fundamental events, such as appropriate levels and sequencing of regulatory signals, the presence and number of progenitor cells that respond to the reparative signal [5].

Tissue engineering using mesenchymal stem cells (MSCs) is a recent therapeutic modality that has several advantages [6]. MSCs have high proliferation potential and may be manipulated to permit differentiation before being transplanted, suggesting they may be an ideal candidate for regenerative procedures [7]. Precise identification of cells capable of regenerating the periodontium is valuable because no predictable regeneration procedure has yet been described [8]. (MSCs) have several advantages, These include high-quality regeneration of damaged tissues without forming fibrous tissue, cells capable of self-renewing at a high rate of proliferation, and differentiating into multiple cell lineages including mesodermal, endodermal, and ectodermal [9]. MSCs have been isolated from different oral tissues cells, periodontal ligament, and dental papilla derived cells and alveolar bone marrow [10]. Their participation in maintaining and repairing those tissues has been proposed. Thus, similarities with skin in structure and cell populations would hint that similar progenitor populations could exist in gingival connective tissue [11]. This idea is consistent with the oral tissues’ ability to repair without scars, reflected by
a minimal inflammatory response\textsuperscript{12}. Consequently, the identification and characterization of stem cells present in the gingiva tissue could give valuable information about the function and regenerative potential of this tissue to be applied in regenerative therapy \textsuperscript{13}. The regenerative therapy needed a specific regenerative technique that allow the genetic factors to play their roles in finishing the outcome of the surgery \textsuperscript{14}. Our innovative procedure appeared useful, practicable, giving excellent clinical result, able to create a suitable protective gingiva with functional and healthy dento-gingival relationship. Indeed it needs a high surgical skill of the operator. Healing taking normal duration in young-adult and adult subjects with two weeks packing. Stem cell activation and specialization looks great, creating attached, marginal and papillary gingival tissues.

\textbf{Conflict of Interest:} Nil

\textbf{Source of Funding:} Self

\textbf{Ethical Clearance:} Not required

\textbf{References}


Factors Related to the Preeclampsia Incidence in the Delivery Room of General Hospital Ulin Banjarmasin 2017

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Abstract

Based on maternal mortality data in South Kalimantan on years 2017 shown that the preeclampsia and eclampsia are leading causes of maternal and perinatal morbidity and mortality in South Kalimantan. From totals data of 75 death cases, preeclampsia and eclampsia have 19 cases, followed by pregnancy bleeding with 18 cases, 5 cases of infection and another causes 33 cases. The General Hospital Ulin Banjarmasin data about maternal mortality in the year 2017 showed that from a total of 13 cases, 6 cases were caused by preeclampsia and eclampsia. The total number of delivery in the General Hospital Ulin Banjarmasin 2017 was 1.505, founded about 251 incidences of preeclampsia with characteristics of 60% at term pregnancy, 32% over 35 years, primipara 24%, 9% obese. This research aim to analyze factors related to preeclampsia at Delivery Rooms in the General Hospital Ulin Banjarmasin on years 2017. This research is a quantitative study with a case-control research design to examine the factors that are related (independent variables) to preeclampsia cases in General Hospital Ulin Banjarmasin (dependent variable). The number of samples in this study was 95 cases and 95 controls with sampling techniques by simple random sampling. The results showed that there was a relationship between mother ages (p=0.011), gestational age (p=0.000), obesity (p=0.001), meanwhile parity factor showed no relationship (p=0.862). Whereas the dominant factor related to the incidence of preeclampsia in the delivery room at The General Hospital Ulin Banjarmasin was obese with OR=2.835. There is a relationship between mothers ages, gestational age, and obesity to the incidence of preeclampsia at Delivery Rooms in the General Hospital Ulin Banjarmasin in the years 2017. Nevertheless, the parity found no relationship. The dominant factor to the incidence of preeclampsia at Delivery Rooms in the General Hospital Ulin Banjarmasin in the years 2017 related to the obesity.

Keywords: Mothers ages, gestational age, obesity, parity, preeclampsia.

Introduction

Preeclampsia is the occurrence of specific hypertension in pregnancy, which involves various multi-organs in the body. It usually occurs in the week above 20 weeks’ gestation, sometimes appearing near the end of pregnancy and can also occur as superimposed preeclampsia due to a pre-existing state of hypertension.¹ The frequency of preeclampsia in Indonesia around 3-10%, South Kalimantan in 2017 found data of pregnant women as much as 90,386 people with a high risk of 20%, namely people with a risk of pre-eclampsia as much as 47% of total risk pregnancies so that it ranks first of all risk factors there.²

The proportion of maternal deaths in Indonesia, namely bleeding reached 28%, pre-eclampsia by 24%, infection by 11%, complications of preeclampsia by 8%, long parturition of 5%, and abortion by 5%. Data from the South Kalimantan Provincial Health Office in 2017 The maternal mortality rate of 75 people with the highest cause was preeclampsia with 19 people, bleeding 18 people, infection with 5 people.³ General Hospital Ulin Banjarmasin in 2017 found maternal mortality rates of

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13 cases, 6 of which were caused by pre-eclampsia and eclampsia or by 56% of 1,484 live births. So if converted into scale per 100,000 births, the maternal mortality rate is 600/100,000 live births.¹

Risk factors for the incidence of preeclampsia include primipara (first pregnancy), previous history of preeclampsia, history of thrombophilia, systemic lupus erythematosus, age >40 years, parity (number of deliveries), gestational age (gestational age), obesity, diabetes mellitus, multiple pregnancies (multiple pregnancy) in vitro fertilization (IVF), chronic hypertension, kidney failure or both, a history of preeclampsia in the family.¹

Data of The General Hospital Ulin Banjarmasin in 2017 total patients in the VK maternity numbered 2387, childbirth 1.505 cases with preeclampsia of 251 (9.5%) of all patients in obstetrics and gynecology. The cases of preeclampsia ranked highest in ten obstetric cases, which were around 42%. Data on cases of preeclampsia in the General Hospital Ulin Banjarmasin, gestational age in atern pregnancies (36 weeks to 42 weeks) is 60%, in preterm pregnancies (20 weeks to 35 weeks) is 40%, in women over 35 years of age is 32%, occurs in pregnancy first (primipara) is 24% that are more than two (multi-para) are only 14%, and obesity is 9%.² Based on the data above, researchers need to research the risk factors for preeclampsia at the General Hospital Ulin Banjarmasin.

Materials and Method

This study used an analytic observational approach with case-control study design.³ The place of research was the delivery room of the General Hospital Ulin Banjarmasin. Time of study from March to May 2019. The population in the study were all pregnant, and childbirth mothers in the delivery room in General Hospital Ulin Banjarmasin in 2017 as many as 1,484 people, pregnancy and childbirth in preeclampsia were 251 people. Samples taken from the existing population are determined by purposive sampling, ie the research is determined by certain criteria determined based on the research objectives.⁴

Findings and Discussion

Table 1. Distribution and Frequency of Age, Parity, Age of Gestation, and Obesity

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;20 and &gt;35 years</td>
<td>49</td>
<td>28.5</td>
</tr>
<tr>
<td>20-35 years</td>
<td>123</td>
<td>71.5</td>
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<tr>
<td>Parity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primigravida</td>
<td>46</td>
<td>26.7</td>
</tr>
<tr>
<td>Multigravida</td>
<td>126</td>
<td>73.3</td>
</tr>
<tr>
<td>Age of Gestation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;37 weeks</td>
<td>25</td>
<td>14.5</td>
</tr>
<tr>
<td>≥37 weeks</td>
<td>147</td>
<td>85.5</td>
</tr>
<tr>
<td>Obesity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obesity</td>
<td>103</td>
<td>59.9</td>
</tr>
<tr>
<td>Not</td>
<td>69</td>
<td>40.1</td>
</tr>
</tbody>
</table>

Table 2. Bivariate Analysis Relationship Age, Parity, Age of Gestation, and Obesity with Pre-Eclampsia in Ulin Banjarmasin Hospital

<table>
<thead>
<tr>
<th>Variable</th>
<th>PE Normal</th>
<th>Total</th>
<th>Chi-square</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
<td>f</td>
</tr>
<tr>
<td>Mother’s age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;20 and &gt;35 years</td>
<td>32</td>
<td>37.2</td>
<td>17</td>
</tr>
<tr>
<td>20-35 years</td>
<td>54</td>
<td>62.8</td>
<td>69</td>
</tr>
<tr>
<td>Parity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primigravida</td>
<td>23</td>
<td>26.7</td>
<td>23</td>
</tr>
<tr>
<td>Multigravida</td>
<td>63</td>
<td>73.3</td>
<td>63</td>
</tr>
<tr>
<td>Age of Gestation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;37 weeks</td>
<td>25</td>
<td>29.1</td>
<td>0</td>
</tr>
<tr>
<td>≥37 weeks</td>
<td>61</td>
<td>70.9</td>
<td>100</td>
</tr>
<tr>
<td>Obesity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BMI &gt;25</td>
<td>62</td>
<td>72.1</td>
<td>41</td>
</tr>
<tr>
<td>BMI ≤25</td>
<td>24</td>
<td>27.9</td>
<td>45</td>
</tr>
</tbody>
</table>
Relationship between Age of Mother and Preeclampsia in VK Ulin Hospital Banjarmasin:
The blood circulation system is related to the elasticity of blood vessels where changes in blood volume will require good adaptation to blood vessels. Young people under 20 years old, children or adolescents up to 18 years the level of elasticity of blood vessels is still not mature or optimal. If at this age, a pregnancy occurs, efforts to adapt to changes in blood volume will have an impact on cardiac output. This event can be at risk of a failure of adaptation to the cardiovascular system so that as far as possible this age, pregnancy is prevented.7

Women aged >35 years are susceptible to the risk of chronic hypertension. Older women who show an increased incidence of chronic hypertension as they age, are at greater risk of developing preeclampsia. The incidence of preeclampsia can occur at all ages during pregnancy, but most are found at the age of ≥35 years because at this age with increasing age, degenerative diseases begin to appear.5,8 In hypertension, there is muscle tension near the spiral arteries and lumen spinal arteries, causing vasoconstriction; this fails arterispiral remodeling. Blood flow to the uteroplacenta will decrease and cause hypoxia and ischemia.5,9

Women at the optimal age of 20-35 years have an optimal circulation system in the heart so that they can carry out the pregnancy process properly and be able to adapt to changes in the blood circulation system. The risk of preeclampsia is almost doubled in pregnant women aged 40 years or more, both in the first pregnancy and in more than one pregnancy.10

Relationship of Parity (Number of Labor) Mothers with Preeclampsia in VK Ulin Hospital Banjarmasin: Primigravida pregnancy is a process of adaptation to the results of conception, in the normal state of the body there is a fetomaternal tolerance process so that the pregnancy can proceed well. The immune system has the task of recognizing and reacting to all foreign proteins that enter the body that is considered as foreign objects including the results of conception, then the reaction of fetomaternal intolerance has a high likelihood due to the incidence of preeclampsia in primigravia.

Primiparous pregnancy has an increased risk of preeclampsia, three times more likely than higher parity, whereas for multiparity only has a 1% chance of preeclampsia. It is estimated that the incidence of preeclampsia increases in nulliparity because the mother’s immune system still considers paternal cells to be antigenic and trigger the occurrence of desensitization resulting in preeclampsia. For newly married women with new husbands, the incidence of preeclampsia can increase, in addition to frequent sexual intercourse before pregnancy can reduce the incidence of preeclampsia.12

The immune system will recognize the results of conception in subsequent pregnancies so that paternal proteins that enter the trophoblast-shaped body are well tolerated. This fetomaternal tolerance will take place if the woman does not change partners, but if a new partner is present, the risk of the occurrence of preeclampsia persists even though it is more than one pregnancy.

Relationship between Gestation Age (Age of Pregnancy) and Preeclampsia in VK Ulin Hospital Banjarmasin: Preeclampsia cases of early preeclampsia are more dominant than late preeclampsia because gestational age associated with the incidence of preeclampsia is below 37 weeks, which means patients may have shown clinical symptoms since under 34 weeks (early onset).13,14 The last few years the distribution of preeclampsia is determined by a new concept, which is based on gestational age or gestational age, where this concept holds to gestational age when the clinical symptoms of preeclampsia occur. This classification is based on the onset of preeclampsia, namely early onset and late onset. Early onset is preeclampsia in pregnancy before or during gestation to 34 weeks, while late onset occurs in pregnancies over 34 weeks. This classification has been widely accepted that these two things are forms of preeclampsia that have different etiologies.15,16

The abnormal placenta is one that is thought to be the main pathophysiology in early preeclampsia while predisposing to cardiovascular or metabolic risk that causes endothelial damage and overreacting acts as pathophysiology in late preeclampsia. This difference has been supported by an analysis of pathological findings in the placenta and maternal factors that circulate.7,17

Relationship between Obesity and Preeclampsia in VK Ulin Hospital Banjarmasin: Obesity is closely related to insulin resistance, which is also a risk factor for preeclampsia. Obesity is one sign that leads to diabetes in pregnancy, where fibroblast growth levels correlate with fetal growth which is characterized by the presence of macrosomia and hyperplasentosis which increases the risk of preeclampsia.18 Increased blood and plasma cells
in pregnancy require increased cardiac output, as is the case with increasing BMI in obesity. Body compensation in obese pregnant women through hypervascularity for the fulfillment of placental blood circulation and hyperplasentosis is possible due to increased needs.19

Women who are overweight, obese, and unhealthy have a higher risk of developing slow-onset preeclampsia with severe conditions. When grouped according to gestational age at delivery, there is a statistically significant increased risk for the potential for late-onset preeclampsia at 34 weeks’ gestation. In obese women, twice the risk of preeclampsia compared to women with normal weight.20

The results of the study found a significant association between obesity and the incidence of preeclampsia (p <0.05) along with the results of the study, obesity is a risk factor for preeclampsia, the risk increases with higher maternal BMI.21 This increase the risk of preeclampsia by 2.47 fold, while women with a BMI >35 before becoming pregnant compared to BMI 19-27 had a fourfold risk.

Table 3. The Most Dominant Relationship Between Independent Variables and Dependent Variables in VK Maternity Ulin Hospital Banjarmasin

<table>
<thead>
<tr>
<th>Variable</th>
<th>P</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Upper limit</td>
</tr>
<tr>
<td>Age</td>
<td>0.011</td>
<td>2.405</td>
<td>1.209</td>
</tr>
<tr>
<td>Parity</td>
<td>1.000</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Age of Gestation</td>
<td>0.000</td>
<td>2.410</td>
<td>1.989</td>
</tr>
<tr>
<td>Obesity</td>
<td>0.001</td>
<td>2.835</td>
<td>1.505</td>
</tr>
</tbody>
</table>

Table 4. The Result of Exponent B on Age of Mother, Age of Gestation, Parity, and Obesity in Preeclampsia in VK Maternity Ulin Hospital Banjarmasin

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE</th>
<th>Wald</th>
<th>df</th>
<th>Sig.</th>
<th>Exp (B)</th>
<th>95.0% CI for EXP (B)</th>
<th>95.0% CI for EXP (B)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lower limit</td>
<td>Upper limit</td>
</tr>
<tr>
<td>Step 1a</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>.754</td>
<td>.366</td>
<td>4.240</td>
<td>1</td>
<td>.039</td>
<td>2.126</td>
<td>1.037</td>
<td>4.360</td>
</tr>
<tr>
<td>Parity</td>
<td>.063</td>
<td>.368</td>
<td>.029</td>
<td>1</td>
<td>.865</td>
<td>1.065</td>
<td>.518</td>
<td>2.190</td>
</tr>
<tr>
<td>Age of Gestation</td>
<td>.898</td>
<td>.408</td>
<td>4.854</td>
<td>1</td>
<td>.028</td>
<td>2.455</td>
<td>1.104</td>
<td>5.457</td>
</tr>
<tr>
<td>Obesity</td>
<td>.961</td>
<td>.334</td>
<td>8.262</td>
<td>1</td>
<td>.004</td>
<td>2.614</td>
<td>1.357</td>
<td>5.032</td>
</tr>
<tr>
<td>Constant</td>
<td>-4.356</td>
<td>1.264</td>
<td>11.872</td>
<td>1</td>
<td>.001</td>
<td>.013</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 2a</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>.749</td>
<td>.365</td>
<td>4.209</td>
<td>1</td>
<td>.040</td>
<td>2.115</td>
<td>1.034</td>
<td>4.326</td>
</tr>
<tr>
<td>Gestation</td>
<td>.903</td>
<td>.407</td>
<td>4.925</td>
<td>1</td>
<td>.026</td>
<td>2.466</td>
<td>1.111</td>
<td>5.473</td>
</tr>
<tr>
<td>Obesity</td>
<td>.958</td>
<td>.334</td>
<td>8.239</td>
<td>1</td>
<td>.004</td>
<td>2.607</td>
<td>1.355</td>
<td>5.016</td>
</tr>
<tr>
<td>Constant</td>
<td>-4.243</td>
<td>1.075</td>
<td>15.573</td>
<td>1</td>
<td>.000</td>
<td>.014</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Variable (s) entered on step 1: Age, Parity, Gestation, obesity

Conclusion

Based on the results of the study, there was a relationship between the age of the mother and the incidence of preeclampsia in the delivery room at Ulin Hospital Banjarmasin. There was no relationship between parity (number of deliveries) and the incidence of preeclampsia in the delivery room at Ulin Banjarmasin Hospital. There is a relationship between gestational age (gestational age) and the incidence of preeclampsia in the delivery room at Ulin Hospital Banjarmasin. There is a relationship between obesity and the incidence of preeclampsia in the delivery room at Ulin Hospital Banjarmasin. The most dominant factor associated with the incidence of preeclampsia in the maternity room at Ulin Hospital Banjarmasin is obesity.

Ethical Clearance: This research has gone ethical feasibility testing by the Ethical Research Commission of the Faculty of Medicine, University of Lambung Mangkurat.

Source Funding: This study was done by self-funding from the authors.

Conflict of Interest: The authors declare that they have no conflict interests.

References


Epidemiology of Hypercholesterolemia among Adults in Samara City

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Abstract

Back ground: Hypercholesteremia is elevation of serum cholesterol level above normal (> 200 mg/dl). There are an association between cardiovascular diseases and high level of blood cholesterol. There are many risk factors of hypercholesterolemia as genetic, environmental, systematic disease as diabetes mellites and some drugs factors.

Subjects and method: A cross sectional study was conducted on adults who were attending Samara general hospital outpatients clinic during the period from 5th February-30th April 2017. The information regarding the problem and demographic characteristics of persons was obtained according to a questionnaire and the weight, height, blood pressure, total blood cholesterol level was recorded.

Results: The frequency of hypercholesterolemia among sample study was (54%). There is no significant association between frequency of hypercholesterolemia according to gender, age group, body mass index, family history and smoking habit but it has been reported that a significant association between high serum cholesterol and presence of hypertension, cardiac diseases and diabetes mellites.

Keywords: Hypercholesteremia, Epidemiology, Samara.

Introduction

Hypercholesterolemia is defined as the presence of high levels of cholesterol in the blood (a form of hyperlipidemia) (1, 2). Normal serum level of cholesterol is < 200 mg/dl (< 5 mmol/l) and considered high (200 mg/dl and above) (3,4).

Cholesterol is manufactured by all animal cells. Steroid hormones and bile acid precursors are cholesterol. It is transported in blood plasma as lipoproteins which classified according to their density (very low, intermediate, low- and high-density lipoprotein (5)).

It has been documented the relation between longstanding high serum cholesterol and atherosclerosis (6), these processes may lead to narrowing of affected arteries and may cause a clot which obstruct blood flow (7). There is a correlation between hypercholesterolemia and coronary heart disease (8) and it has been documented increase of risk five times than those with normal level of blood cholesterol (9).

The most important risk factors of hypercholesterolemia are a combination of environmental and genetic factors. Environmental factors include obesity, diet, and stress, diabetes mellites (8)and certain medications and other systematic diseases (6). It has been found an association between high level of blood cholesterol and cigarette smoking, diabetes mellites and obesity (10). There is an effect of diet on blood cholesterol but the effect varies between individuals (11).

Patients and Methods

A descriptive study was conducted on adults attending outpatient clinic in Samara general hospital. The study started from 5th February-30th April 2017. The patients were sent for investigation of blood total
cholesterol. The sample study individuals demographic information was obtained according to structured-designed questionnaire and by direct interview. The cholesterol level was considered high if it exceeds 200 mg/dl. Blood pressure, body weight, height, were measured in addition to obtain from patients investigation the total blood cholesterol level.

**Statistical Analysis:** By using SPSS 25.0 statistical software package the results were presented as the frequencies, per cent and Chi-square test was used to assess association. Statistical analysis at p-value < 0.05 was considered significant.

**Results**

It has been revealed that the frequency of hypercholesterolemia among study sample was 54% (Fig.1).

![Fig. 1: Distribution of sample study according to total blood cholesterol level](image)

Regarding the gender the frequency of hypercholesterolemia was 54% among each of male and female (Table 1).

**Table (1) Distribution of study sample according to total blood cholesterol level and gender**

<table>
<thead>
<tr>
<th>Total Cholesterol</th>
<th>Sex</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td></td>
<td>Count</td>
<td>% within SEX</td>
</tr>
<tr>
<td>&gt;200</td>
<td>47</td>
<td>54.0%</td>
</tr>
<tr>
<td>&lt;200</td>
<td>40</td>
<td>54.0%</td>
</tr>
<tr>
<td>Total</td>
<td>87</td>
<td>54.0%</td>
</tr>
</tbody>
</table>

P value =0.995 -No significant association

Table (2) shows that hypercholesterolemia was more frequent among age group > 40 years (55.9%) than those among age group <40 years (48.7%) but without significant association.

**Table (2) Distribution of study sample according to total blood cholesterol level and age group**

<table>
<thead>
<tr>
<th>Total Cholesterol</th>
<th>Age</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;40</td>
<td>&gt;40</td>
</tr>
<tr>
<td></td>
<td>Count</td>
<td>% within AGE</td>
</tr>
<tr>
<td>&gt;200</td>
<td>19</td>
<td>48.7%</td>
</tr>
<tr>
<td>&lt;200</td>
<td>20</td>
<td>48.7%</td>
</tr>
<tr>
<td>Total</td>
<td>39</td>
<td>51.3%</td>
</tr>
</tbody>
</table>

P value =0.442 -No significant association
Table (3) shows that hypercholesterolemia was more frequent among those with body mass index (BMI) > 25 (55.1%) than those with BMI < 25 (51.9%) but without significant association.

<table>
<thead>
<tr>
<th>Total Cholesterol</th>
<th>Body Mass Index</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;25 kg/M²</td>
<td>&gt;25 kg/M²</td>
</tr>
<tr>
<td>&gt;200</td>
<td>Count</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>% within BMI</td>
<td>51.9%</td>
</tr>
<tr>
<td>&lt;200</td>
<td>Count</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>% within BMI</td>
<td>48.1%</td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td>% within BMI</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

P value = 0.71 - No significant association

Table (4) shows that hypercholesterolemia was more frequent among those with hypertension (65.5%) than those without hypertension (46.7%). There is a significant association.

<table>
<thead>
<tr>
<th>Total Cholesterol</th>
<th>Hypertension</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive</td>
<td>Negative</td>
</tr>
<tr>
<td>&gt;200</td>
<td>Count</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>% within Hypertension</td>
<td>65.5%</td>
</tr>
<tr>
<td>&lt;200</td>
<td>Count</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>% within Hypertension</td>
<td>34.5%</td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
<td>58</td>
</tr>
<tr>
<td></td>
<td>% within Hypertension</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

P value = 0.025 - Significant association

Table (5) shows that hypercholesterolemia was more frequent among those with cardiac disease (87%) than those without cardiac disease (48%). There is a significant association.

<table>
<thead>
<tr>
<th>Total Cholesterol</th>
<th>Cardiac Disease</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive</td>
<td>Negative</td>
</tr>
<tr>
<td>&gt;200</td>
<td>Count</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>% within Cardiac Disease</td>
<td>87.0%</td>
</tr>
<tr>
<td>&lt;200</td>
<td>Count</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>% within Cardiac Disease</td>
<td>13.0%</td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>% within Cardiac Disease</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

P value = 0.001 – High significant association
Table (6) shows that hypercholesterolemia was more frequent among those with diabetes mellitus (71.4%) than diabetes mellitus those without hypertension (50%). There is a significant association.

Table (6) Distribution of study sample according to total blood cholesterol level and diabetes mellitus

<table>
<thead>
<tr>
<th>Total Cholesterol</th>
<th>Diabetes Mellitus</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive</td>
<td>Negative</td>
</tr>
<tr>
<td>&gt;200</td>
<td>Count</td>
<td>% within DM</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>71.4%</td>
</tr>
<tr>
<td>&lt;200</td>
<td>8</td>
<td>28.6%</td>
</tr>
<tr>
<td>Total</td>
<td>28</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

P value =0.04 - Significant association

Discussion

It has been documented in the current study that the frequency of serum hypercholesterolemia was (54%). This result is similar to result obtained by Al-Nozha et al in Saudi Arabia (12), and higher to that reported in Egypt (38% (13), and by other study done by WHO (36%) (14), in Kuwait (10.6%) (15), in Oman (15.6%) (16), in Sudan (7.8%) (17), in other studies in Saudia (32%) (18), in India (33.2%) (19), other studies (37%) (20), in Korea (1.2%) (21). The current result is lower than that reported in north Kerala in India the prevalence of hypercholesterolemia was 63.8% (22), in other studies (57%) (23), in Nigeria (62.5%) (24) and in Poland (66.4%) (25).

Regarding the gender in the sample study there are no differences in frequency of hypercholesterolemia between male and female (54%). This result is nearly similar to that reported in Saudi Arabia (12). It is higher to that reported in Egypt (male 39.7%, female 38.3%) but there is no significant association (13) like other studies (26, 27). Other studies in India revealed that hypercholesterolemia is more frequent among female (67.6%) than male (57.6%) with a significant association (22).

In the current study the frequency of hypercholesterolemia was more frequent among age group more than 40 years (55.9%) and below age group below 40 years (48.7%) but there is no significant association (P value = 0.442). This result was nearly similar to that reported in Saudi Arabia (12), while in Egypt about (38.9%) above age 20 years and (38.7%) below 20 years without significant association (13).

In the current study the frequency of serum hypercholesterolemia is more frequent among persons with body mass index more than 25 Kg/M\(^2\) (55.1%) than those with body mass index less than 25Kg/M\(^2\) (51%) but there is no significant association (P value = 0.71). This result is nearly similar to result reported by Al-Nozha et al in Saudi Arabia (12). In India it has reported that about (69%) of those with body mass index more than 25Kg/M\(^2\) having hypercholesterolemia and (59%) among those with normal weight (22) while in Egypt the result of hypercholesterolemia among those with high BMI and normal BMI was (48.8%,33.9%) respectively (13). Many studies reported that there are a significant association between obesity and hypercholesterolemia (28, 29, 30, 31).

In current study the frequency of hypercholesterolemia among patients with and without hypertension was (65.5%, 46.7% respectively) and among patients with and without cardiac disease was (87%, 48% respectively). Statistically, there is a high association (P value = 0.025 for hypertension and P value = 0.001 for cardiac diseases). This result is more than that reported in Fayoum in Egypt (frequency of hypercholesterolemia among hypertensive and non-hypertensives 54.5%, 36.8% respectively) and also there is a significant association (13). A significant relation was reported by hypercholesterolemia and high blood pressure by other studies (27,32).

There was a significant association between diabetes mellitus disease presence and hypercholesterolemia among study sample group (P= 0.04). The frequency of hypercholesterolemia in this study among diabetic and nondiabetic patients was (71.4%, 50%) respectively. This result is going with results of other studies.
which reveal that diabetes mellitus is one of causes of hypercholesterolemia and there are a strong association between them\(^{(8,10)}\).

**Conclusions**

The current study revealed that there are a significant association between hypercholesterolemia and hypertension, cardiac diseases and diabetes mellites.

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**Ethical Clearence:** Protocol approval and the Ethical Committee Approval were achieved from the College of Medicine/Tikrit University for the protocol of the study.

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**References**


The Effect of Information, Expertise, and Supervision on the Obedience of Narcotics and Psychotherapy Reporting Officer

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Abstract

Obedience can be influenced by several factors, including information, expertise, and supervision. This study aims to analyze the influence of information, expertise, and supervision on the obedience of narcotics and psychotropic reporting officers in pharmacy service units in Banjarmasin city. The method was an analytical observational study with cross-sectional study design. The sample was 102 respondents using simple random sampling method. The research instrument uses a questionnaire that has been tested for validity and reliability. Data analysis with descriptive and statistics, namely chi-square and multiple logistic regression. Respondents who have quality information will obey with psychotropic narcotics reporting (p=0.000). Respondents who have good skills (expert) will obey to psychotropic narcotics reporting (p=0.000). A respondent who has good supervision will obey to psychotropic narcotics reporting (p=0.005). The analysis using multiple logistic regression analysis showed variable information (p=0.001; Exp. B=6.993), expertise (p=0.012; Exp.B=4.691), and control (p=0.039; Exp.B=2.910) with 95%. There is the influence of information, expertise, and supervision on the obedience of narcotics and psychotropic reporting officers, with the most dominant variable is information.

Keywords: Information, expertise, supervision, obedience, report.

Introduction

Drug prevention cannot be separated from prevention, eradication, and supervision efforts. One form of supervision is the Narcotics and Psychotropic Reporting System Application (SIPNAP) which is developed and managed by the Directorate of Pharmaceutical Production and Distribution of Pharmaceuticals, the Ministry of Health of the Republic of Indonesia which aims to ensure the availability of Narcotics and Psychotropic for health services and/or the development of science and technology. Narcotics and Psychotropic Reporting is an obligation for pharmaceutical service units to the Head of District/City forward to the Head of the Provincial Health Service and Head of the Local Food and Drug Control Center online each month in accordance with the Regulations from Ministry of Health of the Republic of Indonesia number 3 of 2015 concerning circulation, storage, destruction and reporting of Narcotics, Psychotropics and Pharmaceutical Precursors.

According to a study by Milgram in 1963, obedience is one type of social behavior, where someone obeys and obeys the requests of others to do something because of an element of authority.1 Information is a significant factor in social influence. Sometimes someone wants to do something they do not want to do after they have been given some information; someone often influences others by giving them logical information or arguments about what they should do.2

Expertise is specialized knowledge, training, and skills can also be a source of power. Someone submits to the expert and follows his advice because they believe that the knowledge of the ruler will help us achieve our goals.2 There is a significant relationship between

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training variables and knowledge of SIPNAP reporting, so that information and expertise are crucial for a narcotics and psychotropic reporting officer. Narcotics and psychotic reporting is a form of supervision that aims to determine the use of narcotics and psychotropic drugs in the legal pathway and is very important as the International Narcotics Control Board (INCB) report so that it is known how much national consumption of narcotics and psychotropic drugs so that availability can be guaranteed for the benefit of health services and/or the development of science.

The study aims to find out the influence of information, expertise, and supervision on the obedience of narcotics and psychotropic reporting officers in pharmacy service units in Banjarmasin City.

**Materials and Method**

This study uses a tool or instrument in the form of a questionnaire modified by researchers from previous studies containing questions about the influence of information, expertise and supervision on the obedience of report reporting officers for narcotics and psychotropic drugs at the pharmaceutical service unit in Banjarmasin City. The independent variables examined and revealed through questionnaires included information, expertise, and supervision. While the dependent variable is obedience.

The population in this study were 142 pharmacists or pharmaceutical technical personnel who were assigned as narcotics and psychotropic reporting officers in pharmaceutical service units (pharmacies, IFK, IF clinics and IF hospitals) in Banjarmasin city that had reported narcotics reports and psychotropic drugs in the SIPNAP application from January to December 2017, with sample calculations based on the Lameshow formula, namely 92 people plus 9.2 (10%) so that there were 102 people and the method of sampling using a simple random sampling method.

**Findings and Discussion**

**Effect of information on obedience:** Respondents who obeyed to make narcotics and psychotropic reporting as many as 52 people indeed have information that was biased with a score range of> 40 as many as 46 people while six others had information that was not qualified of the 46 people (100%) who have quality information, there are 32 people (69.57%) who do have quality information with an average score of 36 while the other 14 people (30.43%) are the opposite. Based on the facts found in the field in this case because the 14 officers had to ask the clerk SIPNAP Banjarmasin City Health Office for delete and revise report that has been submitted due to an error in the listing on the stock card. Information is data that has been processed and can be felt by the recipient and has a real value, to make decisions now or in the future. Information systems are inseparable from input-process-output which is processed by the system so that it produces useful output. Partially information quality factors through relevant information indicators, information speed, and information consistency had a positive effect on Employee Work Effectiveness in the Health Resources Sector of the West Java Provincial Health Office. Likewise, information quality has a positive effect on information satisfaction with a p-value of 0.000 as well as other studies, which concluded that there was a difference in the quality of information before and after development (p=0.0001).

**Effect of expertise on obedience:** Based on the continuity correction test results with a confidence level of 95%, the p-value=0.000 is obtained so the decision is Ho rejected (p<0.05) which means that expertise has a significant effect on the obedience of narcotics and psychotropic reporting officers. PR results of 4.297 (95% CI 1.889 - 9.773), which means that excellent expertise produces obedience 4.297 times better than respondents with inadequate expertise.

Respondents who obeyed to make narcotics and psychotropic reporting as many as 52 people did indeed have excellent skills with a score range of >30-50 as many as 46 people while five others had inadequate expertise. As operating computers and other digital devices. In
SIPNAP reporting by operating a computer or laptop or smartphone. The skills possessed by someone will make skilled in doing specific skills. Expertise will make someone able to do something according to what has been taught. Training on reporting systems is essential, mainly if the reporting system is based on information technology (IT). There is a meaningful relationship between training variables and knowledge of reporting. With training, it will provide excellent expertise for officers. Knowledge, skills, hardware, software, LAN, and method related to management information systems (p < 0.05). The number of operators in the pilot health center (e-Puskesmas) was categorized as lacking because it was not yet available in each service unit, 48 new people attended the training (80%). The application of applications and software has a significant influence on the dependent variable, namely the performance of the part of human resources with significance values of F and T below 0.05. The medical record information system had an effect on physician performance and from the results of the t-test.

Effect of supervision on obedience: Based on the continuity correction test results with a confidence level of 95%, the p-value = 0.005, then the decision is Ho rejected (p < 0.05) which means that supervision has a significant effect on the obedience of narcotics and psychotropic reporting officers. PR results were 1.935 (95% CI 1.191 - 3.146), which means that proper supervision resulted in obedience 1.935 times better than respondents with inadequate supervision.

Respondents who obeyed to make narcotics and psychotropic reporting as many as 52 people did have proper supervision with a range of scores > 27-45 as many as 39 people while 13 others had inadequate supervision of the 39 (100%) people who have proper supervision, there are 25 people (64.10%) with proper supervision with an average score of 35 while the other 14 people (35.90%) are the opposite. Based on the facts found in the field, the 14 officers were rarely active in social media where online supervision was carried out by SIPNAP officers at the Banjarmasin City Health Office. Supervision is one of the factors that influence obedience. One of the apparent factors of obedience is the permanent presence or supervision of a researcher. If researchers leave the room and give their instructions over the telephone, obedience will decrease. There is an influence between supervision and obedience, the value of p=0.013. Likewise, direct supervision of the hospital leadership had an effect on the performance of nurses (28.62%), indirect supervision of the implementation of indirect supervision (13.32%), indirect influence of the implementation of supervision directly (15.97%), and the implementation of indirect supervision (15.97%).

Effect of information, expertise, and supervision on obedience: Information variable has a significant value of 0.001 with a wald value of 11.235 and a regression coefficient of 1.945. The significant value is <0.05 so that Ho is rejected or means that information has a significant partial effect on the obedience of narcotics and psychotropic reporting officers. The expertise variable has a significant value of 0.012, with a wald value of 6.251 and a regression coefficient of 1.546. The significant value is <0.05 so that Ho is rejected or means that expertise has a significant partial influence on the obedience of narcotics and psychotropic reporting officers. The supervision variable has a significant value of 0.039, with a wald value of 4.276 and a regression coefficient of 1.068. The significant value is < 0.05 so that Ho is rejected or means that supervision provides a significant partial effect on the obedience of narcotics and psychotropic reporting officers.

From the overall independent variable, the most dominant influence on obedience is the information variable (p=0.001) with a beta exponent value (Exp. B) of 6.993, which means that officers with quality information will have 6.993 obedience with officers with information that is not qualified.

Based on the results of the multivariate analysis of three independent variables, variable information is the most dominant variable who influence obedience with narcotics and psychotropic reporting officers. It is known that in total, respondents who are more obedient in reporting narcotics and psychotropic drugs (52 people) are more than respondents those who have excellent skills (47 people) are followed by respondents who have information that is difficult (46 people) and by respondents who have proper supervision (39 people). Based on the factual data, excellent expertise is more than quality information and proper supervision; this is because if the variable itself turns out the expertise that most influences obedience, meaning that without the interaction of quality information and proper supervision, expertise will be most affect obedience. Factually there is zero reporting that does not require data on information on narcotics and psychotropic use to be reported in SIPNAP reporting, and even without proper supervision, so that enough with officers who
have excellent expertise, the zero reports can be reported on SIPNAP reporting online. The findings in the field based on the characteristics of the respondents did show that the younger officers had excellent skills and conversely the older officers had inadequate expertise. However, if the three variables are tested together then the most dominant or most influential information on obedience because after being tested together it turns out that expertise and supervision encourage information to be the most influential factor in obedience with narcotics and psychotropic reporting in pharmacy service units in Banjarmasin city. Quality information is indeed the most dominant or very influential on obedience because based on the facts in the field there are indeed reporting officers who ask SIPNAP officers to delete or edit reports that have been sent and reporting officers will send back (repeat) so that the effect on obedience, in this case, is timeliness of delivery of reports of narcotics and psychotropic substances. If expertise can be improved with education and training, supervision can also be increased by internal and external supervision, but quality information is indeed required to be easily obtained, complete, thorough, suitable and timely and avoid recording errors on the stock card so that the physical goods and there is no difference in stock card. Be clear based on these exact reasons that cause quality information is the primary key of reporting narcotics and psychotropics so that information becomes the most dominant or most influential variable compared to other independent variables. Simultaneously, the Management Information System had a positive effect of 63.50% on the Work Effectiveness of Employees in the Field of Health Resources West Java Province Health Office. Likewise, the overall weighted average value of information quality before system development was 7.51 and after system development 21.87 with a difference of 14.36. The results of the statistical test also show p <0.05, which means there are differences in accessibility, completeness, clarity, speed, timeliness, and accuracy of information before and after system development.

**Conclusion**

There is the influence of information, expertise, and supervision on the obedience of narcotics and psychotropic reporting officers, with the most dominant information variable among the three variables.

**Ethical Clearance:** This research has gone ethical feasibility testing by the Ethical Research Commission of the Faculty of Medicine, University of Lambung Mangkurat.

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Effect of Some Factors and Variables on the Frequency-Time Distribution of the Otoacoustic Emissions

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Abstract

The hearing process of the ear consists of two parts, the first part is related to the ear and its anatomy and the second part is related to the sound and its properties. Therefore, it is expected that there are a number of factors and variables, including those related to the ear, including sound related to the audio process. In this study, the effect of two of these factors on the otoacoustic emission is studied in general and in particular the frequency map. The relationship between frequency and quality factor is examined by changing the stimulus level.

Keywords: Hear process, frequency map, ear, stimulus level, sound.

Introduction

The hearing process is very important to human communication in individuals¹. Our auditory ability is due to the complex automated transmission that takes place within the inner ear that turns the waves caused by pressure into signals transmitted through the auditory nerve to the brain. Takes mechanical energy and produces electrical energy². The inner ear contains an amplification system that leads to the generation of sounds within the cochlea and is transformed into the ear canal through the middle ear. These sounds are known as otoacoustic emissions (OAEs). OAE are acoustic signals generated from within the inner ear, which can be recorded in the ear canal using a sensitive microphone³,⁴. OAE are a consequence of the nonlinear and active pre-processing of sound in the cochlea³. OAE was first demonstrated by (David Kemp in 1978)⁵. Otoacoustic emissions have since been shown to arise through a number of different cellular and mechanical causes within the inner ear⁶,⁷. Studies have shown that OAEs disappear after the inner ear has been damaged, so OAEs are often used in the laboratory and clinic as a measure of inner ear health³.

OAEs have been used to explore the differences in the auditory system between sexes, with a number of studies suggesting that females have larger OAEs than males⁸,⁹. There are several evidence to suggest that the outer hair cells in the human ear are enhanced by the sensitivity of the cochlea and frequency selectivity¹⁰. The mechanical process resulting from the transmission of sound through the ear to the movement of the tympanic membrane causes the transfer of the wave in the cochlea fluids along the basilar membrane. Therefore, the outer hair cells on the basilar membrane are part of this. This active process is emitted from an incoming signal to the auditory nerve and the incoming signal travels back to the outer ear canal through the middle ear where it can be detected¹¹. Each part of the basilar membrane has a maximum sensitivity to the frequency closer to the characteristic oval window with higher frequencies, so the high frequency responses will have the shortest time to move back to the outer ear canal.

Otoacoustic emissions are measured by a probe placed in the ear canal containing microphone that records sounds in the external ear canal. TEOAE is brief acoustic stimulus with a wide frequency spectrum respond to a large part of the basilar membrane, the acoustic stimulus is used with the spectrum at a range of (1000- 4000 Hz)¹¹. At high frequencies, spectroscopy of the TEOAE response can reveal cochlear damage due to noise or toxic drugs of the ear¹²,¹³,¹⁴.

Method

We study here the otoacoustic emission of the ear using the nonlinear model by controlling two variables, the stimulus level and the quality factor, noting the effect of the factors on the distribution of frequency - time by studying a set of frequencies.
As in Adnan Al-Maamury (2018)\textsuperscript{19}, Adnan Al-Maamury (2015)\textsuperscript{15} and Moleti et al. (2009)\textsuperscript{17}, we refer the nonlinear model is mathematically described as follows:

\[
\frac{\partial^2 p(x,0,t)}{\partial x^2} = \frac{2\rho}{H} \ddot{\xi}(x,t) \quad \text{(1)}
\]

\[
\ddot{\xi}(x,t) + \gamma_{bn} \dot{\xi}(x,t) + \omega_{bn}^2 \xi(x,t) = \frac{p(x,0,t)}{\sigma_{bn}} \quad \text{(2)}
\]

In the above equations, the fluid density is denoted as \((\rho)\), the BM surface density is \((\rho_{bn})\), BM transverse displacement at the longitudinal position is \((x)\) and time is \((t)\), and it is assumed that a cochlear duct of rectangular constant cross section of length \((L)\) and half-height \((H)\).

The dynamics of a passive oscillator driven by differential pressure is described by Equation (2).

The relation between longitudinal position \((x)\), angular frequency and passive damping constant of the tonotopically resonant are set by Greenwood (1990)\textsuperscript{18} as in Talmadge et al. (1998)\textsuperscript{16}.

\[
\omega_{bn}(x) = \omega_0 e^{-k_x x} + \omega_1 \quad \text{(3)}
\]

\[
\gamma_{bn}(x) = \gamma_0 e^{-k_x x} + \gamma_1 \quad \text{(4)}
\]

The quality factor is denoted as \(Q(x)\) and the local passive quality factor is defined as:

\[
Q(x) = \frac{\omega_{bn}(x)}{\gamma_{bn}(x)} \quad \text{(5)}
\]

**Results and Discussion**

There are some factors and variables have a clear effect on the hearing mechanism of these factors, anatomy of the ear and nature, age and other related to the sound such as the stimulus level of the sound and the quality factor.

In this study, otoacoustic measurements of the ear were taken with two variables, namely the stimulus level and the quality factor to study the relationship between the auditory process represented by frequency - time distribution and the factors expected to affect the auditory process. This relationship was studied by a set of different frequencies \((0.8227, 1.304, 2.067, 3.271, 4.134\text{ and } 5.197)\) KHz. The results of the research that obtained the of the otoacoustic emissions are presented in the form of steps and according to the selected frequencies, as follows:

**First step: the frequency \((0.8227)\) KHz:** In this case, the otoacoustic emission is studied for a different set of quality factors \((2, 4, 6, 8, 10, 1, 14, 16, 18\text{ and } 20)\). Different stimulus levels \((30, 40, 50, 60, 70, 80\text{ and } 90)\) dB are used for each value of the quality factor.

According to this method, arithmetic sets show the frequency-time distribution, this distribution shows the relationship between frequency and time and according to the method, it will be clear that there are some differences in time due to the effect of changing the stimulus level and the quality factor.

Figure(1) shows all the information for frequency \(0.8227\) KHz where it contains seven different curves each curve showing the relationship between time and quality factor. It refers to a single stimulus level, so the number of curves equals the number of stimulus levels used in the computations. It is generally concerned with frequency \(0.8227\) KHz and all its information. It shows the frequency-time distribution and shows the relationship between time and the quality factor. It also gives information for the frequency-time relationship by changing the quality factor and the stimulus level.
**Second step: the frequency (1.304 KHz):** In this case and the following cases the same technique is used in the first step to study the otoacoustic emission. The same values of the coefficient of quality and intensity levels are used in calculations.

According the results, the frequency-time distribution shows the relationship between frequency and time and according to the method, it will be clear that there are some differences in time due to the effect of changing the stimulus level and the quality factor.

Figure (2) shows all the information for frequency 1.304 KHz where it contains seven different curves each curve showing the relationship between time and quality factor. It is generally concerned with frequency 1.304 KHz and all its information. It shows the frequency-time distribution and shows the relationship between time and the quality factor, and gives information for the frequency-time relationship by changing the quality factor and the stimulus level.

![Figure (2) relationship between the frequency 1.304 KHz and other parameters](image1)

**Third step: the frequency (2.067 KHz):** In this case, Figure (3) shows all the information for frequency (2.067) KHz where it contains seven different curves each curve showing the relationship between time and quality factor. Each curve in the figure refers to a single stimulus level, so the number of curves equals the number of stimulus levels used in the computations. It is generally concerned with frequency (2.067) KHz and all its information. It shows the frequency-time distribution and shows the relationship between time and the quality factor. It also gives information for the frequency-time relationship by changing the quality factor and the stimulus level.

![Figure (3) shows the relationship between the frequency 2.067 KHz and other parameters](image2)
Fourth step: the frequency (3.271 KHz): In this case, Figure (4) shows all the information for frequency (3.271 KHz) where it contains seven different curves each curve showing the relationship between time and quality factor. Each curve in the figure refers to a single stimulus level, so the number of curves equals the number of stimulus levels used in the computations. It is generally concerned with frequency (3.271 KHz) and all its information. It shows the frequency-time distribution and shows the relationship between time and the quality factor. It also gives information for the frequency-time relationship by changing the quality factor and the stimulus level.

**Figure (4) shows the relationship between the frequency 3.271 KHz and other parameters**

Fifth step: the frequency (4.134 KHz): In this case the same technique is used to study the otoacoustic emission. According to this method, arithmetic sets show the frequency-time distribution, this distribution shows the relationship between frequency and time and according to the method, it will be clear that there are some differences in time due to the effect of changing the stimulus level and the quality factor.

**Figure (5) shows all the information for frequency (4.134 KHz) where it contains seven different curves each curve showing the relationship between time and quality factor. Each curve refers to a single stimulus level, so the number of curves equals the number of stimulus levels used in the computations. It shows the frequency-time distribution and shows the relationship between time and the quality factor. It also gives information for the frequency-time relationship by changing the quality factor and the stimulus level.**

**Figure (5) relationship between the frequency 4.134 KHz and other parameters**
Sixth step: the frequency (5.197 KHz): The last case does not differ from all previous cases in terms of calculations, taking into account the use of two parameters, the stimulus level and the quality factor. In the otoacoustic emissions calculations, the stimulus level is changed according to the values (30, 40, 50, 60, 70, 80 and 90) dB, at the same time, the value of the quality factor (Q) is changed according to the values (2, 4, 6, 8, 10, 12, 14, 16, 18 and 20).

According to this method, arithmetic sets show the frequency-time distribution, this distribution shows the relationship between frequency and time and according to the method, it will be clear that there are some differences in time due to the effect of changing the stimulus level and the quality factor.

Figure (6) shows all the information for frequency (5.197 KHz) where it contains seven different curves each curve showing the relationship between time and quality factor. Each curve in Fig. 6 refers to a single stimulus level, so the number of curves equals the number of stimulus levels used in the computations.

Finally, good information is available on the relationship between frequency, stimulus levels, quality factor and time for all cases.

![Figure (6) relationship between the frequency 5.197 KHz and other parameters](image)

**Conclusion**

It is concluded that the quality factor and stimulus levels have a clear vary effect on the otoacoustic emission. The behavior of the quality factor and its effect on the otoacoustic emissions is based on the low and high values and the effect is clear to the low values, this result is consistent with previous studies\(^\text{19, 20}\).

In general, we believe that there are some variables have an effect on the auditory process as an example of these influential factors and variables roughness, As roughness has an effect on other transactions and variables\(^\text{21}\). As for the effect of the stimulus level, the behavior of the stimulus levels divided into two groups according to their effect on the otoacoustic emission, the first group is the low stimulus levels such as 30 dB and 40 dB and the second group is high stimulus levels such as 80 dB and 90 dB.

For low frequencies such as 0.822 KHz, it is observed that the effect of the stimulus levels is clear, as the low levels such as 30 dB are different from the high levels in terms of the time value of the otoacoustic emission as the change in time is greater.

The high stimulus levels such as 90 dB, the time of the otoacoustic emission ranges from 8 ms to 11 ms for the quality factor values 2 to 20. While the time of the otoacoustic emission of the low levels ranges from 10 ms to 16 ms for the values 8 to 20 for the quality factor and similar to the high levels of values 2 to 8 for the quality factor, this situation is shared by a range of frequencies such as frequency 0.8227 KHz.

As for frequencies 1.304 KHz the effect exists but is different from the previous group, the stimulus levels effect is different for the quality factor values less than 8, while the values greater than 8 have almost the same
effect. The frequency 2.067 KHz is a characteristic frequency in terms of the behavior of the stimulus levels and their effect on the otoacoustic emission for all values of the quality factor. Through the results of all frequencies. For frequencies 4.134 KHz and 5.197 KHz, the change of time is from 9ms to 12ms for all levels and for almost all the values of the quality factor. According to the results obtained in this study, it is concluded that levels are classified into two categories, the first category is the low stimulus levels and the second category is the high stimulus levels. The quality factor in terms of its values is classified into two categories: the first category is the low values and the second category is the high values. The frequencies are classified into three categories: Class I is the low frequencies, Class II is the intermediate frequencies and Class III the high frequencies. Where the frequency 2.067 KHz is the best frequency in terms of systematic results.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Department of Medical Physics, College of Science, Al-Karkh University of Science, Baghdad, Iraq and all experiments were carried out in accordance with approved guideline.

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Nickel Ions Release from Orthodontic Retention Wires after Dental Bleaching

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Abstract

In order to preclude relapse after the orthodontic treatment have been completed, majority of orthodontists depend on the permanent retention with bonded lingual retainer wires. It is essential to study the home dental bleaching effect on ions release from permanent retention wires with the increasing demand for bleaching to have gorgeous smile. Our vitro study intended to demonstrate the home dental bleaching gel (carbamide peroxide) effect on Nickel release from orthodontic fixed retainer wires, and how does the type of retainer wire, the carbamide peroxide concentration and the exposure duration effect of carbamide peroxide on the release of nickel ions. The sample was composed of 60 lingual retainer wires of two types (3 braided strands/orthotechnology, and 6 coaxial strands/orthotechnology) and two types of at-home bleaching gel (35% carbamide peroxide/opalescence PF/Ultradent, and 16% carbamide peroxide/polannight SDI). By using a brush, a thin coating of bleaching gel about 1-mm thickness was added onto one surface of the wire and kept for (30 minutes for 35% carbamide peroxide bleached wires and 90 minutes for 16% carbamide peroxide bleached wires -following the instructions of the manufacturer), for each kind of bleaching, after that the wires were bathed and kept at room temperature in 10 ml of artificial saliva in a wrapped container, for 7 days this process was repeated day-to-day. Via flameless atomic absorption spectrophotometer in ppm, nickel ions release was measured. Non significant differences were result between two types of wires and between 30% carbamide peroxide and control group, 16% carbamide peroxide showed significantly less Nickel release compared with control group and 35% carbamide peroxide group. Nickel release was not affected by the wire kind, but if may be affected by the carbamide peroxide concentration and the exposure time. The 16% carbamide peroxide documented the smallest values, that means the nickel release from retention wires was decreased as the exposure time increased to low carbamide peroxide concentration.

Keywords: Nickel Ions, Orthodontic Retention, Wires, Dental Bleaching.

Introduction

At the present time, many orthodontists suggested the non-extraction orthodontics that could be attributable to the use of particular innovative systems which can treat border line cases professionally to acquire attractive wide smile, young-looking facial profile with no extraction. After completion of orthodontic treatment, majority of those orthodontists depend on permanent retention with bonded lingual retainer wires for non-extraction cases talked about above (furthermore to treat spacing and median diastema cases) in order to avert relapse and to realize teeth position immovability after active orthodontic treatment. Furthermore, the self-assurance and social self-perception significantly affected by the color and appearance of the teeth (1), and a lot of patients pursue tooth bleaching that can be accomplished in the office as well as, at home (2).

Home dental bleaching available as gel form, by at ray it applied on the teeth with an expectable volume of the bleach and can cover all teeth excellently extending to all lingual and interproximal surfaces. Therefore, many orthodontists favor it use in office to acquire persistent pleasing results (3).

The behavior of wire can be modified as the fixed retainer wire and bleaching gel come in contact with each other. And the increasing demand for bleaching after orthodontic treatment and since the white smile, its mandatory to estimate the available at home dental bleaching agents’ effect on ion release from
permanent retainer wires. In dentistry and specifically in orthodontics, nickel is used in a wide range of a material alloy such as: arch wires, bands, and brackets in these situation used in short time period around 2 years while in permeant wires it remain in oral cavity for several years or even decades (4).

Allergic and sensitivity can be resulted from nickel (5), and known as allergen immunologically (6). 4.5-28.5% of individuals reported to have sensitivity from nickel (9). The manufacture of fixed retainer wires is from Stainless steel alloy that comprises 8%-12% nickel, 17%-22% chromium and additional elements like: copper, iron, molybdenum, manganese, silicon and sulfur (7). The wire is designed from three to six fine strands, and as an alternative to be plain round or rectangular wire, they were twisted as multistrands so as to increase mechanical retention and in principle the rate of Ni release of these wires might be dissimilar in comparison to straight plain wires (8).

This study aimed to determine whether the home dental bleaching agents influence nickel release from fixed retainer wires and to afford evidence about the most appropriate dental home bleaching concentration and duration for patients with fixed retainers.

Materials and Method

The sample in our study included 60 lingual retainer wires of two types with 30 wires each:

1. 6-Strand (6S) stainless steel coaxial wire (Truforce, Orthotechnology).
2. 3-Strand (3S) stainless steel braided wire (Braided Retainer Wire, Orthotechnology).

Each kind classified into three groups: control group (C), 16% carbamide peroxide (polanight, SDI Australia) bleached group (B1) and 35% carbamide peroxide (Opalescence PF, Ultradent) bleached group (B2), 10 wires included in each group. A section of 22.0 mm in length was cutted from each sample wire and ligated through suture in such a way that the wire length can’t be affected and in order to simplify wire handling through day to day repeated procedure.

Before testing, with aceton, the samples were wiped and with ethanol cleaned ultrasonically for 1 min, rinsed with distilled water and dried out. A thin coating of bleaching gel about 1-mm thick was applied by brush onto the wire and left for 30 minutes, in the 35% carbamide peroxide bleached specimens (B1). However, in the 16% carbamide peroxide bleached group (B2), following the instructions of the manufacturer, the same procedure mentioned above was repeated except the time which was 90 minutes. For 7 days this procedure was repeated in order to simulate the instructions given to the patient daily, after each bleaching procedure, by running water the gel was washed for 10 seconds and in 10 ml synthetic saliva in a closed container at room temperature, the wires were stored as they ligated by suture to keep them suspended in the synthetic saliva from all around. Figure 1

The synthetic saliva mentioned above (The electrolytic media) comprised of: - 0.7g NaCl, 1.2g KCl, 0.26g Na2HPO4, 0.2g K2HPO4, 1.5g NaHCO3, 0.33g KSCN, 0.13g urea and 1000 ml deionized water, the saliva PH adjusted to 6.7 ± 0.10 via the pH- meter, to be similar to that of human saliva (9), and that was used as the testing solution.

We removed the wires from the solution, at the day of the test and the measurement of Nickel ions release was done by flameless atomic absorption spectrophotometer (AA-6800 SHIMADZU/graphite furnace). Figure 2

The results analysis was made by two-way ANOVA test and further by pairwise comparisons.
Results

Non-significant differences between the wire types (3S and 6S) and significant differences between bleaching types was revealed by Two-way ANOVA test. The pairwise comparison show the significant difference between bleaching type due to the significant differences between the control group and 16% carbamide peroxide (B2) and between the 35% carbamide peroxide (B1) and (B2) in each type of retainer wires.

Discussion

The ion release from diverse metallic dental products after they exposed to oral environment that may influence their corrosion vulnerability and result in ion release from them was studied by several earlier studies (10, 11).

Currently it is very essential to evaluate the biocompatibility of frequently used metallic alloy in the oral environment and how corrosion and ion release from the alloy can be affected by this alteration, consequently may influence the durability of this metallic part of the appliance or result in allergic reaction at vulnerable patients. Owing to long duration of orthodontic treatment and retention, this topic revenue a distinctive importance. Retention after orthodontic treatment may takes years or even permanently, it is important to know how dental bleaching agents comprising peroxides influence stainless steel fixed retainer wires with the increasing patients’ requirements for attractive smile and white, well aligned teeth. In patients that have sensitivity to nickel, dental alloys with elevated nickel content should not be used (10).

In 1994 Bour and his coworkers (12) proposed that cytotoxic response can be resulted from a threshold concentration of about 30 ppm of Ni. Extended contact of orthodontic appliances can cause local pain and swelling in the neighboring tissues and the subsequent corrosion products (13) the additional described side effects are edema, gingivitis, gingival hyperplasia, DNA instability and alteration in cellular metabolism (14). Loss of substance from the material, alteration in its structural features, or loss of structural integrity can be resulted from corrosion. Various forms of electrochemical corrosions can ensue in the oral cavity, attributable to the salivary electrolytic capabilities. One of the factors that can influence this process is dental bleaching thus this study intended to evaluate whether Nickel release from stainless steel fixed retainer wires is affected by the commercially available at-home bleaching agents. The result of our study revealed non-significant difference between control group (mean= 27.77 for 3S and 28.75 for 6S) and opalescence 35% carbamide peroxide (B1) of two types of fixed retainer wires (mean= 28.45 for 3S and 30.67 for 6S), significant difference only seen between control group wires and polanight 16% carbamide peroxide group (B2) (mean=12.17 for 3S and 9.42 for 6S) and between B1 and B2 groups with less mean values scored for B2 group. Non-significant difference was seen between two types of wires in all groups this agree with Milheiro and his coworkers (15).

The reaction rate and oxygen release of carbamide peroxideat tissue surfaces was established to be much slower, mainly at oral and room temperatures. It was demonstrated that carbamide peroxide is greatly effective in reduction of plaque buildup and caries incidence. Furthermore, it has been tested to treat oral candidiasis in neonates. Its efficacy was established with no any adverse effects. Since Nickel release from stainless steel reaches its highest level after 7 days, in our study the immersion time in artificial saliva was not exceeded one-week (16).

Peroxides is the chief constituent of at-home bleaching agent commercially accessible, that can cause corrosion in variable degree to stainless steel in 2011 Sharma and Kumar determined that with the increased concentration of peroxides its corrosivity
increases. Moreover, the stainless steel alloy used in orthodontic wires can be affected by peroxides concentration from slight influence in low concentration to slight corrosion at higher concentrations [25]. Current study presented a non-significant difference between control groups and B1 groups, this may be because of carbamide peroxide stability and short application time of opulence 35% carbamide peroxide which was 30 minutes, in comparison to control group this time may be inadequate for production of more nickel release. On the other hand, B2 group was significantly lower than control group to realize that it is imperative to know stainless steel behavior in response to variable peroxides concentrations[17].

According to Johnson Diversity (18) stainless steel can be protected from corrosion connected with ion loss once it is freshly fabricated by: initially, treatment and cleaning with nitric acid in order to eliminate free iron from the surface then on this surface, passive layer formed gradually and naturally as chromium oxide resulted from the reaction between the chromium at the surface and oxygen in the air. The term passive refers to steel now being ‘unreactive’. During passivation, the thin oxide layer, that has produced at the metal surface, makes the surface non-reactive to hydrogen peroxide and averts the metal from putrefying the peroxide (19). In 2014 while reviewing the oxide coating steadiness at stainless steel surface of medical implants Naoun and his coworkers (20) said: this coating is quite essential for protection of medical implants, chemical agents such as hydrogen peroxide can alter its attitude. When used medical implants go through different phases in which hydrogen peroxide is involved (20).

Miyazawa and his coworkers (21) studied the hydrogen peroxide influences on stainless steel corrosion and determined that; as \( \text{H}_2\text{O}_2 \) reduced from 100 to 10 ppb, the oxide film thickness first increased and then it diminished. This meant that thin oxide film causes large dissolution rate and vice versa and give explanation about the less Nickel ions loss of fixed retainer wire in our study at low peroxide concentration which may be because of thick oxide film growing on the wire that may cause less reactivity in the wire as it immersed in synthetic saliva and consequently less Nickle release in B2 groups. The safety and serviceability of new products and procedures received great attentions by researcher as the dentistry goes to be more aesthetic in recent times. Narrow studies accomplished about durability of permanent retention wires in the oral cavity under variable environments, in this area Milheiro and his coworkers (15) studied the action and PH of mechanical loading on Nickle release from retention wires and established that resilient consequence on the Ni release from orthodontic retention wires caused by mechanical loading and in comparison to acidity mechanical loading has less impact on Ni release.

With the emergence of new systems and tendencies inspire non-extraction treatment in orthodontics, permanent retention with fixed retainer wires lingually or palatally used nowadays more than before. The wire serviceability in the oral cavity could be affected by to different influences and conditions wires as stay in the oral cavity for a long period or permanently. Because of overall tendencies toward perfect smile by patients particularly after completion of orthodontic treatment, teeth whitening and bleaching is exceedingly required recently, this leads to the question whether bleaching safe in a permanently retained orthodontic cases and what are the available option of dental bleaching could be used in this cases.

Our study focused on this area of research. Results estimate that some of the at-home dental bleaching agent can be used safely in patient wearing fixed retainer, further studies needed in this field to evaluate other dental bleaching options and their influences on permanent retention wires.

**Conclusions**

Generally speaking, in a patient with fixed retainer wire tested at-home dental bleaching agent can be used safely. Type of retention wire haven’t any effect on Ni release, although carbamide peroxide concentration and exposure time can influence Nickel release with the 16% carbamide peroxide recorded the smallest values that means increasing time exposure to low concentration carbamide peroxide, nickel release from retention wires reduced.

**Conflict of Interests:** The authors declare that they have no conflict of interest

**Source of Funding:** Self–funding

**Ethical Clearance:** Department of pedodontics, orthodontic and prevention/college of dentistry, University of Mustansiriyah
References


Parental Responsiveness of Mindest-Based Nursing on Early Sexual Education to Prevent Child Sexual Abuse

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Abstract

Parents need to emotionally engage and spend more time with the child as a response to the child’s psychological needs. One study explains that the parental response (both father and mother), in the form of support to the child, is a potential factor as a protection against the incidence of sexual abuse in children (1). One of the preventions through parenting that can be done by parents is to provide appropriate and correct sexual education in accordance with early child growth and development. Explanatory research was conducted to 170 pairs of parents (170 fathers and 170 mothers) from early child (aged 3-6 years) in Jember. The results show that parents’ mindset about sexual education has an important contribution to shape parenting skills, especially in preventing children from the risk of sexual abuse (sig = 0.000). Most parents feel that it is not easy to convey sexuality information, but they have a positive understanding of the role of early sexual education as an effort to prevent child sexual abuse. The main obstacles are on how to convey the child sexual education and to trust the early child to be self-reliant in taking a stand on the conditions at risk. It is important for parents to change the mindset that early child has the ability to learn and protect children from sexual abuse through early sexual education in day-to-day care.

Keywords: Child sexual abuse, early sexual education, parenting.

Introduction

Indonesia is in an emergency condition of sexual abuse according to the Indonesian Child Protection Commission. This is because the number of sexual abuse in Indonesia is quite high. The cases reached 1001 in 2015, and dramatically increased to 1424 cases in 2017. The victims of child sexual abuse were 73% more likely than adults. The vast majority of victims of sexual abuse are male (60%) with cases of sexual abuse in the form of sodomy (54%).

Early child (aged 3 - 6 years), based on the concept of Freud’s psychosexual development, is in the phallic phase. This phase is a phase in which children begin to have an interest in their genitals, as well as sex differences (2). This phase is an important phase for parents to raise caring awareness to teach and protect against the risk of sexual abuse in children. Sexual experience is a natural part of the developmental stage of children that allows children to learn to understand their bodies and the rules that shape sexual behavior are not at risk in children in the future (3).

Sexual abuse often occurs in families with low support and harmony (4). Family support in this case is the response or concern of parents in meeting the needs of children, especially in an effort to prevent sexual abuse in children. Another study explains the same thing, that sexual abuse in early child occurs due to risk factors from people closest, especially parents. It was explained that ineffective parenting process became the originator of vulnerable early child victims of sexual abuse (5). Parents have a function as educator and protector for children of early age. This is because early child (3-6 years) should spend most of his time with parents. Children not yet entering regular schooling interact more with the primary environment, especially parents (6). The family has a primary/primary role in preventing child sexual abuse. In principle, each family has great potential to teach children how to deal with child abuse (7).

The concept of parenting based on the perspective of Baumrind Theory explains that there are two parenting dimensions that parents have in applying parenting to children (8). The dimensions of parenting include
responsiveness and demandingness. Responsiveness refers to the extent to which parents deliberately provide encouragement or motivation by adjusting, supporting, and approving the needs and demands of children. Important aspects of responsiveness include warmth, reciprocity, clear communication, and individual-centered discourse, and attachment. This study was conducted to analyze the responsiveness dimensions of parents of early child especially in the effort to prevent sexual abuse in early child. Parental support shows a strong connection to child feelings of security as a responsive form of nurturance. Previous research has shown that fathers are better able to identify KSA signals than mothers, since fathers are more likely to be suspicious of strangers.

Based on their ability to grow up, children of three can effectively be taught self-protection skills especially from the risk of sexual abuse. Parent and family involvement in training is important, and repeated exposure helps children retain their knowledge and understanding of prevention efforts. Another study also explains that families who communicate effectively with children do not report cases of sexual abuse occurring in their children, whereas inadequately communicating parents report some form of sexual abuse experienced by their children.

Characteristics of parents in care will contribute to the interpretation of sex and sexual education for early child as a form of prevention of sexual abuse in children. The parent mindset will affect knowledge, belief, value, and attitude. Talks about sexuality and prevention of sexual harassment between parents and children, in many studies are still hampered by cultural factors and beliefs. When parents want to talk to their children about preventing sexual abuse, many feel that they lack the skills or language to do so.

The mindset which often inhibits parents of early child in providing early sexual education as a form of parental response in care to prevent sexual abuse occurs in their children. Based on this background, this study aims to analyze the four indicators of the dimension of responsiveness in parenting with the parental mindset in providing sexual education in early child as a form of prevention of sexual abuse.

**Material and Method**

This research is an explanatory research that aims to emphasize to find picture of causality among several sub variable of research through hypothesis testing. This study aims to analyze the dimensions of responsiveness in the care of parents’ mindset about early sexual education in an effort to prevent child sexual abuse. The subjects of this study are parents of children of this age (3-6 years) who live in urban areas in Jember. The sample in this study amounted to 170 pairs of parents (170 fathers and 170 mothers) taken by simple random sampling from 10 kindergartens in the urban area of Jember.

The dimensions of parental responsiveness were measured using a parental response skill questionnaire of 24 questions covering 4 responsiveness indicators: 1) self-esteem of early child; 2) Effective communication between parents and young children; 3) Support to establish self-reliance in children and 4) Form of affection given to children. Parental mindset of early sexual education was measured using a gender-based mindset scale questionnaire consisting of 24 questions covering 3 indicators: 1) belief (belief about the impact of early sexual education on sexual prevention); 2) value (assessment of the provision of sexual education in early child) and 3) parental attitudes in the role of educator in parenting.

**Findings**

**Respondents’ Characteristics:** Most of the maternal respondents in the study were aged 26-35 years (66%). The education level of most mothers is high school graduation (38.2%), and most mothers work as housewives (45.9%).

While the respondents’ father, most aged 31-35 years (34.1%). Similar to maternal respondents, most fathers have senior high school graduates (42.4%) with employment as self-employed or private sector employees (75.3%).

Most of these parents have 5-year-olds (40%) with male sex (51.8%).
Parents’ Mindset on Sexual Education:

**Tabel 1. Cross-tabulation of Mindset Categories with the Characteristics of Early Child (n=170)**

<table>
<thead>
<tr>
<th>Parents’ Mindset</th>
<th>Less</th>
<th>Moderate</th>
<th>Good</th>
<th>Sum</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
<td>f</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>Child Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>100,00</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td>0</td>
<td>25</td>
<td>56,82</td>
<td>19</td>
</tr>
<tr>
<td>5</td>
<td>0</td>
<td>0</td>
<td>31</td>
<td>45,59</td>
<td>37</td>
</tr>
<tr>
<td>6</td>
<td>0</td>
<td>0</td>
<td>18</td>
<td>34,62</td>
<td>34</td>
</tr>
<tr>
<td>Total</td>
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<td>0</td>
<td>80</td>
<td>47,06</td>
<td>90</td>
</tr>
<tr>
<td>Child Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>0</td>
<td>0</td>
<td>43</td>
<td>48,86</td>
<td>45</td>
</tr>
<tr>
<td>Female</td>
<td>0</td>
<td>0</td>
<td>37</td>
<td>45,12</td>
<td>45</td>
</tr>
<tr>
<td>Total</td>
<td>0</td>
<td>0</td>
<td>80</td>
<td>1,18</td>
<td>90</td>
</tr>
</tbody>
</table>

The parents’ mindset in this case is related to the parental mindset about the importance of providing early child sexual education to early child. The mindset will contribute to the concept of providing sexual education in early child. The results show that most parents have a good mindset (52.94%) about the importance of early sexual education to prevent child sexual abuse. Mother has a higher mean mindset score (mean = 76.85) than the father’s mean score on the importance of sexual education in early child.

**Tabel 2. Frequency Distribution of Variable Indicator of Parental Mindset of Early Child**

<table>
<thead>
<tr>
<th>Parents’ Mindset on Sexual Education</th>
<th>Mean</th>
<th>Med.</th>
<th>Modus</th>
<th>Std.Dev</th>
<th>Min</th>
<th>Max</th>
<th>Sum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>25,83</td>
<td>26,00</td>
<td>24°</td>
<td>14,497</td>
<td>16</td>
<td>36</td>
<td>4391</td>
</tr>
<tr>
<td>Belief</td>
<td>28,15</td>
<td>28,00</td>
<td>28°</td>
<td>7,361</td>
<td>18</td>
<td>38</td>
<td>4786</td>
</tr>
<tr>
<td>Behavior</td>
<td>21,94</td>
<td>22,00</td>
<td>22°</td>
<td>4,541</td>
<td>17</td>
<td>25</td>
<td>3730</td>
</tr>
</tbody>
</table>

Based on the three indicators of mindset, it is known that belief scores of parents’ beliefs about the positive and negative impact of giving sexual education in early child have the highest mean score (mean = 28.15) compared to other indicators. Parents are more convinced that sexual education will be able to protect their daughters from the risk of sexual abuse. The weakness in the mindset is related to attitudes in applying the provision of sexual education for fathers and mothers to early child. This is shown from the lowest average attitudinal value (mean = 21.98) compared to other indicators.

**Parental Responsiveness in Parenting**

**Tabel 3. Cross-tabulation of parental responsiveness/response skill categories with early child characteristics**

<table>
<thead>
<tr>
<th>Parental Response Skill</th>
<th>Less</th>
<th>Moderate</th>
<th>Good</th>
<th>Sum</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
<td>f</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>Child Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>33,33</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>11,36</td>
<td>39</td>
</tr>
<tr>
<td>5</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>8,82</td>
<td>62</td>
</tr>
<tr>
<td>6</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>7,69</td>
<td>48</td>
</tr>
<tr>
<td>Total</td>
<td>0</td>
<td>0</td>
<td>17</td>
<td>10,00</td>
<td>153</td>
</tr>
<tr>
<td>Child Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>0</td>
<td>0</td>
<td>11</td>
<td>12,50</td>
<td>77</td>
</tr>
<tr>
<td>Female</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>7,32</td>
<td>76</td>
</tr>
<tr>
<td>Total</td>
<td>0</td>
<td>0</td>
<td>17</td>
<td>10,00</td>
<td>153</td>
</tr>
</tbody>
</table>
Based on the results of the tabulation of research data, it shows that most parents have good response skills in either category (90%). The mean maternal skill response (mean = 87.31) is better than the father’s response skills (mean = 84.20) in preventing sexual abuse in early child.

### Tabel 4. Frequency Distribution of Variable Indicator of Parental Response Skill of Early Child

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Mean</th>
<th>Med.</th>
<th>Modus</th>
<th>Std.Dev</th>
<th>Min</th>
<th>Max</th>
<th>Sum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response Skill</td>
<td>85.32</td>
<td>85</td>
<td>85</td>
<td>7.19</td>
<td>71</td>
<td>100</td>
<td>14505</td>
</tr>
<tr>
<td>Appreciation</td>
<td>21.81</td>
<td>22</td>
<td>22</td>
<td>2.14</td>
<td>9</td>
<td>25</td>
<td>3707</td>
</tr>
<tr>
<td>Communication</td>
<td>20.63</td>
<td>21</td>
<td>22</td>
<td>2.38</td>
<td>15</td>
<td>25</td>
<td>3507</td>
</tr>
<tr>
<td>Support</td>
<td>20.85</td>
<td>21</td>
<td>21</td>
<td>2.42</td>
<td>14</td>
<td>25</td>
<td>3544</td>
</tr>
<tr>
<td>Affection</td>
<td>22.04</td>
<td>22</td>
<td>21</td>
<td>2.00</td>
<td>18</td>
<td>25</td>
<td>3747</td>
</tr>
</tbody>
</table>

Based on four indicators of response, the average value of mother majority is higher than the father. Parents have a good response especially on indicators of giving love to young children (mean = 22.04). The weakest parental response ability based on the four indicators of responsiveness is in terms of effective communication with early child (mean = 20.63). Most parents find it easier to communicate openly and positively to girls than boys (84.15%).

### Parental Mindset on Early Sexual Education to Parental Response Skill in Daily Parenting:

The results of statistical analysis using linear regression showed significant parental mindset influence on early sexual education on parental response skills to prevent sexual abuse in early child (p-value = 0.000). The results of this analysis are also supported by the results of multivariate analysis showing the same value (p-value = 0.00) that the mindset contributes to the formation of parenting response skills in care, especially in the prevention of sexual abuse in early child. Indicators that play an important role in this case are the value (value) and attitudes (attitude) parents about the importance of giving sexual abuse in girls and boys.

### Discussion

In particular, the parental mindset about early child sexual education is built on beliefs, values and attitudes (13). Most mothers feel it is important to take sexual abuse precautions with education in early child, but most of them are just beginning to provide sexual education when the child ageturns to 4-6. Most mothers are not yet confident to provide sexual education to younger children even though they believe that sexual education is important for children (15).

Morally, children are entitled to receive the necessary support and information that they will need to make responsible decisions regarding sex and sexuality (16). The results of the study illustrate that most parents already have a good sense of the importance of early sexual education. Early sexual education is believed to be the majority of respondents as a protective factor in the incidence of sexual abuse in children of this age. Their obstacles in applying the parenting is about how to convey the message of preventing sexual abuse with appropriate language and in accordance with early child development.

Improving the ability of parents to communicate expectations and values about sexuality can help support children in making sound decisions about sexual behavior as adolescents (17). The lowest average score indicates that parents often do not provide balanced education to boys and girls. Based on the results of the study conducted in Garwita Institute Jember, the existence of patrilineal culture in Jembercauses differences in the provision of sexual education in boys and girls. More parents feel the need to communicate intensively with their daughters compared to boys. This is because they are more confident that their son has better knowledge so there is no need for too many parental exceptions (18).

Parents can try to communicate at different times with their children, often the topic is started by their children, including when driving in the car, at dinner, and bedtime (19). Effective communication with young children is light and fun communication using positive, easy-to-understand languages. Not by using language or information that is frightening, especially when discussing information prevention of sexual abuse in children.
Conclusion

Parental mindset about early sexual education is an important focus in developing parenting skills in preventing child sexual abuse. Knowledge gained by parents through information from the media and the parenting education process held in Kindergarten is not enough to help improve parenting skills, if the parent mindset is still curative in the sense that their children are not at risk of becoming victims of violence sexual. So often there is a change of care done if their children have been victims of sexual abuse. The findings in this study can be used as a recommendation that effective prevention of sexual abuse by involving parents not only by providing education to increase parental understanding about the risk of sexual abuse in early child. However, there should be the needs to be deeper and sustainable efforts to change parental mindset of curative thinking into preventive thinking for continuous effective parenting as an effort to prevent sexual abuse in early child.

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Conflict of Interest: Nil

References


Microbiological Diagnosis of Bacteria Isolated from Otitis Media

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Abstract

Otitis media is an infection or inflammation in the part or whole of the mucous membrane of the middle ear cleft; it is amongst the most common diseases associated with multiple microbial pathogens within the middle ear and has worldwide distribution, particularly among children. The current study was conducted to investigate the bacterial causes of Otitis Media (acute and chronic). The swabs were collected from patients (n=105) suffering from ear discharge (Otitis Media, acute or chronic) (42 males and 63 females) referred to Salah Al-Din teaching hospital (ENT department) under the supervision of otolaryngologist to avoid any possible contamination during the period from July to December 2018. The ages of the patients ranged between (8 months to 80 years). Bacterial culture was done in regular conditions and biochemical tests were done by using commercial media. Bacterial cultures were positive in 93.3%, while 6.6% patients revealed negative in culture. The most common bacteria isolate included Pseudomonas aerogenosa followed by Staphylococcus aureus.

Keywords: Otitis Media, P. aerogenosa, S. aurous, Biochemical tests, Bacterial cultures.

Introduction

Otitis Media is a poly-microbial multifactorial disease, which is an inflammation of the middle ear that outcomes in the middle ear effusion, irritability, fever, and infection of tympanic membrane1, it is one of the most common problems in the progressing world2, and it is continues to be one of the commonest childhood diseases and linked with multi microbial pathogens inside the middle ear3. Precedent studies4-9 have reported otitis media to possess worldwide propagation, It might result from bacteria, fungi and virus10. It considered as the most common respiratory tract infection of babyhood and early childhood11. The more horizontal Eustachian tube and is shorter in children allows the microorganisms to enter from the nasopharynx to middle ear4. Otitis media may be classified as acute or chronic followed by suppurative or non-suppurative. It may be named as “specific Otitis media” has been utilized to explain tuberculosis and syphilitic otitis media as it may presence of acutely or chronically, with or without purulence and it may namely “adhesive otitis media” has been utilized to describe tympanosclerosis (hyaline degeneration and calcification) and adhesion construction within the tympanic cavity but should be further carefully be regarded as a complication of otitis media12. It occurs in both gender and at different ages and varying estimates and the children less than the age of Ten years are often more susceptible to the injury, especially whose visiting the public swimming pools, kindergarten and nursery13. The etiologic bacteria in otitis media may be aerobic as (P. aerogenosa, S. aureus, Proteus mirabilis, Streptococcus pyogens, E. coli, Klebsiella spp.) or anaerobic as (Peptostreptococcus, Propionibacterium, Bacteroides)14. In current study, in acute otitis media, S. aureus was predominant organism isolated from middle ear, while the most common microorganism found in Chronic suppurative otitis media is P. aerogenosa14. Many studies have indicated that the source of G+ bacteria that causes otitis media is nasopharyngeal cavity, and the source of G- bacteria I auditory canal contamination15. Acute otitis media can cause pain which lead to sleeplessness for both parents and child, and also can cause perforation in the eardrum, in up to 97% of children with ASOM; pathogenic bacteria have been isolated from the nasopharynx1. If severe infection
goes untreated long enough, high fever can occur and cause febrile seizures. The aim of the present study is to determine the pattern of bacteria isolates in patients with Acute Suppurative Otitis Media (ASOM) or Chronic Suppurative Otitis Media (CSOM) by microbiological culture, and biochemical Method.

Material and Method

Clinical specimens and patient data: Clinical specimens and data were collected from 105 patients with ASOM or CSOM who was visit Salah Al-Din teaching hospital (ENT department) under the supervision of otolaryngologist to avoid any possible contamination, these samples collected during the period from July to December 2018. All samples kept in disposable transport media to maintain the vitality of microorganisms until the specimens are processed.

Identification of Bacteria: All samples were inoculated on culture media viz. MacConkey agar plate, blood base agar plate, chocolate agar plate. The inoculated MacConkey and Blood agar plates were incubated aerobically at 37°C for 24 hours. After incubation they were examined for evidence of growth. The colony characters were studied by staining with gram stains kit, and examined under the 100x objective. The bacterial species, then isolated were identified by morphology, characteristic of culture, and biochemical test according to the standard techniques

Isolation of Staphylococcus aureus: S. aureus was inoculated onto Nutrient broth at 37°C for 24 hours then streaked onto Mannitol Salt agar to confirm identified due to this agar contain highly salt (7.5%), and S. aureus tolerant high salt as well as its able to ferment mannitol sugar. Plates are incubated aerobically at 37°C for 24 hours and examined after 24 h for yellow colony surrounded by halo zone incubated aerobically at 37°C for 24 hours and examined after 24 h for yellow colony surrounded by halo zone. Catalase and coagulase test were performed to confirmation of result. This bacteria positive for catalase and coagulase tests. API 20 Staph kit was used to confirm the diagnosis.

Isolation of gram negative bacteria: All gram negative bacteria were inoculated onto nutrient broth at 37°C for 24h and then streaked onto MacConkey agar media, and identified by using biochemical tests and API 20 E. The tests were read after incubation at 37°C for (24-48) hours.

Biochemical tests: Various tests were carried out on gram negative bacteria (Indole, Methyl red, Vogas- Proskaucer, Citrate, Urease, Kligler Iron agar, Catalase, Oxidase tests). All biochemical tests were done according to MacFaddin. All isolates of P. aeroginosawere sub- culturing on cetrimide agar plate, which contain antibiotic inhibited growth of other gram negative bacteria.

Results and Discussion

In this study, the female was seen more susceptible to infection with otitis media than the male (59/98: 60.20%) (39/98: 39.79%), this result was agreeing with Ekpo et al. who found the male to female ratio was 1:16, but dis-agreed with some reports. Other study in South Africa found that the male was more susceptible (64%) than the female (36%) to infect with otitis media. The most common age group affected was (26-30) years (18.36%) followed by (21-25%) years (15.30%), (0-5) years (13.26%), and (6-10) years (12.24%). This result similar to Patigaroo et al. who found the most our patients were young and middle-aged, and Gul et al., who refer to the most common age group more susceptible to infection with otitis media was (21-30) (22%), but disagreed with Ayub et al. that found children more susceptible to infection (Table 1).

<table>
<thead>
<tr>
<th>Age group</th>
<th>Number of Patients</th>
<th>Males</th>
<th>Females</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-5</td>
<td>13</td>
<td>4</td>
<td>9</td>
<td>13.26%</td>
</tr>
<tr>
<td>6-10</td>
<td>12</td>
<td>2</td>
<td>10</td>
<td>12.24%</td>
</tr>
<tr>
<td>11-15</td>
<td>11</td>
<td>7</td>
<td>4</td>
<td>11.22%</td>
</tr>
<tr>
<td>16-20</td>
<td>8</td>
<td>3</td>
<td>5</td>
<td>8.1%</td>
</tr>
<tr>
<td>21-25</td>
<td>15</td>
<td>10</td>
<td>5</td>
<td>15.30%</td>
</tr>
<tr>
<td>26-30</td>
<td>18</td>
<td>6</td>
<td>12</td>
<td>18.36%</td>
</tr>
<tr>
<td>31-35</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>4.08%</td>
</tr>
<tr>
<td>36-40</td>
<td>7</td>
<td>2</td>
<td>5</td>
<td>7.14%</td>
</tr>
<tr>
<td>41-45</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2.04%</td>
</tr>
<tr>
<td>46-50</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>4.08%</td>
</tr>
<tr>
<td>51-55</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2.04%</td>
</tr>
<tr>
<td>56-60</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1.02%</td>
</tr>
<tr>
<td>61-70</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1.02%</td>
</tr>
<tr>
<td>Total</td>
<td>98</td>
<td>39(39.7%)</td>
<td>59(60.20%)</td>
<td></td>
</tr>
</tbody>
</table>

1. Bacteria Isolates from Acute Otitis Media: In the present study, the results showed that the S. aureus was predominant organism isolated
from middle ear, which reached (9/25) (36%), were confirmed by Gram’s Method, catalase and coagulase tests followed by *Pseudomonas aerogenosa* (7/25) (28%). The third most common organism in this study was coagulase negative *S. epidermidis* were (5/25) (20%) as shown in Figure 1. Mixed growth was present in 1 sample. This results identified according to microbiological and biochemical and API tests. The results were agree with previous reports that identified 35 isolate of *S. aureus*, and dis-agree with Ch.Al-Yas, that found *S. aureus* in only 6 isolates, and with Ayub et al. that detect *S. aureus* in 5% of isolates. As well as the results of present study are quite contrast to results, which was the most common isolates was Streptococcus spp. (47.74%) followed by Moraxella spp. (23.84%). All isolates of *S. aureus* were appear to be capable to ferment mannitol when culturing on Mannitol Salt agar medium and the media turned into yellow color as it shows in Figure 2.

![Figure 1: Distribution of pathogenic bacteria [ASOM]](image1)

2. Bacteria Isolates from Chronic Otitis Media: Out of 78 ear swabs cultured, 73 (93.58%) had bacterial growth. Amongst these, the most common pathogenic species were *Pseudomonas aerogenosa* (29/73) (39.72%), were identified by produce some greenish pigmentation on MacConkey agar medium and also gave fishy odour. Strongly oxidase positive was confirmed *P. aerogenosa*. followed by *P. aerogenosa, Staph. Aureus*, which was observed in (26/73) (35.6%) cases, as shown in Figure (2), this result was similar to, but was dis-agreed with which they found that the most common isolates are *S. aureus*. Mixed growth was observed in 4 samples, this result was agree with which found that 3 samples (3.44%) of no growth, 3 samples (3.44%) of mixed growth, and 81 samples (39.1%) positive growth of single bacteria. Some studies showed that the source of infection in otitis media were enteric bacteria and *P. aerogenosa* is not needful to be the nasopharyngeal rout but may be through contamination of fecal of the auditory stream. Another study refers to another way helps transfer pathogens to middle ear is to use incorrect Method for cleaning the external ear. All isolates of *P. aerogenosawere* appear to be able to grow on Cetrimide agar and produce Blue- green color due to production of pyocyanin pigment as it shown in Figure 4.

![Figure 2. Distribution of pathogenic bacteria [CSOM]](image2)
3. Biochemical tests for G-Bacteria Isolate from Otitis media: The results of biochemical tests for G-bacteria isolate from Otitis Media are depicted in the Table 2.

Table 2. Biochemical tests for G-bacteria isolate from Otitis Media

<table>
<thead>
<tr>
<th>Bacteria Type</th>
<th>Indol</th>
<th>MR</th>
<th>VP</th>
<th>Citrate</th>
<th>Urease</th>
<th>Oxidase</th>
<th>Catalase</th>
<th>KIA</th>
<th>Gas</th>
<th>H₂S</th>
<th>Motile</th>
</tr>
</thead>
<tbody>
<tr>
<td>P. aerogenosa</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>V</td>
<td>+</td>
<td>+</td>
<td>K/K</td>
<td>+</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>E. coli</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>A/A</td>
<td>+</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>Proteus spp.</td>
<td>+/-</td>
<td>+</td>
<td>+/-</td>
<td>+/-</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>K/K</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>C. freundii</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>A/A</td>
<td>+</td>
<td>-</td>
<td>+/-</td>
</tr>
<tr>
<td>A. baumannii</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>K/K</td>
<td>-</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>K. pneumonia</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>A/A</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>E. aerogenas</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>A/A</td>
<td>+</td>
<td>-</td>
<td>+</td>
</tr>
</tbody>
</table>


4. Diagnosis of G-bacteria by using API 20 E: API 20 E kit was used to confirmed diagnosis for G-bacteria, Figure 3 showing the result of 3 type of G-bacteria (Acinetabacterbaumanii, Citrobacterfreundii, Proteusvolgaris).

![Figure 3: Diagnosis G-bacteria by using API-20 E system](image)

Diagnosis is done according to manufacturer’s instructions (Biomerieux) according to (15).

5. Biochemical tests of Staphylococcus spp.: S. aureus showed positive results with coagulase, catalase, mannitol fermentation, urease test, β-hemolysis and methyl red (MR) test. It showed negative results with oxidase and vogues proskauer test. However, S. epidermidis showed positive results only with catalase.

6. Diagnosis of G+ bacteria by using API Staph: API Staph. kit was used to confirmed diagnosis for G+ bacteria, a single pure colony cultured aerobically on Mannitol Salt agar or blood agar medium for 18-24hr was transferred to the test tube which contained 5 ml of normal saline, Mixed by using the mixer (perfectly). An inoculation box (Tray and Lid) was prepared by distributing 5ml of sterile distilled water to the wells of the tray to provide the humidity for bacterial growth. The tray was incubated at 35°-37°C for 18-24 hour. After the incubation period was finished, the following reagents were added (VP, NIT, PAL), after 10 minutes, the results were reading.

![Figure 4: Diagnosis of S. aureus by using API-20 staph system](image)

Diagnosis is done according to manufacturer’s instructions (Biomerieux) according to (15).

Ethical Clearance: The blood was collected from the Al-KarkhMaterity hospital after their investigation. Oral consent was taken before enrolled the patients in the study.

Source of Funding: Self

Conflict of Interest: Nil

References

22. Ch.Al-Yas M. Evaluate the antibacterial effect of Garlic (Allium sativum) and antimicrobial susceptibility on Pseudomonas aerogenosaisolated from otitis media. AJP S, 2011, 10(2).


The Relationship Between Family Support and Family Burden Towards Readmission

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¹Master Program of Nursing Faculty of Nursing Andalas University, Limau Manis, Padang, West Sumatera, Indonesia, ²The Relationship between Family Support and Family Burden towards Readmission, ³Master Program in Nursing of Nursing Faculty of Andalas University

Abstract

The number of readmission of psychiatric patients in Padang, West Sumatera, is still very high. This is due to some factors such as the family support and family burden in taking care of the family members with mental disorder that are not good enough. Meanwhile, the Readmission itself can increase the finance and the service quality of the psychiatric hospital. The purpose of this study was to know the relationship between family support and family burden towards the readmission of psychiatric patients at HB Sa’anin Padang Psychiatric Hospital. This study was analytic descriptive with cross-sectional study approach. The sample of this study was 106 respondents. This study used purposive sampling technique based on the inclusion criteria in which the family did the readmission < 1 month or ≥ 1 month at HB Sa’anin Padang Psychiatric Hospital. To collect the data, the researcher used family support and family burden questionnaire. To analyze the data, the researcher used Logistic Regression. The researcher found that there was a significant relationship between family support and family burden towards the readmission (p value <0.05) in which the most dominant variable was the family burden towards readmission. The inadequate family support in taking care of family members with mental disorder would have an impact on patients’ healthcare at home. Ideally, family should become the source of support for family members. On the other hand, for those who didn’t have good understanding of patients’ healthcare, it could be a burden and a problem for the family to take care the mental disorder patients so that the family decided to do readmission for the mental disorder patients. This study is expected to give an input for the psychiatric hospital to improve the education for the family about the mental disorder patients’ healthcare at home after the patients return from hospital.

Keywords: Readmission, Family support, and family burden.

Introduction

Schizophrenia is one of the most severe mental disorders. According to WHO (2012), there are 24 billion people in the world suffered from schizophrenia between the ages of 15 to 35 years. Schizophrenia cases often occur and the patients also often experience readmission repeatedly with a 30-day return indicator(1).

The prevalence of mental disorders in some countries experiencing readmission after 30 days of returning from hospital occurred in the United States, Japan and Brazil. Most of Americans were diagnosed with mood disorder and schizophrenia as many as 12.6%(1). In Japan, there were 62% patients with schizophrenia diagnose conducting readmission in 2014(2).

Readmission towards the psychiatric patients after 30 days of returning from hospital with the same diagnose is a negative result for psychiatric patients(2). This may be due to many factors, such as illness or relapse, low social support, low family income, increased stigma accompanying schizophrenic patients(3), family inability towards patients’ treatment, non-compliance in taking medicine given by the hospital(4). Moreover, the families feel the burdens in taking care of the family members with mental disorders(5).

Readmission is the main source of costs for the health system, in which the re-enrollment, especially for the hospital as an indicator of hospital performance that may impact on the quality of health services(6). Mental health services community can be a solution for the families by providing information and education through
therapeutic communication, thereby increasing the ability of the families to take care of the family members with mental disorders, and reducing the prevalence of readmission at hospital towards psychiatric patients\(^7\).

Research Methodology: This research used descriptive analytic design with cross sectional study approach. The setting of the research was at HB Sa’anin Padang Psychiatric Hospital. The variables were family support, family burden, and readmission. The respondents of this research were the families of the patients with mental disorder who visited HB Sa’anin Padang Psychiatric Hospital. The sampling technique used was purposive sampling technique with the sample as many as 106 families who did readmission towards family members with mental disorder.

The data were collected by using questionnaires given to each family who visited the Psychiatric Hospital and conducted readmission <1 month and ≥ 1 month. The questionnaires about family support were taken from the theory Friedman, 2011 consisted of 24 items of questions about emotional, informational, judgmental and instrumental support. The measurement used median. The family burden theory (CSI) consisted of 13 items of questions which consisted of subjective burden and objective burden.

After that the researcher did analysis data using simpleregresion logistik to know the significant relationship between independent variable and dependent variable if p-value <0,05. The researcher used Logistic Regression analysis to know the dominant variable in relation to the readmission by using Backward LR method to see which variable had the most significant relationship with readmission using SPSS 20 software.

Findings

Univariate Analysis:

Table 1: The Family Support and Family Burden towards Readmission on the Patients with Mental Disorder at HB Sa’anin Padang Psychiatric Hospital

<table>
<thead>
<tr>
<th>No.</th>
<th>Variable</th>
<th>F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Family Support</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Good</td>
<td>52</td>
<td>49,1</td>
</tr>
<tr>
<td></td>
<td>Less good</td>
<td>54</td>
<td>50,9</td>
</tr>
<tr>
<td>2.</td>
<td>Family Burden</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Heavy</td>
<td>56</td>
<td>52,8</td>
</tr>
<tr>
<td></td>
<td>Light</td>
<td>50</td>
<td>47,2</td>
</tr>
</tbody>
</table>

Based on Table 1, the result of the study showed that from 106 respondents, half of the family support was categorized less good (50.9%) and most of the family burden was categorized heavy (52.8%) in taking care the family member with mental disorder.

Table 2: Frequency Distribution of Readmission at HB Sa’anin Padang Psychiatric Hospital in 2018

<table>
<thead>
<tr>
<th>Readmission</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Readmission happened within less than 1 month (&lt; 1 month)</td>
<td>17</td>
<td>16</td>
</tr>
<tr>
<td>Readmission did not happen more than 1 month (≥ 1 month)</td>
<td>89</td>
<td>84</td>
</tr>
<tr>
<td>Total</td>
<td>106</td>
<td>100</td>
</tr>
</tbody>
</table>

Based on Table 2, the result of the research revealed that from 106 respondents, a few readmissions happened less than 1 month (< 1 month) (16%). From the result of HB Sa’anin quality indicator, Readmission happened less than 1 month (< 1 month) after plenary with limit <5%.

Bivariate Analysis:

Table 3: The Relationship of Readmission towards the Patients with Mental Disorder at HB Sa’anin Padang Psychiatric Hospital in 2018

<table>
<thead>
<tr>
<th>The Influencing Factors</th>
<th>Readmission</th>
<th>Total</th>
<th>P- value</th>
<th>OR (CI 95%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Happened&lt; 1 month</td>
<td>Not happened ≥ 1 month</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>Family Support</td>
<td>F</td>
<td>%</td>
<td>F</td>
<td>%</td>
</tr>
<tr>
<td>Good</td>
<td>1</td>
<td>1,9</td>
<td>51</td>
<td>98,1</td>
</tr>
<tr>
<td>Less Good</td>
<td>16</td>
<td>29,6</td>
<td>38</td>
<td>70,4</td>
</tr>
<tr>
<td>Family Burden</td>
<td>F</td>
<td>%</td>
<td>F</td>
<td>%</td>
</tr>
<tr>
<td>Heavy</td>
<td>15</td>
<td>26,8</td>
<td>41</td>
<td>73,2</td>
</tr>
<tr>
<td>Light</td>
<td>2</td>
<td>4,0</td>
<td>48</td>
<td>96,0</td>
</tr>
</tbody>
</table>
Based on Table 3, the result of analysis showed that p-value 0.004 which meant there was a significant relationship between family support and readmission and the result also showed the value of p-value 0.005 which meant that there was a significant relationship between family burden and readmission.

**Multivariate Analysis:**

Table 4: The first model of multivariate analysis of Variables related to Readmission towards Patients with Mental Disorder at HB Sa’anin Padang Psychiatric Hospital in 2018

<table>
<thead>
<tr>
<th>Variables</th>
<th>Model I</th>
<th>Model II</th>
<th>Model III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family Burden</td>
<td>OR</td>
<td>p-value</td>
<td>OR</td>
</tr>
<tr>
<td></td>
<td>4.971</td>
<td>0.071</td>
<td>5.010</td>
</tr>
<tr>
<td>Family Support</td>
<td>OR</td>
<td>p-value</td>
<td>OR</td>
</tr>
<tr>
<td></td>
<td>0.092</td>
<td>0.033</td>
<td>0.092</td>
</tr>
</tbody>
</table>

From Table 5, the results revealed that the variable most closely related to the readmission towards the family members with mental disorder was family burden. Family burden was the most dominant variable in which the value of p-value = 0.035. From the analysis results, it was obtained the value of Odd Ratio (OR) = 6,247 times underwent the readmission within less than 1 month for those with heavy family burden in taking care the family members with mental disorder compared with for those with light family burden in taking care the patients at home.

Family Support: It was supported by the result of the questionnaires in which the family gave less judgmental support. 71.7% of the families rarely spent their time to train the patients with routine activities at home. 69.8% of the families rarely helped the patients in taking the medicine and observing whether the patients really took the medicine. Based on their study, based on the family support surveillance, there are 40% of the family give worst family support to the patients who are not compliant in treatment while there are 49.4% of the family give good family support to the patients and it causes the patients being compliant in treatment. The family support will affect the compliance of the patients in treatment. The better the family support given by the family, the less the relapse happens. It also will reduce the readmission in a short-term or long-term period.

In (9), it is stated that family support towards psychiatric patients is important because with affection, empathy, attention given by the family, the willingness to spend time with the patients will make the patients feel appreciated and loved. This condition enables the patients to take medicine cooperatively and willingly so that it will reduce the readmission towards the psychiatric patients.

The psychiatric patients need family support especially in the treatment process, thus helping the psychiatric patients to go back to the community. The psychiatric patients who do not get enough family support will stigmatize themselves so that it will cause the non-compliance in taking medicine and treatment(10).

According to (16), she states that taking the medicine irregularly and discontinuing the treatment as symptoms subside towards the psychiatric patients will cause relapse and increase the readmission compared with the psychiatric patients who are compliant in taking medicine. Therefore, the families should pay attention to the psychiatric patients’ treatment at home.

The family support consists of informational, judgmental, instrumental and emotional support. It can be done by giving support in treatment, giving compliments, providing information about the patients’ treatment, giving empathy and compassion to the patients so that the patients feel owned and loved. It also raises the patients’ self awareness to recover, makes the patients be compliant in undergoing treatment, and reduces the readmission(10).

Family Burden: The burden felt by the family could be caused by several reasons: 45.3% experienced their thoughts often focused on the patients; 42.5% caused by emotional changes in the family; 86.8% felt uncomfortable in taking care of the patients; 85.8% felt lack of sleep; and 78.3% often had financial problems in treating patients at home.

Based on the result of the research conducted on family members in China, it is stated that the burden of family members doing readmission is a strong correlation between the family members and the patients. It can be caused by the fear about the patients did some violence, the disturbance for the family daily activities (8.3%), and the anxiety experienced by the family. The anxiety felt by the families is a psychological response because the families have less understanding about how to take care the patients. The anxiety is also an emotional burden for the family to take care the patients(5).
The family burden is significantly high in family members with mental disorders, where the families feel uncomfortable at home and also suffer from sleep disorders. This also affects the physical health of the family\(^{(12)}\).

Physical health problems are also associated with the burden felt by the families either in the form of subjective burden and objective burden. The families think that having a family member with mental disorder is a disgrace that made the family feel embarrassed and anxious towards the psychiatric patients\(^{(3)}\).

The problem of stigma in the prevention of psychiatric patients is still a significant constraint for patients and families. It can be seen from the characteristics of the community that are not supportive so that the families want to re-enter the family members with psychiatric problems to the psychiatric hospital\(^{(7)}\). The family should be a source of support for the psychiatric patients but for those who are lack of understanding about how to take care the psychiatric patients will think it is as a burden and problem for the family.

The families as the caregivers for the psychiatric patients at home facing various barriers bear the burden in taking care of the psychiatric patients who are not compliant in taking medicine that can lead to the relapse\(^{(9)}\).

The non-compliance in taking medicine remains as one of the greatest challenges on the psychiatric patients. Based on the study, there were 40%-50% patients whom were not compliance in treatment.

**Multivariate**

**Family Burden:** Family burden is an unpleasant level of experience in the family as a result of the condition of the family members. This condition can lead to the increase of emotional and economic stress for the families as well as the family distress level of experience\(^{(12)}\).

The presence of a person with a mental disorder in the family is often associated with some objective and subjective burden on family members, especially those who have caregivers in taking care of the mental disorder patients. Based on the research\(^{(13)}\), the families with the mental disorder family members experienced 32.1% heavy burden in taking care of them. The family felt emotional burden facing the change of the patients’ behavior and the financial burden in Nepal.

The burden can be felt by the families when the caregivers do not get the help or other family support they need so that the caregivers will do what they can, physically or financially. Consequently, the caregivers will easily experience fatigue, stress, anxiety, and depression. This study also suggests that the emotional burden will be more severe for the families if the families as the care givers give less affection as a caregiver\(^{(14)}\).

The families as the caregivers at home face various barriers and bear the burden of taking care of the clients who are not obedient or the family that have much pressure will easily get stress in taking care of the family members with mental disorders. If the families do not face the burden and understand in taking care of the patient, the family will optimally play the role and function in taking care of the patients with mental disorders\(^{(9)}\).

The caregivers are responsible for the care of family members with mental health disorders at home who often undergo changes in their lives that can produce stress and burden. To avoid those things, the family should understand the symptoms of recurrence on the patients\(^{(15)}\).

**Conclusion and Suggestion**

**Conclusion:** Good family support will affect the patients’ healthcare treatment compared to the family who gave less support. The forms of the family supports that can be given by the family are such as instrumental, assessment, emotional, and informational support. The less support given by the family can be caused by several reasons such as the burden in taking care of the patient, the pressure experienced by the family, the stress, and also the lack of family understanding related to how to take care of the family members with mental disorders that can cause readmission.

**Ethical Consideration:** The study was conducted after going through the procedure of ethical review pass with the research ethics committee at BLU RSUP Dr. M. Djamil Padang

**Source of Funding:** Self

**Conflict of Interest:** To obtain a master’s degree in nursing
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Baby Friendly Hospital Initiative in the Middle East Countries: A Review of the Literature

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Abstract

**Background:** Successful implementation of the Baby Friendly Hospital Initiative programme with continued prenatal and postnatal support for mothers is of great importance at the local, national and global levels, and effectively contributes to the increased initiation, duration and exclusivity of breastfeeding.

**Aim:** The aim of this review is to identify any published studies on BFHI related to the promotion, support and protection of breastfeeding in Middle East countries and regions.

**Method:** Three electronic search databases were used: Cumulative Index of Nursing and Allied Health Literature (CINAHL plus); Medical Literature Analysis and Retrieval System Online (Medline) (1946 to 2018); and Excerpta Medica database (EMBASE). In addition, a hand search of relevant journals was conducted, including the International Breastfeeding Journal and Journal of Human Lactation, and the Iraqi Virtual Science Library and Iraqi Academic Scientific Journals database. The search was limited to studies published in English or Arabic. No limits were placed on the search in relation to publication date.

**Results:** A total of 1542 records were identified from the database searches, 400 of which were duplicates of the 1142 records screened by title and abstract, 1130 were excluded, as they mostly related to breastfeeding and not the BFHI programme. The full texts of 12 studies were reviewed and inclusion and exclusion criteria were applied, resulting in 5 studies eligible for inclusion in this review.

**Conclusion:** Two main gaps have been identified through the literature review. First, there is a dearth of studies which apply Organisation Readiness for Change (ORC) theory to assess clinical and non-clinical staffing levels required to deliver the BFHI programme. Second, few researchers have sought to understand how the organisational cultures of individual hospitals influence compliance with the Ten Steps to Successful Breastfeeding and the Code.

**Keywords:** Baby Friendly Hospital Initiative (BFHI), the Ten Steps to Successful Breastfeeding, International Code of Marketing Breastmilk Substitutes (the Code), Organisational Readiness for Change (ORC), barriers and facilitators to BFHI.

**Introduction**

Studies have shown that successful implementation of the BFHI programme with continued prenatal and postnatal support for mothers is of great importance at the local, national and global levels, and effectively contributes to the increased initiation, duration and exclusivity of breastfeeding.¹

The rationale for this literature review is to explore the barriers and facilitators to implementing and sustaining the BHFI programme in the Middle East. Specifically, this literature review poses two questions:
1. What are the barriers and/or facilitators to implementation and sustained compliance with the BFHI program?
2. What are the levels of knowledge, attitudes and practices of staff working within accredited Baby Friendly hospitals or those working towards accreditation?

The aim of this review is to identify any published studies on BFHI related to the promotion, support and protection of breastfeeding in Middle East countries and regions. The review will also help to gain an understanding of the Method previously used in Middle Eastern studies to evaluate the BFHI programme, and identify any gaps in the literature, helping to inform the current study by leading to a clear conceptualisation of the problem under examination.

**Method**

**Search strategy:** In order to identify relevant published literature related to the review questions above, a systematic search strategy was developed. The search acronym of Population, Exposure, Outcomes, and Study setting (PEOS), which is commonly used in search strategies to identify qualitative and observational research, was used to develop a list of search terms comprising Medical Subject Headings (MeSH terms) and keywords.

The terms were identified and classified into five categories: i. Population (nurses, midwives, physician, or administrators), ii. Exposure 1 (Breastfeeding, Baby Friendly, BFHI or BFI), iii. Exposure 2 (organisational theory, organisational culture or change management), iv. Outcomes (knowledge, attitudes, practices, barriers or facilitators), and v. Study setting (Middle East). Three electronic search databases were used: Cumulative Index of Nursing and Allied Health Literature (CINAHL plus); Medical Literature Analysis and Retrieval System Online (Medline) (1946 to present); and Excerpta Medica database (EMBASE).

In addition, a hand search of relevant journals was conducted, including the International Breastfeeding Journal and Journal of Human Lactation, and the Iraqi Virtual Science Library and Iraqi Academic Scientific Journals database. The search was limited to studies published in English or Arabic. No limits were placed on the search in relation to publication date.

**Selection process:** Following the identification of records from the electronic search and hand search of journals, duplicate records were removed. Inclusion and exclusion criteria were then introduced to screen the title and abstract of each record of the remaining records, the full text was obtained to assess each study’s eligibility for inclusion in this review. Inclusion and exclusion criteria were applied.

**Data extraction and synthesis:** Studies eligible for inclusion were analysed to extract data on the study setting, year of publication, objectives, sample, Method used to conduct the study, the main findings and those presented in tabular form. A narrative synthesis of the studies enabled each of the review questions to be addressed and conclusions to be drawn.

**Critical appraisal tools for quality assessment of included studies:** A critical appraisal of the included studies was conducted. This quality assessment was carried out using the relevant Critical Appraisal Skills Programme (CASP) tool. Critical Appraisal Skills Programme (CASP) tool for qualitative research studies and cohort studies consists of 10 questions. All of the key elements in the research were evaluated to determine quality and credibility in order to provide evidence for the subsequent focus of the research and justification for the study design.

**Results**

**Systematic search process:** Initial searches in electronic search databases were conducted in May 2014 and were updated in August 2017 using the systematic search strategy. Figure 1 presents the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) flow diagram which reports each stage of this process. A total of 1542 records were identified from the database searches, 400 of which were duplicates of the 1142 records screened by title and abstract, 1130 were excluded, as they mostly related to breastfeeding and not the BFHI programme. The full texts of 12 studies were reviewed and inclusion and exclusion criteria were applied, resulting in 5 studies eligible for inclusion in this review.
Evidence of barriers and/or facilitators to the implementation and sustainability of the BFHI in the Middle East

The first review question involves reporting the findings on barriers and/or facilitators to implementation and sustained compliance with the BFHI programme. Studies included in this review provide evidence for this review questions in their research objectives. The first study by Gokcay1 aimed to document practices in the context of the Ten Steps, in order to identify factors which affect the implementation of BFHI programme and make recommendations for improving practice. Several barriers to the implementation of BFHI were identified by this study, specifically related to each of the Ten Steps. They included the absence of a specialised hospital team on lactation management; low number of healthcare staff trained in breastfeeding; inappropriate hospital setting, environment and overcrowding; patient preferences; absence of breastfeeding policy; high turnover of administrative staff; no BFHI courses; lack of staff numbers; no antenatal education about breastfeeding; disagreement among some of physicians about early initiation of breastfeeding; lack of knowledge in nurses about how to maintain breastfeeding; and no breastfeeding support groups.

The second study, by Edward2, described the unique challenges faced by two BFHI hospitals during the accreditation process. It used a problem-solving approach through conducting steering groups, and pre-and post-knowledge tests about breastfeeding and the Ten Steps to Successful Breastfeeding were also applied. The study revealed many of the challenges faced in the implementation of BFHI programme at the study site. They included insufficient breastfeeding policies in written form; different opinions on breastfeeding among staff; and breastfeeding was not seen as a high priority issue among delivery room staff. Formula feeding was normal in the postnatal wards; there was poor coordination between hospital facilities; women attend the hospitals with little or no antenatal education and rely on their families for breastfeeding education more than clinical staff; mixed feeding was a normal practice among mothers; and there was delayed initiation of breastfeeding.

The third study, conducted by Al Ghazal3, was a campaign developed to encourage breastfeeding culture by providing professional support and facilitation during the BFHI accreditation process. This included the development of breastfeeding education resources, professional support, and organising seminars in healthcare facilities and community settings. In addition, the campaign aimed to create community awareness through social media. The study resulted in the accreditation of 11 healthcare facilities.

Evidence on the knowledge, attitudes and practice of staff working with the BFHI in the Middle East: The second review question seeks to report any findings related to the levels of knowledge, attitudes and practices of staff working within accredited Baby Friendly hospitals or those working towards accreditation. Studies included in this review provide evidence which relates to this question. The first study, by Sallam4, evaluated the knowledge, attitudes and practices of healthcare staff and women regarding the initiation of breastfeeding within first hour of life in one hospital. The study revealed that there was a significant statistical difference between the total score of nurses’ practices in the paediatric department, as they were higher than their counterparts in the gynaecology and obstetrics departments. Also, the study showed that the most frequent factors associated with delayed initiation of breastfeeding were caesarean section, maternal anaemia, maternal illness during pregnancy and delivery and premature birth. The recommendation made by this study was to reactivate the BFHI programme at the study site, which indicates that this hospital had lost the BFHI certification due to non-compliance with BFHI standards.

The second study is prospective cohort study survey by Mosher5, designed to study staff opinions in
the context of the BFHI programme in two hospitals (BFH and non-BFH). The results indicated that the staff in the accredited BFH were more familiar with BFHI components. Also, weaknesses which affect exclusive breastfeeding and compliance with BFHI were identified, including a high rate of formula and mixed feeding among the samples (mothers) upon discharge from the non-BFHI hospital, and a high rate of mixed feeding among the samples (mothers) upon discharge from the BFHI hospital.

**Quality assessment of the included studies:** The methodological design of the study by Gokcay was largely based on the WHO/UNICEF reassessment process of the BFHI (1992). This approach is considered a rigorous research mechanism to study the BFHI, as multiple means were used to access the required data, and the tools were derived mainly from standardised tools (WHO/UNICEF, 1992) to reassess the BFHI programme. In terms of sample selection, the numbers are based on the instructions of WHO and UNICEF, and those selected were the most appropriate to provide access to this type of data. This is due to the fact they worked in the clinical departments covered by the BFHI, or were non-clinical staff who held responsibility for the administration of BFHI.

The study by Edward has been described as action research, and used a five stage cycle approach by convening a steering group to study the Ten Steps to Successful Breastfeeding. This problem solving approach is considered a novel approach, as it has not previously been used to study the BFHI programme. The selection method of participants for this study is clear, and they are the most appropriate to provide access to this type of knowledge. The methodology of data collection does not justify why the steering group was chosen and how it was conducted in terms of language, duration, number of participants per group, method of documentation; all of which were not mentioned.

The study by Sallam evaluated knowledge, attitudes and practices regarding the initiation of breastfeeding within the first hour of life. It was conducted through surveys via questionnaire. Systematic random sampling was used, the selection of samples in this study is satisfactory and most appropriate to provide access to this type of knowledge, but is not based on a specific BFHI document. Therefore, we can say that the selection of samples involves unjustified mixing of different groups (i.e. physician and mothers). This is reinforced by the fact that the status of the questionnaire used is unknown, i.e. whether it is a standardised, reliable and valid tool, which may compromise the reliability and validity of the data obtained. The study did not mention any changes to its design or whether they occurred or not.

The study by Al Ghazal was a campaign developed to examine developing breastfeeding culture in 11 healthcare facilities, with a focus on BFHI programme by providing professional support and facilitation for the BFHI accreditation process. It was conducted through multisectorial and multidirectional campaigning, using an educational program. The campaign focused on breastfeeding education through capacity building in both healthcare workers and professional support to facilitate BFHI accreditation. It included the development of educational content and resources; organising and conducting seminars in healthcare facilities and community settings; and increasing community awareness through social media.

The study by Mosher examined staff opinions in the context of the BFHI programme. A prospective cohort study survey method was utilised, conducted between December 2013 and September 2015. The sample was drawn from two healthcare facilities (BFH and non-BFH), 9 hospital staff from the accredited BFH including administrative and maternity staff, and an unknown number from non-BFH. Also, 277 women who attended the study site were also recruited. This was the first study about the BFHI programme in the researchers’ country. The study recruited hospital staff from different levels (clinical and non-clinical). This has potential to provide comprehensive views from all those involved in the implementation of the BFHI programme. The participants were followed up on for six months by trained researchers.

**Discussion**

When a BFHI hospital is evaluated, it is important to obtain a review of relevant data according to WHO/UNICEF. This includes breastfeeding rates for the hospital and/or city; hospital breastfeeding policy; training records; training curriculum followed; BFHI implementation documents; annual hospital birth rates; and numbers of hospital beds. Whether required within the research objectives or obtained through achieving another objective, this may be useful for other facilities seeking to implement the initiative, and to improve the expected outcomes of its implementation. The studies
from Middle Eastern countries included in this review did not consider this advice as relevant to the BFHI.

The lack of theoretical underpinning to support research development and progress is evident in the studies included in this review. Also, there is a lack of adherence with BFHI standards. Additionally, staff knowledge, attitudes and practices regarding the BFHI programme were available, and affected by organisational factors. A new approach in the research field indicates that the best method to evaluate any programme is the mixed method as it measures rates and perceptions.  

**Concluding Remarks**

Two main gaps have been identified through the literature review. First, there is a dearth of studies which apply Organisation Readiness for Change (ORC) theory to assess clinical and non-clinical staffing levels required to deliver the BFHI programme. Second, few researchers have sought to understand how the organisational cultures of individual hospitals influence compliance with the Ten Steps to Successful Breastfeeding and the Code.

**Conflict of Interest:** Nil

**Source of Funding:** This study was funded by the official representative of the Iraqi Ministry of Higher Education and Scientific Research (MOHESR) in the UK and Ireland.

**Ethical Clearance:** Ethical approval and permission to access participants was obtained from the School of Nursing and Midwifery Research Ethics Committee, Queen’s University Belfast and the Ministry of Health in Iraq.

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Antenatal Care Quality Analysis Using the European Foundation Quality for Management Method in the Hospitals in Surabaya

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Abstract

The Maternal Mortality Rate (MMR) in East Java is among 10 regions with the highest rates in Indonesia. Some medical factors constituting the determinant proxies which contribute to the maternal death include pre-eclampsia and eclampsia (36.07%) and bleeding (21.81%), heart disease (12.93%), infection (6.07%) and other causes (22.90%). The purpose of this research is to analyse the quality of antenatal care by using the European Foundation Quality for Management (EFQM) at Hospitals in Surabaya.

This research is an observational descriptive research with a cross-sectional study design. The population on this research comprises of 60 hospital staff who provide antenatal care service, including medical staff and administrative staff, who are chosen through a purposive sampling. The research is conducted between September 2017 and February 2018 at the obstetrics and gynaecology polyclinic at Airlangga University Hospital, Jemursari Islamic Hospital and Haji General Hospital.

The research result shows that the antenatal care service provided at Airlangga University Hospital is categorized as pretty good with a score of 58%, comprised within the phase of development III which covers an orientation to the system with service development innovation for patient. The antenatal care service provided at Jemursari Islamic Hospital is categorized as good, comprised within the phase of development IV with a score of 61%, focusing on the chain of internal and external organization (customers) which become the main highlight in the service development. Meanwhile, the antenatal care service provided by Haji General Hospital falls into the phase of development II which focus on the process of service provided with a score of 39%, thus categorized as poor.

As a conclusion, the analysis result on the quality of antenatal care using the approach of EFQM method at the hospitals in Surabaya is included in the category of pretty good, where the EFQM score of Airlangga University Hospital is considered as pretty good with the score of 580, the antenatal care at Jemursari Islamic Hospital is considered as good with the score of 616 and the antenatal care at Haji General Hospital is considered as poor with the score of 392. The quality of antenatal care in private hospitals is superior than the antenatal care in public hospitals.

Keywords: MMR, European Foundation Quality for Management, Antenatal Care.

Introduction

Maternal Mortality Rate (MMR) is a growing problem and consists of an important issue in the medical world. The MDGs target for MMR in 2015, which is 102 per 100,000 live births, was not accomplished so that its continuation is necessary in the Sustainable Development Goals (SDGs). Maternal and child health is still a priority program and an achievement target for the Sustainable Development Goals (1).
The depiction of maternal and child health in Indonesia is not satisfying yet. East Java is one of the provinces included in the 10 regions with the highest maternal and infant mortality rate in Indonesia. Despite the fact that the MMR in East Java tends to decrease from a general perspective, but the MMR is still considered as high in absolute terms. In 2014, the MMR in East Java has attained 93.52 per 100,000 live births. This number has reached the MDGs’ target of < 102 per 100,000 live births. However, in terms of the national target, that number is still problematic because it is still far from the target determined by the National Strategic Plan which is 80 per 100,000 live births. The high prevalence of MMR is caused by several factors which can be clustered as proxy determinant, intermediate and contextual (2). The medical factors that belong to the proxy determinant and that contribute to the maternal mortality are pre-eclampsia and eclampsia (36.07%) and bleeding (21.81%), heart disease (12.93%), infection (6.07%) and other factors (22.90%) (3).

The low number of the utilization of maternal health service during the pregnancy also contributes to the maternal morbidity and mortality. Yet, there is an increase in the coverage of access for pregnant mothers who receive antenatal care (ANC) from the health workers. In 2014, the prevalence of ANC has attained 81.6% during the first trimester or K1 whilst the frequency of ANC with the 1-1-2 pattern or K4 has attained 70.4 or 70.4%. One of the Method to reduce the MMR and to improve the maternal care is by increasing the quality of ANC service, especially at the hospitals (4).

ANC service in the hospitals should be improved in a comprehensive, integrated and qualified manner so that every problem which may occur during pregnancy and which potentially trigger a complication leading to the maternal death can be detected and prevented. Thus, one of the causative factors of maternal death may be handled because of a quality ANC service in the hospitals. The European Foundation for Quality Management (EFQM) is a tool to assess the service performance of an organization. The EFQM Model in the health service may be used as a self-assessment instrument at all level of health care, including the antenatal care service in the Type B Hospitals as an advanced referral health facility (5). The general purpose of this study is to determine the quality of ANC provided in the Type B Hospitals in Surabaya by using the European Foundation Quality for Management (EFQM) Model.

Method

The approach used in this study is the observational descriptive approach with a cross-sectional design. The locations in this study are Airlangga University Hospital, Haji General Hospital and Jemursari Islamic Hospital. The study period is 6 months, starting from the creation of research proposal in September 2017 up until February 2018. The unit analysis in this study is the hospital, and the populations consist of the staff in 3 (three) Type B hospital in Surabaya which are Airlangga University Hospital, Haji General Hospital and Jemursari Islamic Hospital. The populations include either the medical staff or the non-medical staff related to the ANC service in the Obstetrics and Gynaecology Polyclinic. The total population of this study is 60 people. This study chooses the hospital staff as the research object because they are directly involved in the provision of ANC service for patient. The Obstetrics and Gynaecology Polyclinic is also one of the polyclinics who engage in the implementation of the individual ANC service. A purposive sampling is used as a sampling technique in this study.

Result

Based on the calculation result of each sub process of the service, it can be continued by calculating the process as indicated in the Table 1. This calculation is performed based on the quality management theory of the European Foundation Quality for Management (EFQM). The total process calculation of ANC in Airlangga University Hospital, Jemursari Islamic Hospitals and Haji General Hospital is shown in the Table 1 below.

Table 1. Calculation Result of the Service Process in Airlangga University Hospital

<table>
<thead>
<tr>
<th>No.</th>
<th>Sub Process</th>
<th>Sub Process Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1a</td>
<td>Systematic planning and management</td>
<td>2,85</td>
</tr>
<tr>
<td>1b</td>
<td>Appropriate implementation through the use of innovation</td>
<td>3,20</td>
</tr>
<tr>
<td>1c</td>
<td>Development based on the patient’s needs and expectation</td>
<td>2,55</td>
</tr>
<tr>
<td>1d</td>
<td>Service is produced and provided for the patient</td>
<td>2,60</td>
</tr>
<tr>
<td>1e</td>
<td>Build and maintain good relationship with patient</td>
<td>3,30</td>
</tr>
<tr>
<td></td>
<td>Process Score</td>
<td>2,90</td>
</tr>
<tr>
<td></td>
<td>% Process Achievement</td>
<td>58,00</td>
</tr>
<tr>
<td></td>
<td>Process Criteria</td>
<td>580,00</td>
</tr>
</tbody>
</table>
It can be concluded that the majority of ANC process management in the hospital in Surabaya is in the phase III or level III based on the EFQM criteria, which means that there is an orientation to the system with the process achievement percentage of 58% or ranged between > 40% - 60%. Thus, the general ANC service at the hospital as well as its supporting functions are already managed in accordance with the existing system. So, the highlight in its management still focuses in the external customers. The sub process assessment result indicates a high score for 1b and 1d, which means that the service process has been done appropriately by using a continuous innovation to fulfil the needs of patients and stakeholders. The radar diagram of ANC in Airlangga University Hospital is as follows:

![Figure 1. Airlangga University Hospital ANC Radar](image)

Based on the Table 2 above, it can be concluded that the majority of ANC process management in the hospital in Surabaya is in the phase IV or level IV based on the EFQM criteria, which means that there is an orientation to the chain with the process achievement percentage of 61.60% or ranged between > 60% - 80%. Thus, the general ANC service in Jemursari Islamic Hospital focuses on the ANC process management and the patient assessment. This orientation considers that the internal factor of an organization is something which should be pointed out. The orientation to the chain has already positioned the stakeholders as the strategy partner of an organization to fulfil the ever-changing needs of the customer.

![Figure 2. Jemursari Islamic Hospital ANC Radar](image)

Based on the Figure 2, it is shown that the ANC radar of Jemursari Islamic Hospital focuses on the process management 1b and 1d where the service process is carried out appropriately by using a continuous innovation to fulfil the needs of patients and stakeholders. The ANC in Airlangga University Hospital is considered as pretty good with EFQM score of 580.

### Table 2. Calculation Result of the Service Process in Jemursari Islamic Hospital

<table>
<thead>
<tr>
<th>No.</th>
<th>Sub Process</th>
<th>Sub Process Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1a</td>
<td>Systematic planning and management</td>
<td>2,90</td>
</tr>
<tr>
<td>1b</td>
<td>Appropriate implementation through the use of innovation</td>
<td>3,25</td>
</tr>
<tr>
<td>1c</td>
<td>Development based on the patient’s needs and expectation</td>
<td>2,90</td>
</tr>
<tr>
<td>1d</td>
<td>Service is produced and provided for the patient</td>
<td>3,30</td>
</tr>
<tr>
<td>1e</td>
<td>Build and maintain good relationship with patient</td>
<td>3,05</td>
</tr>
<tr>
<td></td>
<td>Process Score</td>
<td>3,08</td>
</tr>
<tr>
<td></td>
<td>% Process Achievement</td>
<td>61,60</td>
</tr>
<tr>
<td></td>
<td>Process Criteria</td>
<td>616,00</td>
</tr>
</tbody>
</table>

### Table 3. Calculation Result of the Service Process in Haji General Hospital

<table>
<thead>
<tr>
<th>No.</th>
<th>Sub Process</th>
<th>Sub Process Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1a</td>
<td>Systematic planning and management</td>
<td>1,30</td>
</tr>
<tr>
<td>1b</td>
<td>Appropriate implementation through the use of innovation</td>
<td>1,95</td>
</tr>
<tr>
<td>1c</td>
<td>Development based on the patient’s needs and expectation</td>
<td>2,35</td>
</tr>
<tr>
<td>1d</td>
<td>Service is produced and provided for the patient</td>
<td>2,25</td>
</tr>
<tr>
<td>1e</td>
<td>Build and maintain good relationship with patient</td>
<td>1,95</td>
</tr>
<tr>
<td></td>
<td>Process Score</td>
<td>1,96</td>
</tr>
<tr>
<td></td>
<td>% Process Achievement</td>
<td>39,20</td>
</tr>
<tr>
<td></td>
<td>Process Criteria</td>
<td>392,00</td>
</tr>
</tbody>
</table>
Based on the Table 3 above, it can be concluded that the majority of ANC process management in the hospital in Surabaya is in the phase II or level II based on the EFQM criteria, which means that there is an orientation to the chain with the process achievement percentage of 39.20% or ranged between > 20% - 40%. Thus, the general ANC service in Haji General Hospital focuses on the process of providing health care to the patient as well as its improvement.

![Figure 3. Haji General Hospital ANC Radar](image)

Based on the Figure 3, it is shown that the ANC radar of Haji General Hospital focuses on the process management 1c and 1d where the service is planned and developed based on the patient’s needs and expectation as well as the service provided for patient. The ANC in Haji General Hospital is considered as poor with EFQM score of 392.

**Findings**

**Antenatal Care Process is Planned and Developed Based on the Patient’s Needs and Expectation:** The purpose of patient’s needs and expectation assessment is to observe the gap wideness between them. The inexistence of gap between the needs and the expectation results in an optimal satisfaction of patient. Each hospital is required to always maintain the trust from all patients by improving the service in order to increase the patient satisfaction. Thus, the hospital needs to be scrupulous in determining the patient’s needs as a way to fulfil their expectation and increase the satisfaction on the service that has been given. The reason for this is because in principle patient satisfaction is a long-term strategy which requires a commitment for the sustainability of a hospital in carrying out its duties (6).

The research result shows that the calculation of service which is designed and developed based on the needs and expectation of patient has achieved the number of 51% (Airlangga University Hospital), 58% (Jemursari Islamic Hospital) and 47% (Haji General Hospital). This indicates that in the implementation of sub process of ANC Airlangga University Hospital, Jemursari Islamic Hospital and Haji General Hospital are all in the phase of development III which is system-oriented. The tendency to this orientation is located in the external customers where they play a role of a main point of the hospital service process control. It is based on the perception that people’s satisfaction and option is a priority for hospital (7).

**Relation Improvement and Management with Antenatal Care Patient in the Hospital in Surabaya:** The hospital is not only required to be as a systematic and complex medical health care provider but also as a health care provider which maintains a good relationship with the patient and the community. Based on the study result on the ANC patient relationship sub process, the achievement point for Airlangga University Hospital is 66%, 61% for Jemursari Islamic Hospital and 39% for Haji General Hospital. This result indicates that the patient relationship sub process in Airlangga University Hospital and Jemursari Islamic Hospital is included in the chain-oriented phase of development IV. Meanwhile, Haji General Hospital is process-oriented. In each hospital, the relation between health workers and patients should be built to maintain a communication related to the medical service. This may influence the ANC service quality process provided by the health workers in Type B hospitals in Surabaya either mentally or socially.

**European Foundation Quality for Management Score for Antenatal Care in the Hospital in Surabaya:** Based on the study result, the service process calculation shows that the ANC process in Airlangga University Hospital is oriented to the system with a total score of 58% and categorized as quite good according to TQM. The ANC provided in Jemursari Islamic Hospital gains an EFQM score of 61.60% (phase IV) and is categorized as good quality. Meanwhile, the EFQM score of Haji General Hospital is 39.20%, categorized under the process-oriented group and still considered as poor quality. This is supported by the achievement of score majority from the service process to the service sub process according to the total quality management which is comprised within the phase of development IV and is chain-oriented.

Based on the illustration of the position of management in each sub criteria shown in the radar chart,
it can be observed that the total quality management score of Airlangga University Hospital and Jemursari Islamic Hospital in the service suitability in using the innovation to fulfill the needs of patients and stakeholders almost reaches the target, whilst Haji General Hospital mainly focuses on the service produced and provided for patients. It is different from the planned and developed service based on the patient’s need and expectation which attains the lowest position in terms of the total quality management target.

**Conclusion**

The result of antenatal care assessment with EFQM method in the hospitals in Surabaya indicates that the overall antenatal care quality in Airlangga University Hospital is considered as quite good with a score of 580, the ANC in Jemursari Islamic Hospital is considered as good with a score of 616 and ANC in Haji General Hospital is considered as poor with a score of 392. This means that the antenatal care quality in the private hospitals are superior than the antenatal care quality in the public hospitals. It is important for the hospitals to improve the antenatal care quality to be total quality management oriented by performing a periodic service result evaluation weekly at the Obstetrics and Gynaecology Polyclinic and a periodic training and test about ANC service for all staff. The purpose of this training is to upgrade the staff’s knowledge regarding the service in accordance with the current development so that it can be applied when they provide the related service. The test can be carried out as an indicator of achievement from the training.

**Conflict of Interest:** Authors declare that the information above is correct and the manuscript submitted by us is original. We have no conflict of interest to declare and certify that no funding has been received for the conduct of this study and preparation of this manuscript.

**Source of Funding:** This research is self-supporting

**Ethical Clearance:** We would like to thank the Ethics Committee for basic science research/clinics at Airlangga University Hospital the ethical approval granted for this study. Our gratitude also goes to all the participants involved in this study for their commitment.

**References**

1. Hoelman et al.. SDGs guide for local governments and regional stakeholders. Jakarta: infd. 2015
Antibacterial Activity of Zinc Oxide Nanoparticles Against Acinetobacterbaumannii

Firas Nabih Jaafar1, Mustafa Shakir Hashim2, Huda Zuheir Majeed1, Laith Baseim Ali3, Reem Saadi Khaleel3, Nadia Kamil Bashar1, Anaam Hameed Batah1


Abstract

Thirty Acinetobacter baumannii were isolated and identified from different sources. The antibiotic sensitivity test for these bacteria was done against ten antibiotics, showing different high levels of resistance. ZnO particles with the sizes (20 to 520) nm were prepared chemically and used as antibacterial for the most resistible bacterial isolates against ten antibiotics. It was found that the most effective size was 20 nm with the highest inhibition zones.

Keywords: A. baumannii, nano Zinc Oxide and Antibacterial activity.

Introduction

Acinetobacter baumannii (A. baumannii) is anaerobic, immotile, gram negative bacillus and pleomorphic. It has been isolated from skin, respiratory system and its secretions of infected patients [1,2].

It was found that this bacteria had the ability to change its genetic structure from avirulent to virulent by gaining genes encoded of virulence from Pseudomonas, Salmonella and Escherichia, especially in environments filled of patients treated with broad spectrum antibiotics such as intensive care units of hospitals[3]. As bacterial isolate, A. baumannii is considered as the most causing problems to health care workers due multiple antibiotic resistance.

Spread of multiple antibiotic resistant bacteria is due to random use of antibiotics besides acquiring resistance genes from habitat [4]. This problem was overcome by the using of nanoparticles which showed high antimicrobial activity against resistant bacteria with less toxicity.

Nano technology is playing a great role in the field of antibacterial materials. In this important field, Zinc oxide nanoparticles (ZnO NP) are considered to be one of the most active nanoparticles. It was synthesized simply, eco-friendly and had good antimicrobial activity[5].

This study aimed to identify the most resistible A. baumannii isolates against ten antibiotics, then using ZnO NPs as antibacterial against these isolates.

Materials and Method

Samples preparation: 30 isolates of A.baumannii were isolated from different sources (e.g. wound, burn, urine,blood and sputum), bacterial isolates were isolated and identified according to[6], then by VITEK 2 System (Version 5.01 BioMerieux).

Suspension of each of the 30 A. baumnii was isolated (0.5 concentration of McFarland Standard). It was prepared by inoculating culture of the stock to separate tubes containing 3 ml of Mueller Hinton Broth (Difco, USA), then incubated at 37°C/24 h.

Antibiotic sensitivity test: The sensitivity of isolates to antibiotics was done by Kirby-Bauer disc diffusion method using the following antibiotic discs: Tobramycin, Gentamicin, Ciprofloxacin, Chloramphenicol, Cephalotaxidime, Cloxacillin, Piperacillin, Amoxicillin, Amikacin and Imipenem. Isolates were recorded either as sensitive (S) or resistant (R) depending on [7].

Synthesis of ZnO NPs: ZnO NPs were prepared by adding different weights of Zinc acetate dehydrate

Zn(CH3COO)2.2H2Oto isopropanol alcohol(100 ml). Then few drops of mono ethanol amine (MEA) was added to get aclear and homogeneous solution

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The solution was agitated for one day. Six solutions were prepared and coded as it was listed in Table (1). ZnO NPs size was measured by using “Brookhaven instrument” and 90Plus particle sizing software Ver. 5.34.

To test the structure of the prepared ZnO, it was deposited on glass substrate by spin coating machine. Agitated solution (100μl) was added on the surface of substrate when it was rotating with 2000 rpm speed. After coating, the sample was annealed at 400°C for 1 hour. Orientations of ZnO were measured by Shimadzu X-ray diffractometer.

Table (1) Zinc oxide solution codes

<table>
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<tr>
<th>Solution Codes</th>
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</table>

Antimicrobial Activity: The bacterial suspension (24 h age) for each isolates of A. baumannii was prepared formally. Then 100μl of each bacterial suspension was put on Mueller-Hinton agar plates then spread by swabs and were left to dry. Wells were made in agar by cork. 50 μl of each (1 to 6) of ZnO NPs were put in each well. Then plates were incubated at (37°C/24 h). Inhibition zones diameters were recorded.

Statistical Analysis: The Statistical Analysis System- SAS program 20 was used to evaluate the differences in the parameters of this study. Chi-square test was used to significance comparison between percentage and LSD) Least significant difference test was calculated to find significance between Means in the study.

Results

The evaluation of bacterial resistance against ten antibiotics: Identification of bacterial isolates were done by the colony morphology and stained smear was examined microscopically to check shape, structure, arrangement and gramstain reaction of bacterial isolates. Biochemical tests were done and confirmation was done by using VITEK 2 System.

The bacterial isolates showed different levels of resistance against the used antibiotics as shown in Table (2).

From statistical view, there were significant difference between the used antibiotics in this study at level(P<0.05). So some of these antibiotics were effective for therapy but on the other hand, it was not for others like Chloramphenicol and Cloxacillin (there resistance percentages were so high about 93.33 and 100% respectively). This means that those antibiotics were not good enough to treat these bacterial infections.

Cephatazidime was the most effective antibiotic because its resistance percentage was 46.66%, while it was (53.33)% for both Ciprofloxacin and Tobramycin and it was (56.66)% for Gentamycin.

These antibiotic resistance variations were a result for random use of antibiotics for long period without use of traditional ways such as culture and antibiotic sensitivity test.

Maraki et al. reported that the resistance to Imipenem and Amikacin were 82.67% and 83.67% respectively, this result was so close to our results. Boroumand et al. showed that Tobramycin resistance was 55.2%, this is in agreement with current results. Another scientific group informed that for Cephatazidime, the resistance was 44.5%, which is so closely to our results.
Table (2) The Antibiotic sensitivity test results of the 30 isolates for *A. baumannii*

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<tr>
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<th>Tobramycin</th>
<th>Gentamicin</th>
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<th>Cephalazidime</th>
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* = Significant at (P<0.05), NS = Non-Significant.
In addition to its natural resistance, *A. baumannii* is developing resistance under antibiotic pressure. They had gene over express of different efflux pumps, Beta-Lactamase 210 different types, many Oxacillinase enzymes (e.g. OXA-21-like, OXA-23-like and OXA-51-like), and lower permeability of outer membrane[15].

**The estimation of ZnO characterization:** Fig. 1. shows the indexed XRD pattern of ZnO film. This pattern refers to polycrystalline of the film. Diffraction peaks were connected to the ZnO wurtzite structure (JCPDS Card, No. 36-1451).

![Figure 1 XRD of Zn oxide film on glass substrate](image)

**Figure 1** XRD of Zn oxide film on glass substrate

Fig. 2. shows that the solution 1 and 6 contain ZnO NPs with different diameters, most of particles inside solution 6 had diameter equal to 20 nm. On the other hand most particles in solution 1 had diameter 520 nm.

![Figure 2 Particle size distributions of: A(solution 1) and B (solution 6)](image)

**Figure (2) Particle size distributions of:**
*A*(solution 1) and B (solution 6)

The antimicrobial activities of the six different Zinc oxide solutions were shown in Figure (3) and Table (3).

![Figure 3 The antimicrobial activity of the 6 Zinc oxidesolutions against A. baumannii](image)

**Fig. 3 The antimicrobial activity of the 6 Zinc oxidesolutions against A. baumannii**

<table>
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<th>Bacterial isolate No.</th>
<th>Solution codes</th>
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<td>15</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>16</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>17</td>
<td>2.5</td>
<td>1.8</td>
</tr>
<tr>
<td>18</td>
<td>0.6</td>
<td>0.7</td>
</tr>
</tbody>
</table>
### Discussion

By reading the data in table 3 it is clear that there were high toxicity of ZnO NPs against *A. baumannii*. A maximum inhibition zone (3.3 mm) was recorded for isolate No. 6 (solution code 4). There were significant difference at level (P<0.05) for all isolates except four isolates (15, 16, 21, and 27).

The activity of ZnO can be explained by the disruption effects of ZnO NPs on the microbial cells[16]. Li et al. confirmed that the bactericidal activity differs according their size, stability and concentration in culture[17].

ZnO NPs is mentioned as “generally recognized as safe” (GRAS) by the U.S. Food and Drug Administration. More smaller size of ZnO NPs had more anti bacterial activity due to high ratio of surface to volume, So it can be used as bacteriocidal and bacterio-inhibitor especially for nosocomial infections[18].

The ZnO NPs were toxic for both gram-negative and Gram-positive bacteria (e.g. *Escherichia coli* and *Staphylococcus aureus*, etc...) and its therapeutic characters are depending on its size. Also, mixed bacterial combinations could be killed by these nanoparticles. Bacteriocidal effects of ZnO NPs was attributed to their nano-sizes and large surfacetovolume ratio. This makes interaction with cell membranes of microbes directly, in addition to metal ions exit from cell in solution[19].

### Findings

ZnO NP represent an effective therapy for this bacteria especially for multiple resistant isolates and their effectiveness is size- depended.

### Conclusions

Current used antibiotics have different effects on *A. baumannii* and ZnO NP are good choice for killing this bacteria.

### Conflict of Interest:

The authors declare that there is no conflict of interest.

### Source of Funding:

Self funding’s of authors was used.

### Ethical Clearance:

This study was placed and has been approved as there is no objection to hold this study work.

### References


Effect of Selected Breathing Retraining Exercises on Symptoms and Quality of Life among Asthmatic Children

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Abstract

Diaphragmatic and pursed lip breathing are nonpharmacological approaches that designed to improve ventilatory efficiency, respiratory muscle function, and exercise tolerance, in turn improve asthma symptoms and quality of life among children. The aim of the current study was to evaluate the effect of selected breathing retraining exercises on asthma symptoms control and quality of life among children. Time series quasi-experimental research design was utilized. A convenient sample of 30 children with bronchial asthma was recruited. The study findings revealed that the highest total mean score of asthma control were detected before breathing retraining exercise which decreased significantly in immediate after the intervention and it began to rise slightly again one month after. There were a highly statistically significant improvement in the total mean score of pediatric asthma quality of life across immediate and one month after. The study concluded that selected breathing retraining exercises improving an asthma symptom control and quality of life among children. It is recommended that breathing retraining exercise can be used and integrated with the routine care for children with asthma with emphasize to be performed at home.

Keywords: Breathing retraining exercise, asthma symptoms control, quality of Life, children with asthma.

Introduction

Breathing retraining exercise is an essential component in physical therapy programs designed for patients with asthma to correct their symptoms and improve their QoL. Diaphragmatic breathing (DB) is a technique in which the diaphragm is used to expand the lungs that result in decrease the respiratory rate, decrease oxygen demand, and use less effort and energy to breathe1. Pursed lip breathing (PLB) is the breathing technique that consists of exhaling through tightly pressed lips and inhaling through nose with mouth closed. It decreases air trapping in the lungs, decreases the work of breathing, improves breathing patterns, and keeps the airways open longer2.

Controlling of asthma symptoms considered the main stone in management of asthma in children. The most common asthma symptoms are coughing, particularly at night, in the early morning and with exercise, breathlessness, chest tightness and wheezing. When asthma symptoms get worse, it is known as an asthma attack3.

Recurrent asthma symptoms will affect children quality of life as they develop sleeplessness, daytime fatigue, reduced activity levels and school absenteeism that result in reduced activity levels and restrictions in participation in peers activities. Also the disease management and routines often requiring compliance with health regimes and placing extensive behavior demands on children, which could potentially impact on QOL4.

The new millennium has shown that asthma is still among the most frequent inflammatory chronic diseases in childhood that causes greatest disability and frequent hospitalization among children. Repeated, unpredictable episodes of breathlessness and distressing chest symptoms are a fact of life for children with asthma. Unfortunately, children continue to die or experience life-threatening attacks5.

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Hypotheses:

1. Children with bronchial asthma who will receive selected breathing retraining exercises, their symptoms will differ after practicing exercise than before.

2. Children with bronchial asthma who will receive selected breathing retraining exercises their quality of life will differ after practicing exercise.

Material and Method

Participants: A convenient sample of 30 school age children with bronchial asthma.

Setting: The study conducted in chest outpatient clinic at Cairo University Specialized Pediatric Hospital, Cairo, Egypt.

Data Collection Tools:

1. A structured interview sheet: It included child and parents’ personal data as child age, gender, rank, parents’ age, level of education, occupation and child disease history and family history of asthma, fathers’ smoking and the main asthma trigger affecting the child.

2. Observational checklists: It is adapted from about steps of breathing retraining exercise and included two checklists as the following:

   I. Checklist of diaphragmatic breathing: includes six steps, done step scored one and not done scored 0 and the total score was six

   II. Checklist of PLB: involved five steps, done step scored one and not done scored 0 and the total score was five

3. Asthma Control Questionnaire (ACQ): This scale was developed by and includes items that divided to constructs as symptoms (5 items) rescue bronchodilator use (1 item) and forced expiratory volume 1 (FEV1%) (1 item). The responses started from none of the time that scored as zero and considered completely controlled to all the time that scored as 6 and considered poorly controlled, sum points of all questions ranged between 0-42 and divide this sum by 7, score of 0.0-0.75 is classified as well-controlled asthma, score of 0.75 – 1.5 as partially controlled and score that >1.5 as poorly controlled asthma.

4. Pediatric Asthma Quality of Life Questionnaire (PAQLQ): it was developed by and consisted of 23 items that measure three domains of pediatric asthma quality of life including: emotional function (8 items), activity limitation (5 items) and symptom quality of life (10 items). Responses were scored on a 7 point likert scale from (all the time) to 7 (none of the time). Overall QoL score is calculated from the mean score of all the items. Summation of 1 in each item = 23 and indicate maximum impairment, and $7 \times 23 = 161$ that indicate better QoL.

Tool Validity and Reliability: The study tools (Observational checklists, ACQ and PAQLQ) were submitted to 3 experts in pediatric nursing and pediatrician to ensure the content validity. Coefficients’ alpha between questions was 0.7 for observational checklists and 0.9 for ACQ and PAQLQ.

Procedure: Written consent was obtained from caregivers and oral acceptance from the children after description of the aim and nature of the study. The researcher attended to outpatient chest clinic 2 days/week from 9 am to 12 pm. Through an individual interview with each child and caregiver, the researcher provided complete information about prevention of asthma triggers correct use of inhaler. The 4 study tools were administered by the researcher before intervention as the first assessment and one month after that. The second time assessment was administered using 3 tools (checklists, ACQ and PAQLQ). In the first session of intervention; the researcher started immediately to discuss and demonstrate of breathing retraining exercises for each child individually and guided the child to perform the exercise for the first 15-20 minutes, and the researcher start to correct the wrong steps and guide the child to repeat the exercise for other 15 minutes in a session by performing the exercise 5 times and take a period of rest for few minutes and so on until the end of 15 minutes. Also the caregivers were asked to encourage the child to apply DB and PLB for at least two times at home daily. The period of intervention was 6 weeks, two sessions per week were provided to each child. The total number of sessions was 12 sessions to each child. The evaluation were done twice; the first time carried out at the end of session twelve immediately and the second time one month after that. The results of the two times of assessment before the intervention were similar; therefore the data of two times were integrated as only one time before.
**Statistical analysis:** Data were coded and tabulated using SPSS, version 22. The data analyzed using appropriate descriptive and inferential statistical tests. Qualitative data were expressed as frequency and percentage. A comparison between variables carried out by using Chi square and paired-sample t-test. Correlation among variables was done by using Pearson correlation coefficient. A p-value less than 0.05 were considered statistically significant.

**Findings**

Table (1) demonstrated that 70% of children, their age less than 10 years old with the mean of 8.7 ± 2 years. Less than three quarters of children (73.3%) were males, and 60% ranked as the first child.

**Table (1): Percentage Distribution of Children’ Personal Characteristics (n=30).**

<table>
<thead>
<tr>
<th>Item</th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age/years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 10</td>
<td>21</td>
<td>70</td>
</tr>
<tr>
<td>≥ 10</td>
<td>9</td>
<td>30</td>
</tr>
<tr>
<td>X ± SD</td>
<td></td>
<td>8.7 ± 2 years</td>
</tr>
<tr>
<td>Gender:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>22</td>
<td>73.3</td>
</tr>
<tr>
<td>Female</td>
<td>8</td>
<td>26.7</td>
</tr>
<tr>
<td>Rank:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>18</td>
<td>60</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
<td>16.7</td>
</tr>
<tr>
<td>3+</td>
<td>7</td>
<td>23.3</td>
</tr>
<tr>
<td>X ± SD</td>
<td></td>
<td>1.76 ± 1.16</td>
</tr>
</tbody>
</table>

Table (2) Comparison between the Total Mean Scores of Asthma Symptoms, Medications, FEV1 and Total Asthma Control Before, Immediate and One Month After Breathing Retraining Exercise.

The total mean scores of asthma symptoms control were improved immediate (8 ± 4.40) and one month after (12 ± 4.5) than before (29 ± 5.6). There were a highly statistically significant improvement between the total mean score of asthma control between before and immediate and before and one month after.

**Asthma control**

<table>
<thead>
<tr>
<th></th>
<th>Before</th>
<th>Immediate After</th>
<th>One month After</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean ± SD</td>
<td>Mean ± SD</td>
<td>Mean ± SD</td>
</tr>
<tr>
<td>Asthma symptoms</td>
<td>4.56 ± 0.93</td>
<td>1.06 ± 0.69</td>
<td>1.7 ± 0.53</td>
</tr>
<tr>
<td>Short acting beta agonists</td>
<td>2.8 ± 0.66</td>
<td>1.1 ± 0.48</td>
<td>1.9 ± 0.67</td>
</tr>
<tr>
<td>Forced expiratory volume1</td>
<td>1.01 ± 0.43</td>
<td>1.4 ± 0.38</td>
<td>1.21 ± 0.37</td>
</tr>
<tr>
<td>Total asthma control</td>
<td>29 ± 5.6</td>
<td>8 ± 4.40</td>
<td>12 ± 4.5</td>
</tr>
</tbody>
</table>

*p < 0.05, **p < 0.01, ***p < 0.000, ◊ t = before & immediate after, ◊ t = before & one month after, ◊ t = immediate after & one month after
Table (3) Comparison between Levels of Asthma Control Before, Immediate and One Month After Breathing Retraining Exercise (n=30).

Table (3) showed that 80% of children had poorly controlled asthma before breathing retraining exercises compared to two thirds (66.7%), and three fifth (60%) had completely controlled asthma immediate and one month after respectively, and the difference was statistically significant.

<table>
<thead>
<tr>
<th>Items</th>
<th>Before</th>
<th>Immediate after</th>
<th>One month after</th>
<th>X²</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poorly controlled</td>
<td>24 80%</td>
<td>1 3.4%</td>
<td>4 13.3%</td>
<td>4.85</td>
<td>.02*</td>
</tr>
<tr>
<td>Partially controlled</td>
<td>4 13.4%</td>
<td>9 30%</td>
<td>8 26.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Completely controlled</td>
<td>2 6.7%</td>
<td>20 66.7%</td>
<td>18 60%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p < 0.05. **p < 0.01. ***p < 0.000

Table (4) Comparison between the Total Mean Scores of Pediatric Asthma Quality of Life Before, Immediate and One Month after Breathing Retraining Exercise (n=30).

It is evident from table (4) that all the mean scores of QOL components were improved immediate and one month after than before with highly statistically significant differences.

<table>
<thead>
<tr>
<th>Pediatric asthma quality of life</th>
<th>Before Mean ± SD</th>
<th>Immediate After Mean ± SD</th>
<th>One month After Mean ± SD</th>
<th>( \dot{t} )</th>
<th>( \ddot{t} )</th>
<th>( \bullet )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity QoL.</td>
<td>15 ± 2.8</td>
<td>30 ± 2.6</td>
<td>25 ± 2.9</td>
<td>-26.000***</td>
<td>-15.000***</td>
<td>24.4</td>
</tr>
<tr>
<td>Emotion QoL.</td>
<td>22.7 ± 6.3</td>
<td>48 ± 5.4</td>
<td>41.7 ± 5.4</td>
<td>-23.000***</td>
<td>-16.3.000***</td>
<td>35.6</td>
</tr>
<tr>
<td>Symptom QoL.</td>
<td>25.7 ± 7.7</td>
<td>49.7 ± 6.8</td>
<td>49.7 ± 6.8</td>
<td>-19.4.000***</td>
<td>-14.8.000***</td>
<td>19.7</td>
</tr>
<tr>
<td>Total QoL.</td>
<td>64 ± 15.6</td>
<td>137 ± 13</td>
<td>120 ± 13.4</td>
<td>-29.2.000***</td>
<td>-19.4.000***</td>
<td>11.9</td>
</tr>
</tbody>
</table>

*p < 0.05. **p < 0.01. ***p < 0.000
\( \dot{t} \) = before & immediate after, \( \ddot{t} \) = before & one month after, \( \bullet \) = immediate after & one month after

Table (5) Relation between The Total Score of Asthma Control and Pediatric Asthma Quality of Life, Before, Immediate Post And One Month After Breathing Retraining Exercise (n=30).

It is evident from table (5) that there were highly statistically significant negative correlations between total score of asthma control and total score of pediatric asthma quality of life before, immediate after and one month after.

<table>
<thead>
<tr>
<th>Total Score of Asthma Control</th>
<th>Before</th>
<th>Immediate after</th>
<th>One month after</th>
<th>( r )</th>
<th>( p )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before</td>
<td>r: -.812</td>
<td>p: 0.000***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Immediate after</td>
<td>r: -.473</td>
<td>p: 0.008**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One month after</td>
<td>r: -.428</td>
<td>p: 0.018**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before</td>
<td>r: -.448</td>
<td>p: 0.013**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Immediate after</td>
<td>r: -.611</td>
<td>p: 0.000***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One month after</td>
<td>r: -.428</td>
<td>p: 0.018**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before</td>
<td>r: -.531</td>
<td>p: 0.003***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Immediate after</td>
<td>r: -.698</td>
<td>p: 0.000***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One month after</td>
<td>r: -.711</td>
<td>p: 0.000***</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p < 0.05. **p < 0.01. ***p < 0.000
Discussion

The current study results revealed that more than two thirds of children their age less than 10 years and less than three quarters were males. These results supported by 9 who found that asthma was common in age less than 10 years and bronchial asthma was reported more common in boys than girls.

The finding of the current study showed that the total mean score of asthma symptoms control improved significantly immediately and one month after breathing retraining exercise compared with before. These findings goes in line with 10 and 11 who concluded that asthma symptoms control improved after performing breathing retraining exercises in children. From the researcher point of view, this improvement might be due to compliance of children on breathing retraining exercise for twelve sessions and also they did the exercise at home, in addition the caregivers tried to avoid exposure of children for asthma triggers as possible.

Two thirds of children and three fifth had completely controlled asthma immediate and one month after breathing retraining exercise respectively in comparison with the highest percentage of children had poorly controlled asthma before. This result goes in line with 12 who concluded that bronchial asthma is well controlled after breathing retraining exercise. From the researcher point of view that might be due to positive effect of the exercises on the respiratory rate that lead to improvement of ventilatory function and also avoiding asthma triggers as possible.

These results support the first study hypotheses which stated that children with bronchial asthma who will receive selected breathing retraining exercises, their symptoms will differ after practicing exercise than before.

It was found that the highest total mean score of quality of life was detected immediately and one month after compared to the lowest mean score before and these improvements were statistically significant. These results were consistent with 13 and 14 who reported that there were highly statistically significant improvements in total score of pediatric asthma QoL in children following breathing retraining exercise.

These results accept the second hypothesis of the study which stated that children with bronchial asthma who will receive selected breathing retraining exercises, their quality of life will differ after practicing exercise than before.

Conclusion

Breathing retraining exercises improve asthma symptoms control and all domains of quality of life among children with asthma.

The study recommended the following:

- Breathing retraining exercise can be used and integrated with the routine care for children with asthma with emphasize to be performed at home to improve asthma symptoms and quality of life.
- Educational pamphlets or booklets about the technique of breathing retraining exercises should be provided for children and caregivers in outpatient clinic.

Ethical clearance: A written approval was obtained from the ethics and research committee of the Faculty of Nursing - Cairo University. Written informed consent was obtained from the caregivers and oral acceptance from children was confirmed after explaining the purpose, nature and benefits of the study. Children were informed that participation in the study was voluntary; anonymity and confidentiality of the data were assured. Consent was taken from the main author of the current study tools (ACQ and PAQLQ).

Conflict of interest: The authors declare that there is no conflict of interest.

Source of funding: The fund was partially covered by the Faculty of Nursing

References


Gold Mining and its Impact on Agricultural Land, Public Health, Violation of the Law: A Study on Poboya Traditional Mining, Palu, Indonesia

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Abstract

The purpose of the present study was analyzing public health, social economy and law enforcement efforts of the community around Poboya gold mine area. The research method was quantitative survey on the community around Poboya gold mine area, Palu. The sample was 125 people. The research variables were public health status, social economy, and law enforcement effort. The data analysis was descriptive analysis on each variable. The research result was the common health issues among the respondents in the past month were skin diseases (75.2%), ARI (65.60%), hypertension (42.40%) and cramping on legs/arms (35.20%). The public health status was mostly normal (IMT 18.5-25.0) (48.00%) and underweight (IMT < 18.5) (42.40%). The occupations were gold miners (52.00%) and farmers (38.40%). The respondents’ income was low, although most of the respondents were miners. The common types of crime around the gold mine area based on people’s reports were harassment (72.0%), fraud (68.0%), and prostitution (60.0%). The conclusion is gold mine location near human settlements causes health issues related to mining activities, such as mercury exposure and change of occupation and land conversion, as well as high crime rate in the mining area which raises concerns among the community around the mine area.

Keywords: Public health status, income, criminality.

Introduction

Traditional mining activities in Poboya, Palu have been happening since 2008. These activities have a positive impact, i.e. opening employment, but also negative impacts in the form of reduced environmental quality and potential of damaging conservation area, Raya Forest Park. The gold mine activities use mercury and potentially contaminate 400 thousand people living in Palu. A study by the Department of Health of Palu in 2014 showed that 7 of 10 samples of Clean Water Quality Standard wells in Palu had mercury content of 0.005 ppm.

Generally, traditional gold mines use mercury in mining activities to absorb gold from rocks. Mercury usage could impact public health, environmental degradation, which in the long term may reduce land productivity. A previous study in Poboya found agricultural land conversion into gold mine area with very high level of mercury pollution.

Economically mining activities give revenue to the state and local government. However, mining activities also have massive and significant environmental and social impacts. The research result shows that the land/soil damage level in the gold mine location is severe and causes physical environmental impacts, such as soil degradation, loss of nutrients for plant growth, reduced surface water discharge, high traffic causing road damage and air pollution.

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Gold mine is an opportunity for farmers to get better quality of life because for most people farming only provides food while gold mining yields income. Agricultural production lowered in 2009 in Bombana mine. Beside due to draught caused by long dry season, it also happened because some farmers left their agricultural lands to be gold miners despite their lack of experience, in order to get instant revenue. Unlike agricultural activities which require a long time to reap the result, the income from mining can be obtained in a day.

Potential crimes in the community around the mine area are caused by a stipulation in Article 162 of Mineral and Coal Law, which regulates punishment for every person hindering or disturbing mining business only with reference to Article 136 on settlement of land rights. Environmental conservation. Many miners don’t pay attention to good mining techniques in terms of conservation of reserve, occupational health and safety, and environmental management.

The purpose of the present study was analyzing public health, social economy and law enforcement efforts of the community around Poboya gold mine area.

Method

The research method was quantitative survey on the community around Poboya gold mine area, Paluin 2019. The research sample was people living in Poboya Urban Village, Palu. The research sample was 125 people.

The research variables were public health status, social economy, and law enforcement effort. Public health status was measured by questionnaire to determine health issues in the past month related to mercury exposure, and assessment of the respondents’ nutritional status anthropometrically by body mass index. The social economic data of the society included occupation and income. The law enforcement effort was analysis of legal issues faced by the society related to the activities and presence of the gold mine. The data analysis was descriptive analysis on each variable using SPSS software.

Result

Table 1: Health Issues of Community around Poboya Gold Mine Area

<table>
<thead>
<tr>
<th>Health Issue</th>
<th>Yes</th>
<th>%</th>
<th>No</th>
<th>%</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tremor</td>
<td>16</td>
<td>12.80</td>
<td>109</td>
<td>87.20</td>
<td>125</td>
</tr>
<tr>
<td>Reduced hearing</td>
<td>11</td>
<td>8.80</td>
<td>114</td>
<td>91.20</td>
<td>125</td>
</tr>
<tr>
<td>Reduced visibility</td>
<td>28</td>
<td>22.40</td>
<td>97</td>
<td>77.60</td>
<td>125</td>
</tr>
<tr>
<td>Unsteady walk</td>
<td>20</td>
<td>16.00</td>
<td>105</td>
<td>84.00</td>
<td>125</td>
</tr>
<tr>
<td>Cramping on leg/arm</td>
<td>44</td>
<td>35.20</td>
<td>81</td>
<td>64.80</td>
<td>125</td>
</tr>
<tr>
<td>Skin disease</td>
<td>94</td>
<td>75.20</td>
<td>31</td>
<td>24.80</td>
<td>125</td>
</tr>
<tr>
<td>ARI</td>
<td>82</td>
<td>65.60</td>
<td>43</td>
<td>34.40</td>
<td>125</td>
</tr>
<tr>
<td>Vertigo</td>
<td>35</td>
<td>28.00</td>
<td>90</td>
<td>72.00</td>
<td>125</td>
</tr>
<tr>
<td>Hypertension</td>
<td>53</td>
<td>42.40</td>
<td>72</td>
<td>57.60</td>
<td>125</td>
</tr>
</tbody>
</table>

Table 1 shows that the common health issues in the past month were skin disease (75.2%), ARI diseases (65.60%), hypertension (42.40%) and cramping on legs/arms 35.20%.

Table 2 Nutritional Status of Community around Poboya Gold Mine Area

<table>
<thead>
<tr>
<th>Nutritional Status</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight</td>
<td>53</td>
<td>42.40</td>
</tr>
<tr>
<td>Normal</td>
<td>60</td>
<td>48.00</td>
</tr>
<tr>
<td>Overweight</td>
<td>12</td>
<td>9.60</td>
</tr>
<tr>
<td>Total</td>
<td>125</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Table 2 shows that the nutritional status of most of the community was normal (IMT 18.5-25.0) (48.00%) and underweight (IMT < 18.5) (42.40%).

Table 3 Occupation of Community around the Mining Area

<table>
<thead>
<tr>
<th>Occupation of Community around the Mining Area</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employee</td>
<td>12</td>
<td>9.60</td>
</tr>
<tr>
<td>Farmer</td>
<td>48</td>
<td>38.40</td>
</tr>
<tr>
<td>Miner</td>
<td>65</td>
<td>52.00</td>
</tr>
<tr>
<td>Total</td>
<td>125</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Table 3 shows that most of the community were gold miners (52.00%) and 38.40% were farmers, particularly shallot farmers.
Table 4 Income of Community around Poboya Gold Mine Area

<table>
<thead>
<tr>
<th>Income of Community around Poboya Gold Mine Area</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;Rp 3,000,000</td>
<td>35</td>
<td>28.00</td>
</tr>
<tr>
<td>Rp 2,000,000 - 3,000,000</td>
<td>48</td>
<td>38.40</td>
</tr>
<tr>
<td>&lt;Rp 2,000,000</td>
<td>42</td>
<td>33.60</td>
</tr>
<tr>
<td>Total</td>
<td>125</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Table 5 Crime Rate of the Gold Mine Area

<table>
<thead>
<tr>
<th>Crime Rate of the Gold Mine Area</th>
<th>Rare</th>
<th></th>
<th>Frequent</th>
<th></th>
<th>Very Frequent</th>
<th></th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>Fight among miners</td>
<td>69</td>
<td>55.20</td>
<td>34</td>
<td>27.20</td>
<td>22</td>
<td>17.60</td>
<td>125</td>
</tr>
<tr>
<td>Gambling</td>
<td>68</td>
<td>54.40</td>
<td>50</td>
<td>40.00</td>
<td>7</td>
<td>5.60</td>
<td>125</td>
</tr>
<tr>
<td>Prostitution</td>
<td>35</td>
<td>28.00</td>
<td>75</td>
<td>60.00</td>
<td>15</td>
<td>12.00</td>
<td>125</td>
</tr>
<tr>
<td>Fraud</td>
<td>20</td>
<td>16.00</td>
<td>85</td>
<td>68.00</td>
<td>20</td>
<td>16.00</td>
<td>125</td>
</tr>
<tr>
<td>Harassment</td>
<td>25</td>
<td>20.00</td>
<td>90</td>
<td>72.00</td>
<td>10</td>
<td>8.00</td>
<td>125</td>
</tr>
</tbody>
</table>

Table 4 shows that in general, the respondents’ income was low although most of the respondents were miners.

Table 5 shows that the common type of crime in the gold mine area based on people’s reports was harassment (72.0%), fraud (68.0%), and prostitution (60.0%).

**Discussion**

The research result shows that gold mining activities had risks against the environment, economy, social, and health aspects. Polluted environment slowly lowered public health. The common health issues among the community living around the mining area were ARI diseases, skin diseases, hypertension and cramping on legs/arms.

Another study shows that the disease types suffered by gold miners affect some body organs, causing symptoms of chronic and acute diseases. Moreover, mercury concentration in water, fishes, and vegetables is significantly related to health risks due to mercury exposure among people around community gold mines. Miners and community around mines are usually contaminated with mercury through direct contact with skin, mercury vapor inhalation and consumption of fishes exposed to mercury.

The research result showed that gold mining activities caused people to change their jobs from farmer to miner, but they still had low income. However, another study shows that gold mine requires a large number of workers, increasing the income of local communities.

Lowered revenue of agricultural business after the mine opens is caused by increased wage as scarcity of agricultural workers because they switch to mining leads to increased wage. Change from farmer to miner and land conversion into gold mine were caused by economic demands. The study shows that gold mining is an occupation to improve and fulfill people’s economic needs. Gold mine fulfills and improves family welfare. Moreover, the negative impact of illegal gold mine is children choosing to mine gold rather than going to school.

One of the social impacts of gold mine was crime and the common type of crime was fight among miners. High crime rate in the mining area wasn’t addressed completely, increasing people’s concern. Fights among ulayat land owners and theft in houses of people who own a lot of gold cause people to worry. In terms of security, there were classes between native people and migrants which killed some miners, as well as theft. The study showed that there were some factors surrounding each type of crime, but it’s concluded that the dominant factors are needs (individual), situation and condition of mining community and opportunity. Regarding murder, the dominant factor was uncontrollable emotion. To prevent crime, the policy, task unit and miner group leaders guarded, checked and performed searches as preventative measures.
Conclusion

Gold mine near human settlement causes health issues related to mining activities, such as mercury exposure, and change of occupation and land conversion, as well as high crime rate in the mine area which worry the community around the mine area.

Ethical Clearance: Taken from Faculty of Public Health Tadulako University committee.

Source of Funding: Research grant from the Ministry of Research, Technology and Higher Education, Republic of Indonesia

Conflict of Interest: None

Bibliography


Prevalence and Risk Factors of Candida Albicans Infection among Group of Pregnant Women in Maternity Teaching Hospital in Sulimania City

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Abstract

Background: Vulvovaginal candidiasis (VVC) is a major reason for vaginitis throughout pregnancy, and it may lead to serious complications. A relation between candidiasis and preterm birth has been confirmed. Knowledge about the local epidemiology of VVC is crucial for disease management.

Aim of the study: To determine the prevalence and the risk factors of VVC in pregnant women.

Study design: Cross-sectional, non-experimental, descriptive study.

Method: One hundred pregnant women from the labor ward participated in this study carried out from 16th December 2016 to 16th April 2017. High vaginal swabs were used as samples, and cultured in Sabouraud dextrose agar, incubated at 36°C for 48-72 hours. Candida albicans culture was confirmed by germ tube production.

Results: Prevalence of VVC among pregnant women was found to be 26%, common within the age group of 33–40 years. Women of 2-4 gravidity were more affected. There was no association among parity, abortion, with candidiasis. Antibiotics, steroids, and diabetes mellitus are the major risk factors.

Conclusion: The risk of VVC was higher in women who had an unplanned pregnancy, irregular or no visits to antenatal care centers, steroid users and prolonged use of an antibiotic.

Keywords: Vulvovaginal candidiasis, prevalence and risk factor.

Introduction

Infections of birth canal are common throughout pregnancy and Vulvo-Vaginal Candidiasis (VVC) is the most common and frequently distressing infection for many pregnant women ¹. Nearly 75% of all women experience at least an episode of VVC throughout their life, and repeated events occur in almost 50% ²,³. The incidence of infections has greatly increased in recent times especially with the extensive use of antibiotics and immunosuppressive treatment ⁴.

Prevalence of VVC doubles up in the last trimester of pregnancy (because of high production or alterations in the level of sex hormones and deposition of glycogen in the vagina) and those with multigravida suffer significantly more than those with primigravida ⁵.

The exact mechanism of how gestation boosts candida colonization throughout pregnancy is still unclear. However, it is known that during pregnancy the levels of hormones like estrogen and progesterone are elevated. Progesterone has suppressive effects on the anti-candida activity of neutrophils, whereas estrogen has been reported to decrease the ability of...
vaginal epithelial cells to inhibit the growth of Candida albican (CA) and drop the immunoglobulins in vaginal secretions causing increased vulnerability of pregnant women for this infection.

Out of approximately 150 species of yeast, more than 20 species are known to cause infections in human, CA is the most important species among the other clinically significant ones like Candida glabrata, Candida parapsilosis, Candida krusei and Candida dubliniensis. Candida species live commensally on the skin, genitourinary tract and gastrointestinal tract. They are harmless in their human host until they overgrow and interrupt the human immune system. However, under certain conditions, some species exploit the host environment and cause disease.

Pregnancy brings yeast infections, often multiple ones per pregnancy. Candida and pregnancy often go hand in hand, but it often weakens the immune system of the mother making it easier for the opportunistic pathogens to cause illnesses or disease. Symptoms of VVC include dysuria, dyspareunia, enlarged or swollen vulva, white thick curd-like discharge from the vagina, pruritus, irritation of the vaginal area, vaginal edema and erythematous.

Several risk factors can be associated with increased colonization of VVC in women like compromised immune system, HIV/AIDS, obesity, diabetes, pregnancy, frequent uses of antibiotics, corticosteroids, estrogens, oral contraceptive pills, intrauterine contraceptive device, vaginal douches, sponge, diaphragms, tight clothing, poor personal hygiene unprotected sexual intercourse and diet with high glucose content.

Candida albicans infection (CAI) is an important cause of morbidity in pregnancy which can cause abortion, chorioamnionitis, subsequent preterm delivery, premature rupture of membrane and low birth weight.

Material and Method

Study area: Cross-sectional study was carried out at the Maternity Teaching Hospital in Sulaimani city/Iraqi in a group of pregnant women.

Study population: One hundred pregnant women with more than 37 weeks of gestation with different age groups and socioeconomic status were enrolled in this study. The study was conducted over a period (from 16th of December 2016 to 16 April 2017). Inclusion criteria for selection of pregnant women was, more than 37 weeks, intact membrane and cervical dilatation > 3-4 cm.

Data collection: Data collection was done by direct interview of the study participants. For this, a questionnaire was constructed which include the socio-demographic characteristics, information’s regarding current pregnancy, previous obstetric history and other risk factors.

Specimen collection: High vaginal sterile cotton swabs was obtained from them and placed in a sterile container, which contained 2 drops of normal saline to maintain moisture and immediately transported to the Pharma Gen laboratory for diagnosis of CA by culture and germ tube test.

Culture: The swabs were inoculated onto Sabouraud dextrose agar (SDA) plates and incubated at 36°C for 48-72 hours in the laboratory. After 2-3 days of incubation, candida appeared as creamy, smooth, pasty, and convex colonies on SDA plate.

Germ tube test: This is a rapid method for identification of CA. A loop full of inoculum of yeast cells was obtained from an isolated colony from the surface of SDA plate and suspended in 0.5 ml of human serum in a sterile small test tube and incubated at 37°C for 3 hours. After incubation a drop of the incubated serum was placed on a slide covered by cover slip and examined under the microscope at 10X and 40X magnifications for the presence of short, slender, tube-like structures of yeast or candida cell (elongated daughter cells from the mother cell without constriction at their origin) projections extending from the yeast cells. If these features were seen, then the sample was called germ tube positive and if not seen the sample was considered as germ tube negative for the CA.

Statistical analysis: After data collection the questions of the study were coded, data entry was performed in an excel spreadsheet, and then the statistical analysis was performed using SPSS program, version 21. Data were presented in tabular forms showing the frequency and percentages of different variables. Chi-square tests were used to compare the categorical variables. Quantitative variables were expressed as mean ± standard deviation and comparison between groups was done by t-test and p values ≤ 0.05 were statistically significant.
Results

Out of total one hundred pregnant women in labor word, 26% had CAI. Table 1 summarizes the socio-demographic characteristics and the frequency of CAI. Age ranged from 17-40 years, mean age of women was 33.6±5.8 years which was significantly higher than the women without CAI (28± 6.1 years). Most women among the infection group were in the age group of 33-40 years compared to non-infection group (65.4% versus 21.6%), statistically significant.

The findings showed no statistically significant association between CAI and educational status, participant residency, economic status and occupation (Table 1).

Women with unplanned pregnancy had a higher occurrence of the infection, 21(80.8%) compared to women with planned pregnancy 5(19.2%). Women who had regular visits to Anti Natal Care (ANC) had a lower rate of CAI 5 (19.2%) compared to those who had irregular visits 12 (46.2%) or those who did not visit ANC at all 9 (34.6%) (Table 1).

No statistically significant association was found between gravida, parity, abortion and early neonatal death with CAI. Among the women with a positive history of stillbirth, the proportion of women who had CAI 5 (19.2%) was statistically higher when compared to those who did not have CAI 2 (2.7%) (Table 2).

Table 1: Association of socio-demographic characteristics with the occurrence of CAI

<table>
<thead>
<tr>
<th>Socio-Demographic Characteristics</th>
<th>Candida Albicans</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>With Infection N (%)</td>
<td>Without Infection N (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>26 (26)</td>
<td>74 (74)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17 - 24 Years</td>
<td>2 (7.7)</td>
<td>25 (33.8)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25 - 32 Years</td>
<td>7 (26.9)</td>
<td>33 (44.6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>33 - 40 Years</td>
<td>17 (65.4)</td>
<td>16 (21.6)</td>
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<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Mean ± SD</td>
<td>33.6 ± 5.8</td>
<td>28.0 ± 6.1</td>
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<td>13 (17.6)</td>
<td></td>
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<td>Intermediate school</td>
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<td>16 (21.6)</td>
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<td></td>
<td></td>
<td></td>
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<td>Secondary school</td>
<td>10 (38.6)</td>
<td>25 (33.8)</td>
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<td></td>
<td></td>
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</tr>
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<td>Institute</td>
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<td>8 (10.8)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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<td>College and higher</td>
<td>1 (3.8)</td>
<td>9 (11.8)</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Economics Status</td>
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<td></td>
<td></td>
<td></td>
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<td>Sufficient</td>
<td>10 (38.6)</td>
<td>35 (47.3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>0.74</td>
</tr>
<tr>
<td>Insufficient</td>
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<td>5 (6.8)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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<td>Barely sufficient</td>
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<td>34 (45.9)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tr>
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<td></td>
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<td>33 (44.6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
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<td></td>
<td></td>
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<td>Occupation</td>
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<td>11 (14.9)</td>
<td></td>
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<td></td>
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<td>Planned</td>
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<td>60 (81.1)</td>
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<td>Regular visits</td>
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<tr>
<td>Irregular visits</td>
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<td></td>
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<tr>
<td>No visiting</td>
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<td>5 (6.8)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

*T-test

Table 3 shows the association between the possible risk factors like diabetes, steroid use and prolonged use of antibiotics and the presence of CAI. Among the women with a positive history of diabetes mellitus, 10(38.6%) had infection as compared to 6(8.1%) women who did not have infection. Participants who
had a positive history of steroid use, 13(50.0%) were more likely to have infection as compared to those without any history of steroid use 10(13.5). Similarly, the participants who had a positive history of prolonged use of antibiotics, 13(50.0%) were more likely to have infection as compared to those without any history of prolonged use of antibiotics 10(13.5).

### Table 2: Association of obstetric history with CAI

<table>
<thead>
<tr>
<th>Obstetric history</th>
<th>Candida albicans With infection N (%)</th>
<th>Without infection N (%)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>26 (26)</td>
<td>74 (74)</td>
<td></td>
</tr>
<tr>
<td>Gravidity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primigravida</td>
<td>8 (30.8)</td>
<td>27 (36.5)</td>
<td>0.29</td>
</tr>
<tr>
<td>Gravida 2 – 4</td>
<td>13 (50)</td>
<td>41 (55.4)</td>
<td></td>
</tr>
<tr>
<td>Gravida 5 or more</td>
<td>5 (19.2)</td>
<td>6 (8.1)</td>
<td></td>
</tr>
<tr>
<td>Parity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Para 0</td>
<td>11 (42.3)</td>
<td>30 (40.5)</td>
<td>0.18</td>
</tr>
<tr>
<td>Para 1 – 3</td>
<td>12 (46.2)</td>
<td>42 (56.8)</td>
<td></td>
</tr>
<tr>
<td>Para 4 or more</td>
<td>3 (11.5)</td>
<td>2 (2.7)</td>
<td></td>
</tr>
<tr>
<td>Abortion</td>
<td></td>
<td></td>
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<tr>
<td>Yes</td>
<td>9 (34.6)</td>
<td>19 (25.7)</td>
<td>0.38</td>
</tr>
<tr>
<td>No</td>
<td>17 (65.4)</td>
<td>55 (74.3)</td>
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</tr>
<tr>
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</tr>
<tr>
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<td>21 (80.8)</td>
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<tr>
<td>Early neonatal death</td>
<td></td>
<td></td>
<td></td>
</tr>
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<td>Yes</td>
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</tr>
<tr>
<td>No</td>
<td>23 (88.5)</td>
<td>71 (95.9)</td>
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</table>

### Table 3: Association of probable risk factors with CAI

<table>
<thead>
<tr>
<th>Probable risk factors</th>
<th>Candida albicans With infection N (%)</th>
<th>Without infection N (%)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>26 (26)</td>
<td>74 (74)</td>
<td></td>
</tr>
<tr>
<td>Diabetes Mellitus</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>10 (38.5)</td>
<td>6 (8.1)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>No</td>
<td>16 (61.5)</td>
<td>68 (91.9)</td>
<td></td>
</tr>
<tr>
<td>Steroid use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>13 (50.0)</td>
<td>10 (13.5)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>No</td>
<td>13 (50.0)</td>
<td>64 (86.5)</td>
<td></td>
</tr>
<tr>
<td>Prolong use of antibiotics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>13 (50.0)</td>
<td>10 (13.5)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>No</td>
<td>13 (50.0)</td>
<td>64 (86.5)</td>
<td></td>
</tr>
</tbody>
</table>

### Discussion

In the present study, 26% pregnant women participants had CAI, approximately one in every four women was infected which was higher than the study done in Kerkuk-Iraq and Lebanon. However, in the present study the prevalence of CAI in the pregnant women was slightly lower than found in other studies done in Nigeria and Turkey. In another related study on pregnant women in the United Kingdom, the prevalence of CAI was 12.5% as compared to 26% in this study.

In the present study, 65.4% in the infection group were in age group (33-40 years) while a prospective study conducted in the UK reported that CAI was more common in the age group (21-30 years). Another prospective study conducted in India revealed that women in the age group (21-25 years) had the highest frequency of CAI. On the other hand, another recent study on this infection found that majority of CAI during pregnancy was related to reproductive age group between 20-39 years.

Study reported that nearly half (35.9%) of pregnant women colonized with CAI were illiterate, while in the present study, education level did not have a statistically significant association with CAI. Half of the infected women with infection in our study belonged to barely sufficient socio-economic status, while another study done in Nepal found that CAI was common among moderate socio-economic status which constituted 85.7%.
Our finding shows that half of the infected population are from urban (57.7%) area, and most of them were housewives (96.2%). The result of our study is consistent with a study done in India which found that CAI was more common among women living in an urban area which constituted (64%) and among housewives. The present study shows that unplanned pregnancy and irregular visits to ANC clinics were significantly associated with CAI. A similar observation was found in a study done in Saudi Arabia which reported that CAI was associated with irregular visits to ANC clinics during pregnancy.

In the present study among the participants who had CAI, 8(30.8%) had primigravida, and 13(50%) had multigravida. This finding is consistent with the findings of other studies. In the present study, among the pregnant women with the infection, 12(46.2%) had 1-3 which is consistent with the findings of a similar study undertaken in Kuwait that reported that 16% of pregnant women with the infection had 1-3 para.

In the present study, no association was found between early neonatal death and CAI, but a statistically significant association was found between infection and history of stillbirth. In the present study, 9 (34.6%) of the participants who had an infection of previous history of abortion; this finding was in contrast to the findings of a study done in Kuwait that reported 33% of infection occurred in pregnant women who had no history of any abortion.

We explored the relationship between risk factors and CAI. The prevalence of infection was 50% among antibiotic users, as 13 out of 26 women who had history of prolonged antibiotic use recently had CAI compared to 10% in the participants who did not use antibiotics which is highly suggestive of a positive correlation between recent antibiotic use and development CAI. This relationship was also significant and in agreement with other studies that have linked candidiasis to ingestion of antibiotics. An association was found between diabetes mellitus and steroid use with CAI but an opposite result was found in a study that showed no association between these two variables with the infection.

**Conclusion**

*Candida albicans* is a common infectious disease in pregnant women with a high prevalence rate. Unplanned pregnancy, irregular or no visits to antenatal care centers, steroid use and prolonged antibiotic use are the major risk factors.

**Conflict of Interest:** Not

**Ethical Clearance:** The study was approved by the ethical committee of the University of Sulaimani/College of Nursing and by the ethical review committee of the hospital.

**Source of Funding:** Not

**References**


Objective of the study: Is to determine the prevalence of amblyopia and associated refractive errors in a sample of school-age children in Al-Diwaniya Province, Iraq, who are between 6 to 10 years of age.

Design and settings: This is a population based cross section study in Al-Diwaniya Province, Iraq from October 2017 to January 2018. Moreover, 6,742 school-age children are involved, after agreement with the local Ministry of Education Department, along with a team consisting of an ophthalmologist and two optometrists; they visit the school and conduct visual acuity examinations, using the E-test and refraction test, which are both auto- and -manual “with cycloplegia” for children suspected of decreased visual acuity. They do a slit lamp exam (with portable lamps), used to assess anterior segment, red reflex, and lens opacity with a fundus exam to exclude pathology of the eye.

Results: The prevalence rate of amblyopia is 2.2%. There is a significant association between errors of refraction and amblyopia ($p < 0.001$). The most common error of refraction is hypermetropia, followed by myopia and astigmatism.

Conclusion: Amblyopia is a major health problem in school-age children who need active screening programs, since early detection and treatment is vital; amblyopia is more prevalent in young age groups with a greater number of hypermetropic children.

Keywords: Paediatric ophthalmology, squint, amblyopia.

Introduction

Amblyopia, sometimes referred to as lazy eye, is clinically defined as the best corrected visual acuity at 20/40 or worse, even after application of the best corrective measures: this is in the absence of any ocular or neuronal abnormalities of the eye. This abnormality often happens during childhood, extending to about 10 years of age, so that early detection, with effective medical intervention, can offer acceptable visual improvement. On the other hand, delayed recognition of amblyopia can lead to lifelong visual impairment which is difficult to correct. This visual defect is attributed to underdevelopment of the visual system during early life, in that development of the brain’s occipital visual cortex occurs during this critical period: it is linked to the availability of focused and clear visual signals at that point. When a single eye is affected, versus unilateral defect, two issues are involved: first, optical characteristics of either eye tend to have different “anisometropia;” second, the visual axes of the eyes show a misaligned “squint.” Bilateral lesions are infrequent and seen in settings when the retina is deprived of visual signals, such as media opacity and ptosis. Yet, when refractive errors involve both eyes, amblyopia may similarly affect both eyes as well.
A review article published in 2010 reports that 6.8 million individuals worldwide are blind due to uncorrected errors of refraction, and that approximately 101.2 million are visually handicapped.\textsuperscript{113} Refractive problems are visual abnormalities that can affect persons throughout their lives, and represent the most frequent visual problem in most age groups. Children represent the main sector at risk of refractive abnormalities, as vision defects can negatively affect learning abilities and future job opportunities.\textsuperscript{113} The prevalence of amblyopia in the published literature is in the range of 0.7 to 5%, based on features of the population being studied, criteria of visual acuity, and Method of measurement.\textsuperscript{14,15} Amblyopia is regarded as the most frequent reason for monocular visual defect among young adults and children in Central Europe.\textsuperscript{16} Its prevalence in India is reported at 4.4% and in China at 1.9% from 5 to 15 years of age.\textsuperscript{17} Studies on the prevalence rate of amblyopia in nearby countries show: in Iran for example, the rate is estimated to be in the range of 0.2 to 3% among school-age children.\textsuperscript{18,19} In Saudi Arabia, the rate of amblyopia in these children is estimated at 3.9%.\textsuperscript{20}

Due to a lack of adequate data on the prevalence of amblyopia in school-age children in Iraq, as well as the absence of screening programs to highlight the possible correlation between refractive errors and the development of amblyopia in this sector, this study is designed, planned, and conducted in Al-Diwaniya Province of the Mid-Euphrates region of Iraq, along with a baseline study for comparison.

**Patients and Method**

**Sample selection and study design:** The study is cross sectional: among the relatively large number of primary schools in the target region, Al-Diwaniya Province, 25 schools were selected randomly with a computer. The study was conducted from October 2017 to January 2018, when we were able to enroll 6,742 children. Inclusion criteria involves any child from 6 to less than 10 years. Any child 10 years or older is excluded from the study, as any child with motility defects or squint was also omitted from the study, with the SPSS program (Armonk, NY, USA) used for statistical analysis.

**Ethical issues:** The study is approved by the local ethical approval committee of Al-Qadisiyah University College of Medicine. A Formal Agreement is available by the local directorate, representative of the Ministry of Education, while informed consent is taken from all students who participate in the study, including their parents.

**Examining team:** Three teams conduct the examination process, with each consisting of one ophthalmologist and two optometrists.

**Examination:** Each child is examined for visual acuity with the Snellen E-test, and for refraction with an auto-electronic refractometer (Huvitz HRK-7000, Seoul, South Korea); before each measurement, the machine is calibrated with the manufacturer’s specifications, while manual refraction is used for cycloplegia (cyclopentolate 1% eye drops) for children suspected of decreased visual acuity; there is a slit lamp exam with a portable lamp to assess the anterior segment, thered reflex, as well as lens opacity with a fundus exam to exclude eye pathology, with an ocular motility exam of the cover-uncover test to find misalignment, at which point the sample is concluded.

**Results**

The prevalence of amblyopia and errors of refraction in children enrolled in the present study is shown in Table 1. Overall prevalence of amblyopia in all study samples is 2.2%. There was some variation in the prevalence of amblyopia among children in different age groups, ranging from 1.8 to 2.5%; the higher rate is observed in children from 6 to less than 7 years of age. Hypermetropia is seen in 3.7% of the total number of children, which ranges from 3.0 to 4.4%. The highest rate of hypermetropia is found in children aged 9 to less than 10 years. Astigmatism is observed in 2.8% of all participating school-aged children, ranging from 2.1 to 2.6%. The rate of astigmatism is highest from 8 years to less than 10 years of age.

The association between errors of refraction and amblyopia is shown in Table 2 and Fig. 1. The percent of amblyopia is significantly higher in hypermetropic children than normal children ($p<0.001$), 26.2 versus 1.3%; the percent of amblyopia is significantly higher in children with myopia than normal children ($p<0.001$), 24.2 versus 1.6%. Moreover, the percent of amblyopia is significantly higher in children with astigmatism than normal children ($p<0.001$), 22.0 versus 1.7%. These results indicate a strong association between errors of refraction and amblyopia.
The relationship between visual refractive errors and amblyopia seems to lessen with age, as shown in Table 3 and Fig. 2. The percent of children with amblyopia, as related to hypermetropia, is significantly reduced from 30.9% in those from 6 to less than 7, and to 16.4% from 9 to less than 10 years of age. The percent of children with amblyopia linked to myopia is reduced from 31.6% at 6 to less than 7, to 19.4% in those 9 to less than 10 years of age. The percent with amblyopia and hypermetropia is significantly reduced from 27.8% at 6 to less than 7 to 16.3% at 9 to less than 10 years.

### Table 1: Prevalence of amblyopia and refractory abnormalities in children (original)

<table>
<thead>
<tr>
<th>Age group</th>
<th>Amblyopia</th>
<th>Hypermetropia</th>
<th>Myopia</th>
<th>Astigmatism</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 to &lt;7 (n = 1692)</td>
<td>43 (2.5%)</td>
<td>68 (4.0%)</td>
<td>38 (2.2%)</td>
<td>36 (2.1%)</td>
</tr>
<tr>
<td>7 to &lt;8 (n = 1684)</td>
<td>40 (2.4%)</td>
<td>60 (3.6%)</td>
<td>37 (2.2%)</td>
<td>41 (2.4%)</td>
</tr>
<tr>
<td>8 to &lt;9 (n = 1688)</td>
<td>34 (2.0%)</td>
<td>51 (3.0%)</td>
<td>51 (3.0%)</td>
<td>44 (2.6%)</td>
</tr>
<tr>
<td>9 to &lt;10 (n = 1678)</td>
<td>31 (1.8%)</td>
<td>73 (4.4%)</td>
<td>62 (3.7%)</td>
<td>43 (2.6%)</td>
</tr>
<tr>
<td>Total (n = 6742)</td>
<td>148 (2.2%)</td>
<td>252 (3.7%)</td>
<td>188 (2.8%)</td>
<td>164 (2.4%)</td>
</tr>
</tbody>
</table>

### Table 2: Association between amblyopia and visual errors of refraction (original)

<table>
<thead>
<tr>
<th>Error of refraction</th>
<th>Total</th>
<th>Amblyopia n = 148</th>
<th>No amblyopia n = 6594</th>
<th>P *</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypermetropia</td>
<td>Yes</td>
<td>252</td>
<td>66 (26.2%)</td>
<td>186 (73.8%)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>6490</td>
<td>82 (1.3%)</td>
<td>6408 (98.7%)</td>
</tr>
<tr>
<td>Myopia</td>
<td>Yes</td>
<td>188</td>
<td>46 (24.5%)</td>
<td>142 (75.5%)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>6554</td>
<td>102 (1.6%)</td>
<td>6452 (98.4%)</td>
</tr>
<tr>
<td>Astigmatism</td>
<td>Yes</td>
<td>164</td>
<td>36 (22.0%)</td>
<td>128 (78.0%)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>6578</td>
<td>112 (1.7%)</td>
<td>6466 (98.3%)</td>
</tr>
</tbody>
</table>

*: Chi-square test; HS: highly significant

### Table 3: Association between amblyopia and visual errors of refraction according to age (original)

<table>
<thead>
<tr>
<th>Age group (years)</th>
<th>Hypermetropia</th>
<th>Myopia</th>
<th>Astigmatism</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>With amblyopia</td>
<td>Total</td>
</tr>
<tr>
<td>6 to &lt;7</td>
<td>68</td>
<td>21 (30.9%)</td>
<td>38</td>
</tr>
<tr>
<td>7 to &lt;8</td>
<td>60</td>
<td>19 (31.7%)</td>
<td>37</td>
</tr>
<tr>
<td>8 to &lt;9</td>
<td>51</td>
<td>14 (27.5%)</td>
<td>51</td>
</tr>
<tr>
<td>9 to &lt;10</td>
<td>73</td>
<td>12 (16.4%)</td>
<td>62</td>
</tr>
<tr>
<td>Total</td>
<td>252</td>
<td>66 (26.2%)</td>
<td>188</td>
</tr>
</tbody>
</table>
Discussion

This study shows two striking features. First, the prevalence of amblyopia in school-aged children is relatively widespread (2.2%). However, the association between errors of refraction and amblyopia was also highly significant. There is no screening program for amblyopia, so results highlight that it must be used by the Ministry of Health and Health Institutes to focus on refraction errors as early as possible and avoid development of amblyopia later in life.

The rate of amblyopia is variable in different communities; the prevalence of amblyopia in India varies from 1.1% in some regions to 6.6% in other regions. In South-Asian areas, the Chinese reports showed that prevalence rate ranges from 0.8 to 2.5% in various subsets of the population, as carried out by Chia et al. and Fu et al., respectively. In hospital-based research in Nepal, the prevalence is 1%. The prevalence of amblyopia in Saudi Arabia is higher than that reported in our study, 3.9 versus 2.2%. The rate of refractive errors in our study is between 2.4 to 3.7%, which is far less than reported in some Arab countries; for example, it is 13.7% in Saudi children, and 22.1% in Egyptian children.
In this study, we report that hypermetropia is the most common refractory error, followed by myopia and astigmatism. This finding is similar to that of other authors.\cite{21} We also find that amblyopia is most frequent with hypermetropia, as per Menon et al.\cite{27} However, this finding is different from that of other related authors,\cite{28} who find that astigmatism is the most frequent error of refraction associated with amblyopia.

Some authors raise the issue that amblyopia is more common in one gender, with explanation based on social habits rather than pathophysiological differences between boys and girls, attributing some trends within community preference of taking better care of boys than girls.\cite{21,29-32} We cannot evaluate the association between prevalence rate of amblyopia and gender, due to a lack of evidence in published articles; if there is any suggestion that the condition is genetically linked, or that some acquired biologic factor may exist in the male or female gender, this leads to higher rates in one gender. Supporting our view is that some authors refer to higher rates in boys than girls,\cite{21,29,30} whereas, other authors record higher rates in girls than boys.\cite{31,32}

With vision of 20/20, amblyopia is treatable and preventable in a child’s age group.\cite{33-35} If neglected, amblyopia can cause monocular and binocular impaired vision\cite{36-38} with accompanying deterioration in quality of life (QoL). As such, early diagnosis and prompt rehabilitation are a priority. This goal is disregarded by some countries as the hallmark of the Blindness Control Program.\cite{34,35}

Acknowledgment: We would like to express our deep thanks to all members of Diwaniya teaching hospital ophthalmology department who participated in examining the children and assist in doing this research.

Conclusion

Amblyopia is a major health problem in school-age children who need active screening programs, since early detection and treatment is vital; amblyopia is more prevalent in young age groups with a greater number of hypermetropic children.

Conflict of Interest: All authors declare no conflict of interest.

Source of Funding: The work was self funded.

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7. Park KH, Hwang JM, Ahn JK. Efficacy of amblyopia therapy initiated after 9 years of age. Eye (Lond) 2004; 18:571-4


Efficacy of the Health Belief Model and Multi-Dimensional Locus of Control Theory-Led of Influenza Vaccination among High School Students in Al-Nasiriyah City

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¹Department of Community Health Nursing, College of Nursing, University of Baghdad, Iraq

Abstract

A randomized controlled trial was conducted by applying the health belief model and multi-dimensional locus of control theory (HBM-MLOC) of change to (1) examine the effect of the theory-led intervention in enhancing decision on influenza vaccine, (2) identify the association between students’ age, family’s socioeconomic status (SES), frequency of contracting influenza, subjective norms, and their decision on influenza vaccine. The study included a simple random sample of (152) male students (76), students for the study group and (76) students for the control group aged 15 to 20 years who were selected from the highschool of “Al-Sadeqeen” in The-Qar in the Iraq. Data were collected through a self-report instrument that included the demographic data, the survey based on the health belief model (hbm) questionnaire, and the multidimensional locus of control questionnaire. The study results revealed that the mean age for participants in the study group was 17.52 ± 1.20; more than a quarter age 18-years-old (n = 22; 28.9%). The HBM-MLOC-based intervention positively influenced the students’ perceived barriers to receive influenza vaccine, perceived benefits of receiving influenza vaccine, perceived susceptibility of contracting influenza, perceived severity of contracting influenza, the internal locus of control related to taking Influenza vaccine, the powerful others locus of control related to taking Influenza vaccine, and the chance locus of control related to taking influenza vaccine. In our study recommends to conduct similar studies over broader geographical regions throughout Iraq, incorporate the theory-based intervention that address the determinants of health; particularly the epidemics into the nursing curricula, and the necessity of community health nurses in Iraq to conduct community-based studies using theory-based interventions.

Keywords: Contagious disease, Influenza vaccination, health belief model.

Introduction

Influenza, commonly called “the flu”, is a contagious disease caused by a virus which spreads easily from person to person. Compared with other viral respiratory infections such as the common cold, influenza infection can cause severe illness and also precipitate serious and life-threatening complications. Influenza viruses infect many parts of the body, including the nose, throat and lungs. Influenza symptoms include fever, cough, sore throat, fatigue, muscle aches, headaches, runny nose and watery eyes. Although the fever and body aches usually last for 3 – 5 days, coughing and fatigue can persist for two weeks or more. The virus is highly contagious and is spread from one person to another by coughing, sneezing or talking. Influenza infections typically occur between October and April each year¹. Typical influenza disease is characterized by abrupt onset of fever, aching muscles, sore throat, and non-productive cough. Typical influenza disease does not occur in every infected person. Someone who has been previously exposed to similar virus strains (through natural infection or vaccination) is less likely to develop serious clinical illness². Yearly flu vaccination is the best tool currently available to protect against influenza (flu). While how well the flu vaccine works can vary, the Centers for Disease Control and Prevention (CDC) recommends a yearly flu vaccination as the first and most important step in protecting against

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flu and its potentially serious complications. Millions of people have safely received flu vaccines for decades. A flu vaccination does not guarantee protection against the flu. Some people who get vaccinated might still get sick. However, people who get a flu vaccine are less likely to get sick with flu than someone who does not get vaccinated. The vaccine effectiveness of seasonal influenza vaccines is a measure of how well the seasonal influenza vaccine prevents influenza virus infection in the general population during a given influenza season. During seasons when most circulating influenza viruses are similar to the viruses in the influenza vaccine, the vaccine can reduce the risk of illness caused by influenza virus infection by about 50-60% among the overall population. The objective of the present study was to efficacy of the health belief model and multi-dimensional locus of control theory-led intervention in enhancing decision on influenza vaccination among high school students in Al-Nasiriyah city.

Methodology

Design of the Study: The research design for this study was an experimental, randomized controlled trial design. Control occurs to decrease the possibility of error and thus increase the probability that the study’s findings are an accurate reflection of reality and the researcher can reduce the influence also controlling extraneous variables enable the researcher to identify relationships among the study variables accurately and examine the effects of one variable on another.

The Study Population: The study population included high school students. The target population for this study was drawn from Al-Sadeqeen Secondary School for Boys, The-Qar Directorate of Education, male students, aged 15 to 20-years who met the inclusion criteria mentioned below.

The Sample of the Study: The study applied the randomized sampling method. The name of all secondary and high schools belong to The-Qar Directorate of Education were written in identical pieces of paper. These pieces were put in container and stirred well. A systematic random sample comprised of (152) male middle school students was divided into two groups. The number of elements in the population N = 450 students. Based on a medium effect size (0.25), a error probability of 0.05, and a power of 0.95, the number of groups is 2, the repetitions are 3, the minimum required sample size for each group would be 71. The researcher distributed (170) copies of the study questionnaire to the students. The returned questionnaires were 160. Eight copies were incomplete. So, they were excluded. The final sample size was 152. Thus, the response rate was 94.1%. The final sample size n = 76 for each group. By dividing the population size by the desired sample size (450/152), the result is 2.96 which means that every 3rd student on the list would be included in one of the two groups.

The Health Belief Model Questionnaire (HBMQ): The health belief model questionnaire (hbmq) was used to measure the students’ health beliefs about taking influenza vaccine. The hbmq consists of 16 items, 6 of them for perceived barriers to influenza vaccine, one item for the perceived benefits of influenza vaccine, 3 items for the perceived susceptibility of contracting influenza, and 6 items for the perceived severity of influenza. Responses are arranged on a 5-points likert-type scale from (1 as “strongly disagree” and 5 as “strongly agree”). Total scores range from 16 to 80, with a higher score indicating greater perceived barriers to influenza, perceived benefits of influenza vaccine, perceived susceptibility of contracting influenza, and perceived severity of influenza. The hbmq has shown satisfactory reliability and concurrent validity.

Statistical Analysis: The descriptive statistical measures of frequency, percent, mean, and standard deviation were used to describe participants’ demographics. The repeated measures analysis of variance (RM-ANOVA) was used to measure the difference in the constructs of the HBM.

Results

The age mean (Table 1) for participants in the study group is 17.52 ± 1.20; more than a quarter age 18-years-old (n = 22; 28.9%), followed by those who age 17-years-old (n = 19; 25.0%), those who age 19-years-old (n = 16; 21.1%), those who age 16-years-old (n = 14; 18.4%), those who age 15-years-old (n = 3; 3.9%), and those who age 20-years-old (n = 2; 2.6%). For the control group, the age mean is 17.89 ± 1.49; more than a quarter age 17-years-old (n = 20; 39.5%), followed by those who age 20-years-old (n = 16; 31.1%), those who age each of 16-years-old and 18-years-old (n = 13; 13.7%), those who age 19-years-old (n = 12; 15.8%), and one who ages 15-years-old (n = 2; 2.6%). Concerning grade, more than a third in the study group are freshmen (n = 27; 35.5%), followed by seniors (n = 26; 34.2%), and juniors (n = 23; 30.3%). For the control group, more than a third are
each of freshmen and seniors (n = 26; 34.2%) followed by juniors (n = 24; 31.6%). As per the birth order, less than a third in the study group came in the first order (n = 13; 17.1%), those who came in the fifth order (n = 9; 11.8%), those who came in the fourth order (n = 6; 7.9%), those who came in the seventh order (n = 4; 5.3%), and those who came in the sixth order (n = 2; 2.6%). For the control group, more than a third came in the first order (n = 26; 34.2%), followed by those who came in the third order (n = 18; 23.7%), those who came in the second order (n = 17; 22.4%), those who came in the fourth order (n = 10; 13.2%), those who came in the fifth order (n = 4; 5.3%), and one who came in the seventh order (n = 1; 1.3%). Regarding the SES, less than a half in the study group are of the upper middle class (n = 34; 44.7%), followed by those who are of the lower middle class (n = 23; 30.3%), those who are of the upper lower class (n = 18; 23.7%), and one who is of the lower class (n = 1; 1.3%). For the control group, more than two-fifth are of the upper middle class (n = 32; 42.1%), followed by those who are of the upper lower class (n = 21; 27.6%), those who are of the lower middle class (n = 20; 26.3%), those who are of the lower class (n = 2; 2.6%), and one who is of upper class (n = 1; 1.3%).

The values (Table 2) of the Perceived barriers to receive Influenza vaccine for the study group noticeably increase by time compared to the control group in (Pretest = 14.68 vs. Posttest I = 18.19 vs. Posttest II = 27.11 vs. 14.75) respectively. Higher score means lesser barriers to receive Influenza vaccine. Whether these represent significant differences is the job of the repeated measures (RM) ANOVA. There are significant differences in the values (Table 3) of the Perceived barriers to receive Influenza vaccine over time for participants both in the study and control groups (F = 584.754, df = 2, p < .05 vs. F = 2.880, df = 2, p < .05). The Mauchly’s Test of Sphericity (Table 4) is significant (p < .05), which indicates that these data do not violate the Sphericity assumption of the univariate approach to repeated-measures ANOVA. So, we accept the assumption that the variances of the differences between levels are equal. There was a (a priori p = 0.01) significant difference (F (1.977, 136.390) = 29.349, p = 0.01) in the Perceived barriers to receive Influenza vaccine over time for participants in the study group. The omnibus effect (measure of association) for this analysis is .903, which indicates that approximately 90% of the total variance in the perceived barriers receiving.

### Table 1: Participants’ Sociodemographic Characteristics

<table>
<thead>
<tr>
<th></th>
<th>Study (N = 76)</th>
<th>Control (N = 76)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>3</td>
<td>2</td>
</tr>
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<td>16</td>
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<td>13</td>
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<tr>
<td>17</td>
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<td>20</td>
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<tr>
<td>18</td>
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<td>12</td>
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<tr>
<td>20</td>
<td>2</td>
<td>16</td>
</tr>
<tr>
<td>Mean</td>
<td>17.52</td>
<td>17.89</td>
</tr>
<tr>
<td>Grade</td>
<td></td>
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<tr>
<td>Freshmen</td>
<td>27</td>
<td>26</td>
</tr>
<tr>
<td>Junior</td>
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<td>24</td>
</tr>
<tr>
<td>Senior</td>
<td>26</td>
<td>26</td>
</tr>
<tr>
<td>1st</td>
<td>23</td>
<td>26</td>
</tr>
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<td>2nd</td>
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<td>18</td>
</tr>
<tr>
<td>4th</td>
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<td>10</td>
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<tr>
<td>5th</td>
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<td>4</td>
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<tr>
<td>6th</td>
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<td>0</td>
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<tr>
<td>7th</td>
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<tr>
<td>SES</td>
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<td></td>
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<tr>
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<td>2</td>
</tr>
<tr>
<td>Upper lower class</td>
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<td>21</td>
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<tr>
<td>Lower middle class</td>
<td>23</td>
<td>20</td>
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<td>Upper middle class</td>
<td>34</td>
<td>32</td>
</tr>
<tr>
<td>Upper class</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

### Table 2: Descriptive statistics for the values of the perceived barriers to receive influenza vaccine over time

<table>
<thead>
<tr>
<th>Perceived barriers</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study Pretest</td>
<td>14.68</td>
<td>4.451</td>
<td>76</td>
</tr>
<tr>
<td>Study Posttest I</td>
<td>18.19</td>
<td>4.033</td>
<td>76</td>
</tr>
<tr>
<td>Study Posttest II</td>
<td>27.11</td>
<td>.951</td>
<td>76</td>
</tr>
<tr>
<td>Control Pretest</td>
<td>14.80</td>
<td>3.145</td>
<td>76</td>
</tr>
<tr>
<td>Control Posttest I</td>
<td>14.71</td>
<td>3.148</td>
<td>76</td>
</tr>
<tr>
<td>Control Posttest II</td>
<td>14.75</td>
<td>3.094</td>
<td>76</td>
</tr>
</tbody>
</table>
### Table 3: Multivariate Tests of the Within-subjects for the Perceived barriers to receive Influenza vaccine

<table>
<thead>
<tr>
<th>Effect</th>
<th>Value</th>
<th>Pillai’s Trace</th>
<th>Wilks’ Lambda</th>
<th>Hotelling’s Trace</th>
<th>Roy’s Largest Root</th>
<th>F Hypothesis df</th>
<th>Error df</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barriers (Study)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.940</td>
<td>584.754</td>
<td>2.000</td>
<td>.000 .940</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>.060</td>
<td>584.754</td>
<td></td>
<td>584.754</td>
<td>2.000</td>
<td>.000</td>
<td>.940</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>15.804</td>
<td>584.754</td>
<td></td>
<td>584.754</td>
<td>2.000</td>
<td>.000</td>
<td>.940</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>.078</td>
<td>2.880</td>
<td></td>
<td>2.880</td>
<td>2.000</td>
<td>.062</td>
<td>.072</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Effect</th>
<th>Value</th>
<th>Pillai’s Trace</th>
<th>Wilks’ Lambda</th>
<th>Hotelling’s Trace</th>
<th>Roy’s Largest Root</th>
<th>F Hypothesis df</th>
<th>Error df</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barriers (Control)</td>
<td></td>
<td></td>
<td>.072</td>
<td>2.880</td>
<td></td>
<td>2.880</td>
<td>2.000</td>
<td>.062</td>
<td>.072</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>.928</td>
<td>2.880</td>
<td></td>
<td>2.880</td>
<td>2.000</td>
<td>.062</td>
<td>.072</td>
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<td></td>
<td>.078</td>
<td>2.880</td>
<td></td>
<td>2.880</td>
<td>2.000</td>
<td>.062</td>
<td>.072</td>
</tr>
</tbody>
</table>

a. Design: Intercept Within Subjects Design: Perceived barriers receiving Influenza vaccine, b. Exact statistic

### Table 4: Mauchly’s Test of Sphericity for the Perceived barriers to receive Influenza vaccine

<table>
<thead>
<tr>
<th>Within Subjects Effect</th>
<th>Mauchly’s W</th>
<th>Approx. Chi-Square</th>
<th>Df</th>
<th>Sig.</th>
<th>Epsilonb Greenhouse-Geisser</th>
<th>Huynh-Feldt</th>
<th>Lower-bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barriers</td>
<td>.154</td>
<td>138534</td>
<td>2</td>
<td>.000</td>
<td>.542</td>
<td>.543</td>
<td>.500</td>
</tr>
</tbody>
</table>

### Discussion

This randomized controlled trial was implemented to enhance students’ readiness to receive Influenza vaccine by implementing the Health Belief Model and Multi-Dimensional Locus of control Theory-based intervention (HBM-MLOC). There was significant difference in the values of the Perceived barriers to receive Influenza vaccine over time for participants in the study group. The omnibus effect of for this analysis was .903, which indicates that approximately 90% of the total variance in the Perceived barriers receiving Influenza vaccine values is accounted for by the variance in the administered intervention. For the control group, there was no significant difference in the perceived barriers to receive Influenza vaccine over time. Participants’ perceived barriers to receive Influenza vaccine in the study group in the pretest time statistically differ from such barriers in the posttest I and posttest II. Such barriers in the posttest I statistically differ from these in the pretest time and posttest II. Such barriers in the posttest II statistically differ from these in the pretest time and the posttest I. This finding indicates the positive, constant effect of the Health Belief Model and Multi-Dimensional Locus of control Theory-based intervention (HBM-MLOC) in overcoming the barriers to receive Influenza vaccine for students. There was a significant difference in the Perceived Benefits of receiving Influenza vaccine over time for participants in the study group. The omnibus effect for this analysis was .468, which indicates that approximately 46% of the total variance in the Perceived Benefits of receiving Influenza vaccine values is accounted for by the variance in the administered intervention. For the control group, there was no significant difference in the Perceived Benefits of receiving Influenza vaccine over time. Participants’ Perceived Benefits of receiving Influenza vaccine in the study group in the pretest time statistically differ from such benefits in the posttest I and posttest II. Such benefits in the posttest I statistically differ from that in the pretest time and posttest II. Such benefits in the posttest II statistically differ from that in the pretest time and posttest I. There was a significant difference in the Perceived Susceptibility of contracting Influenza over time for participants in the study group. This results agree with 9,10,11,12,13.

### Conclusions

The Health Belief Model and Multi-Dimensional Locus of control Theory-based intervention (HBM-MLOC) has a positive effect the Perceived barriers to receive Influenza vaccine over time for students in the study group. The HBM-MLOC enabled students to overcome the barriers to receive Influenza vaccine for students. The HBM-MLOC enabled students to outweigh the Perceived Benefits of receiving Influenza vaccine over their barriers.
Conflict of Interest: None

Funding: Self

Ethical Clearance: Not required.

References


2. Centers for Disease Control and Prevention 2012.


Determinant of Personal Protective Equipment Practices on Construction Welders

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¹Occupational Health and Safety Department, Faculty of Medicine, Universitas Sebelas Maret

Abstract

The construction sector has been the largest contributor to the occurrence of accidents around the world. One of the production processes in construction at risk of accidents and occupational diseases is welding work. In Indonesia, especially in Surakarta, there are still a number of welders in the construction sector who work without using personal protective equipment (PPE), while the welding work itself is a risky job in terms of health and safety. This paper examines the most influential predisposing factor towards the practice of personal protective equipment application on welders. Predisposing factors studied in this study were age, working hours, level of education, history of work accidents in welding, knowledge and practice in the use of personal protective equipment. Cross sectional study was employed in the study conducted from February to July 2017 in 20 construction site locations in Surakarta, Central Java, Indonesia. Data was collected through face-to-face interviews using a structured questionnaire. The research population consisted of 430 construction workers in 100 construction site locations of welding in Surakarta. The sampling technique employed was multistage random sampling one. Sample was taken from 20 locations in 5 districts of Surakarta, leaving 245 welders being the sample. The knowledge is the most influential factor surrounding the practice of using protective equipment on construction workers welding in Surakarta, Indonesia. A good knowledge of welders can increase the opportunities in the good practice of using personal protective equipment up to 6 times (p value=0.001, Exp.B=6.020).

Keywords: Predisposing factors, knowledge, practices, personal protective equipment, construction welder.

Introduction

The development of construction businesses in Indonesia has grown rapidly and was instrumental in the growth of the economy. Construction activities that do not implement safety aspects properly will have an impact on the risk of accidents. Based on data from the International Labor Organization (ILO), from 1996 until the year 2017, 1 worker in the world dies every 15 seconds due to a work accident while 153 workers experience pain due to work(1). In 2015, the construction sector was the largest contributor to the occurrence of accidents around the world. Prevention of accidents and occupational diseases are essential as a form of a company’s efforts to improve work productivity(2). The more workers’ complaints about illness, the larger the funds spent and the more time wasted for processes and medical expenses(3). One of the production processes in construction at risk of accidents and occupational diseases is the welding work. Toxic fumes resulting from welding work, consisting of a mixture of metal oxides, silicates and fluoride are harmful to the respiratory system, eyes and nervous system. Moreover, the intensity of the lighting is often too high at the time of the welding process, which can damage the lens and iris via inflammation(4). Fire-sparks during welding processes can cause sores and irritation to the skin and eyes. The inflammation can be prevented by using Personal Protective Equipment(PPE) appropriately while working. By the standards of Occupational Safety and Health Association(OSHA), it is mandatory for welding work in the construction sector to wear PPE when performing welding work; this consists of a protective tool for the face and eyes, a respiratory protection, safety
helmets, gloves, eye protection, high-visibility clothing, safety footwear and safety harnesses. In Indonesia, especially in Surakarta, there are still a number of welders in the construction sector who work without using self-protection, while the welding work itself is a risky job in terms of health and safety.

According to the Precede Proceed Theory, human behavior is caused by three important factors, i.e. predisposing, enabling and reinforcing factors. Predisposing factors include knowledge and attitudes toward health, the traditions and beliefs of the community, level of education, socio-economic level and so on. Enabling factors include the availability of infrastructure or health facilities for the community. Lastly, reinforcing factors include attitudes and behavior factors of community leaders and religious personages. Some studies believe the predisposing factors are predominant against the practice of PPE application among welders.

This research aims to examine the most substantial predisposing factor towards the practice of PPE application on the welder. Predisposing factors studied in this study were age, duration of work, duration of work, education level, history of work accident, knowledge and practice about the application of PPE.

### Material and Method

Surakarta Regency, Central Java, Indonesia; 5 districts and 51 villages with population density of 13,636 people/km²: most of them work in the trade, agriculture, industry and construction sectors. Surakarta consists of 100 construction sites in 5 districts, wherein many workers don’t have a construction worker certificate especially in welding. Cross sectional study was employed in the study conducted from February to July 2017 in 20 construction site locations in Surakarta, Central Java, Indonesia. The research population consisted of 430 welding construction workers in Surakarta. The sampling technique employed was multistage random sampling one. Sample was taken from 20 locations in 5 districts of Surakarta, leaving 245 welders being the sample. The welders of this study has job to fabricate and assemble metal equipment and structures in building construction. Data was collected through face-to-face interviews using a structured questionnaire. Socio-demographics including age, working hours, level of education, History of work accidents in welding. The questionnaire in knowledge (20 questions) and practice of the use of protective equipment (20 questions) using closed ended questions in multiple choice were measured using a 4-grade answer choice. The highest score (4) was given to the strongly agree answer, while the lowest one (1) to strongly disagree. The scale of research data is included in the data category with proportion and percentages were used for expression, and then data tested using the chi-square for a bivariate relationship between variables. A multivariate logistic regression test was conducted to affirm which of the variables dominantly influence the use of protective equipment. P value of < 0.05 was set as the level of statistical significance. The test is performed using SPSS 17.

### Findings

This research was conducted in Surakarta, Central Java, which included 20 construction sites of welding scattered in Banjarsari, Jebres, Laweyan, Pasar Kliwon and Serengan. The respondents in this study are part of a welder team whose the duty is to carry out welding work, either cutting or joining steel and aluminum. Table 1 shows the characteristics and predisposing factors in the use of PPE, which reveals that knowledge of PPE on welders is mostly in the ‘bad’ category. Table 2 shows only the knowledge level that indicates a significant correlation against the use of PPE. Table 3 shows that knowledge is the most influencing variable on the practice of PPE application among welders in Surakarta.

### Table 1, Distribution of Respondents’ Personal Protective Equipment Practices

<table>
<thead>
<tr>
<th>Variables</th>
<th>Category</th>
<th>Frequency (N/%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>&gt; 40 years</td>
<td>82(33.3%)</td>
</tr>
<tr>
<td></td>
<td>≤ 40 years</td>
<td>163(66.7%)</td>
</tr>
<tr>
<td>Working hours</td>
<td>&gt; 8 hour/day</td>
<td>28(11.4%)</td>
</tr>
<tr>
<td></td>
<td>≤ 8 hour/day</td>
<td>217(88.6%)</td>
</tr>
<tr>
<td>Level of Education</td>
<td>Not Graduated in Elementary School</td>
<td>5(2%)</td>
</tr>
<tr>
<td></td>
<td>Elementary School</td>
<td>28(11.4%)</td>
</tr>
<tr>
<td></td>
<td>Junior High School</td>
<td>68(27.8%)</td>
</tr>
<tr>
<td></td>
<td>Senior High School</td>
<td>133(54.3%)</td>
</tr>
<tr>
<td></td>
<td>College</td>
<td>11(4.5%)</td>
</tr>
<tr>
<td>History of work accidents in welding</td>
<td>Has an accident</td>
<td>32(13.1%)</td>
</tr>
<tr>
<td></td>
<td>Didn’t has an accident</td>
<td>213(86.9%)</td>
</tr>
<tr>
<td>Knowledge of PPE</td>
<td>Bad</td>
<td>141(57.6%)</td>
</tr>
<tr>
<td></td>
<td>Good</td>
<td>104(42.4%)</td>
</tr>
<tr>
<td>Practices of PPE</td>
<td>Bad</td>
<td>117(47.8%)</td>
</tr>
<tr>
<td></td>
<td>Good</td>
<td>128(52.2%)</td>
</tr>
</tbody>
</table>
Table 2 Bivariate Analysis of Personal Protective Equipment Practices using Chi Square Statistic Test

<table>
<thead>
<tr>
<th>Predisposing factors</th>
<th>Category</th>
<th>Personal Protective Equipment Practices Category (N/%)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Bad</td>
<td>Good</td>
</tr>
<tr>
<td>Age</td>
<td>Old &gt; 40 years</td>
<td>46(56.1%)</td>
<td>36(43.9%)</td>
</tr>
<tr>
<td></td>
<td>Young ≤ 40 years</td>
<td>71(54.6%)</td>
<td>92(56.4%)</td>
</tr>
<tr>
<td>Working hours</td>
<td>&gt; 8 hour/day</td>
<td>17(60.7%)</td>
<td>11(39.3%)</td>
</tr>
<tr>
<td></td>
<td>≤ 8 hour/day</td>
<td>100(46.1%)</td>
<td>117(53.9%)</td>
</tr>
<tr>
<td>Level of Education</td>
<td>Not Graduated in Elementary School</td>
<td>3(60%)</td>
<td>2(40%)</td>
</tr>
<tr>
<td></td>
<td>Elementary School</td>
<td>19(67.9%)</td>
<td>9(32.1%)</td>
</tr>
<tr>
<td></td>
<td>Junior High School</td>
<td>35(51.2%)</td>
<td>33(48.6%)</td>
</tr>
<tr>
<td></td>
<td>Senior High School</td>
<td>57(42.9%)</td>
<td>76(57.1%)</td>
</tr>
<tr>
<td></td>
<td>College</td>
<td>3(27.2%)</td>
<td>8(72.8%)</td>
</tr>
<tr>
<td>History of work accidents in welding</td>
<td>Has an accident</td>
<td>15(46.9%)</td>
<td>17(53.1%)</td>
</tr>
<tr>
<td></td>
<td>Didn’t has an accident</td>
<td>102(47.9%)</td>
<td>111(52.1%)</td>
</tr>
<tr>
<td>Knowledge of PPE</td>
<td>Bad</td>
<td>92(65.2%)</td>
<td>49(34.8%)</td>
</tr>
<tr>
<td></td>
<td>Good</td>
<td>25(24%)</td>
<td>79(76%)</td>
</tr>
</tbody>
</table>

Table 3 Multivariate Analysis using Binomial Regression Statistic Test

<table>
<thead>
<tr>
<th>Variables</th>
<th>B</th>
<th>P Value</th>
<th>Exp. B</th>
<th>95% CI</th>
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</thead>
<tbody>
<tr>
<td>Age</td>
<td>0.208</td>
<td>0.507</td>
<td>1.232</td>
<td>0.666 - 2.278</td>
</tr>
<tr>
<td>Working hours</td>
<td>0.618</td>
<td>0.178</td>
<td>1.856</td>
<td>0.754 - 4.566</td>
</tr>
<tr>
<td>Level of Education</td>
<td>0.426</td>
<td>0.018</td>
<td>1.531</td>
<td>1.076 - 2.179</td>
</tr>
<tr>
<td>Knowledge of PPE</td>
<td>1.795</td>
<td>0.001</td>
<td>6.020</td>
<td>3.361 - 10.784</td>
</tr>
</tbody>
</table>

Discussion

Personal factors, social factors and the economic condition of a person are strongly related to a person’s behavior and decision-making process, especially when it comes to safety and usage of PPE while working\(^8\). Bivariate results using the statistic test of the chi-square showed that there is no significant correlation (p-value=0.086) between age and usage of PPE. The result of frequency distribution showed that the welders under 40 years old have a personal protective equipment practice in good category (56.4%). The results of this research are different from some studies of welders aged above 40 years old who have a sound compliance in the use of protective equipment\(^9\). Increase in age should also be in line with increased knowledge and awareness of the importance of health and safety in performing a job\(^10\). Based on the results of the multivariate logistic regression, it’s exhibited that age is not the most influential variable against the practice of using PPE on the welder (p-value = 0507). Age is one factor that can alter one’s personal behavior and one’s behavior shaping. However, the age of a person without education, training and knowledge about adequate safety can also hamper how safely a person behaves in the workplace\(^11\).

The number of working hours of labor is also correlated with productivity, health and safety in working customs\(^12\). Bivariate results using the test statistic of chi-square indicate that the number of hours of work with the practice of PPE usage has no significant relationship (p-value=0.208) and the largest percentage of the results obtained on workers who have had hours of work less than 8 hours per day, have a good behavior in the use of protective tools themselves(51.6%). This is in line with the studies of safety in the workplace, that the accidents and occupational diseases are prone to occur in working hours of the work day beyond the regular 8 hours. The event happens due to longer exposure to hazards in the workplace, which in turn enlarges the possibilities of the risk of an accident. Violation of maximum limit of work-hours per day negatively affects mental and psychological stress causes including fatigue, decreased productivity and morale and the lack of concentration that are dangerous to safety in working practices\(^13\). Test results based on multivariate logistic regression exposed that the number of working hours showed no effect on the practice of the use of the protector on workers welding section(p-value = 0178).
Indonesia is one of the developing countries that has yet to implement safety practices appropriately particularly in the construction sector. A study of the practice of safety in developing economic countries such as Saudi Arabia, Pakistan, Nigeria and South Africa showed that the level of education associated with the use of PPE was a bad category\(^{14}\). The results using the bivariate statistic of chi-square tests showed that there is no significant correlation between the level of education with the practice of PPE usage (p-value = 0.06); there is no dominance against the application of PPE. In south east Asian countries, which is one of the regions with low education levels education on the construction sector workers, influence of inferior education highly impacts the number of work accidents in the sector\(^{15}\).

The construction sector is vulnerable to various accidents that could lead to injuries on workers\(^{16}\). Bivariate results showed that history of work accidents in welding with the practice of PPE usage has no significant correlation(p-value = 0.915), whereas the results of frequency distribution confirmed that the welders who have a history a work accident have PPE usage in the category of good(53.1%). It can be indicated that laborers who have experienced an incident of wounds and injuries will possess better knowledge, memory and awareness about safety in the workplace compared to those who have never experienced any incident\(^{17}\).

Lack of knowledge about safety at work could trigger a person to behave unsafely \(^{18}\). Bivariate results using the test statistic of chi-square showed that education and the application of PPE has no significant correlation(p-value=0.001). The results of frequency distribution revealed that the welder who has knowledge in PPE usage possesses good behavior in the good category(76%). Through the multivariate test, it is unveiled that knowledge has vast influence on the application of PPE(p value=0.001,Exp.B =6,020) which means that the knowledge of good practices of PPE may enhance the application of PPE (around 6 times better). The results of this research are in line with some of the inquiries, which mentioned that knowledge on safe and sound practices in work affect the use of PPE. The knowledge might be gained through training programs, simulation and manufacturing of standard operational procedures, especially in the prevention of accidents\(^{19}\).

The PPE for welders comprises of the face shield, goggles, gloves, wear pack, safety shoes and masks. The respondents who did not use protective tools argue with various reasons as to why PPE was not worth practicing i.e. disturbing flexibility at work, unavailable face shield and damaged self-protector equipment.

**Conclusion**

Knowledge of personal protective equipment is the most influential factor against the practice in the use of protective tools on construction workers welding in Surakarta, and a good knowledge of PPE has a good opportunity to increase the practice of using PPE up to 6 times (p value=0.001,Exp.B=6,020). Knowledge in the usage of PPE might be improved through training and simulation regarding self-protection. It is highly recommended for the 20 sites of construction to perform a standard operational procedure especially in welding practices, so that workers can avoid accidents and occupational diseases.

**Conflict-of-Interests Statement:** The authors declare that there are no competing or potential conflicts of interest.

**Source of Funding:** The authors thank the Chairperson of Research and Public Service Institution of Universitas Sebelas Maret for funding this study in Enhancement of the Capacity Group Research scheme.

**Ethical Clearence:** These research does not apply an ethical clearance because is an observational research with aims of this study are knows the determining factors of PPE practice in construction workers using questionares, without doing interventions or things that can harm the respondents. However, the research team stays giving inform concern to all respondents as a sign of willingness. The authors is fully responsible for the content in this article.

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Is There an Association between Body Mass Index and Cervical Length?

Hawzheen Q. Jalal, Srwa Ismael Khalid

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Abstract

Objective: Assess the relationship between maternal body mass index and second trimester cervical length

Method: This is a prospective study conducted on 100 singleton women, aged between 18 to 34 years with mean age of 24.03 ± 4.34 from 2017 to 2019, all these women have their BMI measured in 1st trimester according to WHO criteria and cervical length measured in 2nd trimester (16-24 weeks)

Results: The rate of premature delivery among women aged ≥ 25 years was 52.3% compared to 35.7% among those aged <35 years (p = 0.097). The rate of premature delivery among women living in rural areas was 52.9%, compared with 41% among women living in urban areas (p = 0.363). The more the body mass index (BMI), the less the rate of premature delivery (p = 0.002) where it was 50% among thin women and 0% among obese women. Premature delivery was 89.5% among women with short cervical length and 32.1% among women with normal cervical length (p < 0.001). 19% of the women of the whole sample had short cervix but none of the women with normal weight or obese had short cervix.

Conclusions: This study demonstrates a relationship between BMI and cervical length suggesting that obesity may be associated with longer cervical length.

Keywords: Premature delivery, body mass index, cervical length, Female, Pregnancy.

Introduction

Obesity and cervical insufficiency are leading causes of morbidity in pregnancy. Over the past two decades in the United States, the rate of obesity has more than doubled from 15 to 33%. It is estimated that more than one in five women of reproductive age are obese (body mass index, BMI ≥30 kg/m²), and the rate of obesity continues to rise. The prevalence of obesity among adults in the United States has increased from 12% in 1991 to 20.9% in 2001. Obese women appear to have a lower rate of spontaneous preterm birth than normal weight women. Prior data suggest that maternal obesity in pregnancy is associated with an increased need for labor induction, longer duration of labor, higher oxytocin and misoprostol requirements, and importantly, more frequent cesarean sections. Obesity before pregnancy is associated with an increased risk of fetal acrosomia and prenatal mortality. The mother’s being leaner than average (underweight), on the other hand, is associated with an increased risk of delivering an infant who is small for gestational age and perhaps also the risk of preterm delivery. Pregnancies among underweight or over-weight women are therefore often regarded as high risk pregnancies, and thin women are frequently advised to gain weight before becoming pregnant. Nonetheless, the optimal weight or body-mass index for women who wish to become pregnant is not known.

However, evidence regarding the association of maternal obesity and spontaneous preterm birth (SPB) is conflicting. Although some studies suggest that obesity does not influence the rate of preterm birth at 37 weeks of gestation, other studies have found reduced rates of preterm birth in obese and morbidly obese patients.

The prevalence of overweight and obesity is increasing among women of childbearing age. An estimated 22% of non-pregnant women 18–49 years of age in the United States are considered overweight (BMI25–29.9 kg/m²) and an additional 22% are classified...
as obese (BMI >29.9 kg/m²)\textsuperscript{12}. Throughout pregnancy the cervix plays an important role in maintaining the fetus in utero and preventing premature delivery\textsuperscript{13}.

The length of the cervix may be useful in predicting the risk of premature delivery, with a shorter cervix predicting a higher risk. Traditional Method to evaluate the cervix in pregnancy are limited and unsatisfactory\textsuperscript{14}. Digital examination, the standard method, suffers from large variation among examiners. In contrast, transvaginal ultrasonography is a reproducible method of examination during pregnancy\textsuperscript{14}. A short cervix, traditionally defined as a transvaginal sonographic cervical length (CL) ≤ 25mm in the mid-trimester of pregnancy, is an important risk factor for preterm birth and has emerged as one of the strongest and most consistent predictors of preterm birth in asymptomatic women with a singleton or twin gestation\textsuperscript{15}. The current study assessed the relationship between first trimester BMI and cervical length measured between 16 and 24 weeks of gestation.

**Method**

This is a prospective study of 100 women with singleton gestation conducted in Erbil Maternal Hospital from October 2017 to January 2019.

Gestational age was calculated based on first day LMP and or early first trimester ultrasound. First trimester pregnancy BMI was calculated for women (BMI equal to weight in Kg/height in meter). Women were classified into the following groups according to WHO criteria:

- Underweight BMI less 18.5 kg/m²
- Normal weight BMI 18.5 to 24.9 kg/m²
- Over weight BMI 25 to 29.9 kg/m²
- Class one obesity BMI 30 to 34.9 kg/m²
- Class two or morbid obesity BMI ≥35 kg/m²

Cervical length measured in centimeter by ultrasound scan between 16 and 24 weeks of gestation.

**Inclusion criteria**

- All primigravida and those with miss carriage only aged between 18-35 years

**Exclusion criteria**

- Multiple gestations
- Previous cervical surgeries
- History of IVF
- Age less than 18 or more than 35 year
- No history of any medical diseases

**Statistical analysis:** Data were analyzed using the Statistical Package for Social Sciences (SPSS, version 22). Chi square test of association was used to compare proportions. Fisher’s exact test was used when the expected count of more than 20% of the cells of the table was less than 5. Pearson’s correlation coefficient was calculated to assess the strength of correlation between two numerical variables. A p value of ≤ 0.05 was considered statistically significant

**Result**

Hundred women participated in the study. Their mean age ± SD was 24.03 ± 4.34 years, ranging from 18 to 34 years. The median was 23 years. Table 1 shows that the rate of premature delivery among women aged ≥ 25 years was 52.3% compared with 35.7% among those aged less than 25 years (p = 0.097). The rate of premature delivery among women living in rural areas was 52.9%, compared with 41% among women living in urban areas (p = 0.363). No significant association was detected between the rate of premature delivery and the other factors like educational level (p = 0.268), and progesterone intake (p = 0.522) as presented in Table 1.

**Table 1. Incidence of premature delivery by age, residency, education, and progesterone intake**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Premature</th>
<th>Normal</th>
<th>Total</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 25</td>
<td>20 (35.7)</td>
<td>36 (64.3)</td>
<td>56 (100.0)</td>
<td>0.097</td>
</tr>
<tr>
<td>≥ 25</td>
<td>23 (52.3)</td>
<td>21 (47.7)</td>
<td>44 (100.0)</td>
<td></td>
</tr>
</tbody>
</table>
Table 2 shows that the more the body mass index (BMI), the less the rate of premature delivery (p = 0.002) where it was 50% among thin women and 0% among obese women. The same table shows that the rate of premature delivery was 89.5% among women with short cervical length and 32.1% among women with normal cervical length (p < 0.001).

Table 3 shows that 19% of the women of the whole sample had short cervix but none of the women with normal weight or obese had short cervix. It is evident in the table that 66.7% of thin women had short cervix (p < 0.001).

<table>
<thead>
<tr>
<th>Variables</th>
<th>Delivery</th>
<th>Total</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Premature</td>
<td>Normal</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No.</td>
<td>(%)</td>
<td>No.</td>
</tr>
<tr>
<td>Residency</td>
<td>Urban</td>
<td>34 (41.0)</td>
<td>49 (59.0)</td>
</tr>
<tr>
<td></td>
<td>Rural</td>
<td>9 (52.9)</td>
<td>8 (47.1)</td>
</tr>
<tr>
<td>Educational</td>
<td>Educated</td>
<td>19 (50.0)</td>
<td>19 (50.0)</td>
</tr>
<tr>
<td></td>
<td>Illiterate</td>
<td>24 (38.7)</td>
<td>38 (61.3)</td>
</tr>
<tr>
<td>Progesterone</td>
<td>No</td>
<td>26 (40.6)</td>
<td>38 (59.4)</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>17 (47.2)</td>
<td>19 (52.8)</td>
</tr>
<tr>
<td>Total</td>
<td>43 (43.0)</td>
<td>57 (57.0)</td>
<td>100 (100.0)</td>
</tr>
</tbody>
</table>

Table 2. Incidence of premature delivery by Body Mass Index (BMI) and cervical length

<table>
<thead>
<tr>
<th>Length of cervix</th>
<th>Total</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>(%)</td>
<td>No.</td>
</tr>
<tr>
<td>BMI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 18.5</td>
<td>6 (50.0)</td>
<td>6 (50.0)</td>
</tr>
<tr>
<td>18.5-24.9</td>
<td>33 (55.0)</td>
<td>27 (45.0)</td>
</tr>
<tr>
<td>25-29.9</td>
<td>4 (17.4)</td>
<td>19 (82.6)</td>
</tr>
<tr>
<td>≥ 30</td>
<td>0 (0.0)</td>
<td>5 (100.0)</td>
</tr>
<tr>
<td>Cervical length</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Short</td>
<td>17 (89.5)</td>
<td>2 (10.5)</td>
</tr>
<tr>
<td>Normal</td>
<td>26 (32.1)</td>
<td>55 (67.9)</td>
</tr>
<tr>
<td>Total</td>
<td>43 (43.0)</td>
<td>57 (57.0)</td>
</tr>
</tbody>
</table>

Table 3. Association between length of the cervix and the Body Mass Index (BMI)
**Figure 1** shows that there was a strong positive correlation between cervical length and the weeks of delivery. The more the cervical length, the more the weeks at delivery ($r = 0.708, p < 0.001$)

![Figure 1. Correlation between cervical length and weeks at delivery](image1)

The same pattern is observed in **Figure 2** where it is evident that the more the body mass index, the more the weeks at delivery ($r = 0.555, p < 0.001$)

![Figure 2. Correlation between body mass index and weeks at delivery.](image2)

**Figure 3** shows a positive significant correlation between the BMI and the cervical length ($r = 0.710, p < 0.001$).

![Figure 3. Correlation between body mass index and cervical length.](image3)
Discussion

BMI, which is derived from weight and height measurements, is one of the best markers of nutritional status and is used to classify populations from thin to obese\textsuperscript{4}.

In our study we found that the relation between BMI and cervical length is proportional, patient who have normal or high BMI, they do have normal cervical length, for example patients who have BMI >25 kg/m\textsuperscript{2} all of them have normal cervical length, while patients who have BMI <18.5, 66.7% of them, they have short cervix. These findingssuggest that maternal obesity early in pregnancy may be associated with longer cervical length, a possible explanation for the decreased rate of spontaneous preterm birth and increased rates of induction of labor and cesarean section among obese women. Importantly, these results will need to be replicated in larger cohorts of pregnant women undergoing universal second-trimester transvaginal ultrasound screening of cervical length before further inferences can be made.

Furthermore in our study we found out that 17 cases (89.5\%) who have short cervix, had premature delivery. An explanation for why pregnant women with a higher BMI may have a longer cervical length remains to be elucidated. Obese women may have a different physiology, endocrine environment, and profile of comorbid conditions compared to their normal weight counterparts, which could influence cervical length\textsuperscript{16, 17}.

However in other study conducted by YS Hanet al\textsuperscript{10}, they found that the average length of neonates delivered by obese mothers was significantly shorter than the average length of neonates delivered by mothers of normal weight, because of the high rates of preterm andLBW delivery in the obese group.

Conclusions

This study demonstrates a relationship between BMI and cervical length suggesting that obesity may be associated with longer cervical length. These results will need to be replicated in larger cohorts undergoing universal cervical length assessment.

Conflict of Interest: None

Ethical Clearance: Informed written consent was obtained from all the participants in the study, and the study and all its procedure were done in accordance with the Helsinki Declaration of 1975, as revised in 2000. The study was approved by theKurdistan Board of Medical Specialties and administration of the Maternity hospital.

Source of Funding: The study supported by authors only

References


Effect of Bee Venom on MRSA Isolated from Patient’s Wounds at Tikrit Teaching Hospital

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Abstract

The widespread prevalence of bacterial resistance to currently available antibiotics has led to search for non-antibiotic agent to combat infections caused by these bacteria. The goal of this study was to investigate the antibiotic effect of bee venom against Methicillin-resistant Staphylococcus aureus (MRSA). The results showed significant differences of inhibition zone of MRSA in vitro when increasing the bee venom concentration.

Keywords: MRSA., Methicillin, Staph. aureus, BV ., Melittin.

Introduction

Staphylococcus aureus is one of the most important human pathogens both in the hospital and the community. Since the beginning of the antibiotic era, S. aureus has been a privileged target of the therapeutic research and numerous antimicrobial agents, as well as vaccine attempts, were specifically designed to combat this bacterium.

Methicillin-resistant Staphylococcus aureus (MRSA) is resistant to all currently available beta-lactam antibiotics. Although this pathogen emerged rapidly after the introduction of methicillin in clinical practice in the early 1960s, it only became public health threat during the 1980s. Its expansion was accompanied by the acquisition of resistant to non-beta lactam antibiotics, which led some authors to suggest that beta lactam alone was not sufficient to promote MRSA dissemination in the hospital.

Honeybee venom is a complex mixture of pharmacologically active chemicals. Bee venom has been widely used in traditional medicine to treat various inflammatory disorders such as rheumatism, arthritis, tendonitis, fibrosis, lupus, multiple sclerosis and to dissolve scar issue. In addition, several studies have reported its cytotoxic properties against various types of tumor cells. Beside 88% water, bee venom consists of at least 18 pharmacologically active components including a variety of peptides, enzymes, bioactive amines (histamine and epinephrine) and other non-peptide components (lipids, carbohydrates and free amino acids), minerals and volatiles. The principal toxin and the major active peptide is melittin (52% of bee venom dry weight), a polypeptide of 26 amino acids with anti-cancer, anti-inflammatory, antibacterial and antiviral effects.

Materials and Method

Culture media: Swabs were taken from patient’s wounds (12 patient) who are in Tikrit teaching hospital, cultured on nutrient agar for 24h. at 37°C. After the expiry of the period, the bacterial growth will be obvious, samples of that growth were cultured on mannitol salt agar (which considered as selective and differential medium for the isolation), incubated foe 24h. at 37°C. Then bacterial samples were streaked on blood agar to examine haemolytic activity.

All the media were prepared according to manufacturer instructions, sterilized by autoclave for 15 min. at 121°C.

Antimicrobial susceptibility test: Bacterial samples were taken from mannitol salt agar to McFarland solution, then bacterial samples were transferred to Mueller-Hinton agar by dipping swab in the solution and streaked it on the agar. By using a sterile forceps the Methicillin (antimicrobial) disc was placed on the surface of the inoculated plate. Three repetition plates were made. Each plate were incubated for 24h. at 37°C.
Bee venom activity test against MRSA: Bee venom was collected by using Electric Shock device. The electric shock makes the workers ajaculate venom from its sting in to the plastic sheet on the glass plate. Bacterial samples were taken from mannitol salt agar to McFarland solution, then bacterial samples were transfered to Mueller-Hinton agar by dipping swab in the solution and streaked it on the agar. Four holes were made in the inoculated culture media of each plate and different concentrations of bee venom were inject in each plate holes (100µg- 1mg) and (5,10,15& 20 mg). Three repetition plates were made for each concentration. The plates were incubated for 24h. at 37°C to see the results.

Results and Discussion

Table (1) inhibition zone of Methicillin antibiotic against MRSA

<table>
<thead>
<tr>
<th>Interpretation</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resistant</td>
<td>12</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Intermediate</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Sensitive</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>12</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Multiple drug resistance bacterial infections are a worldwide burden and treatment of patients with traditional antibiotics is becoming increasingly challenging or ineffective\(^\text{12}\), as we can see in table (1) the Methicillin antibiotic have no effect on MRSA, this result is similar to the results of Lamyaa and Raed\(^\text{13}\).

Table (2) inhibition zone of BV. antibiotic against MRSA

<table>
<thead>
<tr>
<th>BV Concentration</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>12</td>
<td>11.917</td>
<td>0.996</td>
<td>11</td>
<td>13</td>
</tr>
<tr>
<td>10</td>
<td>12</td>
<td>14.250</td>
<td>0.452</td>
<td>14</td>
<td>15</td>
</tr>
<tr>
<td>15</td>
<td>12</td>
<td>18.500</td>
<td>1.168</td>
<td>17</td>
<td>20</td>
</tr>
<tr>
<td>20</td>
<td>12</td>
<td>24.250</td>
<td>1.357</td>
<td>22</td>
<td>26</td>
</tr>
<tr>
<td>ANOVA</td>
<td></td>
<td>F</td>
<td>1109.21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P</td>
<td></td>
<td>0.00002</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The concentrations (100 µg - 1mg) of BV. showed no effect on the MRSA inhibition, but as showed in table (2) the (5,10,15& 20 mg) concentrations of BV. showed that the inhibition zone increased when the concentration of BV. increased\(^\text{14}\).Several studies have clearly demonstrated that bee venom and melittin (one of bee venom component) exhibit a broad-spectrum antibacterial activity\(^\text{15,16}\). Han\(^\text{17}\) found that Gram-positive bacteria were more sensitive than Gram-negative bacteria, This difference may be due to the different cell wall and membrane structure in both types of bacteria.

Melittin can penetrate the peptidoglycan envelope and reach the cell membrane of Gram-positive bacteria easier than in Gram-negative bacteria, which are protected by a lipopolysaccharide envelope\(^\text{18,19}\).
Interval Plot of Methicillin; 5; ...
95% CI for the Mean

The pooled standard deviation was used to calculate the intervals.

Figure (1) The relationship between Methicillin antibiotic and the different concentration of BV.

Conclusions
1. All isolates resist the Methicillin antibiotic.
2. Bee venom has a significant effect on MRSA, the inhibition increased when the concentration of bee venom increased.

Interest Statement Conflict: the authors declare that there is no Interest conflict.

Ethical Clearance: Taken from Faculty of Science Tikrit University committee

Source of Funding: Self

References


Evaluation the Effect of Bone Wax on Healing of Bone in Rats

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Abstract

The current study proceeded on twenty adult rats were used to evaluate the effect of bone wax on healing of fractured femoral bone. After anesthetized two holes were drilled on femoral bone of 20 adult rats of all animals and divided into two groups randomly treated group each hole was filled with bone wax, and the other was left unfilled as control. Sites of intervention were estimated by histopathology. This study evidence complete bone hemostasis was achieved immediately after the application of bone wax on fractured bone but this agent inhibit bone healing and osteogenesis and they made bony lesions in animal femoral bone. The data were analyzed by using the SPSS version 24 showed a significant difference between bone wax and control groups.

Keywords: Bleeding, Bone wax, Orthopedic surgery, Fracture, Hemostasis.

Introduction

Bleeding during and postoperatively in orthopedic surgery poses a numerous intimidation to the animal life and can lead to serious unfavorable sequel if uncontrolled [1]. The surgeon should be known with the range of hemostatic agents available and their implementation during bleeding [2]. Topical haemostatic treatment was applied since ancient time. They used herbs, mixture of wax, grease and barley and also animal hides mixed with hot sand to stop bleeding [3]. Bone bleeding can be difficult to manage especially in highly vascularized bone such as the spine and sternum. Currently, bone wax is used as a mechanical tamponade to stop bone bleeding [4, 5]. Bone wax is a well-known topical hemostatic agent composed of beeswax (70%) and Vaseline (30%). Its hemostatic effect is based on physical rather than biochemical properties: it allows clot formation by stopping the blood flow from damaged vessels into the bone [6]. The chemical formula of bone wax is CH3(CH2)14COOCH(CH3)2, and it is used to control massive bleeding in thoracic surgery, orthopedic surgery, neurosurgery, and craniofacial surgery [7]. The use of hemostatic agents is not free from health risks and complications can arise as a result of physical attributes of the hemostatic material like mechanical compression or due to phlogistic effects secondary to their chemical nature [8, 9]. The bone wax is pliable enough to be placed within a vascular channel and burnished, immediately tamponading the vascular source and achieves bone hemostasis [10]. It is insoluble and therefore non-resorbable, and it interferes with bone healing at the site of application and causes infection by decreasing bacterial clearance in cancellous bone [11, 1].

The objective of this study was to evaluate the effect of bone wax on healing of fractured femoral bone.

Materials and Method

Experimental Animals: The experiment was performed on a twenty adult 4-month-old rats weighing 250 to 300g were housed individually in a controlled environmental condition including; temperature, light, and humidity. Animals were fed a standard diet pre-operatively. Postoperatively, animals were fed a normal diet ad libitum.

Surgical Operation: The experiment was done under general anesthesia, each animal was injected intraperitoneally with (75 mg/kg ketamine 10% and 2.5 mg/kg xylazine 2%) [12]. The left thigh and lower extremity were then washed and shaved, the surgical site was cleaned and disinfected using 10% Povidone Iodine solution, then under aseptic conditions a longitudinal skin incision was made over the lateral aspect of the left thigh and via the fascia lata. Then vastus lateralis retracted anteriorly and posteriorly the biceps femoral was wicked [13]. In the meantime the midshaft of femoral bone was evidence. Two holes, each 2 mm in diameter, were drilled into the diaphyseal part of femoral bone using a dental drill to secure each hole have equal depth and the drilling was done under Irrigation with saline to avoid overheating [7].
**Experimental Design:** The animals were randomly divided into 2 experimental main groups (treated and control) 10 animals for each group, the holes was filled with bone wax (Bone Wax, W31G, 12/Pkg - Ethicon, Inc.) and the other was left unfilled as control. The suturing of muscle was done by using of sterile natural absorbable, chromic catgut suture size 3/0 and suturing the skin by using of sterile natural non-absorbable, silk suture size 2/0.

**Histopathological Study:** Microscopic examinations of the bone healing were performed on all rats at 7, 14 days after treatment. Ten rats used for each group. The rats were euthanized and sacrificed at each time interval using an overdose of anesthesia. The left femurs were harvested and stored for analyses.

**Declaration**

Buffered formalin 10% was a satisfactory fixative for femoral bone to 24 h [14]. Then the samples were washed in tap water for 24 h and incubated with four different decalcifying solutions: 10% EDTA (pH 7.4); 3% nitric acid; 5% nitric acid; and 8% hydrochloric acid/formic acid followed by neutralizing with 0.1% aqueous ammonia solution for 30 min. Decalcification was performed under continuous shaking [15]. Changing of decalcifying solutions daily and a perfect time of decalcification was noted, the decalcification process was ended when the bone was easily penetrated through by a needle without any force [16]. After modulation the specimens in paraffin, sequent slices of 5 μm thickness were performed. The histological slides were then stained by hematoxylin eosin [17].

**Statistical Analysis:** By using the SPSS version 24 for Windows 10 pro, Sony Vaio laptop. The data were analyzed statistically and showed significant differences between the control and Bone Wax group (Table 1).

**Results**

After all animals of experiment were killed as scheduled, differentiation between two experimental groups were analyzed by using Friedman test.

In group (Bone wax), the defect in bone specimens after first week evidence that the defect kept unchanged and there were some fiber sat the base of bony defects, and the other part continued empty (fig. 3). After second week, there were nobody trabeculae formation, but there were some inflammatory cells and vacuoles between the fibers formed (fig. 4).

<table>
<thead>
<tr>
<th>Variables</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>7 Days</td>
</tr>
<tr>
<td>Bone Wax</td>
<td>14 Day</td>
</tr>
</tbody>
</table>

*statistical significant result p ≤ 0.05*
Bone wax is insoluble and therefore not resorbable, this agreement with Sudmann, et al., (2006) which indicates that bone wax is not resorbable or biocompatible. It is also non-resorbable impregnated with bone and muscle, and it can induce chronic inflammation and marked foreign body reaction after application in the calcaneus and inhibits osteoblasts from reaching bony defects and interferes with bone healing at the site of application.

During study periods a comparison of bone healing between control group and Bone wax group showed retardation and inhibition of bone healing. This established by deprivation of collagen fibers or bony trabeculae formation. This indicates that bone wax prevents and inhibits osteogenesis. This result in approval with several studies, which announced the action of bone wax as a mechanical barrier to bone regeneration.

Wellisz, et al., (2008) and Vestergaard, et al., (2010) found that the bone wax was effective in stopping bone healing, it remains at the site of application and has a number of adverse effects, forming a physical barrier to bone healing.

In our experimental study the results showed, bone wax act as local hemostatic agents that decrease postoperative pain, edema and hematoma but in the same time inhibition the osteogenesis and retardation of bone healing, as well, bone wax cause foreign body reactions, serve as a nidus for infection and inflammation.

**Conclusions**

The results obtained from this study and other studies reflected Bone wax agents are utilized with caution to minimize blood loss during and post-surgery and there complication effect appear as bony lesion and prevention of healing.

**Conflict of Interest:** Nil

**Source of Funding:** Self

**Ethical Clearance:** Not required

**References**


Isolation and Diagnosis of Fungus Fungi from Blood and Skin Samples in Dhi-Qar Province

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Abstract
About 60 clinical samples have been collected (40 of both sexes from Al Hussein Educational Hospital in Dhi-Qar and 20 UTI students). Also 40 samples from of patients with skin fungal infections (including skin scraps, nail clippings, and parts of hair). The morphological and microscopic results of the isolates revealed that 21 isolates were Candida spp (Candida spp.), while the rest of the isolates were isolated at different rates and less frequently in the citrus samples. The skin samples showed 5 fungal species causing represented in 9 species involve Aspergillus flavus, Aspergillus fumigatus, Candida albicans, C. tropicalis, Micrasterigmatum gypseum, M. nanum, M. canis, Trichophyton spp, Epidermatophyton spp. The study also nails are the areas that mostly are infected according other areas, this may be because of their ability to produce some enzymes such as Phospholipase which plays an important role in breaking through the host issues.

Keywords: Isolation, fungus fungi, blood, skin.

Introduction

The fungus is a eukaryotic organism, with approximately 50,000 species living in nature, of which 80 species are yeast and fungal, which cause many different diseases for animals and humans¹. One of the diseases caused by fungi is the so-called “Mycosis”, which is usually a chronic and serious disease because the fungus grows slowly, including systemic, opportunistic, superficial, and other infections that affect people who have weak immunity². Among these fungus is the importance of human health and the animal is the fungus (Dermatophytes), which is known as fungus Saprophytic on the materials of keratin in the skin and nails and hair and cause diseases. Keratinophilic fungi are able to produce enzymes to decompose keratin structures and destructing³. Studies indicate that yeast in the ovaries is existed naturally in the oral cavity of healthy people from 20% to 40% of its presence in the vagina and the respiratory canal and penis⁴. But its – and others - transformation is from other pathogenetic fungi from organisms that coexist peacefully to opportunistic beings as a result of its ferocity factors that help it to become pathogenetic organisms such as the production of proteins and lipid enzymes as well as adhesives on the surfaces of phagocytic cells⁵, and their susceptibility depends on the weakness of immunity in people with immune weakness, such as cases, such as HIV/AIDS, (Diabetes mellitus), tumors and the use of antibiotics for a long period of time, such as cortisone and others, it has caused many diseases, such as mucosal infections, which are widespread, including chronic skin injuries (Chronic mucocutaneous), and infections of Vaginal, penis, etc.

This study aims to:
1. Isolation and diagnosis of pathogenic fungi from the samples of urine in some people infected with UTI.
2. Identifying the most common types of UTI.
3. Isolation and Diagnosis of dermophytic

Materials and Method

Samples Collection: About 60 samples of urine from some people infected of UTI, and 40 skin samples (nail clippings, skin scraps, parts of hair) were collected from some people with urinary and skin infections from Al Hussein Educational Hospital in Dhi-Qar and some from the Dermatology Clinics during the period from October 2016 - March 2017, samples were kept in test tubes in the laboratory for the purpose of examination and diagnosis.
Cultivation

A–Medium of Sibroids-Dextrose Agar (SAD):
The Center was prepared according the company instructions, and after the sterilization and cooling, this center has been used for isolating the fungus by transplanting the skin samples taken from the patients, then dishes were left in the incubator for 3 weeks at 28°C to allow the largest number of fungi to grow and appear for isolation and diagnosis.

Isolation and identification: Urine samples have been cultivated on Sabouraud’s dextrose -Agar/oxide and Potato dextrose Agar by immersing the Loop in the sample and then plotting on the pre-prepared plant medium, work 3 replicates for each sample on the above-mentioned areas to ensure that the medium is free from contamination during implantation. Then incubated the dishes in the incubator at 37 C and checked weekly in three weeks. The samples were examined directly on the samples (skin scraps and nail clippings) by taking part of the samples on a clean glass slide containing 10% KOH and placing the lid on it and left in the laboratory for half an hour to dissolve the cretonne of the sample, then examined under the microscope to observe the spores and the fungal filaments on them, then all the fungal species and their associated species were then identified by Assist Prof. Mohamed Hashim Al-Mousawi/Faculty of Science/University of Thi-Qar, and relying on taxonomic keys according to.

1. Direct microscopy of samples by adopting the method of
2. Composition of spores and microbial pathology by adapting

The percentage of the appearance of fungus in the urine samples was calculated according to the following equation:

\[
\text{Percentage of fungi appearance} = \frac{\text{Number of samples in which the fungus}}{\text{Total number of samples}} \times 100
\]

Results and Discussion

The study proved emergence of colonies growing on the medium Sibroids agar (SDA) in form of white colonies to brown and almost circular-shaped Candida genus. This is consistent with Sadie and his group that the colonies of Candida spp possess these qualities when cultivating them on the mentioned medium, in addition to the emergence of other species, including Mucor Aspergillus Spp, Curvulariaspp, Cladosporiumspp, Pseudomonas, Enterococcus. In this study, the isolates, which were the most isolated species, were identified based on the microscopic and visual diagnosis of the medium of SDA which corresponds to and during this study, the infection was identified in 20 samples of patients collected. It stated that Candida Spp was about 15% of all infections in the University hospital in Turkey with the Candidasis, while the average of Candidasis in this study was slightly higher than that reported by which was 3.4% of the total samples collected by him and his group. Also Curvularia, clodosporium, Mucor, Pseudomonasspp, Enterococcus spp have been isolated, and this is in line with, which shows that Staphylococcus, Candida and Enterococcus are among the most common pathogens of hospital-acquired infections in all sections of Italy. Candida was found to be the fourth leading cause of intrauterine infections in the United States of America. Candida infection was more frequent than isolated samples. This was agreed by. In this study, these isolates were extracted from urinary, which was 20 isolates of Candida and other fungi less frequently, similar to as shown in table below:

Table 1: Types and percentages of fungus isolated from the samples of urine:

<table>
<thead>
<tr>
<th>No.</th>
<th>The percentage of their presence in the samples</th>
<th>The types of isolated fungus</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>21</td>
<td>Candida spp</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>Mucor spp</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>Curvulariaspp</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
<td>Cladosporiumspp</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>Pseudomonas</td>
</tr>
<tr>
<td>6</td>
<td>4</td>
<td>Enterococcus spp</td>
</tr>
</tbody>
</table>

For the pathogens were isolated from 18 skin samples and identified several species belonging to 5 fungal strains as shown in Table (2)

Table 2: Fungal species and strains isolated from the skin sample

<table>
<thead>
<tr>
<th>No.</th>
<th>The types of isolated fungus</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Aspergillusflavus</td>
</tr>
<tr>
<td>2</td>
<td>Aspergillus fumigatus</td>
</tr>
<tr>
<td>3</td>
<td>Candida albicans</td>
</tr>
<tr>
<td>4</td>
<td>C. tropicalis</td>
</tr>
<tr>
<td>5</td>
<td>Microsporium. Gypseum</td>
</tr>
<tr>
<td>6</td>
<td>M. nanum</td>
</tr>
<tr>
<td>7</td>
<td>M. canis</td>
</tr>
<tr>
<td>8</td>
<td>Trichophytonspp</td>
</tr>
</tbody>
</table>
Table 3: The isolates isolated by injury

<table>
<thead>
<tr>
<th>No.</th>
<th>Fungal species</th>
<th>Location injury</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Aspergillusflavus</td>
<td>Skin and hair</td>
</tr>
<tr>
<td>2</td>
<td>Aspergillus fumigatus</td>
<td>Scraps Skin and hair</td>
</tr>
<tr>
<td>3</td>
<td>Candida albicans</td>
<td>Nails</td>
</tr>
<tr>
<td>4</td>
<td>C. tropicalis</td>
<td>Nails and hair</td>
</tr>
<tr>
<td>5</td>
<td>Microsporium gypseum</td>
<td>Scraps Skin and hair and nail</td>
</tr>
<tr>
<td>6</td>
<td>M. nanum</td>
<td>hair</td>
</tr>
<tr>
<td>7</td>
<td>M. canis</td>
<td>Skin and hair</td>
</tr>
<tr>
<td>8</td>
<td>Trichophytonspp</td>
<td>Scraps Skin and hair</td>
</tr>
<tr>
<td>9</td>
<td>Epidermatophytonsspp</td>
<td>Scraps Skin and hair</td>
</tr>
</tbody>
</table>

The results of fungal species and genus isolated from skin samples have revealed emergence of fungal species including *Aspergillusflavus, A. fumigatus, Candida spp, Microsporiumcanis, Trichophytonspp, Epidermatophyton spp*, and this result is consistent with the findings\(^2^3\), and this study mentioned above has shown that *Trichophytonspp*, responsible for *Tinea nail* infection, more frequent among fungi and this is consistent with the findings of the researchers\(^2^4\). The study also showed that the most common areas of the body are nails if they are isolated from fungi *Candida spp, Microsporiumcanis, Trichophytonspp* and *Epidermatophyton spp*. It may be due to its ability to produce some enzymes such as Phospholipase, which play an important role in penetrating host tissues. *Candida spp*. Yeast has been isolated which plays an important role in superficial skin injuries, especially in the nails and in systemic infections\(^2^5\).

**Conclusion**

It is known that the fungi are eukaryotic organisms with metabolic processes and structures similar to hosts of other eukaryotes, including animals and humans, so it is difficult to treat the problems of fungi over the years, especially in superficial and deep skin injuries.

**Conflict of Interest:** None

**Funding:** Self

**Ethical Clearance:** Not required.

**Reference**


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Waiting Time and Patient Satisfaction in Oral Diagnostic Polyclinic, Department of Dentistry, RSUPN dr. Cipto Mangunkusumo

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Abstract

Background: The decline of patients in the Department of Dentistry by 2017 compared to 2016 indicated a problem with the quality of service. One of factors that affected patient satisfaction was waiting times. The length of waiting times could decrease patient perceptions of satisfaction.

Objective: To analyze waiting times and patient satisfaction in the Oral Diagnostic Polyclinic, Department of Dentistry, RSUPN Dr Cipto Mangunkusumo.

Method: A cross-sectional study was conducted on 70 respondents. Data was analyzed to calculate frequency distribution of variables and correlation between the survey and waiting time using Spearman test (p value<0.05).

Results: Response time and satisfaction survey on waiting time to dentist in this study didn’t fulfill the standards set by the Ministry of Health (<60 minutes for response time and ≥90% for survey). Some medical record also was found after the dentist examination. There was a significant relationship between the waiting time to dentist with patient satisfaction on waiting time to dentist (p=0.043, r=-0.242).

Conclusion: Increasing length of waiting time in oral diagnostic polyclinic, RSUPN-CM, due to medical record and dentist examination factor, could decrease patient satisfaction.

Keywords: Waiting time, Patient Satisfaction, Response Time, Public Hospital.

Introduction

National Central General Public Hospital Dr. Cipto Mangunkusumo (RSUPN-CM) is a type A hospital which is the highest referral center in Indonesia. Although in the current era of National Health Insurance imposed a tiered referral system, the high number of referrals to the RSUPN-CM lead the patient’s overload and waiting time enhancement ¹. Patients declining in 2017 compared to 2016 indicated a problem with the quality of service. Quality of service patient satisfaction assessment revolved around skills, attitudes, behaviors, facilities and waiting time ². Waiting time is one of the important points in health service aspect ³. Waiting time is how longer patient wait in the polyclinic before meeting with the medical staff. The length of waiting times could lead to a decrease in patient perceptions of satisfaction³, ⁴.

The type and quality of basic services for the patient had been established by the Ministry of Health through Kepmenkes No.129/2008 on Hospital Minimum Service Standard. In the regulation, the waiting time indicator in outpatient service is less than 60 minutes and patient satisfaction should be more than 90%⁵. In Indonesia, research on outpatient waiting time had been done.

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RSUD Indramayu response time was 70.18 minutes. Department of Dentistry in RSPAD Gatot Soebroto response time was 93.3 minutes. In Malaysia, the length of waiting time on doctor was 70 minutes. In Nigeria, the waiting time of most respondents was 90-180 minutes while the recommendation was 30 minutes.

Every patient who was treated at the Department of Dentistry would be checked first in oral diagnostic polyclinic. Oral Diagnostic was the forefront of Department of Dentistry as every new patient or long-term patients every two years should undergo re-examination before delivered into appropriate field of dental specialization. The examination time in the diagnostic oral polyclinic was often prolonged and leads to treatment inhibition.

In conducting public services, the hospital was responsible for the quality provided, including the case of patients waiting time to received health services. This had been reflected in the vision and clarified in the first mission of RSUPN-CM which was to provide high quality and affordable health services to all levels of society.

Objectives: The purpose of this study was to analyze service waiting times and patient satisfaction surveys in the Oral Diagnostic Polyclinic, Department of Dentistry, RSUPN-CM.

Materials and Method

Cross sectional study was done to 70 respondents after ethical clearance has been approved by Health Research Ethics Committee, Faculty of Medicine, Indonesia University (Number:0718/UN2.F1/ETIK/2018). The study was conducted from March to May 2018 in the Integrated Outpatient Unit, Department of Dentistry, RSUPN dr. Cipto Mangunkusumo, Jakarta. Data was collected by questionnaires for satisfaction survey and direct observation for the analysis of waiting time in oral diagnostic polyclinic.

Data analysis used in this research was univariate and bivariate analysis. Univariate analysis was used to calculate frequency distribution of variables. Bivariate analysis was used to determine relationship between two variables using spearman test.

Results

A. The Characteristic of Respondent: Table 1 showed the most widely respondent’s age range was >46 years (41.4%). Most respondents were female (62.9%). Respondents came mostly for two reasons, doctor’s referral (55.7%) and willingness of their own (40%). National health insurance was the most payment used by respondents (72.9%).

Table 1. The Frequency of Respondents Characteristics (n=70).

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n (% )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
</tr>
<tr>
<td>&lt;18</td>
<td>4 (5.7 )</td>
</tr>
<tr>
<td>18-25</td>
<td>10 (14.9)</td>
</tr>
<tr>
<td>26-35</td>
<td>13 (18.8)</td>
</tr>
<tr>
<td>36-45</td>
<td>14 (20 )</td>
</tr>
<tr>
<td>&gt;46</td>
<td>29 (41.4)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>26 (37.1)</td>
</tr>
<tr>
<td>Female</td>
<td>44 (62.9)</td>
</tr>
<tr>
<td>Reason for Choosing RSUPN-CM</td>
<td></td>
</tr>
<tr>
<td>Doctor’s referral</td>
<td>39 (55.7)</td>
</tr>
<tr>
<td>Friend’s referral</td>
<td>0</td>
</tr>
<tr>
<td>Willingness of their own</td>
<td>28 (40 )</td>
</tr>
<tr>
<td>Family’s referral</td>
<td>3 (4.3 )</td>
</tr>
<tr>
<td>Others</td>
<td>0</td>
</tr>
<tr>
<td>Payment Method</td>
<td></td>
</tr>
<tr>
<td>Personal</td>
<td>19 (27.1)</td>
</tr>
<tr>
<td>National health insurance</td>
<td>51 (72.9)</td>
</tr>
</tbody>
</table>

B. Satisfaction Survey: Table 2 showed that 70 respondents were satisfied with polyclinic registration. A total of 92.9% of respondents stated the length of waiting time to the nurse was good and very good. There were 41 respondents stated that the length of waiting time to the doctor was good and very good (74.3%) but there were 25.7% of respondents stated fair. 58.6% of respondents stated that the conspicuousness of waiting time in oral diagnostic polyclinic was good and very good but there are 2.9% of respondents and 38.6% of respondents stated the conspicuousness of waiting time is poor and fair. The conspicuousness of waiting time is questions of patient about when exactly patient was called and how long it took to wait.
Table 2. Frequency distribution of patient satisfaction level at March-May 2018

<table>
<thead>
<tr>
<th>Statement</th>
<th>Poor</th>
<th>Fair</th>
<th>Good</th>
<th>Very Good</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>(%)</td>
<td>n</td>
<td>(%)</td>
</tr>
<tr>
<td>Policlinic Registration</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>The length of waiting time to nurse</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>7.1</td>
</tr>
<tr>
<td>The length of waiting time to the doctor</td>
<td>0</td>
<td>0</td>
<td>18</td>
<td>25.7</td>
</tr>
<tr>
<td>The conspicuousness of waiting time</td>
<td>2</td>
<td>2.9</td>
<td>27</td>
<td>38.6</td>
</tr>
</tbody>
</table>

C. Waiting Time Analysis

1. **The Length of Medical Record Found:** The length of medical record found was the time difference between admission registration to medical records found. The median record value of the duration was 43 minutes with the range 3 minutes and 367 minutes.

2. **The length of the nursing care:** The length of the nursing care is the time the nurse need to do nursing care to the patient in the examination room. The length of the nursing care in this study showed a median value 10 minutes with a minimum value 3 minutes to a maximum value 15 minutes.

3. **The length of dentist’s examination:** The length of dentist’s examination is the time dentist needs to consult and perform a physical examination with a patient in the examination room. The median value of the length of dentist’s examination was 12 minutes with a minimum value of 5 minutes and a maximum value of 95 minutes.

4. **Response time:**

Table 3. Frequency of Outpatient Response Time in Oral Diagnostic Polyclinic, RSUPN-CM

<table>
<thead>
<tr>
<th>Waktu (in minutes)</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤60</td>
<td>10 (14.3)</td>
</tr>
<tr>
<td>&gt;60</td>
<td>60 (85.7)</td>
</tr>
</tbody>
</table>

Response time is the time patient takes from registration in admission until examined by the doctor in the examination room. In this study, only 10 patients meet the ideal response time (14.29%) and 60 patients have more than 60 minutes (85.71%) for response time.

5. **Outpatient Waiting Time Stage from Admission to Oral Diagnostic Polyclinic**

Table 3. Frequency of Waiting Time for Outpatient Oral Diagnostic Polyclinic

<table>
<thead>
<tr>
<th>Time (in minutes)</th>
<th>17 (3-301)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interval of Admission – Polyclinic Registration</td>
<td></td>
</tr>
<tr>
<td>Interval of Polyclinic Registration – Nursing Care</td>
<td>30 (0-142)</td>
</tr>
<tr>
<td>Interval of Nursing Care – Dentist Examination</td>
<td>40 (5-159)</td>
</tr>
</tbody>
</table>

*Median (min-max)*

Table 4 showed the frequency of waiting time outpatient oral diagnostic polyclinic. The patient took 17 minutes (minimum 3 minutes and maximum 301 minutes) for admission registration to polyclinic registration. Then the patient waited 30 minutes (with a minimum value of 0 minutes and a maximum value of 142 minutes) to obtain nursing care from oral diagnostic nurses. After that, the patient returned to wait 40 minutes (with a minimum grade 5 minutes and a maximum value 159 minutes) to obtain examination by an oral diagnostic dentist.

Table 5 stated 77% of patients who registered in the Admission before 10 am. From 77% patients, only 58.6% who reached the polyclinic before 10 am. This also showed a gap of time between patients registered in admission and in oral diagnostic polyclinic. This may be because the patient did a prior examination in another polyclinic then oral diagnostic polyclinic. Medical records found before 10 am was only 44.3%. There was a gap of time between medical record found and dentist’s examination start time in some patients. Nursing care had been done by nurse before 10 am only 40% and examination done by doctor only 18.6%. The dentist’s examination was performed in the absence of complete medical records.
Table 5. The Stage of Outpatient Oral Diagnostic from Admission Registration to Dentist Examination.

<table>
<thead>
<tr>
<th>Stages n (%)</th>
<th>Admission Registration Time</th>
<th>Polyclinic Registration Time</th>
<th>Medical Record Found Time</th>
<th>Nursing Care Start Time</th>
<th>Dentist Examination Start Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;09.00</td>
<td>35 (50)</td>
<td>20 (28,57)</td>
<td>8 (11,43)</td>
<td>8 (11,43)</td>
<td>2 (2,86)</td>
</tr>
<tr>
<td>09.00-09.59</td>
<td>19 (27,14)</td>
<td>21 (30)</td>
<td>23 (32,86)</td>
<td>20 (28,57)</td>
<td>11 (15,71)</td>
</tr>
<tr>
<td>10.00-10.59</td>
<td>14 (20)</td>
<td>16 (22,86)</td>
<td>15 (21,43)</td>
<td>19 (27,14)</td>
<td>20 (28,57)</td>
</tr>
<tr>
<td>11.00-12.00</td>
<td>2 (2,86)</td>
<td>11 (15,71)</td>
<td>9 (12,86)</td>
<td>15 (21,43)</td>
<td>15 (21,43)</td>
</tr>
<tr>
<td>&gt;12.00</td>
<td>0</td>
<td>2 (2,86)</td>
<td>15 (21,43)</td>
<td>8 (11,43)</td>
<td>22 (31,43)</td>
</tr>
</tbody>
</table>

D. Relationship between Satisfaction Survey and Waiting Time

Table 6. Correlation statistic test between satisfaction survey and waiting time of outpatient oral diagnostic polyclinic

<table>
<thead>
<tr>
<th></th>
<th>Data distribution</th>
<th>Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>p</td>
<td>p</td>
</tr>
<tr>
<td>Waiting time to Nurse</td>
<td>0.004</td>
<td>0.969</td>
</tr>
<tr>
<td>Patient statement on waiting time to nurse</td>
<td>0.000</td>
<td>0.043*</td>
</tr>
<tr>
<td>Waiting time to dentist</td>
<td>0.024</td>
<td>0.969</td>
</tr>
</tbody>
</table>

Data distribution test showed all variables had abnormal data distribution. The correlation test between waiting time to nurse and patient satisfaction on waiting time to nurse was not significant (p> 0.05) Whereas, the correlation test between waiting time to dentist and patient satisfaction on waiting time to dentist was significant (p <0.05). The r value -0.242 indicates the longer waiting time, the less patient satisfied and vice versa.

Discussion

In this study, most patients waited more than 60 minutes (85.7%), which were not suitable with Minimum Service Standards Hospital. Huang (1994) stated that patients were more satisfied when they waited less than 37 minutes. The length of response time (> 60 minutes) was due to large numbers of patients, frequent late-delivery medical records, limited examination room, lack of personnel, and the presence of internet connection problem. RSUPN dr. Cipto Mangunkusumo is an educational hospital where the medical personnel is an educators and also administration job who take time in hours of service.

Most patients in RSUPN-CM used national health insurance covered payment system. Based on national health insurance regulation, the patient was allowed to visit two polyclinics in one day. There was a gap between registration between admission and oral diagnostic polyclinic because the patient had been treated in other polyclinics then registered in dental polyclinic after. The outcome was the medical record obstructed and not arrived on time in oral diagnostic polyclinic.

Medical records were found in a long time for some patients that contribute to the length of waiting times because dentist needed medical records to take subsequent decisions on dental practice accurately for complex cases to determine optimal treatment. Unchecking medical history and past treatment were an extreme-categorized incident that could induce iatrogenic harm and endanger patient safety. Medical records were found frequently in 43 minutes. Ideally, the medical records have to be found less than 10 minutes.

In this study, the length of dentist examination was frequently 12 minutes. The dentist need more time if it required exploring psychosocial issues related to diagnose the disease. Slower and longer consultation was also associated with doctors being more likely to explore presenting complaints more accurately, prescribe less and offer more preventative advice. Communication was important because the good interpersonal communication was built to improve the positive response of the patient. Most nurses checked patients less than 10 minutes (90%). However, rapid examination could also be detrimental, as nurses did not understand that longer examination time was useful in order to identify patient factors better and strengthen patient and nurse relationships.

In this study, patient’s waiting time to the dentist is negatively correlated with patient satisfaction which means the longer the patient waits the more dissatisfy the patient would be. The patient stated only 74.3% satisfied
for satisfaction survey for waiting time on doctor. That was not suitable with the standards set by the Ministry of Health (≥90%) 5.

The same statement also expressed by Anderson that patients were more satisfied when waiting time in the waiting room is shorter 18. Bleustein (2014) also stated that patient satisfaction was influenced by the length of waiting time. Increased waiting time also affected the perception of information, instruction and overall treatment by doctors. Most importantly, longer waiting time could actually reduce the patient’s perception of a doctor’s ability and the confidence expressed in the care provided. The doctor tardiness and patient complexity could also heavily impact waiting time 19. Another study by Kreitz (2016) stated the same thing that the longer the patient waited would affect his satisfaction 20. Increasing waiting time in RSUPN-CM required follow-up either on system improvement or on facility improvement as of RSUPN dr. Cipto Mangunkusumo could improve the quality of patient care.

**Conclusion**

This cross sectional study concludes that the longer the patient waits the more dissatisfy the patient would be. The length of waiting time from admission to dentist examination exceeded the limit set by the Minister of Health (≤60 minutes). The medical staff and medical record factors became factors causing long waiting in oral diagnostic polyclinic

**Conflict of Interest:** No potential conflict of interest was reported by author.

**Source of Funding:** The current research did not receive any specific grant.

**Ethical Clearance:** All of the procedures were conducted according to the approval of Health Research Ethics Committee, Faculty of Medicine, Indonesia University (Number:0718/UN2.F1/ETIK/2018).

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Spectrophotometric Determination of Nifedipine in Pharmaceutical Tablets Using Batch and Flow Injection Method Via Diazotization Coupling Reaction

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Abstract

Batch and Flow injection analysis (FIA) spectrophotometric Method have been presented for determination of nifedipine (NIF) in pure and pharmaceutical forms. The Method were based on the diazotization coupling reaction of NIF with diazotized p-nitro aniline (DPNA) in the presence of alkaline medium. Red product was formed and measured at $\lambda_{\text{max}}$ 509 nm. All optimum conditions were studied for each method. Linearity of NIF was observed for batch 20-100 µg.mL$^{-1}$ and for FIA 5-120 µg.mL$^{-1}$ and the detection limits were 4.197, 1.326 µg.mL$^{-1}$ for batch, FIA respectively. The method offered a good sensitivity, accuracy and precision; FIA was more convenient than batch method because of the wider linear range moreover, the sampling rate was 28 injections per hour but less reproducibility than batch method. A comparison study was carried out between the proposed and standard Method by calculating students’ t-test and F-test indicated no significant differences between them, the suggested method could be utilized for pharmaceutical analysis.

Keywords: Nifedipine, p-nitro aniline, diazotization coupling reaction, flow injection analysis, spectrophotometry.

Introduction

Nifedipen (NIF) is calcium channel blocker and kind of 1,4-dihydropyridine (1,4-DHP), chemically known as dimethyl-1,4-dihydro-2,6-dimethyl-4-(2-nitrophenyl) pyridine-3,5 dicarboxylate. It is a yellow crystalline substance, insoluble in water but soluble in ethanol¹, it undergoes photochemical oxidation when exposing to light, more sensitive to light in solution than in crystalline form². NIF has abundant therapeutic activities; used in the management of hypertension, angina pectoris, and some other cardiovascular disorders³. Various analytical Method have been reported for determination NIF in pharmaceutical forms, and biological fluids, such as spectrophotometric⁴,⁵; spectrofluorometric⁶,⁷; electrochemical method⁸,⁹; liquid chromatographic method¹⁰,¹¹ and recently flow injection analysis¹². Determination of NIF by spectrophotometric technique considered as available and uncomplicated method that can use in routine analysis as quality control laboratories. This technique based on the reaction of drug with specific reagents to form colored product¹³,¹⁴. Diazotization coupling reaction is one of the important reactions that gives stable and rapid coupling organic product, with high sensitivity measured spectrophotometrically¹⁵,¹⁶. The suggested study described two spectrophotometric Method, batch and FIA for determination of NIF by diazotization coupling reaction through reaction of p-nitro aniline (PNA) with sodium nitrite and hydrochloric acid then the formed diazotized reagent coupled with NIF in the presence of alkaline medium, a colored product appeared directly and measured.

Experimental

Apparatus: Shimadzu UV Visible spectrophotometer (UVmini-1240 apan) was used for spectral and absorbance measurements, 1cm quartz cell, flow cell (Cecil) with 50µL internal volume and 1cm path length. Peristaltic pump with 6 channels (Ismatec, Labortechnik-Analytic, type CH-8152, Glatbrugg Zurich-Switzerland) to pump the solutions through flexible tubs (0.8mm i.d.), teflon tubes (0.5mm i.d.) were used to make different reaction coil lengths. Injection valve (Knauer, Germany) included 6-ports with different loops (Rheodyne, Altex210, Supelco USA) to inject samples. In FIA, two-channel manifolds were provided.
Materials: All the reagents, solvents and chemicals were of analytical grade. NIF as pharmaceutical grade was supplied from sigma chemical co. (Germany) and the Pharmaceutical dosage as tablets (Adalat®LA, 30mg, Payer Pharma, Germany).

Preparation of Solutions

Hydrochloric acid solution (1M): Diluting 8.4mL of 11.97M concentrated hydrochloric acid (Thomas Baker, India 37%, M. Wt=36.46 g.mol\(^{-1}\)) with distilled water in 100 mL volumetric flask.

Sodium hydroxide solution (1M): dissolving 4g of sodium hydroxide (BDH, England, M. Wt=40g.mol\(^{-1}\)) using distilled water and complete the volume to 100mL with the same solvent.

Potassium hydroxide solution (1M): Weighing 5.6g of potassium hydroxide (BDH, England, M.Wt=56.11g.mol\(^{-1}\)) and dissolved by the use of distilled water, transferred into 100 mL volumetric flask then completed to the mark with same solvent.

Ammonium hydroxide (1M): Diluting 7.5mL of 13.36M of concentrated ammonium hydroxide (Fluka, Switzerland, 25%, M. Wt=17.03g.mol\(^{-1}\)) with distilled water in 100mL volumetric flask.

Sodium carbonate (1M): Dissolving 10.6g of sodium carbonate (BDH, England, M. Wt=106g.mol\(^{-1}\)) using distilled water and poured into 100 mL volumetric flask made up to the mark with same solvent.

Diazotized p-nitroaniline (DPNA) solutions (0.007, 0.005M): The solutions of PNA (BDH, UK, M.Wt=138.126g.mol\(^{-1}\)) and NaNO\(_2\) (Fluka, Switzerland, M.Wt=69g.mol\(^{-1}\)) were prepared freshly. Equimolar prepared by dissolving (0.0966, 0.0690g) of PNA followed by 3mL of HCl (1M) and (0.0483, 0.0345g) of NaNO\(_2\) respectively in 100 mL volumetric flasks. The mixtures were chilled on an ice bath with shaking for 5 minutes, then made up to the mark with distilled water. The diazotized reagents were left to stabilize for 15 minutes.

Reduction nitro group to amino group in NIF: Reduced NIF solution was performed by weighing pure NIF 50mg and dissolved in 50mL of ethanol, transferred the solution into 150mL beaker; 20mL of distilled water was added then 20mL of conc. HCl(11.97M) and 3g of zinc powder. The solution was stood for 15min at 25°C then filtered in 100mL volumetric flask and completed with distilled water to get 500µg.mL\(^{-1}\) stock solution\(^{17}\) and was ready for next experiments.

Preparation of pharmaceutical form samples: Commercial NIF (adalat-30mg) 20 tablets were weighted and grinded. The amount of NIF equivalent to 50mg was taken, dissolved in 30mL of ethanol. The solution filtered into a 50mL volumetric flask, washed and completed with ethanol into 150mL beaker and reduced as previously described. Working solutions of pharmaceutical tablets were made using distilled water.

General batch procedure: Various concentrations (20-100µg.mL\(^{-1}\)) were prepared from reduced NIF solution and transferred into a set of 10 mL volumetric flasks then added 1mL of KOH(1M) followed by 3mL of DPNA (5x10\(^{-3}\)M). The solutions were mixed well and left 15min, diluted to the mark with distilled water. Red dye was formed and measured at 509 nm. For the optimization of conditions in all subsequent experiments, 40µg.mL\(^{-1}\) of NIF was chosen.

General FIA procedure: Working solutions of NIF ranged from 5 to 120µg.mL\(^{-1}\) were prepared. The solutions were injected in 100µL sample loop through a carrier solution of DPNA (7x10\(^{-3}\)M) then mixed with a stream solution of KOH (0.1M). The flow rate was -1.9mL.min\(^{-1}\), the stream solutions mixed together in 150cm reaction coil (Figure 1a). The red dye absorbance was measured at 509nm. Optimization of conditions was carried out using 40µg.mL\(^{-1}\) of NIF.
Results and Discussion

It was found that NIF could be coupled with DPNA in alkaline medium to form a red dye measured at $\lambda_{\text{max}}$ 509 nm (Figure 1b). The chemical and physical parameters which may be affected the sensitivity and stability of colored product were optimized by studying one variable with time and established the others.

Optimization of Reaction Conditions

Batch spectrophotometric method: The optimum of conditions for the determination of NIF in batch method were studied. The optimum volume of HCl(M) was 3 mL which given high sensitivity, DPNA as diazotized reagent is rapid, available and stable reactant in diazotization coupling reaction, so it was necessary to study the effect of different volumes of DPNA-(5x10${}^{-3}$M), the optimum volume was 3 mL which suitable to get the highest intensity color and absorbance. The effect of alkaline medium in diazotization coupling reaction was confirmed by previous studies which proved the colored dyes were formed only after adding bases. Various types of basic were studied to select suitable one, NaOH, KOH, NH$_4$OH and Na$_2$CO$_3$ (1M) were chosen and the results revealed maximum stability and sensitivity when KOH added. The influence of KOH volume was also studied, the maximum absorbance was observed when adding 1 mL of KOH. The order of adding NIF, DPNA and KOH solutions were considered and studied by selecting three different orders, the best was revealed in (NIF-OH-DPNA) order. It was important to measure how long the colored product can be stable, so the effect of reaction time was studied started from 3 to 40 min, the intensity of the color increased and reached the maximum after 15 min then stabilized for at least 40 min.
The Stoichiometry of the reaction product: The structure of the red product was adopted based on Mole ratio method to investigate the stoichiometry of the reaction between NIF and DPNA. An equimolar (1.4×10⁻³ M) of NIF and DPNA solutions were used, (Figure-2a) indicated the existence of 1:1 (DPNA:NIF).

Reaction mechanism of the method: The proposed mechanism as described below, the reaction involving two steps the first one sodium nitrite reacted with p-nitroaniline in acidic medium, to form diazonium chloride ion the second step, the diazonium ion is coupled with NIF in alkaline medium to give red product.¹⁸,¹⁹

![Figure 2: a-The Stoichiometry of the reaction product using mole ratio method. b-Studying the effect of DPNA concentrations in the FIA method and selecting the optimum. c-Studying the effect of KOH concentrations in the FIA method and chosen the optimum.]

![Reaction mechanism diagram]
**FIA-Spectrophotometric Method**

**Effect of FIA manifold:** Selection of the best manifold for flow system is very essential, therefore various manifolds were utilized to perform the reaction when the 75 µL of 40 µg mL⁻¹ of NIF was injected with total flow rate 1.9 mL min⁻¹ and 100 cm reaction coil, the concentrations for DPNA, KOH solutions were 5x10⁻³, 0.2 M respectively. The results revealed the manifold in (Figure 1a) given the best absorbance and was chosen for further experiments. The physical and chemical parameters were studied by varying one while the other parameters fixed and the injection sample repeated three times.

**Optimization of the FIA System Parameters**

**Effect of chemicals variables:** Studying the effect of different concentrations of each DPNA, KOH solutions were essential to improve the sensitivity of the adopted reaction. The range of (1x10⁻³-10x10⁻³ M) of DPNA solutions was examined. Through the results in (Figure 2b), the optimum concentration was 7x10⁻³ M given highest absorbance, therefore was chosen for further use. Different concentrations of alkaline medium KOH were also investigated ranged from (0.05-0.5 M), the best concentration was 0.1 M because it showed maximum absorbance (Figure 2c), so it was considered as optimum variable.

**Effect of physical variables:** The physical parameters have an effective role in FIA to produce high sensitivity. Flow rate was an important condition because of its influence on dispersion of sample zone, so different flow rates were selected from 0.7 to 3.2 mL min⁻¹, the results showed that flow rate 1.9 mL min⁻¹ gave the highest absorbance and good precision (Figure 3a). After this value the absorbance would be decreased with increasing the flow rate because the high flow of the solutions may never give the reactants enough time to mix with the sample zone, hence it get out the flow cell radially. For mixing the reactants and complete the coupling reaction, different reaction coil lengths was studied in the range of 25-250 cm. The results indicated 150 cm length of reaction coil gave the highest absorbance as shown in (Figure 3b) and established as optimum parameter, whereas increasing coil length higher than 150 cm may cause increasing in dispersion resulting from dilution which was due to spending more time in the coil thus led to decrease the absorbance in addition to increase the analysis time. The volume of the injected sample was investigated using fivesample loops (75-250 µL) it was shown that the injected sample of 100 µL gave the best absorbance, therefore chosen for further experiments, above this volume may effect on dispersion of the sample zone and caused no intermixing with the reagents streams led to drop of sensitivity and sampling rate (Figure 3c). After studied all variables, the sampling frequency or sampling rate can be calculated theoretically by measuring the time from the moment of sample injection to the appearance of the maximum absorbance. The calculated time was 2.15 min; therefore the sampling frequency was 28 samples per hour.

**Validation of the current method:** Analytical characteristics; linearity, detection limit, sampling rate, correlation coefficient and relative standard deviation (RSD) of each method were calculated (Table 1). Comparison of batch with FIA Method, the latter is more convenient than the former method, more sensitive and wider linear range furthermore it was rapid (sampling rate 28 injections per hour), but less in reproducibility.

**Accuracy and precision:** Accuracy and precision of the proposed Method were estimated, three different concentrations of NIF were applied for batch and FIA with five replicate. The values of RE%, Rec%, and RSD% summarized in (Table 2) and indicated a good accuracy, and high precision for the two current Method.
Pharmaceutical applications: Batch and FIA Method were adopted to estimate NIF in pharmaceutical forms (tablets containing 30mg NIF) by taken three different concentrations of pharmaceutical dosages with five replicate, the results in (Table2) indicated a good precision and accuracy. To evaluate the efficiency of the suggested Method, a comparison study was carried out between the proposed and standard Method by calculating Student’s t-test and F-test. The results proved that calculated value less than theoretical one, so there was no significant difference between the Method (Table 2).

Table1: The analytical characteristics of Batch and FIA Method

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Batch method</th>
<th>FIA method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression equation</td>
<td>$y = 0.0083x + 0.151$</td>
<td>$y = 0.0127x + 0.0007$</td>
</tr>
<tr>
<td>Linear range (µg.mL$^{-1}$)</td>
<td>20-100</td>
<td>5-120</td>
</tr>
<tr>
<td>Correlation coefficient (R2)</td>
<td>$r^2 = 0.9944$</td>
<td>$r^2 = 0.9993$</td>
</tr>
<tr>
<td>Limit of detection (µg.mL$^{-1}$)</td>
<td>4.197</td>
<td>1.326</td>
</tr>
<tr>
<td>Limit of quantification (µg.mL$^{-1}$)</td>
<td>12.718</td>
<td>4.019</td>
</tr>
<tr>
<td>Reproducibility %</td>
<td>&lt;0.573</td>
<td>&lt;1.26</td>
</tr>
<tr>
<td>Average of recovery, %</td>
<td>101.107</td>
<td>99.93</td>
</tr>
<tr>
<td>Through-put (sample per hour)</td>
<td>4</td>
<td>28</td>
</tr>
</tbody>
</table>
Table 2: Accuracy and precision of batch and FIA Method for NIF (pure) and pharmaceutical tablets and the statistical comparison between the current and standard Method.

<table>
<thead>
<tr>
<th>Dosage form</th>
<th>Method</th>
<th>Conc. of NIF, µg.mL⁻¹</th>
<th>RE%</th>
<th>Rec.%</th>
<th>RSD%&lt;sup&gt;a&lt;/sup&gt;</th>
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<tbody>
<tr>
<td>NIF (pure)</td>
<td>Batch</td>
<td>Added 50</td>
<td>50.72</td>
<td>1.45</td>
<td>101.45</td>
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<tr>
<td></td>
<td></td>
<td>70</td>
<td>70.55</td>
<td>0.79</td>
<td>100.79</td>
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<tr>
<td></td>
<td></td>
<td>80</td>
<td>80.87</td>
<td>1.08</td>
<td>101.08</td>
</tr>
<tr>
<td></td>
<td>FIA</td>
<td>30</td>
<td>30.10</td>
<td>0.34</td>
<td>100.34</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50</td>
<td>48.53</td>
<td>-2.94</td>
<td>97.06</td>
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<tr>
<td></td>
<td></td>
<td>60</td>
<td>61.44</td>
<td>2.40</td>
<td>102.40</td>
</tr>
<tr>
<td>NIF Tablets (adalat-30mg)</td>
<td>Batch</td>
<td>30</td>
<td>29.40</td>
<td>-2.01</td>
<td>97.99</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50</td>
<td>50.12</td>
<td>0.24</td>
<td>100.24</td>
</tr>
<tr>
<td></td>
<td></td>
<td>70</td>
<td>71.93</td>
<td>2.75</td>
<td>102.75</td>
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<tr>
<td></td>
<td>FIA</td>
<td>40</td>
<td>41.30</td>
<td>3.25</td>
<td>103.25</td>
</tr>
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<td>60</td>
<td>60.80</td>
<td>1.33</td>
<td>101.33</td>
</tr>
<tr>
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<td></td>
<td>80</td>
<td>80.01</td>
<td>0.01</td>
<td>100.01</td>
</tr>
<tr>
<td>Pharmaceutical formulation</td>
<td>Rec%&lt;sup&gt;b&lt;/sup&gt;</td>
<td>Batch</td>
<td>100.33</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>FIA</td>
<td>101.53</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Standard method</td>
<td>101.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NIF Tablets (adalat-30mg)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pure NIF</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>t-test(4.303)&lt;sup&gt;c&lt;/sup&gt;</td>
<td></td>
<td></td>
<td>0.435</td>
<td></td>
<td>0.387</td>
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<tr>
<td>F-test(161.4)</td>
<td></td>
<td></td>
<td>2.564</td>
<td></td>
<td>1.198</td>
</tr>
</tbody>
</table>

<sup>a</sup>Five replicated injection for RSD, <sup>b</sup> average of three determination, <sup>c</sup> theoretical value

**Conclusion**

This study submitted new simple and sensitive Method (batch and FIA) for evaluation NIF in pure and pharmaceutical form via stable reagent PNA which is freely reacts to produce diazotized reagent and coupling with NIF to yield red product. Each suggested Method were simple, rapid and effective without requiring any complicated steps like extraction, heating or difficult preparation. As compared with other expensive techniques, the proposed Method are economic and inexpensive with an excellent accuracy and precision. FIA method more convenient than batch method, the sensitivity was better and linear range wider and sampling rate 28 injections per hour. The proposed Method could be employed for routine analysis.

**Conflict of Interest:** Nil

**Source of Funding:** Self

**Ethical Clearance:** Nil

**References**


Redesign of the Traditional Handloom for Sarong Female-Weavers Based on Anthropometric Data

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Abstract

Introduction: Poor working posture due to non-ergonomic handloom design might be a cause of musculoskeletal disorders (MSDs) in Samarinda Sarong weavers.

Objectives: This study describes the inconsistency of the present handloom used with weaver anthropometry data and presents a new design of handloom based on anthropometric dimensions.

Method: An anthropometric survey was carried out to determine the anthropometric dimensions of 50 female weavers. The existing handloom dimensions were also measured. The data were analysed using descriptive statistics (min., max., mean, median, mode, standard deviation and 5th, 50th and 95th percentiles), as well as distribution and uniformity. The Indonesian Standard for Workstation Design (ISWD) was used to redesign the chair and table of the traditional handloom.

Results: The traditional handloom dimensions were found to be incompatible with the body dimensions of the female weavers. This suggests that the weavers MSD sexhibited could be due to this incompatibility. Based on the anthropometric data collected, we have redesigned the traditional handloom.

Conclusions: The anthropometric data of the Samarinda Sarong female-weavers revealed body dimensions ill-suited to current traditional handloom dimensions. We have redesigned the traditional handloom based on these findings.

Keywords: Anthropometric dimension, musculoskeletal disorders, ergonomic, working posture, redesign handloom.

Introduction

In several countries, the rising of musculoskeletal disorders (MSDs) prevalence resulted considerable costs for both health and the weaving industry.1,2 Recently, we reported that 85% of Sarong Samarinda weavers in Indonesia experienced MSDs prevalence, with incidence of low, moderate, and high ratings at 15.0%, 7.5% and 77.5%, respectively.3 Skeletal muscle pain was primarily detected in the lower neck, shoulders, upper hands, bottom, waist, thighs, calves and ankles. MSDs were found to be associated with the education level, work experience, prolonged sitting time, work posture and body anthropometry. Work posture was the dominant variable responsible for MSD prevalence. Poor work posture may be caused by the ill-suited fit of the handlooms’ design to the anthropometry dimensions of the weavers.3

The risk factors of MSDs for the weavers are include awkward and static work postures, twisting and lifting motions, pushing and pulling motions, and repetitive work.2,3,4 Awkward and static posture problems are generally caused by non-ergonomic work equipment and workstation design,5 which greatly affected on performance and work productivity.6 This research describes the redesign of traditional handlooms, which is used by Samarinda Sarong weavers based on their anthropometric data.
**Material and Method**

An anthropometric survey was carried out to determine the anthropometric dimensions of 50 female weavers of Samarinda Sarongat East Kalimantan, Indonesia, from March to August in 2018.

Anthropometric dimensionsof the weavers, i.e. sitting height, sitting eye height, sitting shoulder height, sitting elbow height, sitting mid-shoulder height, waist height, popliteal height, buttock-popliteal length, shoulder breadth, hip breadth, waist breadth, elbow-to-elbow width, forearm-hand length and upper limb length (maximum extended arm) were determined. While the handloom chair dimensions measured were height, depth, width, backrest tilt angle, upper backrest, lower backrest, armrest height and armrest length; the handloom table dimensions included surface height, surface width, surface depth, foot rest/step-on height, swing arm handle and the surface angle.

Data were analysed using descriptive statistics (minimum, maximum, mean, median, mode, standard deviation and 5th, 50th and 95th percentiles), in addition to distribution and uniformity.\(^{(7)}\)

**Results and Discussion**

Demographic, anthropometric and current handloom dimension data: Demographic and anthropometric data of the weavers in this study are shown in Table 1 and Table 2, while dimension data of the current handloom\(^{(3)}\) is shown in Table 3.

### Table 1. Personal Characteristics of Samarinda Sarong Female Weavers (census, n=50)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Mean</th>
<th>SD</th>
<th>Range</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>45.60</td>
<td>11.55</td>
<td>45.00</td>
<td>28.00</td>
<td>73.00</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>55.88</td>
<td>9.40</td>
<td>39.00</td>
<td>35.00</td>
<td>74.00</td>
</tr>
<tr>
<td>Height (cm)</td>
<td>151.12</td>
<td>6.30</td>
<td>25.00</td>
<td>140.00</td>
<td>165.00</td>
</tr>
<tr>
<td>Working period (years)</td>
<td>20.38</td>
<td>13.43</td>
<td>57.00</td>
<td>1.00</td>
<td>58.00</td>
</tr>
<tr>
<td>Working time per day (hours)</td>
<td>6.12</td>
<td>1.25</td>
<td>7.00</td>
<td>3.00</td>
<td>10.00</td>
</tr>
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</table>

### Table 2. Anthropometric dimension of Samarinda Sarong weavers (census, n=50)

<table>
<thead>
<tr>
<th>Dimension (cm)</th>
<th>Mean</th>
<th>SD</th>
<th>5th</th>
<th>50th</th>
<th>95th</th>
<th>(p^*)</th>
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</thead>
<tbody>
<tr>
<td>Sitting height</td>
<td>81.50</td>
<td>3.63</td>
<td>74.00</td>
<td>82.00</td>
<td>87.45</td>
<td></td>
</tr>
<tr>
<td>Sitting eye height</td>
<td>69.44</td>
<td>3.79</td>
<td>62.55</td>
<td>70.00</td>
<td>75.45</td>
<td></td>
</tr>
<tr>
<td>Sitting shoulder height</td>
<td>52.90</td>
<td>2.92</td>
<td>47.00</td>
<td>53.00</td>
<td>58.00</td>
<td>0.909</td>
</tr>
<tr>
<td>Sitting elbow height</td>
<td>32.92</td>
<td>4.14</td>
<td>24.10</td>
<td>33.50</td>
<td>37.45</td>
<td>1.18</td>
</tr>
<tr>
<td>Sitting mid shoulder height</td>
<td>38.44</td>
<td>4.45</td>
<td>30.00</td>
<td>39.00</td>
<td>44.00</td>
<td></td>
</tr>
<tr>
<td>Waist height</td>
<td>23.88</td>
<td>2.56</td>
<td>20.00</td>
<td>24.00</td>
<td>28.00</td>
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<tr>
<td>Popliteal height</td>
<td>45.88</td>
<td>4.95</td>
<td>35.55</td>
<td>46.00</td>
<td>54.90</td>
<td>0.492</td>
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<tr>
<td>Buttock-popliteal length</td>
<td>53.32</td>
<td>3.49</td>
<td>47.00</td>
<td>53.50</td>
<td>60.45</td>
<td>0.928</td>
</tr>
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<td>Shoulder breadth</td>
<td>21.36</td>
<td>4.10</td>
<td>17.00</td>
<td>20.00</td>
<td>30.90</td>
<td></td>
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<tr>
<td>Hip breadth</td>
<td>34.34</td>
<td>4.52</td>
<td>27.00</td>
<td>34.50</td>
<td>42.45</td>
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<td>Waist breadth</td>
<td>29.16</td>
<td>3.90</td>
<td>24.10</td>
<td>28.00</td>
<td>36.90</td>
<td></td>
</tr>
<tr>
<td>Elbow to elbow</td>
<td>35.14</td>
<td>4.10</td>
<td>29.55</td>
<td>35.00</td>
<td>42.00</td>
<td></td>
</tr>
<tr>
<td>Forearm-hand length</td>
<td>33.72</td>
<td>2.09</td>
<td>30.00</td>
<td>34.00</td>
<td>37.00</td>
<td></td>
</tr>
<tr>
<td>Upper limb length/arm reach forward</td>
<td>69.20</td>
<td>3.44</td>
<td>63.55</td>
<td>70.00</td>
<td>73.00</td>
<td>1.158</td>
</tr>
</tbody>
</table>

Note: * Normality distribution and uniformity data test (Kolmogorov–Smirnov at \(\alpha 0.05\))
Table 3. Dimension difference of current and redesigned traditional handloom

<table>
<thead>
<tr>
<th>Part</th>
<th>Current</th>
<th>Redesigned</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chair</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Height (cm)</td>
<td>56.00</td>
<td>55.35</td>
</tr>
<tr>
<td>Depth (cm)</td>
<td>27.00</td>
<td>47.00</td>
</tr>
<tr>
<td>Width (cm)</td>
<td>40.00</td>
<td>48.65</td>
</tr>
<tr>
<td>Backrest tilt angle</td>
<td>-</td>
<td>120°</td>
</tr>
<tr>
<td>Upper backrest (cm)</td>
<td>-</td>
<td>47.00</td>
</tr>
<tr>
<td>Lower backrest (cm)</td>
<td>-</td>
<td>24.10</td>
</tr>
<tr>
<td>Armrest height (cm)</td>
<td>-</td>
<td>37.45</td>
</tr>
<tr>
<td>Armrest length (cm)</td>
<td>-</td>
<td>37.00</td>
</tr>
<tr>
<td><strong>Table</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surface height (cm)</td>
<td>79.00</td>
<td>88.44</td>
</tr>
<tr>
<td>Surface width (cm)</td>
<td>92.00</td>
<td>92.00</td>
</tr>
<tr>
<td>Surface depth (cm)</td>
<td>150.00</td>
<td>150.00</td>
</tr>
<tr>
<td>Foot rest/Step on (cm)</td>
<td>17.00</td>
<td>17.00</td>
</tr>
<tr>
<td>Swing arm handle (cm)</td>
<td>33-37</td>
<td>33-37</td>
</tr>
<tr>
<td>Angle to horizontal (°)</td>
<td>0° (flat)</td>
<td>0° (flat)</td>
</tr>
</tbody>
</table>

The proposed dimension of redesign handloom: Based on the MSDs prevalence from the previous study, we consider the dimension of the current traditional handloom design. Seven dimensions for the chair design (seat height, seat width, seat depth, seat angle/backrest tilt angle, seat backrest height (upper), seat backrest height (lower) and armrest height and length) and six dimensions for the table design (table surface height, table surface width, table surface depth, foot rest/step-on, swing arm handle depth and table angle). From in depth interviews with the female weavers, we found that only the table surface height dimension was detected as uncomfortable. We changed the table surface dimension and the rest of the handloom table dimensions remained the same as the original dimensions (Table 3). The proposed dimension of redesign handloom is shown in Figure 1.

**Figure 1. Construction of redesigned traditional handloom for Sarong Samarinda woman weavers.**

**Seat height:** The seat height is set to the non-adjustable height of 55.35 cm. It was designed using the 95th percentile of the popliteal height, as suggested by the ISWD, combined with the requirements of adding a shoe-heel allowance of 0.45 cm. The 95th percentile of the popliteal height of the weavers is 54.90 cm, while the handloom ‘step-on’ component is 0.45 cm because the weavers work without shoes.

**Seat depth:** The seat depth is set to 47 cm, as suggested by Molenbroek et al., Thariq et al., and Woo et al., to adhere to the 5th percentile of the buttock-popliteal length and the requirement that the seat depth should not exceed the buttock-popliteal length of the shortest user.
Seat width: The seat width of handloom chair is designed to be 42.45 cm with an allowance of 15% (6.3 cm), which translates to a seat width of 48.65 cm. The chair width constitutes the horizontal distance from the outer left side of the sitting surface of the seat to the outer right side. The seat width was designed using the 95th percentile of hip breadth.\(^{(15,18,17)}\)

Seat angle: The seat angle, or backrest tilt angle, is set to 120°, as this will reduce the occurrence of disc pressure as recommended from previous studies.\(^{(13–15)}\)

Upper backrest height: The upper backrest height (the vertical distance from the top side of the seat surface to the highest point of the backrest) is set to 47 cm, based on the recommendations to use the 5th percentile of sitting shoulder height.\(^{(18,14,19)}\) The upper backrest height is the key ergonomic element in the chair’s design, with its form and degrees important influences in improving sitting posture and maintaining a normal spine.\(^{(10)}\)

Lower and upper backrest heights: The lower and upper backrest heights of the handloom chair seat are set to 24.10 cm and 47 cm, respectively, based on the 5th percentile of sitting elbow height and the 5th percentile of sitting shoulder height measurements.\(^{(18,21)}\)

Armrest height and length: The armrest height and length are set to 37.45 cm and 37.00 cm, respectively. Appropriate height adjustments and sufficient armrest padding can reduce pressure on the undersides of the forearms and elbows. Unfortunately, some national standards provide missing or ambiguous information on the requirements for armrest design.\(^{(13)}\) These armrest height and length dimensions are based on the use of the 95th percentile of the sitting elbow height and the 95th percentile of forearm-hand length.\(^{(8)}\)

Table surface height: The table surface height for the redesign is set to 88.4 cm, using the 50th percentile of the sitting elbow height (vertical distance of the seat to the bottom of the elbow) plus the 95th percentile of the popliteal. The formula recommended by the ISWD\(^{(8)}\) is more suitable for the female weavers of the Samarinda Sarong than the formula proposed by Ismaila et al.\(^{(10)}\)

Table underneath the knees height: The height of the table underneath the knees (i.e. the distance between the bottom of the table and the knees of the user) is set to 25.50 cm based on considerations to use the 95th percentile popliteal height, which is 54.90 cm, added to the thickness of the handloom table (8.00 cm). This distance allows weavers space to perform “step-on” activities and to cross their legs.\(^{(19,22)}\)

Table surface: The ISWD\(^{(8)}\) recommends using the 95th percentile of forward arm reach, which was 73.00 cm in this study. Other standards suggest minimum work desk areas of 150 cm (Australia), 90 cm (Canada) and 70 cm (United States).\(^{(13)}\) However, the traditional handloom table surface width featured in this study is 92 cm, and the majority of weavers interviewed said they could operate comfortably within this space. Therefore, the width was not modified from this in the redesigned handloom.

Table surface depth: The table surface depth upholds the original dimensions of the traditional handloom (150 cm) because the weavers cited feeling comfortable with the original table surface depth dimensions in using the tool to roll the thread and stretch it into the swing arm handle. It is different with recommends the use of the 50th percentile of the forearm-hand length to determine the table surface depth\(^{(16)}\) or other recommended standards of the table surface depth minimums of 90 cm (Australia and Canada) or 50 cm (United States).\(^{(13)}\)

Swing arm handle depth: The swing arm handle depth also maintains the same dimensions as the traditional handloom at 33-37 cm. The swing arm handle is used to compress the woven thread and is operated by pushing and pulling the handle. The weavers reported being comfortable with the current swing arm distance, and it fits their anthropometric dimensions; therefore, it did not need to be modified.

Table angle: The horizontal table angles set to remain flat at 0°. Chaffin\(^{(18)}\) suggests that the slope of the table surface has a positive impact on the neck, back and shoulders, but that it must be adjusted according to its function. For reading and writing activities, users being able to adjust table tilt settings can reduce spinal flexion, which in turn reduces the risk of fatigue.\(^{(21,25)}\) However, the slope of the handloom table should be set to 0° to keep all components and materials sitting on the surface of the weaving table from falling off. Changing this angle will cause the table to slope, which can cause the components and material son top to shift, disrupting the weaving activities.

The limitation of the redesign traditional handloom: The redesign of the traditional handloom is expected to reduce the prevalence of MSDs in the
Samarinda Sarong weavers studied, similar to the results of the study by Purnomo et al.\textsuperscript{(20)} on redesigning school furniture. Choobineh et al.\textsuperscript{(21)} also showed that upholding appropriate workstation dimensions for carpet hand-weaving improved the weavers’ work posture and reduced incidence of MSDs. Currently, no data exists on the impact of redesigning traditional handlooms based on the work posture and MSD prevalence of the weavers. However, we are now preparing a follow-up study to test the handloom chair and table we developed in this study to determine how it affects weavers’ posture, comfort and MSD occurrences. The limitation of this study is that our handloom redesign is only applicable to users in the south eastern region of Asia because the anthropometry dimensions gathered exclusively reflect the Samarinda Sarong weavers of this region. However, the newly redesigned handloom may be usable for weaving workstations beyond traditional weaving products.

Conclusion

The traditional handloom currently used by female weavers making Samarinda Sarongs is not compatible with the anthropometric dimensions of these female Indonesian weavers. In this study, we redesigned the traditional handloom based on the anthropometry data collected from the woman weavers to fit the handloom dimensions to their body characteristics. The redesigned handloom is significantly different from the current traditional handloom in several ways. Moving forward, the new design needs to be assessed to determine if it will improve posture and comfort and reduce MSD occurrences in the weavers.

Acknowledgements: The authors are grateful to all female weavers who participated in this research, Rector of Mulawarman University and Ministry of Research Technology, and the Ministry of Research Technology and Higher Education of Indonesia.

Ethical Clearance: This study was reviewed and approved by the Ethical Commission of Health and Medical Research of Mulawarman University (Indonesia) Faculty of Medicine, with the reference number of 33/KEPK-FK/IV/2018.

Source of Funding: This work is supported by the Ministry of Research Technology and Higher Education of Indonesia (award number: 03/E/KPT/2018).

Conflict of Interest: Nil

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Alteration in Quality of Life after Kidney Transplantation

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²Urological Department, Faculty of Medical Sciences, College of Medicine, University of Sulaimani

Abstract

Background: The surgical insertion of a human kidney from a cadaver or a living donor to a recipient with end-stage renal disease is called kidney transplantation, which can lead to recovery of the lost renal functions. This study was aimed to evaluate the changes in quality of life in patients with who underwent kidney transplantation.

Method: In a descriptive, prospective, single-center study with a longitudinal design, the quality of life of 50 patients with chronic renal failure who had kidney transplantation operation in Department of Urology at Shar Hospital, in Sulaimani city, was assessed before and after the surgery. Before transplantation, the patients also underwent hemodialysis. Ferrans and powers Quality of life Index (the World Health Organization) was utilized to collect the required data.

Results: Analyzing the collected data indicated that the patients perception of quality of life was not affected by the studied sociodemographic factors. It was also concluded that the dialysis period and post-transplantation period were significantly different with regard to physical, psychological, and spiritual domains, but not regarding the social domain. It was observed that was significant improvement in the quality of life regarding educational level and marital status. Moreover, the greatest change was observed in the general, satisfaction and importance variables.

Conclusion: It was concluded that the dialysis and post- transplantation periods were significantly different regarding domains of quality of life, but there was no statistically significant difference between them in terms of socio-economic domain of quality of life.

Keywords: Renal transplantation, quality of life.

Introduction

The term quality of life (QoL) was first utilized in clinical studies that were carried out in the 1980s ¹. This term in medicine and public health is referred to as health-related quality of life (HRQOL) which is defined as the perception held by individuals on their position in relation to their expectations, goals, concerns, standards and in the context of the value and culture systems where they live ².

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With its prevalence of 5% to 8% worldwide, chronic kidney disease (CKD) is considered as a major indicator of poor health outcome resulted from non-communicable diseases. Kidney transplantation and long-term dialysis are the two significant treatments that patients with advanced chronic kidney disease (CKD) or end-stage renal disease (ESRD) are provided with ³. Research has indicated that renal transplantation can lead to major changes in every single dimension of the quality of life and the kidney recipients have to get accustomed with the changes in their lifestyle, they will have more time to meet new people because they do not need to undergo time-consuming dialysis anymore, and they can also go back to work ⁴,⁵. quality of life among renal recipients can differ largely given the specific personal characteristics and transplanting conditions ⁶. Therefore, all environmental, personal, and clinical factors which
could negatively impact HRQOL outcomes should be clearly specified and taken into account in future renal transplantations.

The World Health Organization have put emphasis on improving HRQOL among people that are suffering from chronic disease, and it has developed a specific program for ESRD patients. All renal (i.e., regulatory, excretion, metabolic, and endocrine) functions are recovered through renal transplantation; however, the recipients’ immune system can be suppressed permanently. It is stated that dialysis leads to only partial or intermittent elimination while there is no doubt that kidney transplantation is a quantitatively better method, although it is not risk-free. Since QoL among patients who undergo renal transplantation is affected by transplanting conditions and individual characteristics, it is necessary to come up with deeper understanding of such factors through descriptive studies in order to promote QOL among such recipients. In this regard, this study was aimed at evaluating the changes in quality of life in patients with ESRD who underwent kidney transplantation.

Method

The study was a prospective, descriptive study that was carried out using longitudinal design from November 2016 to November 2017. The statistical population included all patients with chronic renal failure who were referred to the Department of Urology at Shar Hospital, Sulaimani, and it is a public hospital in which kidney transplantation is performed, and the patients are provided with specialized care. Out of that population, a total of 50 patients with the age range of between 6 and 70 years were chosen as the study sample. In order to assess the perception of kidney recipients before and after transplantation, the required data were collected in two steps. In the first step, all the enrolled transplant candidates on the waiting list were interviewed, and in the second stage, the kidney transplantation patients were interviewed after minimum of two months from their surgery which is a necessary time for the patients to recovery and return to their daily life activities. Before the interviews, the objectives of the study were explained to all of the patients, and the consent form was filled up by those who agreed to participate in the study. In order to collect the required data were collected in a Shar hospital, the researchers referred to Shar Hospital and they utilized Ferrans and Powers Quality of Life Index (the World Health Organization) This index consists of 35 closed questions aimed at assessing the perceptions of QOL and two general questions about pre-and post transplantation health and QOL the first part of index evaluates different dimensions of quality of life: including physical function, physical role, role limitation caused by emotional problems, body pain, general health perceptions, social function, emotional wellbeing and energy/fatigue and the second part focuses more specifically on renal disease, effect of kidney disease, burden of kidney disease, work status, cognitive function, quality of social interaction, sexual function, sleep, social support, patient satisfaction and dialysis staff encouragement. The index is scored based on a 6-point Likert scale ranging from 1 to 6, with higher scores indicating better QOL. This instrument is easy to understand, and its reliability has been tested in patients with renal disease and its Cronbach Alpha index was reported to be 0.88 which confirms its applicability for the patients of the present study.

In order to analyze the collected data, they were first organized using an electronic spreadsheet (Microsoft Office Excel) and then categorized, processed, and analyzed by importing them into SPSS/21 in so doing descriptive and univariate statistics were utilized, and one-way (ANOVA) and t-test were run the level of statistical significance was set at p< 0.05.

In order to take the ethical considerations into account, the study methodology was approved by the local College Review Board, Sulaimani Medical College, Sulaimani University, the Kurdistan Region of Iraq. Which ensures the confidentiality of all collected data. Development of this study followed national and international ethical and legal aspects of research in to human. Moreover, as mentioned before, the participants were given thorough information about the study’s methodology and objectives, and informed consent was obtained from them prior to data collection. They were also told that they had the right to quite the study whenever they wanted to.

Results

A total of 50 renal transplantation patients participated in the study. According to the collected sociodemographic data from the participants, it was observed that most of the patients (62%) were men, they aged 39.6 years (SD=15.8) on average, 74% were married 66% were illiterate; most of them (76%) were during the study period. The collected data also revealed that most of the patients (44%) had an average socioeconomic status (Table 1).
Table 1. The Sociodemographic characteristics.

<table>
<thead>
<tr>
<th>Sociodemographic variables</th>
<th>N (%)</th>
<th>Gender</th>
<th>N (%)</th>
<th>Age</th>
<th>N (%)</th>
<th>Marital Status</th>
<th>N (%)</th>
<th>Occupation</th>
<th>N (%)</th>
<th>Socioeconomic</th>
<th>N (%)</th>
<th>Level of Education</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>N (%)</td>
<td>Male</td>
<td>31(62)</td>
<td>Age</td>
<td>N (%)</td>
<td>Single</td>
<td>13(26)</td>
<td>Employed</td>
<td>12(24)</td>
<td>Low</td>
<td>1(2)</td>
<td>Illiterate</td>
<td>33(66)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Female</td>
<td>19(38)</td>
<td>&lt; 25 years</td>
<td>13(26)</td>
<td>Married</td>
<td>37(74)</td>
<td>Unemployed</td>
<td>38(76)</td>
<td>Middle</td>
<td>22(44)</td>
<td>Secondary Institute</td>
<td>6(12)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Age</td>
<td></td>
<td>&gt; 25 years</td>
<td>37(74)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>High</td>
<td>17(34)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Marital Status</td>
<td></td>
<td></td>
<td></td>
<td>Socioeconomic</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Occupation</td>
<td></td>
<td></td>
<td></td>
<td>Level of Education</td>
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</tr>
</tbody>
</table>

Analyzing the association between the patients’ sociodemographic characteristics and their perception of general QOL before and after transplantation indicated that there was no significant relationship between their sociodemographic characteristics and their perception of general QOL before and after transplantation (p>0.05). However, significant improvement was observed in level of education and marital status (Table 2).

Table 2: Association between sociodemographic variables and General quality of life

<table>
<thead>
<tr>
<th>Socio demographic variables</th>
<th>N (%)</th>
<th>Gender</th>
<th>N (%)</th>
<th>General QOL</th>
<th>N (%)</th>
<th>Marital Status</th>
<th>N (%)</th>
<th>Occupation</th>
<th>N (%)</th>
<th>Socioeconomic</th>
<th>N (%)</th>
<th>Level of Education</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>N (%)</td>
<td>Male</td>
<td>31(62)</td>
<td>Pre-transplantation</td>
<td>Post-transplantation</td>
<td>p-value Mann</td>
<td></td>
<td></td>
<td></td>
<td>Socioeconomic</td>
<td>N (%)</td>
<td>Level of Education</td>
<td>N (%)</td>
</tr>
<tr>
<td></td>
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<td>Female</td>
<td>19(38)</td>
<td></td>
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<td>&lt; 25 years</td>
<td>13(26)</td>
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<td>&gt; 25 years</td>
<td>37(74)</td>
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<td></td>
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<td>Marital status</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Married</td>
<td>37(74)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Further analysis of the collected data indicated that the greatest change occurred in the general QOL, which was assessed through the overall importance with QOL and health satisfaction. The results revealed that the patients’ overall satisfaction with their and importance of transplantation underwent significant changes after the renal transplantation compared to the pre-transplantation status (Table 3)

Table 3. Quality of life scores before and after kidney transplantation

<table>
<thead>
<tr>
<th>General variables</th>
<th>Before Transplant</th>
<th>After Transplant</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean ±Standard deviation</td>
<td></td>
<td>t-Test</td>
</tr>
<tr>
<td>Total Satisfaction</td>
<td>95.2±18.8</td>
<td>155.2±14.6</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Total Importance</td>
<td>92.3±17.8</td>
<td>158.8±7.1</td>
<td>&lt;0.001*</td>
</tr>
</tbody>
</table>

Discussion

In this study, it was observed that most of the participants (74%) were young adults aging up to 25 years with a mean age of 39.6 years (SD=15.8); which is a worrying statistic highlighting the early development of kidney disease and its rapid progression among economically active young individuals. It was also seen that most of the patients (60.3%) in the present study had less than 8 years of formal education. Similarly, Kusumota et al.11 studied 107 chronic renal disease patients and reported of higher incidence of chronic kidney disease in older ages with mean age of 51.1 years they also observed that a great part of the respondents (48.6%) had completed high school 11. In the present study it was also observed that 74% of the patients were married Similar findings were reported by Bertolin et al.
and Kirchner et al. whose studies were participated by more than 50% married individuals or those who lived in a stable relationship. With regard to the participants occupational status, the results of the present study indicated that 74% were not working during the study period. Similarly, very few participants (6.7%) in the studies carried out by Cavalcante had a job, and most of them (80%) were retired in their study.

The results of the present study also indicated that some variables including female gender, older age, lower education, unemployment, diabetes, living alone, repeated hospitalization, and long duration of dialysis were associated with lower QoL scores. Similar findings were reported by previous studies.

According to the results of the present study, sociodemographic factors did not impact the perception of overall pre-and post-transplantation QoL among the patients. This finding is in line with that of the study carried out by Soza et al., who reported that sociodemographic factors and QoL after renal transplantation were not significantly correlated. According to study that compared the mean scores of QoL variables before and after renal transplantation, significant improvement was observed in general QoL. This data was based on the study by Kovacs et al., that carried out a study to compare quality of life among kidney transplant recipients and wait listed patients.

Bohlke et al. assessed health-related QoL issues in 262 renal transplant recipients, and they concluded that the physical component of QoL was affected by presence hypertension and diabetes, factors such as levels of creatinine and hematocrit, which improved after the transplantation. Their finding was consistent to this present study.

Social relation domain assesses the patients’ degree of satisfaction with their relationship and the time they spend with their family and friends and the support given by them. The results of this study revealed that the average score of this domain underwent a significant increase after transplantation. Valcanti et al., reported that social relationships have a strong impact on the perception of QoL, health welfare and susceptibility among the patients and help them deal with the disease process; therefore, the social relationship has been configured as a space for exchanging experiences, social protection and potential development.

Moreover, according to the psychological domain, the results of transplantation are reflected as the patients’ emotions and fears which demonstrate perceptions of coping strategies in situations of distress. In addition, the emotional aspects should be regarded as important indices of health and QoL in patients with chronic kidney diseases. Since patients’ daily activities might be limited by the changes in lifestyle imposed by the disease, treatment and progression of symptoms the patients’ perception of QoL will be affected negatively. Other researchers have reported that transplantation can lead to improvement in psychological factors. A significant difference was observed between pre-and post-transplantation states; which indicates improvements in this aspect. This result can be explained part by the safety and property conditions after transplantation; these results indicated that patients who had undergone renal transplantation had improvements in all dimensions of quality of life.

Conclusion
This study revealed that renal transplantation had a positive impact on changing the perception of QoL in the patients. Also, all domains of QoL improved after transplantation, especially those related to general QoL perception. Sociodemographic factors, however, had no significant influence on the participating patients, which indicated that transplantation was the main reason for changes in quality of life.

Conflict of Intrest: Not

Ethical Clearance: The study was approved by the ethical committee of the University of Sulaimani/College of Nursing and by the ethical review committee of the hospital.

Source of Funding: By self

References


Family Empowerment with the Case Model on the Role of the Family and Exclusive Breastfeeding Behavior

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Abstract

Background: Family empowerment is an effort or process to foster family awareness, willingness and ability to recognize, overcome, maintain, protect, and improve their own welfare. Family empowerment in exclusive breastfeeding behavior is very necessary because exclusive breastfeeding is a world problem that affects infant morbidity and mortality.

Objective: This study aims to analyze family empowerment with the CASE model on family roles and exclusive breastfeeding behavior.

Method: Type of Quasy-experimental research by dividing two experimental groups namely the treatment group and the control group. Both groups are initiated with pre-test, and after the treatment is measured again (post-test). Statistical analysis uses multivariate analysis of covariance (Manacova) to test whether there are differences in treatment of a group of dependent variables after adjusting for the influence of confounding variables.

Results: For the pre-test results: family empowerment on the role of the family obtained a significance value of 0.229 and family empowerment of exclusive breastfeeding behavior obtained a significance value of 0.710 so that greater than 0.05 means that there is no linear relationship of family empowerment with family roles and exclusive breastfeeding behavior. For the results of the post-test: family empowerment on the role of the family obtained a significance value of 0.000 and family empowerment of exclusive breastfeeding behavior obtained a significance value of 0.000 so smaller than 0.05 means that there is a linear relationship of family empowerment with family roles and exclusive breastfeeding behavior.

Conclusion: Family empowerment with the CASE model is a support for mothers to exclusively breastfeed that can be used as a way to motivate and support pregnant women to have the intention to breastfeed exclusively since pregnancy.

Keywords: Empowerment, role, family, breastfeeding, exclusive.

Introduction

Exclusive breastfeeding is a world problem because exclusive breastfeeding affects infant morbidity and mortality. Exclusive breastfeeding at 6 weeks of age significantly reduced the likelihood of hospitalization for pneumonia and diarrhea(1). Breastfeeding can protect babies against the risk of asthma, eczema, rhinitis, and reduce the risk of otitis media in early childhood up to 40-50%(2)(3). Exclusive breastfeeding reduces the risk of the incidence of ARI (Acute Respiratory Infection) 32,738 times(4).

Even so, only about 2/5 of babies worldwide are exclusively breastfed and only about two-thirds of babies are introduced to solid foods at the right time. WHO data shows that the average rate of exclusive breastfeeding in the world is only 38%. Data on exclusive breastfeeding in Indonesia is still below the national target (80%) which is 52.3% (2014), 55.7% (2015), and 54% (up to 6 months) and 29.5% (0-5 months) (2016). While the
data of exclusive breastfeeding in East Java is 74% (2014), 74.1% (2015), and in 2016 there were 31.3% (up to 6 months) and 48.1% (0-5 months)\(^{(5)(6)(7)}\). Data on exclusive breastfeeding in Sidoarjo Regency is 54.5% (2014), 57.3% (2015), and 54.7% (2016)\(^{(8)(9)(10)}\).

Although many efforts have been made by the government, family support is needed because families with breastfeeding mothers need patience, time, and knowledge about breastfeeding. The most important family support is the support of each family member (husband / mother / mother-in-law), as well as other relatives who live in one house, which can have an impact at the beginning of initiation and the duration of breastfeeding\(^{(11)(12)(13)}\). Family empowerment is an effort or process to foster family awareness, willingness, and ability to recognize, overcome, maintain, protect, and improve their own welfare\(^{(14)}\). In several studies, it is shown that family empowerment can improve family coping\(^{(15)}\) and change the behavior of family members\(^{(16)}\).

The research objective was to develop family empowerment method through a family guidebook, analyze the use of family empowerment guidebooks on family roles and exclusive breastfeeding behavior in the control group and treatment group. pre-test and post-test are conducted for both groups.

**Materials and Method**

Type of Quasy-experimental research. In this design, the experimental group was treated while the control group did not. In both groups the pre-test is taken place, and after the treatment is measured again (post-test)\(^{(17)}\). The sampling technique used is multistage sampling. Multistage shows several stages of sampling. Stage 1 selects the sample and sample size according to certain criteria with the cluster. Phase 1 cluster is district. Phase 2 determines the public health center cluster. Large sample collection is like stage 1. Stage 3 is the village, etc\(^{(18)}\).

The next stage, using purposive sampling technique is a sample selection technique by determining research subjects who meet the research criteria. The sample was chosen by choosing a family with 30 respondents in the final trimester pregnant mothers. Then included in the control group and the treatment group of 15 respondents each. After that the control group and treatment group were given pre-test for 60 minutes. The treatment given was an explanation and implementation of a family empowerment guidebook with the CASE model. Treatment is given for 3x60 minutes which includes explanations and demonstrations carried out by respondents. Evaluation (post-test) is done when the baby is 1 month old.

Intervention effect analysis uses multivariate analysis of covariance (Manacova) to test whether there is a difference in treatment of a group of dependent variables after adjusting for the influence of confounding variables.

**Findings:** According to Sulistyani (2004) family empowerment aims to form individuals, families, or communities to become independent. Independent in thinking, acting, and controlling what will be done. It is shown by the ability to think, decide and do something that is considered appropriate so that the problems can be resolved\(^{(19)}\).

Important reasons for family empowerment include: the family as the smallest social system that can influence and be influenced by a wider social system; the family is the basic unit of society so that it determines the social and health system of the community; families are able to adapt (respond to, change, develop, act and modify their environment); families help determine the decision to achieve individual and family goals\(^{(20)}\).

### 1. Pre-test analysis results

<table>
<thead>
<tr>
<th>Effect</th>
<th>Group</th>
<th>Value</th>
<th>F</th>
<th>Hypothesis df</th>
<th>Error df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
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<td>2.138</td>
<td>2.000</td>
<td>26.000</td>
<td>.138</td>
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<tr>
<td>Pillai’s Trace</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Wilks’ Lambda</td>
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<td>2.138</td>
<td>2.000</td>
<td>26.000</td>
<td>.138</td>
</tr>
<tr>
<td>Roy’s Largest Root</td>
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<td>.164</td>
<td>2.138</td>
<td>2.000</td>
<td>26.000</td>
<td>.138</td>
</tr>
<tr>
<td>Group</td>
<td>Z1+group</td>
<td>.071</td>
<td>.923</td>
<td>2.000</td>
<td>26.000</td>
<td>.384</td>
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<tr>
<td>Wilks’ Lambda</td>
<td></td>
<td>.929</td>
<td>.923</td>
<td>2.000</td>
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<td>.384</td>
</tr>
<tr>
<td>Hotelling’s Trace</td>
<td></td>
<td>.076</td>
<td>.923</td>
<td>2.000</td>
<td>26.000</td>
<td>.384</td>
</tr>
<tr>
<td>Roy’s Largest Root</td>
<td></td>
<td>.076</td>
<td>.923</td>
<td>2.000</td>
<td>26.000</td>
<td>.384</td>
</tr>
</tbody>
</table>

a. Design: Z1 + group, b. Exact statistic
The analysis shows that the F value for the Hotelling Trace group, has a greater significance than 0.05 which means it is not significant. Meaning that there is no difference in family role (y1) and exclusive breastfeeding behavior (y2) between the treatment group and the control group after controlling for the promotion of formula milk (Z1).

**Table 2. Test of between-subjects effects**

<table>
<thead>
<tr>
<th>Source</th>
<th>Dependent Variable</th>
<th>Type III Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Model</td>
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<td>12,418(^a)</td>
<td>2</td>
<td>6,209</td>
<td>1,272</td>
<td>.296</td>
</tr>
<tr>
<td></td>
<td>Behavior</td>
<td>26,270(^b)</td>
<td>2</td>
<td>13,135</td>
<td>1,683</td>
<td>.205</td>
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<tr>
<td>Z1</td>
<td>Family Role</td>
<td>2,784</td>
<td>1</td>
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<td>.457</td>
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<tr>
<td></td>
<td>Behavior</td>
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<td>1</td>
<td>22,237</td>
<td>2,850</td>
<td>.103</td>
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<tr>
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<td>7,393</td>
<td>1</td>
<td>7,393</td>
<td>1,515</td>
<td>.229</td>
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<tr>
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<td>Behavior</td>
<td>1,104</td>
<td>1</td>
<td>1,104</td>
<td>.142</td>
<td>.710</td>
</tr>
<tr>
<td>Error</td>
<td>Family Role</td>
<td>131,749</td>
<td>27</td>
<td>4,880</td>
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</tr>
<tr>
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<td>Behavior</td>
<td>210,696</td>
<td>27</td>
<td>7,804</td>
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<tr>
<td>Total</td>
<td>Family Role</td>
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</tr>
<tr>
<td></td>
<td>Behavior</td>
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<td></td>
<td></td>
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<tr>
<td>Corrected Total</td>
<td>Family Role</td>
<td>144,167</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>behavior</td>
<td>236,967</td>
<td>29</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


The interaction between family empowerment and promotion of formula milk on the role of the family obtained a significance value of 0.296 so that it was greater than 0.05, meaning that there was no influence of family empowerment and promotion of formula milk on the role of the family. The interaction between family empowerment and promotion of formula milk on exclusive breastfeeding behavior obtained a significance value of 0.205 so that it was greater than 0.05, meaning that there was no influence of family empowerment and promotion of formula milk on exclusive breastfeeding behavior. The treatment group has not been given a family guidebook so there is no difference between the treatment group and the control group.

2. **Post – test analysis results**

**Table 3. Multivariate tests**

<table>
<thead>
<tr>
<th>Effect</th>
<th>Value</th>
<th>F</th>
<th>Hypothesis df</th>
<th>Error df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z1</td>
<td>Pillai’s Trace</td>
<td>,007</td>
<td>,091(^b)</td>
<td>2,000</td>
<td>26,000</td>
</tr>
<tr>
<td></td>
<td>Wilks’ Lambda</td>
<td>,993</td>
<td>,091(^b)</td>
<td>2,000</td>
<td>26,000</td>
</tr>
<tr>
<td></td>
<td>Hotelling’s Trace</td>
<td>,007</td>
<td>,091(^b)</td>
<td>2,000</td>
<td>26,000</td>
</tr>
<tr>
<td></td>
<td>Roy’s Largest Root</td>
<td>,007</td>
<td>,091(^b)</td>
<td>2,000</td>
<td>26,000</td>
</tr>
<tr>
<td>Group</td>
<td>Pillai’s Trace</td>
<td>,984</td>
<td>812,714(^b)</td>
<td>2,000</td>
<td>26,000</td>
</tr>
<tr>
<td></td>
<td>Wilks’ Lambda</td>
<td>,016</td>
<td>812,714(^b)</td>
<td>2,000</td>
<td>26,000</td>
</tr>
<tr>
<td></td>
<td>Hotelling’s Trace</td>
<td>62,516</td>
<td>812,714(^b)</td>
<td>2,000</td>
<td>26,000</td>
</tr>
<tr>
<td></td>
<td>Roy’s Largest Root</td>
<td>62,516</td>
<td>812,714(^b)</td>
<td>2,000</td>
<td>26,000</td>
</tr>
</tbody>
</table>

a. Design: Intercept + Z1 + group, b. Exact statistic

The analysis shows that the F value for the Hotelling Trace group, has a smaller significance than 0.05 which means significant. This means that there are differences in family roles (y1) and exclusive breastfeeding behavior (y2) between the treatment group and the control group after controlling for the promotion of formula milk (Z1).
The interaction between family empowerment and promotion of formula milk on the role of the family obtained a significance value of 0.000 so that it was smaller than 0.05, meaning that there was an influence of family empowerment and promotion of formula milk on the role of the family. The interaction between family empowerment and promotion of formula milk on exclusive breastfeeding behavior obtained a significance value of 0.000 so that it was smaller than 0.05, meaning that there was an effect of family empowerment and promotion of formula milk on exclusive breastfeeding behavior.

Family empowerment with the CASE model can enhance the role of families in supporting exclusive breastfeeding behavior. Family empowerment can improve family functions which ultimately can make the family independent(21). Family empowerment is a form of family support for pregnant women so that mothers can breastfeed exclusively after giving birth. Factors that influence maternal intention to breastfeed are knowledge, trust (stigma about breastfeeding), and family support (husband, family members, and relatives). These factors affect the continuation of breastfeeding in the first month of postpartum(22). The most important family support is the support of each family member (husband / mother / mother-in-law), as well as other relatives who live in one house, which can have an impact at the beginning of initiation and the duration of breastfeeding. Breastfeeding mothers need informational support, assessment support, instrumental support, and emotional support from the family (mother / mother-in-law) to improve breastfeeding(23).

Family empowerment means to provide knowledge, understanding and practice the material in the family guide book. The family guide book contains things related to the role of the family, breastfeeding behavior, stages of breastfeeding, conditions often encountered in breastfeeding, and dairy breast milk. After being given the material in the guidebook and practicing it, it is hoped that the family can motivate and support pregnant women to exclusively breastfeed.

**Conclusion**

The use of a family empowerment guidebook with the CASE model has a linear relationship with family roles and exclusive breastfeeding behavior.

Family empowerment increases the role of the family (family support and intentions of pregnant women for exclusive breastfeeding) and increases exclusive breastfeeding behavior (knowledge, attitudes, actions).

This shows that family empowerment can be used as a family guide to support pregnant women to exclusively breastfeed.

**Conflict of Interest:** There is no conflict of interest for the five authors.

**Source of Funding:** This research was funded by the author himself. There is no other financial support.

**Ethical Clearance:** All procedures carried out in this study are in accordance with the ethical standards of the Airlangga University Public Health Research Ethics Committee.
Informed Consent: Informed consent was obtained from all panelists who participated in this study.

Reference


Functional Features of Platelets in Rats Fed a Standard Diet with Low Antioxidant Content During Ontogenesis

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Abstract

The aim: To evaluate the developmental dynamics of the hemostatic properties of platelets in rats with a low amount of antioxidants in their diet. The study took 116 healthy male Wistar rats, which during their lives contained on a standard diet, not rich in antioxidants, under normal vivarium conditions, including 23 rats of 3 months of age, 22 rats aged 6 months, 24 rats aged 12 months, 22 rats 18 months of age and 25 animals at the age of 24 months. In rats, their general state and parameters of biochemical and hematological blood parameters were determined. The results were processed by student’s criterion. In the rats examined, the biochemical parameters of platelets and their activity remained stable between 3 and 6 months of life. The intensity of lipid peroxidation in the platelets of the observed rats remained normal until 6 months of age, and subsequently increased. In the blood plates of animals over the age of 6 months, the processes of self-assembly of the actin-myosin complex intensified and the content of platelets increased and the secretion of adenosine phosphates from them increased. Platelet activity in rats that are on the course of ontogenesis on the diet of not rich with antioxidants, grew older than 6 months and increased until the end of the observation-24 months.

Keywords: Ontogenesis, rats, platelets, aggregation, hemostasis, intravascular platelet activity.

Introduction

It becomes clear that platelet activity plays an important role in the vital processes of the body at any age¹. No doubt that it is extremely important for hemocirculation through the capillaries, necessary for the growth and implementation of certain hereditary characteristics and properties². It is clear that they are sensitive to environmental factors through activation of their hemostatic properties³,⁴. Their ability to aggregation is highly dynamic and regulates blood rheology, and, consequently, the level of its revenues in tissue⁵,⁶. For many research and practical action have a very great significance of ontogenetic changes in the level of activity of platelets. This is especially important because of their involvement in the provision of microcirculation. It is known that their properties deteriorate in terms of diet with a low content of antioxidants⁷,⁸. This situation is highly relevant for assessing aspects of their participation in the formation of cardiovascular and metabolic diseases in humans at any age⁹,¹⁰. For this reason it is necessary to assess age-related changes in platelet activity for the life of the available and commonly used in the scientific works of laboratory rats in which the diet can be set in full compliance with the objectives of the study. The identified information will be very useful for experiments on the search for corrective effects on platelet activity at any age¹¹ and any pathology¹²,¹³ with a very careful migration patterns obtained in studies conducted with human participants. In this context, the aim of this study was to assess ontogenetic dynamics of

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the hemostatic properties of platelets in rats with a low amount of antioxidants in their diet.

Materials and Method

The study was conducted in strict accordance with the ethical principles established by the European Convention for the Protection of Vertebrate Animals used for experimental and other scientific purposes (adopted in Strasbourg on March 18, 1986 and confirmed in Strasbourg on June 15, 2006).

The study included healthy male Wistar rats (n = 116) that were kept on a standard diet, not rich in antioxidants, under normal vivarium conditions, including 23 rats 3 months of age, 22 rats aged 6 months, 24 rats at the age of 12 months, 22 rats 18 months of age and 25 animals at the age of 24 months. In rats, their general state and parameters of biochemical and hematological blood parameters were determined. Platelets were isolated from their blood during washing and resuspension, with further evaluation of the amount of malonic dialdehyde (MDA) in them during the reduction reaction with thiobarbituric acid and by determining the concentration of acyl hydroperoxides (AHP)\(^1\). The functional activity of platelet antioxidant enzymes, catalase and superoxide dismutase (SOD), was recorded\(^1\). In the blood plates, the amount of adenosine triphosphate (ATP) and adenosine diphosphate (ADP) with the determination of the degree of their secretion under the action of collagen. The composition of the protein cytoskeleton of platelets consists of actin and myosin, determined during activation and during platelet aggregation in response to ADP and thrombin\(^5\). The number of platelets in rats was counted in the Goryaev chamber. Platelet aggregation (AT) activity was determined using a visual micromethod\(^6\) using a number of agonists: ADP (0.5×10\(^{-4}\) M), thrombin (0.125 units/ml), collagen (dilution 1: 2 of the main suspension), ristomycin (0.8 mg/ml), \(\mathrm{H}_2\mathrm{O}_2\) (7.3 × 10\(^{-3}\) M), adrenaline (5×10\(^{-6}\) M). The state of intravascular platelet activity (IPA) was determined using a phase-contrast microscope\(^6\). The results were processed by student’s criterion.

Research Results and Discussion

The functional general state of the observed rats, which did not regularly receive antioxidants, was without features. Assessment of biochemical parameters of blood platelets in the course of ontogenesis shows their stability in the period between 3 and 6 months of life. The quantity of AHP in their platelet counts at 3 months was of 2.47±0.19 D\(_{233}\)/10\(^9\) platelets and remained stable up to 6 months (2.49±0.23 D\(_{233}\)/10\(^9\) platelets). It increased in 12 month old animals to 2.90±0.26 D\(_{233}\)/10\(^9\) platelets and further increasing to 24 months to 3.29±0.31 D\(_{233}\)/10\(^9\) platelets. The concentration of MDA in platelets of rats of 3 months on a poor antioxidant diet was 0.73±0.16 nmol/10\(^9\) platelets and remained stable up to 6 months of life (0.74±0.12 nmol/10\(^9\) platelets). It increased further, averaging 12 months of 0.96±0.18 nmol/10\(^9\) platelets and 24 months of 1.16±0.22 nmol/10\(^9\) platelets. The level of activity of catalase and SOD platelets in examined rats was consistently high until 6 months (9762.0±rate of 16.07 IU/10\(^9\) platelets, and 1800.0±18.24 IU/10\(^9\) platelets). In older age it decreased, accounting for 24 months animals 8000.0±16.01 IU/10\(^9\) platelets and 1560.0±6.45 IU/10\(^9\) platelets, respectively.

The found changes in the activity of free radical processes during ontogenesis in rats seriously affected the state of their processes that activate the activation of blood plates. This concerned the content in platelets and the secretion of ADP and ATP from them. During the observation, the constancy of the low to 6 months content of ATP and ADP in rat platelets (5.70 ± 0.19 μmol /10\(^9\) platelets and 3.42±0.21 μmol/10\(^9\) platelets) was replaced by their growth by 24 months to 6.18 ±0.28 μmol/10\(^9\) platelets and 4.25±0.20 μmol/10\(^9\) platelets, respectively. The activity of secretion of ATP and ADP from platelets during the action of collagen on them for the time between 6 and 24 months of life grew by 18.5% and 19.7%, respectively (table 1).

The level of actin in the composition of platelets of rats in the age between 3 and 6 months was stable and small, but then increasing, increasing to 2 years to 46.7±0.12% of the total protein in the platelet. The degree of additional generating actin in rats with aggregation of platelets under the action of strong or weak inductor has grown after the age of 6 months. Comparable activity in platelets of rats identified for myosin mechanism. It is found that in the inactive blood platelets in rats in 6 months life level of myosin was 16.0±0.14% of the total protein content in platelet. In older rats, this indicator was higher and reached 24 months of age to a level of 22.6±0.13%. In the course of platelet aggregation in response to strong or weak inducers in rats after 6 months of life increased the intensity of processes of Assembly of myosin (table 1).

In rats after 6 months, the development of a reduction in the period of occurrence of antibodies in relation to all
inductors used (table 1). First of all, AT came in response to collagen, developing in 24 month-old rats after 28.1 ± 0.10 s. Similar AT dynamics in response to ADP and ristomycin were found in rats. A little later, AT appeared in response to H\textsubscript{2}O\textsubscript{2}, thrombin, and adrenaline. AT time with them was significantly reduced after 6 months of life.

The performed assessment of antibodies with individual inductors made it possible to establish in rats older than 6 months the enhancement of the ability of blood platelets to antibodies. The reduction in the time of observation of antibodies with strong agonists (collagen and thrombin) indicated the activation of phospholipase C in them, which realizes the phosphoinositol pathway of platelet involvement in hemostasis. This indicated an increase in the number of diacylglycerol and protein kinase C, which strengthen the assembly of actin and myosin molecules\textsuperscript{7}. A decrease in the AT period in response to a weak inducer (ADP) indicated an increase in the availability of receptors for this inducer with an increase in the density of fibrinogen receptors on the platelet surface and an increase in the activity of phospholipase A\textsubscript{2}, which releases arachidonic acid from membranes to generate thromboxane A\textsubscript{2}\textsuperscript{9}.

The age-related changes in the level of platelet activity found in the course of an in vitro assessment were confirmed by the IPA assessment. Thus, the number of platelet-blood cells in rats is up to 6 months it was stable and equaled at this age 79.9±0.18%. Subsequently, this value decreased by 24 months to 68.5±0.22%. The total number of active platelet forms after the age of 6 months gradually increased during the observation period by 61.7%. During the first half of the year, the number of free small and large platelet aggregates in the blood of animals was stable and low. Subsequently, their number increased from 3.2 ±0.08 and 0.13±0.003 per 100 free platelets at 6 months of age to 6.1±0.08 and 0.47±0.004 per 100 free platelets at 24 months. The number of platelet aggregates in rats during the considered observation period increased by 36.2%. The found increase in IPA parameters in rats indicated an increase in their expression of fibrinogen receptors on their surface, confirming the increased sensitivity of platelets to physiological inducers of aggregation (ADP, thrombin, adrenaline) against the background of the activation of intra-platelet hemostasis mechanisms\textsuperscript{2,17}.

Table 1. Indicators of platelets of rats who are on the course of ontogenesis on a diet not rich in antioxidants

<table>
<thead>
<tr>
<th>Registrated parameters</th>
<th>Age of rats (M±m), n=116</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>3 month, n=23</td>
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<tr>
<td><strong>Actin mechanism</strong></td>
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<tr>
<td>intact,% of total protein content on the background of ADP aggregation,% of the total protein content</td>
<td>32.9±0.16</td>
</tr>
<tr>
<td></td>
<td>43.4±0.13</td>
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<tr>
<td>against the background of thrombin aggregation,% of the total protein content</td>
<td>39.6±0.16</td>
</tr>
<tr>
<td><strong>Myosin mechanism</strong></td>
<td></td>
</tr>
<tr>
<td>intact,% of total protein content on the background of ADP aggregation,% of the total protein content</td>
<td>15.6±0.10</td>
</tr>
<tr>
<td></td>
<td>27.8±0.10</td>
</tr>
<tr>
<td>against the background of thrombin aggregation,% of the total protein content</td>
<td>42.6±0.12</td>
</tr>
<tr>
<td><strong>Platelet aggregation in vitro</strong></td>
<td></td>
</tr>
<tr>
<td>ADP, s</td>
<td>39.2±0.12</td>
</tr>
<tr>
<td>Collagen, s</td>
<td>32.0±0.14</td>
</tr>
<tr>
<td>Thrombin, s</td>
<td>54.6±0.13</td>
</tr>
<tr>
<td>Ristomycin, s</td>
<td>48.2±0.16</td>
</tr>
<tr>
<td>H\textsubscript{2}O\textsubscript{2}, c.</td>
<td>43.3±0.05</td>
</tr>
<tr>
<td>Adrenalin, s</td>
<td>100.6±0.11</td>
</tr>
</tbody>
</table>
Registrated parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>3 month, n=23</th>
<th>6 month, n=22</th>
<th>12 month, n=24</th>
<th>18 month, n=22</th>
<th>24 month, n=25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discocytes, %</td>
<td>80.6±0.27</td>
<td>79.9±0.18</td>
<td>75.8±0.12*</td>
<td>72.0±0.19**</td>
<td>68.5±0.22**</td>
</tr>
<tr>
<td>Sum of active forms, %</td>
<td>19.4±0.16</td>
<td>20.1±0.19</td>
<td>24.2±0.17*</td>
<td>28.0±0.27**</td>
<td>32.5±0.24***</td>
</tr>
<tr>
<td>Platelet count in aggregates, %</td>
<td>4.5±0.09</td>
<td>4.7±0.06</td>
<td>5.2±0.17*</td>
<td>5.8±0.09**</td>
<td>6.4±0.11**</td>
</tr>
<tr>
<td>The number of small units of 2-3 platelets per 100 free platelets</td>
<td>3.1±0.05</td>
<td>3.2±0.08</td>
<td>3.9±0.04*</td>
<td>4.8±0.07**</td>
<td>6.1±0.08**</td>
</tr>
<tr>
<td>The number of medium and large units of 4 or more platelets per 100 free-lying platelets</td>
<td>0.12±0.002</td>
<td>0.13±0.003</td>
<td>0.16±0.006*</td>
<td>0.22±0.005*</td>
<td>0.47±0.004**</td>
</tr>
</tbody>
</table>

Note: * - p <0.05, ** - p <0.01. Reliability of the dynamics of the indicators taken into account compared with the outcome. In the following table, the notation is similar.

Conclusion

In rats during life, who are on a diet that is not rich in antioxidants, between 6 and 24 months of age, a significant increase in platelet readiness for the aggregation process develops. This leads to a very pronounced increase in their blood of the total volume of activated platelet species and their aggregates of any size freely circulating through the vessels.

Conflict of Interest: No conflict of interest is declared.

Sources of Financing: The study was conducted at the expense of the authors.

Ethics Committee Resolution: The study was approved by the local ethics committee of the All-Russian Research Institute of Physiology, Biochemistry and Nutrition of Animals on September 15, 2018 (protocol №17).

References


Socioeconomic Disparities and Depression among Cambodian Migrant Workers in Thailand

Pall Chamroen\textsuperscript{1}, Wongsa Laohasiriwong\textsuperscript{2}, Amornrat Luenam\textsuperscript{3}, Poonsri Rangseekajee\textsuperscript{4}

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Abstract

Migrant workers poor working and living conditions have put them vulnerable to both physical and mental problems. However, little is known about the influence of socioeconomic conditions on depression of Cambodian migrant workers in Thailand.

This study aimed to determine the prevalence of depression and the influence of socioeconomic factors on depression among Cambodian migrant workers in Thailand.

A cross-sectional of 1,211 samples were selected by using a multi-stage random sampling from 2 provinces along Thai-Cambodia border to respond to a structured questionnaire interview. The multilevel logistic regression was used to determine the association between socioeconomic factors and depression when controlling other covariates, presenting adjusted odds ratio (AOR), 95% CI and p-value.

Most of the Cambodian migrant workers had moderate to severe levels of depression (69.69%, 95%CI: 67.10 to 72.29). The socioeconomic factors that were associated with depression were: lived alone (AOR= 3.42; 95% CI: 2.01 to 5.82, p-value <0.001), a construction worker (AOR=2.11; 95% CI: 1.47 to 3.02, p-value <0.001), stayed in employer’s accommodation (AOR=1.85; 95% CI: 1.31 to 2.62, p-value <0.001), had no formal education or finished primary education (AOR=1.63; 95% CI: 1.18 to 2.25, p-value = 0.003) had monthly income ≥6000 Baht (AOR=1.57; 95% CI: 1.037 to 2.37, p-value = 0.033).

More than two-thirds of Cambodian migrant workers in Thailand had depression. The working and living conditions hardships and their adaptation abilities had influenced on the depression.

Keywords: Adaptation, Cambodian migrant workers, Depression, Socioeconomic disparities.

Introduction

Depression is one of the most common mental health problems as well as is a major disease burden worldwide\textsuperscript{(1)} . The American Psychiatric Association indicated that depression symptoms can vary from mild to severe\textsuperscript{(2)} . The symptoms include: feeling sad or having a depressed mood, loss of interest or pleasure in activities once enjoyed, changes in appetite resulted in weight loss or gain unrelated to dieting, loss of energy or increased fatigue and trouble sleeping or sleeping too much\textsuperscript{(1,2)} . The severe symptoms are feeling worthless or guilty, difficulty thinking, concentrating or making decisions and thoughts of death or suicide. These symptoms must last at least two weeks for a diagnosis of depression\textsuperscript{(2)} .

Epidemiological research indicated the association between socioeconomic status (SES) and health that “the lower people’s SES, the poorer their health and the greater their risk of chronic disease and premature death”\textsuperscript{(3)} . This socioeconomic risk factors does not influence only physical conditions and mortality, but also to mental health problems especially anxiety and mood.
disorders. Mood disorder such as depression are more prevalent in those with lower SES\(^4\). A “migrant worker” is a person who migrates from one country to another for employment (UN)\(^5\). Thailand booming of development especially constructions and food processing industries has created demands for low-skilled worker and low-pay laborers. Gaps of development and economic growth between Thailand and its neighboring countries have attracted trans-border migrants to meet the demand\(^6\). Cambodians migrant workers are the second largest group in Thailand, after the Burmese. Almost all Cambodian migrant workers get into Thailand through land borders. Thai and Cambodian people near the border shared similar language, therefore many rural villagers with low-socioeconomic status could migrate to work in all sectors in provinces near the border. Most of the migrant workers are typically employed in the ‘3D jobs’—dirty, dangerous and demeaning\(^7\). Cambodian migrant workers in Thailand are mostly low skills and work under poor working conditions, therefore many of them are vulnerable to mental health problems such as depression or anxiety since these psychological problems is related to poverty, debt or lack of access to basic needs\(^8\).

Migrant workers have to live outside their home countries, they are more likely to have difficulty in adaptation to the environment resulted in stress and feeling loneliness. In addition, lack of social support and struggling in financial constraint also worsen their mental health status\(^9\). A nationwide survey on mental health among Cambodian population indicated that 16.6% of the population had acute depression\(^10\), of which the problems among migrant workers might more severe. Therefore, this study aimed to determine the prevalence of depression and the influence of socioeconomic factors on depression of Cambodian migrant workers in Thailand.

### Material and Method

**Study Design and Sampling:** This cross-sectional survey was conducted in 2 provinces along Thai-Cambodia border, Sakaeo and Surin provinces. The sample size was calculated following formula\(^11\)

\[
np = \frac{n_i}{1 - \rho^2,1,2,3, \ldots ,p}
\]

The approximate sample size was 435 which were further adjusted to control the over-fitting using the rho (\(\rho\)) of 0.65 and variance inflation factor (VIF) equal to 2.85. Therefore, the total number of the sample was 1,211.

A multistage random sampling method was used to select participants in 8 districts of 2 provinces along Thai-Cambodia border. There were 24,256 Cambodian migrant workers registered with the Department of Employment Office. Finally, all participants who met the inclusion criteria were randomly selected proportionally to size of the samples added to the total of 1,211 samples. Data were collected between March 2018 and May 2018.

**Questionnaires:** A structured questionnaire was developed from reviewed literatures based on research questions, first in English version and translated into Khmer using forward and backward translation procedures. The questionnaire consisted of 4 sections which were a) Demographic and socioeconomic, b) The Perceived of Stress Scale (PSS) of Cohen et al.\((1983)\), c) WHOQOL-BREF Khmer version, and d) Depression Scale (CES-D) of Radloff et al.\((1977)\). The questionnaire was undergone content validation by 5 experts and was revised to improve validity.

**Data Analysis:** STATA® (version.13; College Station, TX, USA: Stata Corp) was used to analyze the data. Demographic characteristics of the participants were described as frequency and percentage for categorical data; mean and standard deviation for continuous data. Inferential statistics, a simple logistic regression was used for bivariate analysis to identify individual risk factors associated with depression. The factors that had \(p\)-value < 0.25 were processed into the multivariable analysis using multilevel logistic regression and reported the adjusted odds ratio (AOR) and their 95% confidence interval (95% CI) and \(p\)-value < 0.05 was considered as statistically significant.

**Result**

**Demographic Characteristics:** About half of the samples were male 50.37% with mean age of 32.54 ± 11.14 years old, 62.59% were married, and 68.13% had children. As high as 42.69% had no formal education, 55.57% worked in agricultural sectors and 66.47% were outdoor workers. More than half of them stayed with family or relative, and lived in a house provided by their employer. Their average monthly income was 7,487.98 ± 2075.10 THB. More than half 61.44% had work-related diseases during the past 12 months and 28.57% were the smoker. Regarding perceived stress: 10.24% of the migrant workers had high level of stress whereas 57.72% had moderate levels of stress. As high as 34.52% of the migrants workers had a low level of QOL.
Factors associated with depression: Bivariate analysis: Bivariate analysis on the association between each independent variable and depression symptom was performed presenting the crude odds ratio (OR) with 95% CI, and p-value. All factors that had p-value <0.25 were proceeded to multivariable analysis by using multilevel logistic regression (Table 1).

### Table 1: Factors associated with Depression (CES-D) of Cambodian migrant workers: Bivariate analysis

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Number</th>
<th>Depression (%)</th>
<th>Crude OR</th>
<th>95% CI</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>844</td>
<td>69.69</td>
<td>N/A</td>
<td>67.10 - 72.29</td>
<td>N/A</td>
</tr>
<tr>
<td>1. Type of resident</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Lived with family/relative/friend</td>
<td>1,085</td>
<td>67.93</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lived alone</td>
<td>126</td>
<td>84.92</td>
<td>2.66</td>
<td>1.61 to 4.40</td>
<td></td>
</tr>
<tr>
<td>2. Occupation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Agriculture worker /service worker</td>
<td>933</td>
<td>65.92</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction worker</td>
<td>278</td>
<td>82.37</td>
<td>2.42</td>
<td>1.73 to 3.38</td>
<td></td>
</tr>
<tr>
<td>3. Housing tenure</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Rented</td>
<td>196</td>
<td>53.57</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stayed in employer’s accommodation</td>
<td>1,015</td>
<td>72.81</td>
<td>2.32</td>
<td>1.70 to 3.17</td>
<td></td>
</tr>
<tr>
<td>4. Educational attainment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.001</td>
</tr>
<tr>
<td>Secondary education or higher</td>
<td>240</td>
<td>59.17</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary education or less</td>
<td>971</td>
<td>72.30</td>
<td>1.80</td>
<td>1.34 to 2.41</td>
<td></td>
</tr>
<tr>
<td>5. Type of work environment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.018</td>
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<tr>
<td>Indoor worker</td>
<td>406</td>
<td>65.27</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Semi-outdoor/outdoor worker</td>
<td>805</td>
<td>71.93</td>
<td>1.36</td>
<td>1.06 to 1.76</td>
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<td>6. Marital status</td>
<td></td>
<td></td>
<td></td>
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<td>0.019</td>
</tr>
<tr>
<td>Single/divorced/separated/widowed</td>
<td>346</td>
<td>64.74</td>
<td>1</td>
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<td></td>
</tr>
<tr>
<td>Married/De facto</td>
<td>865</td>
<td>71.68</td>
<td>1.38</td>
<td>1.06 to 1.80</td>
<td></td>
</tr>
<tr>
<td>7. Have children</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.045</td>
</tr>
<tr>
<td>No</td>
<td>386</td>
<td>65.80</td>
<td>1</td>
<td></td>
<td></td>
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<tr>
<td>Yes</td>
<td>825</td>
<td>71.52</td>
<td>1.30</td>
<td>1.01 to 1.70</td>
<td></td>
</tr>
<tr>
<td>8. Monthly income (THB)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.049</td>
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<tr>
<td>&lt;6,000 Baht</td>
<td>132</td>
<td>62.12</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥6,000 Baht</td>
<td>1,079</td>
<td>70.62</td>
<td>1.47</td>
<td>1.01 to 2.13</td>
<td></td>
</tr>
<tr>
<td>9. Age (years)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.060</td>
</tr>
<tr>
<td>&lt;30</td>
<td>538</td>
<td>66.91</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥30</td>
<td>673</td>
<td>71.92</td>
<td>1.27</td>
<td>1.00 to 1.62</td>
<td></td>
</tr>
<tr>
<td>10. Smoking</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>No</td>
<td>865</td>
<td>68.32</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>346</td>
<td>73.12</td>
<td>1.26</td>
<td>0.96 to 1.66</td>
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</tr>
<tr>
<td>11. Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Female</td>
<td>601</td>
<td>67.55</td>
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<td></td>
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<tr>
<td>Male</td>
<td>610</td>
<td>71.80</td>
<td>1.22</td>
<td>0.96 to 1.56</td>
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<tr>
<td>12. Work-related diseases (during past 12 months)</td>
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<tr>
<td>No</td>
<td>467</td>
<td>71.95</td>
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<tr>
<td>Yes</td>
<td>744</td>
<td>68.28</td>
<td>0.84</td>
<td>0.65 to 1.08</td>
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<td>13. Perceived of Stress (PSS)</td>
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<td>&lt;0.001</td>
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<td>Low/moderate</td>
<td>1,067</td>
<td>67.20</td>
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<tr>
<td>High</td>
<td>144</td>
<td>88.19</td>
<td>3.65</td>
<td>2.16 to 6.15</td>
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<td>14. Quality of life (QOL)</td>
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<td>Moderate/high</td>
<td>793</td>
<td>66.33</td>
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<td></td>
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<tr>
<td>Low</td>
<td>418</td>
<td>76.08</td>
<td>1.61</td>
<td>1.23 – 2.11</td>
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</tbody>
</table>
Factors associated with depression: Multivariable analysis: Multilevel logistic regression by Backward elimination indicated that Cambodian migrant workers who lived alone were 3.42 times more likely to have depression when compared to those who lived with family/relative/friend (AOR=3.42; 95%CI: 2.01 to 5.82), were a construction worker (AOR=2.11; 95%CI: 1.47 to 3.02), stayed in employer’s accommodation (AOR=1.85; 95%CI: 1.31 to 2.62), had no formal education or finished primary education (AOR=1.63; 95%CI: 1.18 to 2.25), and had monthly income ≥6000 (AOR=1.57; 95%CI: 1.037 to 2.37) (Table 2).

Table 2: Factors associated with Depression (CES-D) of Cambodian migrant workers: Multilevel logistic regression analysis

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Number</th>
<th>Depress (%)</th>
<th>Crude OR</th>
<th>Adjusted OR</th>
<th>95% CI</th>
<th>p-value</th>
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<tr>
<td>1. Type of resident</td>
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<td></td>
<td></td>
<td>&lt;0.001</td>
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<tr>
<td>Stayed with family/relative/friend</td>
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<td>3. Housing tenure</td>
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<td></td>
<td></td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Rented</td>
<td>196</td>
<td>53.57</td>
<td>1</td>
<td>1</td>
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<td></td>
</tr>
<tr>
<td>Stayed in employer’s accommodation</td>
<td>1,015</td>
<td>72.81</td>
<td>2.32</td>
<td>1.85</td>
<td>1.31 to 2.62</td>
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<td>4. Educational attainment</td>
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<td>0.003</td>
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<tr>
<td>Secondary education or higher</td>
<td>240</td>
<td>59.17</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary education or less</td>
<td>971</td>
<td>72.30</td>
<td>1.80</td>
<td>1.63</td>
<td>1.18 to 2.25</td>
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</tr>
<tr>
<td>5. Monthly income (THB)</td>
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<td></td>
<td>0.033</td>
</tr>
<tr>
<td>&lt;6,000 Baht</td>
<td>132</td>
<td>62.12</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
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<td>≥6,000 Baht</td>
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<td>70.62</td>
<td>1.47</td>
<td>1.57</td>
<td>1.04 to 2.37</td>
<td></td>
</tr>
<tr>
<td>6. Perceived of stress (PSS)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Low/moderate</td>
<td>1,067</td>
<td>67.20</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High stress</td>
<td>144</td>
<td>88.19</td>
<td>3.65</td>
<td>3.74</td>
<td>2.11 to 6.62</td>
<td></td>
</tr>
<tr>
<td>7. Quality of life (QOL)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Moderate/high</td>
<td>793</td>
<td>66.33</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>418</td>
<td>76.08</td>
<td>1.61</td>
<td>2.20</td>
<td>1.48 to 3.27</td>
<td></td>
</tr>
</tbody>
</table>

Discussion

Previous study indicated that socioeconomic status had high impact on depression and other mental symptoms\(^{12}\). The multivariable analysis of this study also confirmed that SES, the socioeconomic disparities, was associated with depression of Cambodian migrant workers in Thailand. The migrant workers who had only primary education or no formal education were 1.63 times more likely to depress more than those with higher levels\(^{13}\). Those with lower level of education are usually have a lower position with less salary. The respondents who were construction workers were 2.11 times more likely to depress than others. It might be related to work conditions such occupational injuries and frequently exposed to various risks from poor working environments with long hours and male workers were more likely to face with depressed\(^{14}\). Participants who had greater personal monthly income ≥6000THB were more depressed than those with lower income\(^{15}\). It might be that a higher income was followed by higher responsibility on their work. In addition, they might have fewer times to rest with family.

Participants who stayed alone were 3.42 times more likely to depress than those who stayed together with family, relatives, and friends. Staying alone might lack interaction and advising from family or friend. Therefore when they faced with problems they have to take responsibility alone\(^{16}\). Respondents who stayed in a house provided by the employer were 1.85 times more depressed than those who were in a rent house. Even though the house was provided for free by the employer but its location might too far from the community.
center and temporary shelter especially for agriculture and construction workers. Moreover, it also limited their accessibility to services for their basic needs in everyday living especially poorly access to health services could contribute to high prevalence of depressed\(^{(17)}\).

Participants who reported having high level of PSS were three times more likely to depress than those with low to moderate levels of PSS with also similar with a previous study\(^{(18)}\). Many reasons that could explain; hardship in working conditions, work relating illness, living environment, language barrier, a might cause them more stressful to develop depression\(^{(19)}\). Participants who has a low level of QOL were two times more likely to depress when compared with those who has moderate to high levels of QOL. It might be resulted from lack of social integration when they lived in new environments for long period of times that make them feel missing home, deprivation and could result in depressed\(^{(20)}\).

**Conclusion**

The current study reported almost 70% of Cambodian migrant workers in Thailand had depression. Socioeconomic factors, stress, and quality of life had a high impact on depression of these migrant workers. Relevant sectors such as employers, local administration, and health sectors should collaborate work to improve the migrant workers’ working and living condition. Counseling is also essential to help improving their ability to coping with stress and other socioeconomic and environmental factors.

**Conflict of Interest Statement:** The authors declare that no conflict of interest.

**Source of Funding:** The Research and Training Center for Enhancing Quality of Life for Working-Age People, KhonKaen University (Contract No.60/023).

**Ethical Clearance:** Taken from the office of the KhonKaen University Ethics Committee in human research (HE602361).

**References**


The Effects of an Integration of PRECEDE-PROCEED Model and Health Literacy in Behavioral Modification for Weight Control among Overweight and Obesity of Adolescents in the Northeast of Thailand

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Abstract

This study was aimed to investigate the effects of the Integration of PRECEDE-PROCEED Model and Health Literacy in behavioral modification for weight control among overweight and obesity of adolescents in the Northeast of Thailand. This study was an experimental intervention. The sample size included 80 Mattayom 2 students in 2 lower-secondary school. It was two group clusters randomized controlled trial that were divided into 2 groups of intervention (40) and the control (40) in lower-secondary school in Nakhon Ratchasima province.

The results were concluded that the experimental group had better health behavior including physical activities (Mean difference = 9.47, 95% CI = 7.38 to 11.55, P-value < 0.001), consumption behaviors (Mean difference = 9.45, 95% CI = 6.75 to 12.15, P-value < 0.001) and behaviors of coping with emotion (Mean difference = 8.48, 95% CI = 6.16 to 10.79, P-value < 0.001) more than the control group with statistical significance at the level of 0.05.

This means that the integration of the PRECEDE-PROCEED Model with health literacy can increase in the average score of health behaviors higher than before the experiment. The clinical result of obesity which decreased means that study can be used as a model for controlling and preventing overweight and obesity of adolescents and in other areas.

Keywords: Overweight, Obesity, Health Education, Weight Control.

Introduction

Obesity is chronic disease which ruins one’s health both in physical and mental, including any risk factors to have other diseases (1). The estimation for the global prevalence of overweight and obesity in 2016, over 340 million children and adolescents aged between 5 to 19 years were overweight. This prevalence has risen dramatically from 4% in 1975 to over 18% in 2016 in both boys (19%) and girls (18%) (2). In Thailand in 2017 children aged 6-14 years old showed that they seemed to gain weight and overweight at 10.61% in 2014, 11.73% in 2016 and 12.77% in 2017 (3).

Nowadays the adolescents and youths in Thailand, quite concentrates on external appearance and be unsatisfied with their own shapes. It effects to their diet disorder behavior such as using diet pills and do fasting; which extremely impacts to their health (4). The last demonstration has increased rates of obesity in children and adolescents which indicated that an urgent administration to correct the action among them would be essentially needed by using the PRECEDE-PROCEED Model and health literacy to key mine weight situation.

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The PRECEDE–PROCEED model is a cost–benefit evaluation framework proposed in 1974 by Lawrence W. Green that can help health program planners, policy makers and other evaluators analyze situations and design health programs efficiently\(^{(5)}\). Health literacy is the personal, cognitive and social skills which determine the ability of individuals to access, understand and use information to promote and maintain good health\(^{(6)}\). The research found that the obesity in school-aged children was associated with parental factors. The obesity in adolescents were strongly associated with health knowledge of the adolescents\(^{(7)}\).

Consequently, the researcher pays attention on this issue in order to study the behavioral modification for weight control among overweight and obesity of adolescents. The intervention was developed to modify from PRECEDE-PROCEED Model and health literacy.

**Material and Method**

**Study Design and Sampling:** This study was an experimental interventional. Data were collected from May 2018 to October 2018. The sample size was calculated following formula of Hemming et al\(^{(8)}\).

\[
n = \frac{Z_{\alpha/2}^2 + Z_{\beta}^2 \times \text{VIP}^2}{(\mu_X - \mu_Y)^2}
\]

The approximate sample size was 34 and preventing missing data or loss of 5% sample size can be adjusted by using formula of Lachin\(^{(9)}\). Therefore, the total number of the sample was 40. This study has two group clusters randomized controlled trial. The sampling was selected from 2 schools. The researcher was interested in students in Lower Secondary Mathayom 2 due to the fact that the result in phase 1 found out the highest prevalence of obesity. That was divided into 2 groups of intervention (40) and the control (40) students, so the total was 80 students in lower-secondary school in Nakhon Ratchasima provinces. The process of random allocation to the intervention and control groups of the participants in these two groups. Inclusion criteria were among overweight and obese students in junior high schools in Nakhon Ratchasima province, (BMI for age 85th to < 95th Percentile and ≥ 95th Percentile)\(^{(10)}\), students who have permission from their parents and voluntarily participate in the study. Besides, they have not ever joined any health improvement behaviors before and everyone has their personal mobile phone. Exclusion criteria were students has BMI ≥40 as morbidly obese and students with Chronic Illnesses which obstruct to the research and use a dietary supplement for weight loss. Data collection was performed in 3 periods. Baseline measures and 3 and 6 months after measures after receiving the intervention and additional analyses body weight, body mass index, waist circumference, and waist to hip ratio, body fat and triceps skinfold.

**Intervention:** The experimental group would receive an intervention according to our plan and fixed period which each time was not over than 45 minutes. Week 1-12, those in the control group are free of intervention. The experimental group receiving the intervention they were determined to join 6 activities as following,

**Week1,** 1\(^{st}\) activity, develop the cognitive skills including predisposing factors to obesity in Adolescence. The purpose of the activity was to build up group dynamics in order to make friendliness relationship to each other; moreover, the activity in group brought them, to get better knowledge, improving attitude of obesity.

**Week2,** 2\(^{nd}\) activity, develop the access skill and media literacy skill by creating group in Facebook, Line, using application “FoodiEat” diet manual so that they can share and exchange the health literacy skill to each other, including encouraging their behavior as well.

**Week3,** 3\(^{rd}\) activity, develop the Self-management skill including enabling factors to obesity, first of all, they had to set target how to do on diet, preventing gain weight and keep control their weight not to be over, next, recording on their personal notebook what food they ate, their workout and any change of their weight and the last one was to practice how to select healthy food in order to lose weight.

**Week3-10,** the activity was to work out as aerobic dance 3 days week, in 30 minutes each time in the afternoon after class.

**Week4,** 4\(^{th}\) activity, develop the communication skill including reinforcing factors to obesity, the method was to have role models to weight loss journey has been motivation to motivate them or earn any reward if they could be done with it successfully.

**Week5,** 5\(^{th}\) activity, develop the decision skill, they had to know how to handle with stress and control their hunger, and moreover, they learned both good things
and bad things once they were on diet and what they should deny to do while they were on experiment period.

Week 6-12, to stimulate them on diet correctly continually, group members could urge their team via social network like Line and Facebook at least once a week.

Week12, 6th activity, the school proposed the policy and rules in order to support this activity which is able to improve adolescents’ diet behaviors sustainably. After experimental evaluation in week13.

**Questionnaires:** The questionnaire was modified from reviewed literatures based on research questions. The questionnaire contained 4 parts: 1) Demographic Characteristics, 2) evaluate of overweight and obesity, 3) health literacy in order to prevent obesity disease, and 4) behaviors which effect to obesity disease. The validity of the questionnaire was confirmed during piloting.

**Data Analysis:** Stata version 10.0 (StataCorp, College Station, TX) was used for data analyses by using multiple linear regression statistics. The results were repeatedly measured over time analyzed with Generalized Estimating Equations (GEE) statistics reported Mean difference and a 95% confidence interval (95%CI) and considered significant at P < 0.05.

**Result**

The results found that after receiving Intervention, the experimental group has better health literacy to prevent the obesity including cognitive skill (Mean difference = 1.51, 95% CI = 1.11 to 1.19, P-value < 0.001), access skill (Mean difference = 3.17, 95% CI = 1.92 to 4.43, P-value < 0.001), communication skill (Mean difference = 3.80, 95% CI = 2.46 to 5.14, P-value < 0.001), self-management skill (Mean difference = 1.83, 95% CI = 1.15 to 2.51, P-value < 0.001), decision skill (Mean difference = 3.91, 95% CI = 2.77 to 5.04, P-value < 0.001) more than the control group with statistical significance at the level of 0.05 (Table 1).

**Table 1: The comparison of the average scores of health literacy between experimental group and controlled group at baseline, 3 months and 6 months of trial**

<table>
<thead>
<tr>
<th>Trial period</th>
<th>Group</th>
<th>Mean difference</th>
<th>95% CI</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intervention group</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Control group</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive skill</td>
<td>Mena ± SD</td>
<td>Mena ± SD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline</td>
<td>5.50 ±1.52</td>
<td>5.92±1.38</td>
<td>0.42</td>
<td>-0.22 to 1.07</td>
</tr>
<tr>
<td>3 months after</td>
<td>7.55±1.13</td>
<td>6.02±1.35</td>
<td>1.75</td>
<td>1.31 to 2.19</td>
</tr>
<tr>
<td>6 months after</td>
<td>7.38±0.98</td>
<td>6.25±1.55</td>
<td>1.26</td>
<td>0.71 to 1.81</td>
</tr>
<tr>
<td>Overall</td>
<td>1.51</td>
<td>1.11 to 1.19</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>Access skill</td>
<td>Mena ± SD</td>
<td>Mena ± SD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline</td>
<td>14.18±2.28</td>
<td>15.18±3.24</td>
<td>1</td>
<td>-0.24 to 2.24</td>
</tr>
<tr>
<td>3 months after</td>
<td>17.90±2.79</td>
<td>15.58±3.93</td>
<td>2.88</td>
<td>1.51 to 4.26</td>
</tr>
<tr>
<td>6 months after</td>
<td>18.32±2.43</td>
<td>15.48±4.08</td>
<td>3.46</td>
<td>2.14 to 4.78</td>
</tr>
<tr>
<td>Overall</td>
<td>3.17</td>
<td>1.92 to 4.43</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>Communication skill</td>
<td>Mena ± SD</td>
<td>Mena ± SD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline</td>
<td>17.30±3.66</td>
<td>17.92±3.78</td>
<td>0.62</td>
<td>-1.03 to 2.28</td>
</tr>
<tr>
<td>3 months after</td>
<td>21.40±3.54</td>
<td>18.05±4.87</td>
<td>3.46</td>
<td>2.19 to 5.33</td>
</tr>
<tr>
<td>6 months after</td>
<td>21.52±3.26</td>
<td>15.08±4.13</td>
<td>3.84</td>
<td>2.46 to 5.22</td>
</tr>
<tr>
<td>Overall</td>
<td>3.80</td>
<td>2.46 to 5.14</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>Self-management skill</td>
<td>Mena ± SD</td>
<td>Mena ± SD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline</td>
<td>15.32±2.93</td>
<td>15.42±4.06</td>
<td>0.07</td>
<td>-1.50 to 1.65</td>
</tr>
<tr>
<td>3 months after</td>
<td>16.92±3.09</td>
<td>15.48±3.64</td>
<td>1.51</td>
<td>0.67 to 2.35</td>
</tr>
<tr>
<td>6 months after</td>
<td>17.18±2.61</td>
<td>15.08±4.13</td>
<td>2.16</td>
<td>1.20 to 3.11</td>
</tr>
<tr>
<td>Overall</td>
<td>1.83</td>
<td>1.15 to 2.51</td>
<td>&lt;0.001</td>
<td></td>
</tr>
</tbody>
</table>
The results found that after receiving Intervention, the experimental group has the health behavior including physical activities (Mean difference = 9.47, 95% CI = 7.38 to 11.55, P-value < 0.001), consumption behaviors (Mean difference = 9.45, 95% CI = 6.75 to 12.15, P-value < 0.001) and behaviors of coping with emotion (Mean difference = 8.48, 95% CI = 6.16 to 10.79, P-value < 0.001) more than the control group with statistical significance at the level of 0.05 (Table 2).

### Table 2: The comparison of the average scores of behaviors between experimental group and controlled group at baseline, 3 months and 6 months of trial

<table>
<thead>
<tr>
<th>Trial period</th>
<th>Group</th>
<th>Mean difference</th>
<th>95% CI</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intervention group</td>
<td>Control group</td>
<td>Mena ± SD</td>
<td>Mena ± SD</td>
</tr>
<tr>
<td>Media literacy</td>
<td>Baseline</td>
<td>13.82±3.24</td>
<td>14.15±3.68</td>
<td>0.32</td>
</tr>
<tr>
<td></td>
<td>3 months after</td>
<td>18.08±3.19</td>
<td>15.05±3.72</td>
<td>3.15</td>
</tr>
<tr>
<td></td>
<td>6 months after</td>
<td>19.10±2.82</td>
<td>14.60±3.30</td>
<td>4.67</td>
</tr>
<tr>
<td></td>
<td>Overall</td>
<td>3.91</td>
<td>2.77 to 5.04</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Decision skill</td>
<td>Baseline</td>
<td>10.28±2.79</td>
<td>11.30±2.44</td>
<td>1.02</td>
</tr>
<tr>
<td></td>
<td>3 months after</td>
<td>13.72±3.00</td>
<td>11.65±2.61</td>
<td>2.61</td>
</tr>
<tr>
<td></td>
<td>6 months after</td>
<td>13.48±2.36</td>
<td>11.88±2.44</td>
<td>1.71</td>
</tr>
<tr>
<td></td>
<td>Overall</td>
<td>2.16</td>
<td>1.39 to 2.93</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Physical activities behaviors</td>
<td>Baseline</td>
<td>25.55±5.93</td>
<td>26.45±7.05</td>
<td>0.90</td>
</tr>
<tr>
<td></td>
<td>3 months after</td>
<td>34.35±7.91</td>
<td>25.92±7.03</td>
<td>8.53</td>
</tr>
<tr>
<td></td>
<td>6 months after</td>
<td>35.32±5.63</td>
<td>25.25±6.19</td>
<td>10.40</td>
</tr>
<tr>
<td></td>
<td>Overall</td>
<td>9.47</td>
<td>7.38 to 11.55</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Consumption behaviors</td>
<td>Baseline</td>
<td>28.45±4.47</td>
<td>26.90±6.78</td>
<td>-1.55</td>
</tr>
<tr>
<td></td>
<td>3 months after</td>
<td>34.00±6.84</td>
<td>23.82±6.74</td>
<td>9.95</td>
</tr>
<tr>
<td></td>
<td>6 months after</td>
<td>35.10±6.13</td>
<td>26.10±6.18</td>
<td>8.95</td>
</tr>
<tr>
<td></td>
<td>Overall</td>
<td>9.45</td>
<td>6.75 to 12.15</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Self-emotion management</td>
<td>Baseline</td>
<td>26.55 (4.36)</td>
<td>25.80 (6.95)</td>
<td>-0.75</td>
</tr>
<tr>
<td></td>
<td>3 months after</td>
<td>34.40 (6.57)</td>
<td>25.62 (7.10)</td>
<td>8.24</td>
</tr>
<tr>
<td></td>
<td>6 months after</td>
<td>34.90 (6.00)</td>
<td>25.70 (6.76)</td>
<td>8.71</td>
</tr>
<tr>
<td></td>
<td>Overall</td>
<td>8.48</td>
<td>6.16 to 10.79</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

The results found that after receiving Intervention, the experimental group has the body weight, body mass index, waist circumference, waist to hip ratio, body fat and triceps skin fold lower than the control group (Table 3).
Table 3: The comparison of the average scores of clinical score between experimental group and controlled group at baseline, 3 months and 6 months of trial

<table>
<thead>
<tr>
<th>The clinical result</th>
<th>Experimental (n=40)</th>
<th>Control (n=40)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean ± SD</td>
<td>Median(IQR)</td>
<td>Mean ± SD</td>
</tr>
<tr>
<td><strong>Body weight</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>baseline</td>
<td>81.53±10.633</td>
<td>79.45(12.25)</td>
<td>82.42±12.05</td>
</tr>
<tr>
<td>3 months after</td>
<td>78.28±10.00</td>
<td>75.85(12.95)</td>
<td>83.52±11.71</td>
</tr>
<tr>
<td>6 months after</td>
<td>81.78±11.12</td>
<td>80.00(13.25)</td>
<td>84.34±11.96</td>
</tr>
<tr>
<td><strong>BMI for age</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>baseline</td>
<td>99.32±10.82</td>
<td>98.15(2.05)</td>
<td>97.42±2.01</td>
</tr>
<tr>
<td>3 months after</td>
<td>96.85±2.59</td>
<td>97.4(2.35)</td>
<td>97.86±1.73</td>
</tr>
<tr>
<td>6 months after</td>
<td>97.45±1.99</td>
<td>98.00(2.30)</td>
<td>98.05±1.41</td>
</tr>
<tr>
<td><strong>Waist circumference</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>baseline</td>
<td>99.68±12.92</td>
<td>98.50(10.50)</td>
<td>100.50±10.85</td>
</tr>
<tr>
<td>3 months after</td>
<td>97.20±10.35</td>
<td>98.00(8.50)</td>
<td>102.72±9.77</td>
</tr>
<tr>
<td>6 months after</td>
<td>99.85±9.40</td>
<td>100.00(10.00)</td>
<td>104.12±10.34</td>
</tr>
<tr>
<td><strong>Waist-hip ratio</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>baseline</td>
<td>0.93±0.09</td>
<td>0.94(0.14)</td>
<td>0.94±0.08</td>
</tr>
<tr>
<td>3 months after</td>
<td>0.91±0.08</td>
<td>0.92(0.14)</td>
<td>0.95±0.06</td>
</tr>
<tr>
<td>6 months after</td>
<td>0.93±0.07</td>
<td>0.94(0.10)</td>
<td>0.96±0.07</td>
</tr>
<tr>
<td><strong>Body fat</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>baseline</td>
<td>37.38±10.95</td>
<td>35.15(16.70)</td>
<td>37.50±11.20</td>
</tr>
<tr>
<td>3 months after</td>
<td>37.08±10.62</td>
<td>35.10(16.80)</td>
<td>38.21±10.51</td>
</tr>
<tr>
<td>6 months after</td>
<td>37.74±11.04</td>
<td>36.00(16.40)</td>
<td>38.58±10.57</td>
</tr>
<tr>
<td><strong>Triceps skinfold</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>baseline</td>
<td>27.99±4.59</td>
<td>28.30(7.55)</td>
<td>25.98±6.17</td>
</tr>
<tr>
<td>3 months after</td>
<td>27.72±4.45</td>
<td>27.25(6.25)</td>
<td>27.36±5.88</td>
</tr>
<tr>
<td>6 months after</td>
<td>27.37±4.61</td>
<td>27.25(7.20)</td>
<td>28.02±5.58</td>
</tr>
</tbody>
</table>

**Discussion**

The results found that three and six months after the intervention the experimental group has the health literacy to prevent the obesity include cognitive skill, access skill, communication skill, self-management skill, media literacy skill and decision skill, and has the health behavior including physical activities, consumption behaviors and behaviors of coping with emotion more than the control group with statistical significance at the level of 0.05. This result is consistent with the study of Rezapour et al. (2016) study School-Based and PRECEDE-PROCEED-Model Intervention to Promote Physical Activity in the High School Students. The results, the school-based intervention, and components of PRECEDE-PROCCEED Model had a positive impact on the improvement of physical activity and a decrease in physical inactivity among the students, and conforms to the study of Chari et al. (2014). The results showed up that health literacy is associated with obesity in teenagers. It quite affects the strategies of prevention and remedial treatment to the obesity disease. Therefore, the integration of PRECEDE-PROCESS Model with health literacy might improve the adolescents’ diet behaviors that were overweight and obesity in the region of north eastern of Thailand as the experiment had reflected the increasing of average scores in health literacy higher.

The experimental period had evident changed that occurred to the overweight and obesity of the adolescents of both experimental and controlled groups. After receiving Intervention, the experimental group has the body weight, body mass index, waist circumference, waist to hip ratio, body fat and triceps skinfold lower than the control group. This result is similar to Triffoni-Melo A et al. (2014) The results showed was significant reduction of all variables in the intervention group (p<0.01). Patients of the intervention group presented greater weight loss (4.4kg, p<0.01) and reduction of body
mass index, waist circumference, waist circumference 1, waist circumference 2 (p<0.01), and fat mass (p=0.04) than the control group (11).

Conclusion

From this study showed the reflection of the increase in the average scores of health literacy and health behavior higher. So if we wanted to improve their behaviors, should bring the integration of PRECEDE-PROCESS Model with health literacy by using to the Behavioral Modification for Weight Control among Overweight and Obesity of adolescents including another age period as well.

Conflict of Interest Statement: The authors declare no conflict of interest.

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Ethical Clearance: Taken from the office of Khonkaen University Ethics Committee in human research (HE602200).

References

Identification and Job Hazard Analysis in Playing Facilities at Klojen Kindergarten, Indonesia

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Abstract

Learning activities in Kindergarten are conducted by learning while playing. Kindergarten of Klojen is one of the Kindergarten that provides playing facilities that are very diverse for their students. The types of games in Kindergarten include 1-seat swing, (playground) / slide board, climbing iron, half-circle climbing game. All of these playing facilities still have potential hazards for children. The purpose of this study was to analyze the potential hazards at playing facilities in Kindergarten and find the cause, and propose improvements to safer children’s playing facilities. This observational descriptive study aims to determine the level of safety risk in playing activities related to the use of game equipment in outdoor playing areas. This study identifies hazards and risks at each stage of play activity using the Job Hazard Analysis method and analyzes the value of probability, exposure, and consequences at each of these stages. The results of this study state that the level of risk at each stage of playing activities in the outdoor play area includes very high levels, priority 1, substantial, priority 3, and acceptable. The proposed improvements made on the 1-seat swing include adding backrests and armrests, the height of the seat board adjusted to the children, the shade roof. Sliding boards include repairing stairs, adding sandboxes, raising the side of the sled.

Keywords: Kindergarten, job hazard analysis, playing facilities, danger.

Introduction

Safety is an important aspect in the implementation of industrial processes and in daily activities. The safety of industrial processes in its activities has been regulated by their respective companies with the establishment of a special division of occupational safety and health which is commonly known as the division of health safety and environment (HSE)1. While the implementation of safety aspects in various activities carried out by individuals and the public every day (outside the industrial process) escapes the government’s attention2.

One of the most frequent and crowded places to visit is a playground. Playground is a playground for children, a place to develop creativity, as well as a place to socialize for them but in the playground there is a risk of danger due to falling from a height that can result in injury or maybe to experience a more fatal injury3,4.

Based on research conducted by Tinsworth and McDonald related to cases of injury / injury to children, it is known that every year in the United States there are more than 200,000 children under the age of 15 years treated in the emergency part of the hospital due to injury / injury related to play equipment in the playing area. Cases of injury / injury experienced are in the form of falling from a height while playing. The results of the study found that 76% of injury / injury incidents related to play equipment occurred in the general playground with a proportion of 45% occurring in the school play area and 31% occurred in public playgrounds, such as fast food restaurants, a childcare playground, and an apartment play area5.

In Indonesia, child mortality due to land accidents was recorded at 7.3% in 1992 and is one of the five highest causes of child mortality. From the Basic Health Research data in 2007, cases of land accidents in children, one of which was caused by a fall from a height in the play area, which was a percentage of 19.2%6.

Kindergarten is one of the forms of early childhood education units7. All learning activities in Kindergarten are packed in the form of learning while playing so that Kindergarten is generally equipped with a playground with various types of playgrounds8.
In the initial observations made by the author, it was found that there were a number of rotten play tools, did not have their own safe zones, and the distance between the game equipment was not standard (due to the limited play area). In addition, in the Kindergarten of Klojen there have been cases of injury to students who use playground equipment in outdoor play areas. Cases of injury that have occurred are in 2016 with 4 cases. The case was in the form of bumping the head of the student while playing a swing impacting the bruise on the head, the fall of the student from the swing impacting the blisters, and the bumping of the student’s nose when playing the swing had an impact on the nose.

Based on these findings, a risk management effort is needed which begins with identifying safety hazards and risks in playing activities related to the use of game equipment in the outdoor play area of Kindergarten of Klojen, Malang.

**Method**

The design of this study is descriptive observational by using a semi-quantitative approach to determine or estimate the level of safety risk in playing activities in the playing area of Kindergarten of Klojen, Malang. Identification of hazards and risks is carried out using the JHA method. After that, risk analysis is performed using semi-quantitative method based on AS / NZS 4360: 2004 standard on Risk Management by determining the value of probability, exposure, and consequences, these values are then calculated to get the level of risk (level of risk) at each Play activities carried out by Kindergarten of Klojen students, Malang.

The results of the study in the form of identification of hazards and safety risks and the results of the analysis of the level of risk of safety and the discussion described in the form of narrative. The instruments used were interview sheets, JHA sheets, cameras, tables of probability, exposure, consequences, and the level of risk (level of risk) of W.T. Fine J., and a risk calculation formula from software (Microsoft Excel).

**Results and Discussion**

**Risk of Playing Facilities Based on Risk Analysis AS / NZS 4360: 2004**

**Slides:** The level of risk in slides is based on the results of risk analysis, generally have a Priority 3 risk level both in Basic Risk Level, Existing Risk Level, and Predictive Risk Level. This is caused by most of the hazards and safety risks that occur in this game tool, which is likely to be quite frequent, but it causes the impact of minor abrasions and causes loss of learning time which is estimated to be less than 1 hour (noticeable) to cause injury serious enough that it needs to be addressed by providing first aid medicines at school and causing loss of study time which is estimated to be one hour to one day (important).

The size of the slide is suitable for Kindergarten age, namely the length of the slide board from the beginning to the exit of the slide board of (100-150 cm) and the distance between the slide stairs is 25 cm.

In the slide game equipment in the Kindergarten of Klojen, the size of the slide height was 114 cm, the length of the slide board from the beginning to the exit section of the skateboard was 150 cm, and the distance between stairs was 25 cm. In addition, the average size of students as game users is an average height of 104 cm. The average student’s body weight is 18 kg. From the comparison between the size of the Safety Playground standard, the size of the slide, and the average height and weight size of the Kindergarten of Klojen students found that this slide play device was not dangerous for students because the game device was not too high and the sled was sloping.

From the results of the risk level analysis and comparison between the size of the Safety Playground standard the size of the slide, and the average size of the height and weight of the student as a user of the game device (user) can be concluded that the slide play equipment in the Kindergarten of Klojen is suitable for the age of students.

**Arch Climber:** The level of risk in the semicircular climbing game equipment (arch climber) is based on the results of risk analysis has a Priority 1 risk level in the Basic Risk Level and has a Priority 3 risk level on the Existing Risk Level and Predictive Risk Level. This is caused by most of the hazards and safety risks that occur in this game tool, which is likely to be quite frequent and cause an impact in the form of injuries that are quite serious so that it needs to be dealt with by providing first aid medicines at school and causing loss of learning time, estimated one hour to one day. However, after risk control is already in place at school and given risk control recommendations by the author, the level of risk can drop to priority 3, which means that it needs to be
maintained in control that is already in school and given continuous supervision.

The size of the semicircular climbing (arch climber) which is in accordance with the Kindergarten age, ie the height of climbing is 135 cm), the distance between the arch climber stairs (vertical rises) is 22 cm and the diameter of the stairs is 2.2-3.1 cm. In the semicircular climbing game (arch climber) in Kindergarten of Klojen it was found that its height was 134 cm, the distance between arch climber stairs (vertical rises) was 26.5 cm, and the staircase diameter was 5.15 cm. In addition, the average size of students as game users is an average height of 104 cm. The average student’s body weight is 18 kg. From the comparison between the size of the Safety Playground standard, Semicircular climbing size, and the average height and weight size of Klojen Kindergarten students found that this semicircular climbing game is not dangerous for students because the playground is not too high (still below the standard) and students are still easy to move and hold on each step.

From the results of the risk level analysis and comparison between the size of the Safety Playground standard, the size of the semicircular climbing (arch climber), and the average size of the height and weight of students as users of the game (user) can be concluded that the semicircular climbing game in the Kindergarten of Klojen was suitable for the age of Kindergarten students.

**Single Swings:** The level of risk in the single swings game is based on the results of risk analysis has a Very High risk level in the Basic Risk Level and has a Priority 3 risk level on the Existing Risk Level and Predictive Risk Level. This is caused by most of the hazards and safety risks that occur in this game tool that is likely to be frequent and cause serious injury such as a tear on the head due to a fall from a swing, broken teeth due to the impact of the swing holder, and bruises on the nose due to hit the swing seat so that it requires medical treatment by a doctor, and causes loss of study time estimated to be 2-3 days or more (serious). After controlling for risks that already exist in schools and given risk control recommendations by the author, the level of risk can go down to priority 3, which means that it needs to be maintained in control that was already in school and given continuous supervision.

Single swings are suitable for Kindergarten age, which is a measure of the distance between the swing holder and the surface of the playing area of at least 12 inches (maximum 30.48 cm) and fall height, which is a maximum of 60 inches (maximum 152.4 cm). There are two single swings that are the same size. In single swings, it was found that the height was 158 cm, the height of the fall (fall height) was 78 cm, and the distance between the swing seat and the surface of the playing area was 22 cm. In addition, the average student as a user of the game is the average height of 104 cm. The average student’s body weight is 18 kg. From the comparison between the size of the Safety Playground standard, Single swings, and the average height and weight size of Kindergarten of Klojen students found that single swings are not dangerous for students because of the size of the fall height and the distance between the swings to the surface of the play area. Both small and large swings are below the standard size and can still be reached by students.

From the results of the risk level analysis and comparison between the size of the Safety Playground standard, single swings, and the average size of height and weight of students as users of the game (user) can be concluded that single swings in the Kindergarten of Klojen are suitable for Kindergarten students.

**Vertical Climber:** The level of risk in the vertical climber is based on the results of risk analysis has a Priority 1 risk level in the Basic Risk Level and has a Priority 3 risk level on the Existing Risk Level and Predictive Risk Level. This is caused by most of the hazards and safety risks that occur in this game tool that is likely to be quite frequent and cause the impact of serious injuries such as bruises, lumps that need to be treated with first aid medication at school and cause time loss study which is estimated to be one hour to one day. However, after risk control is already in place at school and given risk control recommendations by the author, the level of risk can drop to priority 3, which means that it needs to be maintained in control that is already in school and given continuous supervision.

Vertical climbers size that corresponds to Kindergarten age, which is the height of climbing by 142.5 cm), the distance between stairs vertical climber (vertical rises) is 23 cm and the diameter of the stairs is 2.2-3.1 cm. In vertical climbing equipment in Klojen Kindergarten, the height is 218 cm, vertical climber (vertical rises) is 25 cm, and the ladder diameter is 5.15 cm. In addition, the average size of students as game users is an average height of 104 cm. The average student’s body weight
is 18 kg. From the comparison between standard Safety Playground size, vertical climbing size, and average height and weight size of Klojen Kindergarten students found that this vertical climbing game is quite dangerous for students because the game equipment has a high size that exceeds the standard.

From the results of the risk level analysis and a comparison between the size of the Safety Playground standard, vertical climber size, and the average height and weight of students as users of the game (user) can be concluded that the vertical climbing game in the Kindergarten of Klojen is not suitable for Kindergarten age.

**Conclusion**

Risks caused by playing activities are 7 types of risks, namely the risk of being hit, falling, slipping, scratched, dislocated, rubbed, and pinched. The control efforts that have been made by the Kindergarten of Klojen are providing rubber mats on the bottom of the slide board and under the single swing, supervision by the class teacher when students are playing, division of play schedules, rules notification or the right way to play to students (at the beginning of entering the new school year and sometimes before the playing activity begins), make a story from the experience of the incident the friend who was injured because of falling so that the other friends know the danger and the consequences, and available School Health Unit facilities and drugs. Based on Safety Playground standards, slides play equipment, arch climber, vertical climber, single swing were suitable for Kindergarten students, but improvements were still needed.

**Ethical Clearance:** Not required.

**Funding:** This study was supported by a 2018 Grant from Research and Community Development Center of University of Brawijaya.

**Conflict of Interest:** There is no conflict of interest exist.

**References**

The Prevalence of H. Pylori Infection in Patients with Non-Ulcerative Dyspepsia

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²FIBMS General Medicine, FIBMS Gastroenterology, Kirkuk Medical College

Abstract

Background: Dyspepsia is considered as an important public health to involve a variety of upper gastrointestinal non-specific symptoms showing no any organ involvement about 60-70% of patients attending GIT clinic suffered from dyspepsia. The aim of our study to estimate the association of infection with H. pylori bacteria with No-ulcerative dyspepsia diagnosed by upper GIT endoscopy and rapid urease test.

Material and method: 455 patients having dyspepsia, attending GIT clinic in Azadi teaching hospital over a period extending April 2008 to April 2107, were examined clinically and history were taken, then endoscopy to upper GIT done under local anesthesia, antral biopsy took and investigated for evidence of H. pylori bacteria by urease test doing rapidly.

Results: 455 patients having non ulcerative dyspepsia proved by endoscopy enrolled in this study, 260 (57.14%) having Pylori infection by urease test, with no significant correlation from those 260 patients 143 (55%) of them showing improvement after receiving eradication therapy for H.pylori infection.

Conclusions: current study, it was founded that there is no e correlation between Helicobacter pylori and NUD, giving broad spectrum treatment for patients NUD and H.pylori infection showing no significant effect in relieving dyspeptic symptoms.

Keywords: H. Pylori, Dyspepsia, anesthesia.

Introduction

There is a certain fact that one of the most important etiologies for peptic ulcer disease is the Helicobacter pylori infection which is founded in 80-95% from cases diagnosed as having peptic ulcer disease. Healing of ulcers depends mainly on treating that infection[1].

Eradication therapy for H. pylori infection causes absolute cure for peptic ulcer disease. While relapse of the disease is expected in 60-80% of patients treated with anti-secretory drugs.

Although an acute dyspeptic symptom which is self-limited commonly occurs after ingestion of H. pylori, the role of H. pylori infection in symptomatic Non ulcerative dyspepsia remain not obvious.

The Incidence of non-ulcerative dyspepsia resulted from gastritis related with H. pylori infection ranging from (39-87)%[2,3]. Inspite of that controversy remains to be present about if H. pylori infection causes chronic dyspeptic symptoms or not [3-6]. Improvement of dyspeptic symptoms after a course of eradication therapy for H. pylori infection strengthen the idea of a clear relationship between Non-ulcerative dyspepsia and infection with H. pylori bacteria. three papers reported that there is a strong relation between get rid of H. pylori infection and disappearance of dyspeptic signs[7-9].

An article published by Patchett et al[10] stated that there is no relationship between Non-ulcerative dyspeptic symptoms and antral infection with H.pylori bacteria in the short term. A prospective study done for assessment of effect of three different types of drugregimens on patients having both NUD and H. pylori infection lasted for a four-week (colloidal bismuth sub citrate alone; metronidazole with amoxycillin; bismuth sub citrate, metronidazole and amoxycillin) showed that there is different effect of giving these drug or not on two different groups of patient one group received treatment...
and another one not received. The final result showed that there is similar improvement of symptoms in those patients taking drugs and another group including patients not receiving any treatment, suggested that the improvement of symptoms not depend on eradication of H. pylori infection. Inspite of that the role of prolonged treatment is not evaluated. This fact initiates us to follow those patients for a long period of time of treatment and to see if there is any change or effect at level of relieving symptoms after complete eradication of infection.[10].

Aim of the study is to estimate the prevalence of h. pylori infection in patients with Non-ulcerative dyspepsia.

**Patients and Method**

455 patients were enrolled in this prospective study, 355 were males and 100 were females those patients attend Gastroenterology Clinic in Azadi teaching hospital, over a period expanding from April 2008 to April 2017, all patients taken presented with dyspepsia. Informed consent and agreement of medical ethics committee was taken for this study, endoscopy was done for all those patients and diagnosed as Non ulcer dyspepsia, antral biopsies taken, rapid Urease test was done to diagnose the presence of evidence of H.pylori infection. After that patients with non-ulcerative dyspepsia and positive urease test for h.pylori bacteria treated with eradication therapy (omeprazol and metronidazole plus amoxicillin) for 4 weeks duration and then assessment of absence or presence of dyspepsia recorded.

Statistical Analysis: The chi square test was used to assess the effect of the presence of evidence of h.pylori infection by antral biopsy taken by endoscopy. Student T test were used to analyze the effect of H. pylori infection on the Non ulcerative. Significant value for all analyses represented by P < 0.05. Values are measured as mean ± SD.

**Results**

This prospective study included 455 patients, 355 (78.02%) were male their mean age±SD was (45.3 ±1.23) years and 100 (21.9%) female patients with mean age ±SD of (56.4 ±1.89) Which is older than male patients enrolled in this study. Table 1 shows that Male patients suffered from dyspeptic symptoms for a duration of about (6±1.1) months which is longer duration of symptoms for those female patients enrolled in this study which is about (3±1.5) months, 60.2% about 214 male patients were smokers while only 11% (11 patients) from females were smokers.

Antral biopsy taken through OGD and rapid urease test was done for all patients shows that 260 (57.14%) of patients were positive for the presence of H.pylori bacterial infection in comparison to 195 (42.86%) patients shows Negative urease test with no significant correlation seen (P-value=0.067) (Table 2).

Table 3 shows significant correlation in comparison of positive urease test male gender patients to those female patients in this study 183 (51.5%) male patients samples showing positive tests in comparison to majority of female patients 77 (77%) recorded as having positive Urease test with P-value equal to 0.02, with no significance when comparison done between positive and negative urease tests among male patients (P-value =0.33), while strong significant relationship seen in comparing positive urease test for those female patients with Negative one (P-value=0.001). No significant correlation reported when the study comparing the Negative results in both Genders (P-value=0.07).

All patients received eradication therapy for H.pylori infection for 4 weeks to show if there is a significant improvement of dyspeptic symptoms among those patients with positive tests. Table 4 shows that 105 (57.3%) of male patients shows a significant improvement after taking eradication therapy for 4 weeks while only 38 (49.3%) female patients showing that significant better feeling after well management with the same therapy with no significant correlation between both groups (P-value =0.07).

**Table 1 demographic distribution of patients with non-ulcerative dyspepsia**

<table>
<thead>
<tr>
<th>Total No. of cases 455 patients</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>355 (78.02%)</td>
<td>100 (21.9%)</td>
</tr>
<tr>
<td>Age mean±SD</td>
<td>45.3 ±1.23</td>
<td>56.4 ±1.89</td>
</tr>
<tr>
<td>Duration of symptoms (months)</td>
<td>Mean±SD</td>
<td></td>
</tr>
<tr>
<td>Smokers</td>
<td>6±1.1</td>
<td>3±1.5</td>
</tr>
<tr>
<td>Smokers</td>
<td>214(60.2%)</td>
<td>11 (11%)</td>
</tr>
</tbody>
</table>

**Table 2: Comparison between total number of patients with Non-ulcerative dyspepsia with positive urease test and Negative urease test of H.pylori infection**

<table>
<thead>
<tr>
<th>Total number of patients</th>
<th>Positive urease test</th>
<th>Negative Urease test</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>455</td>
<td>260 (57.14%)</td>
<td>195 (42.86%)</td>
<td>0.067</td>
</tr>
</tbody>
</table>
Table 3: Gender comparison between patients with non-ulcerative dyspepsia among positive and negative urease test

<table>
<thead>
<tr>
<th>Urease test</th>
<th>Male patients (355)</th>
<th>Female patients (100)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>183 (51.5%)</td>
<td>77 (77%)</td>
<td>0.001</td>
</tr>
<tr>
<td>Negative</td>
<td>172 (48.4%)</td>
<td>23 (23%)</td>
<td>0.07</td>
</tr>
<tr>
<td>P value</td>
<td>0.33</td>
<td>0.001</td>
<td></td>
</tr>
</tbody>
</table>

Table 4: Rate of disappearance of dyspepsia for patients taken H. pylori eradication therapy for 4 weeks

<table>
<thead>
<tr>
<th>Patients with positive urease test</th>
<th>Percentage of relieve symptoms of dyspepsia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male patients (183)</td>
<td>105 (57.3%)</td>
</tr>
<tr>
<td>Female patients (77)</td>
<td>38 (49.3%)</td>
</tr>
</tbody>
</table>

Discussion

Dyspepsia affecting (20-40)% of western population in which endoscopy reveals no ulceration all over the gastrointestinal tract, those patients classified as having Non-ulcer dyspepsia [11, 12]. The etiology is not clear and the correlation between peptic ulcer and the presence of infection with H. pylori bacteria strengthen the relationship between these types of infection with Non –ulcerative dyspepsia [13-15]. Few studies reported that the management of infection with Non-ulcerative dyspepsia show improvement of symptoms more than placebo did [16].

In the current study it was founded that the male patients were more than those female patients with no such difference in their age with high percentage of smoker patients among male gender these result came concordant with other studies [17-18]. While other study shows that advancing age has an effect to increase the possibility of H. pylori infection among patients with non-ulcerative dyspepsia [19]. May be due to firstly larger sample taken in these studies different socioeconomic societies may be poor societies taken or decrease immunity in elderly, no significant correlation seen between patients with non-ulcerative dyspepsia and positive urease test for pylori infection (p-value=0.067) these result agreed with other different studies shows no significant correlation between infection with H. pylori and non-ulcerative dyspepsia [20]. In fact, well designed large studies should be done to prove the effect of the presence of H. pylori infection and non-ulcerative dyspepsia since many systemic reviews including small sample studies only report that effect while no large reviews with prolonged period assess this effect. At the same any weak association between infection and NUD not proved or excluded by any published work [21]. In the current study NUD in male patients showed to be significantly correlated with pylori infection which is not approved by other studies [21]. Current study result may be because small sample taken or chronic inflammatory process associated with H. pylori infection. 143 patients (55%) of patients showing relieve dyspeptic symptoms with no significant correlation between male and female percentages these result strongly agreed with other studies that shows that there is a benefit from using eradication therapy for H. pylori in NUD [22]. The current study result concerning eradication therapy benefit is disconcordant with many meta-analysis showing to specific benefit from giving eradication therapy because different definitions of NUD and reported side effect of therapy regarding gastric carcinoma. The case was pointed by the two meta-analyses published by Laine in 2001 [23] and Gisbert et al. in 2002 [24]. The previous two studies showed minimal effect of treatment of H. pylori with eradication therapy on relieving dyspepsia two another best randomized trial having a same idea by testing the effect of eradication therapy on relieving symptoms by comparing a two groups of patients one of them taking eradication therapy and placebo given to another group over a period of 1 year, No significant difference reported also [23-25].

Conclusion

There is significant correlation approved between infection with H. pylori infection and Non–ulcerative dyspepsia with minimal role of eradication therapy in relief of dyspepsia.

Source of Funding: Self

Ethical Clearance: Not required

Conflict of Interest: None

References


Effectiveness of an Education Program on Nurses’ Knowledge and Practice toward Nursing Management for Patients with Leukemia who are Undergoing Chemotherapy in Baghdad Teaching Hospital

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Abstract

Pre-experimental design, using one group pretest-posttest design, is conducted to determine the effectiveness of an education program on nurses’ knowledge and practice for patients with leukemia who are undergoing chemotherapy. The study was conducted for the period from October 25th, 2018 to April 29th, 2019. The study included a purposive sample of nurses who deliver a bedside care to patients with leukemia. The study sample included (20) male and (20) female nurses. Self-report questionnaire is constructed. It encompasses (5) parts, first part deals with nurses’ socio-demographic characteristics, Part II Nurses’ Knowledge about Leukemia, Part III Nurses’ Knowledge about chemotherapy and Its Side Effects Part IV Nurses’ Knowledge about Nursing Management, Part V Observational Checklist for Nurses’ Practice.

Results: The study findings indicate that there are significant differences between (pre and post1-post2) regarding (nurses’ knowledge and practice for patients with leukemia).

Recommendations: The researchers recommend specific training courses for nurses with exam to get the benefit and to have effect on the oncology nurses’ knowledge and practice, oncology nurses must have a specific pre–oncology educational courses before participation in the oncology ward.

Keywords: Educational Program, Nurses’ Knowledge and Practices, Leukemia.

Introduction

Leukemia is a rapidly progressive malignant proliferation of white blood cell, normal white blood cells are produced in the bone marrow to fight infections, precursors in bone marrow or lymph tissue and their accumulation in peripheral blood, bone marrow, and body tissues. The blood cellular components originate primarily in the marrow of bones such as the sternum, iliac crest, and cranium. All blood cells begin as immature cells (blasts or stem cells) that differentiate and mature into RBCs, platelets, and various types of WBCs.

In leukemia, many immature or ineffective WBCs crowd out the developing normal cells. As the normal cells are replaced by leukemic cells, anemia, neutropenia, and thrombocytopenia occur. Furthermore, many immature or ineffective WBCs crowd out the developing normal cells (1).

As the normal cells are replaced by leukemic cells, anemia, neutropenia, and thrombocytopenia occur. In leukemia, the bone marrow produces a large number of abnormal white blood cells. This affects the development of patient’s normal blood elements and can have serious clinical consequences including life-threatening problems with infection and bleeding. There are two main types of acute leukemia, each named after the type of cell that is affected: Acute Myeloid Leukemia and Acute Lymphoblastic Leukemia (2).

Leukemia requires timely intervention with special type of chemotherapy. Chemotherapy treatment is
prolonged and requires hospitalization for intensive chemotherapy regimens followed by frequent outpatient clinic visits for monitoring, blood product support and additional treatment (3).

Chemotherapy is given for different reasons. It can be given because it is the best way to combat the cancer. It can be administered because other treatments are not enough on their own to combat the cancer. It can be provided to help the patients live longer (4).

Nursing management for patients with leukemia needs specialized information. These information are necessary for making sure of safety for each patient’s life and for the nurses’ safety. So, the little negligence or mistake occur during chemotherapy treatment may result in adverse consequences for patients (5). The care plan for patients with leukemia should emphasize on comfort, minimize the adverse effects of chemotherapy, promote preservation of veins, manage complications, and provide teaching and psychological support (1).

Approximately, every three minutes, one person is diagnosed with a blood cancer and some of them are expected to be diagnosed with leukemia, lymphoma, or myeloma in Iraq at 2018. Prevalence is the estimated number of people alive on a certain date in a population who previously had a diagnosis of the disease. Relative survival compares the survival rate of a person diagnosed with a disease to that of a person without the disease.

**Method**

A pre-experimental design, using one group pretest-posttest approach was used to guide this study. This study was conducted at Baghdad Teaching Hospital in Baghdad City at hematology center. The study included a purposive, non-probability, sample of (40) nurses who work and deliver a bedside care to patients with leukemia who undergoing chemotherapy in Baghdad Teaching Hospital. The sample is comprised of (20) males and (20) females.

The study instrument encompasses five parts; part I is the demographic information sheet (age, gender, education, years of work in hospital, years of experience in blood diseases and training sessions). Part II is nurses’ knowledge about leukemia which includes (12) items.

Part III is nurses’ knowledge about chemotherapy and its side-effects which includes (9) items. Part IV is nurses’ knowledge about nursing management which includes (5) items.

The items in these parts are dichotomous. They are measured on 2-levels scale of (1) for incorrect answer and (2) for the correct answer.

Part V is the observational checklist for nurses’ practices. This part is comprised of (25) items for blood transfusion; (11) items for infection control; (16) items for administration of chemotherapy, and (7) items for nursing management of venous infusion. The checklist items are measured throughout observational techniques of employed and unemployed for (3) episodes.

A pilot study is carried out for the period of January 28th, 2019 to February 11th, 2019 in order to determine the validity and reliability of the study instrument. A test-retest reliability is employed for the determination of the study instrument stability. Pearson correlation coefficient is computed on responses of (10) staff nurses of Baghdad Teaching Hospital, Hematology center. Finding of this computation indicates that the correlation coefficient is (r=0.87) which is approving that the instrument is highly reliable measure for the phenomenon underlying the present study.

Data were analyzed using the statistical package for social sciences (SPSS) for windows, version 24.

**Results**

<table>
<thead>
<tr>
<th>List</th>
<th>Characteristics</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Age (Years):</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Mean = 29.48)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>20–29</td>
<td>22</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td>30–39</td>
<td>16</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>≥ 40</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>Gender:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>20</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>20</td>
<td>50</td>
</tr>
<tr>
<td>3</td>
<td>Nursing educational level:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nursing High School</td>
<td>18</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>Nursing Diploma</td>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Nursing Bachelor/high</td>
<td>12</td>
<td>30</td>
</tr>
<tr>
<td>4</td>
<td>Years of experience in nursing:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1–5</td>
<td>21</td>
<td>52.5</td>
</tr>
<tr>
<td></td>
<td>6–10</td>
<td>12</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>11–15</td>
<td>6</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>16–20</td>
<td>1</td>
<td>2.5</td>
</tr>
<tr>
<td>5</td>
<td>Years of experience in Hematology center:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1–5</td>
<td>29</td>
<td>72.5</td>
</tr>
<tr>
<td></td>
<td>6–10</td>
<td>9</td>
<td>22.5</td>
</tr>
<tr>
<td></td>
<td>11–15</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>16–20</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Nurses are with age group of 20-29-years (55%) from both gender; male and female that show equal number (male = 50% and female = 50%). (45%) of them were graduated from nursing high school which is the highest percentage among educational level variable. More than half of nurses reporting 1-5-years of experience for working in nursing field (52.5%), more of their working years were in hematology ward that refer to (1-5) years with percentage of (72.5%). Regarding getting training courses about management of leukemia, (67.5%) of them showing that they get training courses; (57.5%) are trained inside Iraq and (10%) are trained outside Iraq.

Table 2. Overall Assessment of Nurses’ Knowledge about Management of Patients with Leukemia (N=40)

<table>
<thead>
<tr>
<th>Levels of Knowledge</th>
<th>Pre-test</th>
<th>Post-test I</th>
<th>Post-test II</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
<td>M</td>
</tr>
<tr>
<td>Poor</td>
<td>2</td>
<td>5</td>
<td>2.15</td>
</tr>
<tr>
<td>Fair</td>
<td>30</td>
<td>75</td>
<td>0</td>
</tr>
<tr>
<td>Good</td>
<td>8</td>
<td>20</td>
<td>40</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>100</td>
<td>40</td>
</tr>
</tbody>
</table>

f: Frequency, %: Percentage, M: Mean, SD: Standard deviation, Poor = 0-8, Fair = 9-17, Good = 18-26

This table presents the overall assessment of nurses’ level about management of leukemia; the findings reveal that (75%) of nurses showing fair level of knowledge prior application of educational program during pre-test time, but they are showing good level of knowledge during the time of post-test I and post-test II (100%).

Table 3. Assessment of Nurses’ Knowledge Levels about Assessment of Leukemia (N=40)

<table>
<thead>
<tr>
<th>List</th>
<th>Knowledge about Assessment of Leukemia</th>
<th>Pre-test</th>
<th>Post-test 1 (N=40)</th>
<th>Post-test 2 (N=40)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The volume of blood in the human body is 5-6 liters</td>
<td>0.33</td>
<td>16.5</td>
<td>Poor</td>
</tr>
<tr>
<td>2</td>
<td>Leukemia occurs in bone marrow</td>
<td>0.83</td>
<td>41.5</td>
<td>Good</td>
</tr>
<tr>
<td>3</td>
<td>Leukemia is a cancer of white blood cells</td>
<td>0.83</td>
<td>41.5</td>
<td>Good</td>
</tr>
<tr>
<td>4</td>
<td>The most important symptom of leukemia is hypotension</td>
<td>0.38</td>
<td>19</td>
<td>Fair</td>
</tr>
<tr>
<td>5</td>
<td>Symptoms and signs of leukemia are enlarged by the thymus gland in the chest</td>
<td>0.18</td>
<td>9</td>
<td>Poor</td>
</tr>
<tr>
<td>6</td>
<td>Risks factors of leukemia includes: genetic, environmental and exposure to chemical and radioactive materials</td>
<td>0.38</td>
<td>19</td>
<td>Fair</td>
</tr>
<tr>
<td>7</td>
<td>One of the risk factors for leukemia is down syndrome</td>
<td>0.25</td>
<td>12.5</td>
<td>Poor</td>
</tr>
<tr>
<td>8</td>
<td>Acute leukemia characterized by an increase in the number of immature white blood cells</td>
<td>0.60</td>
<td>30</td>
<td>Fair</td>
</tr>
<tr>
<td>9</td>
<td>Chronic leukemia characterized by an increase in the number of mature white blood cells</td>
<td>0.58</td>
<td>29</td>
<td>Fair</td>
</tr>
<tr>
<td>10</td>
<td>Chronic myeloid leukemia is a type of leukemia that occurs because of increased protein production</td>
<td>0.18</td>
<td>9</td>
<td>Poor</td>
</tr>
<tr>
<td>11</td>
<td>Chronic lymphocytic leukemia is a type of leukemia that occurs in 90-80% of adults</td>
<td>0.20</td>
<td>10</td>
<td>Poor</td>
</tr>
<tr>
<td>12</td>
<td>Bone marrow samples are taken from hip bone</td>
<td>0.58</td>
<td>29</td>
<td>Fair</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>0.44</td>
<td>22</td>
<td>Fair</td>
</tr>
</tbody>
</table>

M.S: Mean of score, R.S: Relative sufficiency, As 0.88sess: Assessment, Poor= 0-0.33, Fair= 0.34-0.67, Good= 0.68-1
This table presents the level of nurses’ knowledge about the assessment of patients with leukemia; the findings indicate that nurses are showing fair level during time pre-test (M.S= 0.44) in which they show poor level of knowledge in items 1, 5, 7, 10, and 11; fair level in items 4, 6, 8, 9, and 12; and good level in items 2, 3, and 11.

During the time of post-test 1 and 2, the nurses showing good level of knowledge about assessment of leukemia (M.S = 0.87) in which the mean of scores during post-test I, show good level in all items except the items 1, 10, and 11. While during post-test II, all items were indicated good levels indicated by high mean of scores.

Table 4. Assessment of Nurses’ Knowledge Levels about Management of Leukemia (N=40)

<table>
<thead>
<tr>
<th>List</th>
<th>Knowledge about Management of Leukemia</th>
<th>Pre-test</th>
<th>Post-test 1 (N=40)</th>
<th>Post-test 2 (N=40)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.13</td>
<td>6.5</td>
<td>Poor</td>
<td>0.80</td>
</tr>
<tr>
<td>2</td>
<td>0.55</td>
<td>27.5</td>
<td>Fair</td>
<td>0.93</td>
</tr>
<tr>
<td>3</td>
<td>0.75</td>
<td>37.5</td>
<td>Good</td>
<td>0.88</td>
</tr>
<tr>
<td>4</td>
<td>0.38</td>
<td>19</td>
<td>Fair</td>
<td>0.78</td>
</tr>
<tr>
<td>5</td>
<td>0.68</td>
<td>34</td>
<td>Good</td>
<td>0.95</td>
</tr>
<tr>
<td>Total</td>
<td>0.50</td>
<td>25</td>
<td>Fair</td>
<td>0.87</td>
</tr>
</tbody>
</table>

M.S: Mean of score, R.S: Relative sufficiency, Assess: Assessment, Poor= 0-0.33, Fair= 0.34-0.67, Good= 0.68-1

This table presents the level of nurses’ knowledge about management of leukemia; the findings show that nurses showing fair level of knowledge during pre-test (M.S= 0.50) in which the mean of scores in item 1 showing poor level; the items 2 and 4 showing fair level and the items 3 and 5 showing good level.

During the post-test I and II, nurses showing good level of knowledge (M.S= 0.87 and 0.81), in which the mean of scores reflect good levels in all items among the time of post-test I and II.

Table 5. Overall evaluation of nurses’ practices toward management of patients with leukemia(N=40)

<table>
<thead>
<tr>
<th>Levels of Practices</th>
<th>Pre-test</th>
<th>Post-test I</th>
<th>Post-test II</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
<td>M</td>
</tr>
<tr>
<td>Poor</td>
<td>2</td>
<td>5</td>
<td>1.95</td>
</tr>
<tr>
<td>Fair</td>
<td>38</td>
<td>95</td>
<td>21</td>
</tr>
<tr>
<td>Good</td>
<td>0</td>
<td>0</td>
<td>19</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>100</td>
<td>40</td>
</tr>
</tbody>
</table>

f: Frequency, %: Percentage, M: Mean, SD Standard deviation, Poor= 0-60, Fair= 61-120, Good=121-180

This table indicates that nurses are showing fair level of practices toward management of leukemia during the pre-test time (95%). During the post-test I and II, more than half of nurses showing fair level of practices (52.5%) and the remaining are showing good level (47.5%). During the post-test II, more than half are show good level (55%) and (45%) are still showing fair level of practices.
Discussion

This pre-experimental study was designed to measure the effectiveness of an educational program nurses’ knowledge and practices about management of leukemia among patients undergoing chemotherapy.

The level of knowledge about the management of leukemia has improved for the majority of nurses over time. This finding indicates the positive influence of the administered educational program. This finding is consistent with that obtained by Shafik and Abd Allah \(^6\) and El-Sawy, Ismail, Magdy, and El-Sam-Man \(^7\) who concluded that nurses’ knowledge about leukemia has improved after administering the educational program. According to Knowles’s Theory of Adult Education, Knowles postulated a number of requirements for optimal education of the adult learner \(^8\). Specialists in curriculum design need to take into account the learning environment, safeguarding that it is conducive to efficient adult learning. The instructional style should be taken into account. Contrary to children, adult learners may take themselves into account to be invariant in standing to their instructors, so they may not accept an authoritative teaching style. Knowles proposed that educators can minimize the frustration of adult learners by adopting self-direction, which enables learners to sustain a level of control over the direction of their learning and an explicit understanding of reason behind their taking on the learning initiative and how it can affect their real-world roles.

There was an improvement in nurses’ knowledge about assessment of leukemia over time. This finding reflects that the administered educational program positively nurses’ knowledge about assessment of leukemia. This finding was higher than that reported by who stated that More than half of the nurses 51.6% stated that they were able to evaluate the patients psychosocially, while 48.4% stated that they were not able to evaluate the patients psychosocially.

There was an improvement in the level of nurses’ knowledge about management of leukemia over time. This finding indicates that the administered educational program positively influenced nurses’ knowledge about the management of leukemia. This finding is congruent with that of Binner, Ross and Browner \(^9\) who reported that there was an improvement in nurses’ knowledge about the management of leukemia post intervention.

Regarding nurses’ practices related to management of leukemia, the study findings demonstrated that such practices noticeably improved over time. This finding reflects the positive influence of the administered educational program in enhancing nurses’ practices related to the management of leukemia. This finding is consistent with that of El-Sawy, Ismail, Magdy, and El-Sam-Man \(^7\) and Shafik and Abd Allah \(^6\) who stated that nurses’ practices have improved after administering the educational program.

Conclusion

The administered educational program positively influenced nurses’ knowledge and practices related to management of patients with leukemia.

Recommendations

1. Nurses should be encouraged to attend specific meetings, programs, workshops and seminars concerning nursing management of leukemia, chemotherapy administration and side effect.

2. Continue implementation of training programs for all nurses who work in hematology center to update their practice and knowledge base.

Conflict of Interest: The researchers report no conflict of interest.

Funding: This study did not receive any funding from any agency.

Ethical Clearance: A permission to conduct this study was obtained from the ethical committee in the College of Nursing, University of Baghdad.

References


8. Crotty J. Learning from each other. Nursing, 2010, 40(3), 51-52. doi:10.1097/01.NURSE.0000368820.12723.6a

In Vitro and Molecular Assessment for Lead Tolerance in Aloevera L. Callus

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¹Department of Biology, College of Science, Al-Mustansiriyah University, Iraq

Abstract

A biotic ecological stress element has negative influences on various characteristics of plant growth, crop productivity, and development. In the past few decades there were advances in plant molecular biology, physiology, tissue culture, and genetics, have greatly improved our perception of plant response to a biotic stress situations. In vitro culture may produce a suitable method for selection of heavy metal tolerant plantlets. Aloe callus were grown on media supplemented with 0.5, 1.0, 1.5, and 2.0 mg/l lead nitrate. Level of lead bioaccumulation, mineral status, and growth parameters of cultured callus were investigated. Results showed an increase in Pb accumulation with increase of lead concentration treatment, reaching 124.633 ppm. at 1.5 mg/l Pb, in regard to PCR analysis, experiment included catalase (CAT), glutathione peroxidase (GPX), and glutathione reductase (GR) genes. Results revealed that the number of amplicons varied with increase of lead concentration treatment with the compare of control treatment.

Keywords: In vitro, lead tolerance, Aloe, callus.

Introduction

In vitro cultivation is a valuable technique in the selection of heavy metal tolerant cell lines that could be used as a source to regenerate plants resistant to hard environmental conditions.

Heavy metal pollution is constantly deteriorating, due to a sequence of human activities, inducing too many researches regarding with the mechanisms used by plants to counter their harmful effect (1).

Propagation in vitro essentially begin with explants excised from mother plants grown subjected to in vitro conditions. Murashige and Skooge (MS) medium is a common vital plant tissue culture medium (2) extended with different mixture and concentrations of plant growth regulators (PGRs). The two fundamental PGRs often used are cytokinins and auxins which in ideal circumstances can prompt totipotent cells to form undistinguished cells called callus (3). Ashrafzadeh and

Leung 2015 (4) reported that it may be good to add a heavy metal (HM) of interest in culture medium to help to select for any HM- resistant soma clonal variation cells, and that the increasing concentration of HMs could also assist to capture soma clonal variation existence, and this is agreed with Bairu and Kane. 2011 (5) and with Wang and Wang 2012 (6).

Hazardous environmental conditions demand a good understanding for mechanisms involved throughout crops response to a biotic stresses which request of applicable means to improve crop productivity undergo such conditions (7).

Gharsallah and his coworkers (8) cleared that characterizing and cloning genes in a biotic stress tolerant plants is consider an important application in present plant research, creating mutants with transformed phenotypes and physiological responses could be a powerful way to discover the biological function of genes in these plants. Despite a significance progress has been reached in remedial of environmental pollutants employing genetic engineering technology (9, 10), but efficient micropropagation protocol is necessary to effectively develop genetically modified plants. Useful alternative to genetic transformation would be acquiring the resistant plant material applying technique of in vitro selection (11).
The HMs are known to cause oxidative stress in plants by disrupting plant growth and metabolism\(^4, 12\). Thus an extra important procedure is the activation of antioxidative enzymes neutralizes reactive oxygen species (ROS) produced by HMs stress\(^13, 14\) clearly, plants which cannot evolve an efficient resistance mechanism, can barely survive in HM-polluted regions. Rosa and her coworker\(^15\) cleared that Plants have developed mechanisms that can preserve cells from heavy metal cytotoxicity, as the cytosolic detoxification through linking to metal-binding particles as metallothioneins, and phytochelatins which play a critical role in heavy metal detoxification and homeostasis of intracellular metal ions in the tissues of plants. Production of reactive oxygen species (ROS) is a common factor for stress, and they are not only toxic to plant cells but also have a significant role as a signaling molecule. And in order to regulate the level of ROS, plants have evolved a complicated antioxidant defense system to scavenge the ROS\(^16\). The antioxidant system involves different enzymes such as glutathione reductase, superoxide dismutase, ascorbate peroxidases, and glutathione peroxidase\(^17\).

The major aim for this experiment was to study the effect of various lead nitrate concentration on callus growth and the mineral status of Alloe plant during in vitro selection, the other purpose of this project was the possible selection of clones tolerant to lead.

### Materials and Method

**Plant material and culture medium:** Sterilized Explants (leaves) of *Aloe vera* L. were excised and cultured in universal tubes containing MS medium\(^2\). Different concentrations of the auxin 2,4-D were tested (0.5, 1.0, 1.5, and 2.0 mg/l) which incubated in dark at a temperature 25 ± 1 °C for callus initiation\(^18\).

**Lead treatment:** In vitro selection was conducted using MS medium supplemented with Pb(NO\(_3\))\(_2\). Four different concentrations were tested: 0.5, 1.0, 1.5, and 2.0 mg/l Pb(NO\(_3\))\(_2\) plus the control treatment, ten replicates were tested for each treatment. Cultures were maintained in a growth chamber at 25 ± 1°C with a three-week subculture interval.

**Evaluation of callus growth:** Fresh and dry weight of callus were calculated, using three replicates for each treatment in the auxin 2,4-D experiment, while regarding the heavy metal experiment using Pb(NO\(_3\))\(_2\) five replicates were used for each treatment.

### Determination of Pb, essential and other trace elements content

Callus samples were previously dried in oven in order to determine the content of K, Ca, Fe, Cu, Co, Mn, Na, Mg, and Pb using Atomic Absorption Spectrometer (Solar Mb, thermo Fisher, USA).

**Molecular analysis:** Total genomic DNA was extracted from callus using CTAB method\(^19\), PCR amplification was performed for three genes of interest (CAT, GPX, and GR) using PCR reaction kit (Bioneer PCR premix kit), and primers manufactured at Bioneer company, Thailand.

**Statistical analysis:** Biometrical data concerning the fresh and dry weight of callus, and the content of lead and other chemical elements were subjected to Randomized completely block design (CRD) analysis. The least significant difference L.S.D. test was used to study differences means between treatments at \(P < 0.05\)\(^20\).

### Results and discussion

**Callus growth:** Data in table-1 shows a significant differences using 2,4-D at different concentrations (0.5-2.0) mg/l on fresh weight of callus in regard to control treatment which no callus was initiated, yet the dry weight of callus recorded a significant difference at 1 mg/l 2,4-D reaching 0.112 mg/l. Table -2 indicate no significant differences in fresh and dry weight of callus using different Pb concentration comparing with control treatment.

**Table 1:** The effect of 2,4 D concentration on fresh and dry weight mean of *Aloe vera* callus in mg

<table>
<thead>
<tr>
<th>Mean</th>
<th>2,4 D mg/l</th>
<th>LSD 0.05</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.0</td>
<td>1.5</td>
</tr>
<tr>
<td>Fresh weight</td>
<td>1202 a</td>
<td>1640 a</td>
</tr>
<tr>
<td>Dry weight</td>
<td>0.104b</td>
<td>0.103b</td>
</tr>
</tbody>
</table>

**Table 2:** Effect of lead (Pb(NO\(_3\))\(_2\)) concentration on fresh and dry weight mean of *Aloe vera* callus in mg

<table>
<thead>
<tr>
<th>Mean</th>
<th>Pb(NO(_3))(_2) Concentration</th>
<th>LSD 0.05</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.0</td>
<td>1.5</td>
</tr>
<tr>
<td>Fresh weight</td>
<td>535</td>
<td>507</td>
</tr>
<tr>
<td>Dry weight</td>
<td>68.0</td>
<td>50.0</td>
</tr>
</tbody>
</table>

**Lead (Pb(NO\(_3\))\(_2\)) treatment:** Table -3 demonstrated that there was a significant difference in Pb contents
in callus at all Pb concentration treatments showing an increase in lead accumulation with the increase of concentration treatment giving the highest amount at 1.5 mg/l Pb treatment recording 124.633 ppm. The table also reveals that Ca, Mg, Mn and Fe elements decreased significantly with increasing Pb concentration levels, while Co element show the opposite behavior reaching 12.097 ppm at 1.5 mg/l Pb. Data in table-3 displayed that Cu element give the highest amount of concentration in callus at the control treatment reaching 13.913 ppm which differed significantly than all other treatments. Yet the Na element recorded the less concentration amount at 1.5 mg/l Pb treatment reaching 31.60 ppm. These results in agreed with Alina et al. 2015, for the effect of lead on shoot culture of Daphne sp.

**Table 3:** Effect of lead (pb) concentration on minerals content means of Aloe vera callus in (ppm)

<table>
<thead>
<tr>
<th>Mean</th>
<th>Pb concentration</th>
<th>Callus cont.</th>
<th>Plant cont.</th>
<th>LSD 0.05</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.0</td>
<td>1.5</td>
<td>1.0</td>
<td>0.5</td>
</tr>
<tr>
<td>Pb</td>
<td>70.307 b</td>
<td>124.633 a</td>
<td>52.173 c</td>
<td>45.520 d</td>
</tr>
<tr>
<td>Ca</td>
<td>15746.3 e</td>
<td>15208.0 f</td>
<td>17394.6 d</td>
<td>20210.3 b</td>
</tr>
<tr>
<td>Mg</td>
<td>170.29 f</td>
<td>186.60 e</td>
<td>197.27 d</td>
<td>215.10 b</td>
</tr>
<tr>
<td>K</td>
<td>13903.3 f</td>
<td>22214.0 b</td>
<td>19700.6 d</td>
<td>17534.6 e</td>
</tr>
<tr>
<td>Co</td>
<td>10.160 b</td>
<td>12.097 a</td>
<td>5.267 d</td>
<td>3.167 e</td>
</tr>
<tr>
<td>Cu</td>
<td>5.607 b</td>
<td>5.403 b</td>
<td>4.630 c</td>
<td>5.250 bc</td>
</tr>
<tr>
<td>Mn</td>
<td>306.40 a</td>
<td>246.33 b</td>
<td>246.73 b</td>
<td>234.73 d</td>
</tr>
<tr>
<td>Fe</td>
<td>277.23 a</td>
<td>287.77 d</td>
<td>295.90 b</td>
<td>340.17 a</td>
</tr>
<tr>
<td>Na</td>
<td>50.47 b</td>
<td>31.60 e</td>
<td>35.50 d</td>
<td>49.97 b</td>
</tr>
</tbody>
</table>

PCR analysis for cat gene Figure 1 indicates that the control was different than the other treatments of Pb showing only one fragment about 100 bp, while in increasing concentration of lead, Fig. 1 shows two fragments of DNA with 100 and 400 bp. for CAT gene.

Li and his coworker (21) reported that the overexpression of phytochelatin synthesis in Arabidopsis leads to improve arsenic tolerance however incredibly to cadmium hypersensitivity. Consequently, new method could provide to expose the complexity of plant tolerance to heavy metal stress (15, 22).

**Figure 1:** Amplification of cat gene extracted from DNA Aloe vera callus; M= 100bp ladder DNA, 1=control, 2-5= lead concentration treatments, -ev= negative control.

Fig. 2 display the DNA fragments amplified in PCR for GPX gene, the results revealed that the highest number of amplicon was in control and 0.5mg/l Pb concentration with length varied from about 100-500 bp. and that the fragments decreased in number with the increase of Pb concentration in callus. Induced stresses using ascending mutagenesis levels generates a random distributed mutations all over the genome, for this reason using chemical mutagenesis could be used not only in understanding the role of a specific genes function but also to select a tolerant species (23, 24).

**Figure 2:** Amplification of cyt gene extracted from DNA Aloe vera callus; -ev= negative control; M= 100bp ladder DNA, 1=control, 2-5= lead concentration treatments

Regarding glutathione reductase gene Fig. 3 displays the highest number of amplicon recorded with increasing...
concentration of Pb in callus giving two fragments with about 100 and 350 bp. in compare with control which showed one fragment about 100 bp.

Figure 3: Amplification of G3 gene extracted from DNA *Aloe vera* callus; M= 100bp ladder DNA, 1=control, 2-5= lead concentration treatments, -ev= negative control

ROS could result in DNA strand breakage, defragmentation of proteins, and damage of photosynthetic pigments, which may trigger cell death, plants response to ROS with antioxidant defense mechanism by synthesis of antioxidant enzymes such as catalase, superoxide dismutase, and glutathione reductase, that act as the scavengers of free radicals\(^{(25,26)}\). Obriuchava and his coworkers\(^{(26)}\) reported that *Phaseolus vulgaris* and *Pisum sativum* plants, the seed coat is easily absorbent to Pb, and that the presence of lead salt prevented seeds from germinating. Abolghassem and his coworkers\(^{(27)}\) cleared that the toxic effect of Pb is on cell division and elongation, and there are many mechanisms involved in decrease of rate of cell division and some of these mechanisms include direct binding to DNA, metal-induced defect, and reduction of the glutathione pool.

The objective of this study was to develop an in vitro protocol for *Aloe vera* as a necessary first step for biotechnology studies as molecular physiology gives greater understanding into characteristic genes that control metal accumulation and we may identify a range of gene families that are likely to be involved in transition metal transport.

**Acknowledgement:** The study was conducted and supported by College of science, Biology department, Plant Tissue Culture Laboratory, at Al-Mustansiriyah University.

**Conflict of Interests:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding.

**Ethical Clearance:** The researchers already have ethical clearance from College of Science, Al-Mustansiriyah University, Iraq.

**References**


Expression of APOBEC3H Isoenzyme on the Level of Protein in Breast Cancer Patients

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Abstract

Breast Cancer is a disease that results from the alteration of the cellular genome in breast tissue and can lead to the second cause of cancer death in human so that it is an object of intensive research. APOBEC3H is a member of APOBEC3 sub-family of DNA cytosine deaminases, which have evolved as a crucial role of innate immune defense and have been contributing to cancer development throughout genetic mutations. Eighty subjects were conducted to this study, forty subjects for each breast cancer patients and healthy group. Blood samples were analyzed for this study. After clotting blood sera were used to determine the quantity of APOBEC3H protein by Elisa technique. This study demonstrates that APOBEC3H expression on the level of protein is significantly down-regulated in breast cancer patients compared to that of a healthy group. This study reveals that the APOBEC3H expression on the level of protein can be used as a potential biomarker for predicting breast cancer with the significant high value of AUC.

Keywords: APOBEC3H, biomarker, breast cancer.

Introduction

Cancer is a genetic disease that results from an accumulation of mutations in which a group of cells become abnormal and grow out of control1, 2. Breast cancer is the second most common cancer leading cause of death in developed countries and usually affects the women, though it’s rare among men about one percentage3. It is a complex disease resulting from the disorganized proliferation of cells that compose breast tissue. About 95% of malignant breast tumours are carcinomas, which originate from the epithelium of the mammary gland4.

Genomic DNA is being continuously damaged and therefore, requires continuous DNA repair5, 6. Away from spontaneous cytosine hydrolysis, uracil can also be formed by cytidine deaminase7. The dCdeaminases all belong to the APOBEC family of deaminases in higher eukaryotes8. Apolipoprotein B mRNA editing enzyme, catalytic (APOBEC) family are capable of editing cytosine in single-stranded DNA (ssDNA) through a deamination reaction that converts it to uracil (C-to-U)9. In higher primates and humans, 11 APOBEC isoenzymes are involved at various stages of the immune response10, 11. These isoenzymes are activation-induced deaminases (AID), APOBEC1, APOBEC2, APOBEC3A-H, and APOBEC411, 12. All members of the APOBEC family share at least one zinc-3 binding catalytic domain with the consent amino acid sequence11,13,14. The human APOBEC3 family comprises of seven members arranged on chromosome 22, containing one or two zinc binding deaminase domains, namely, APOBEC3A-APOBEC3H13.

APOBEC3H developed from ancestral genes at least 33 million years ago during primate evolution and it is the most divergent member of the APOBEC3 family and has a single Zn-binding domain that refers to the unique Z3 group15. The APOBEC3H protein is the most polymorphic member of APOBEC3 family with seven reported haplotypes (hap I-VII) which are formed from various combinations of polymorphisms that influence the protein stability and its activity against HIV16. In addition to the human APOBEC3H haplotypes, four
distinct splice variants containing different C-terminal regions, namely sv-154, sv-182, sv-183 and sv-200. The numbers express the length of the proteins in amino acids.

The APOBEC gene family was initially reported to play critical roles in virus restrictions. Recently, aberrant expression in APOBEC gene family was strongly associated with breast cancer development. In this study, we will investigate the expression profiles of APOBEC3H on the level protein in breast cancer patients by using enzyme-linked immunosorbent assay (ELISA) technique.

**Material and Method**

**Sample collection:** The samples were collected from the Hiwa Hospital, Sulaymaniyah, Iraq. A total of 80 samples were analyzed. The study included 40 paired normal and tumor samples of patients that were grouped according to the types of breast cancer (Table 3) and the clinical characteristics of the patients, including the average of age and grade. The blood samples of the breast are stored at -80°C until further analysis.

Informed consent was taken from all participants and the study approved by the local ethics committee. Approval number: 02.07.2018/137.

**Protein expression analysis:** In ELISA, different antigen-antibody combinations are used, always including an enzyme-labeled antigen or antibody. ELISAs can give a useful measurement of antigen or antibody concentration. Human (APOBEC-3H) ELISA Kit was used to detecting the level of human (APOBEC-3H) in serum samples, which uses a double-antibody sandwich (ELISA). Firstly have been prepared reagents, samples and standards according to this manufacture instruction kite. The blank wells were labeled with all of the materials which include in this kite except sample sera and apobec3h antibody. In the test walls, 40 μl of the sample sera were added, and then added both APOBEC-3H (10 μl) and streptavidin-HRP (50 μl) to the monoclonal antibody-enzyme well which is precoated with human APOBEC-3H monoclonal antibody. So, gently mixed and incubated for 60 min at 37°C and washing with 30x concentrate washing buffer to remove the uncombined enzyme. Subsequently chromogenic solution A (50 μl) and B (50 μl) were added to each well gently mixed and incubate for 10 min at 37°C, that caused to change the color to blue. Finally stop solution was added about 50 μl into each well to stop the reaction; the well color becomes yellow. The Chroma of color and the concentration of the Human APOBEC-3H of a sample were positively correlated.

**Statistical analysis:** For a case study, the data were expressed as interquartile. Statistical analysis was carried out using one-way analysis of variance (ANOVA) by using Graph pad prism (Version 6). Independent t-test was used for comparing the measured parameters between patients and control group. Receiver Operating Characteristic (ROC) curve is a graphical display of sensitivity on a y-axis and (1 – specificity) on the x-axis for varying cut-off points of test values. Area under the curve (AUC): this is a useful quantitative measure of accuracy. An area of 1 represents a perfect test; an area of 0.5 represents a worthless test. A rough guide for classifying the accuracy of a diagnostic test is the traditional academic point system: 0.90-1 = excellent (A) 0.80-0.90= good (B) 0.70-0.80= fair (C) 0.60-0.70= poor (D) 0.50-0.60= fail (F).

**Results and Discussion**

**Determination of APOBEC3H in breast cancer patients and control subjects using ELISA:** APOBEC3H, as mentioned above, has a protective role in cellular regulation against viral infection and cancer. It is considered that APOBEC3H as well as play a positive role in breast cancer. To check the expression APOBEC3H on the level of protein, it is useful to estimate the APOBEC3H protein either by western blotting or ELISA. For this purpose, it is decided to perform the experiments using the Elisa method. These data show that the level APOBEC3H in sera of patients is significantly lower compared to the control group (Table 1 and Figure 1).

The present study is the first to investigate breast cancer in the level of APOBEC3H and found it is down-regulated. Previous studies showed that these mutations in the APOBEC family are prevalence in more than half of human cancer, and the majority of these mutations are in a single tumour. Recent studies have demonstrated that APOBEC families are involved in cancer development. It has been reported that the APOBEC3A, APOBEC3B, APOBEC3C, and APOBEC3G are up-regulated in different cancer types such as breast cancer, liver, ovarian, gastric, T-Cell lymphomas and lung cancer.

It is interesting to demonstrate for the first time that the expression of APOBEC3H is downregulated...
in breast cancer. This could be due to the interaction of the miR-103a-2-5p with a target gene of APOBEC3H in the position 3UTR. These may lead to suppressing the translation of the target gene, namely APOBEC3H. The overexpression of the other different isoforms of APOBEC3 family may be due to the interaction of miR-103a-2-5p in the position 5UTR, and this may cause the up-regulation of the APOBEC3 proteins.

Table 1: Comparison of APOBEC3H on the level of proteins between healthy and breast cancer patients.

<table>
<thead>
<tr>
<th>Group</th>
<th>Parameter</th>
<th>Control (Median (interquartile range) IQR)</th>
<th>Patient (Median (interquartile range) IQR)</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>APOBEC3H</td>
<td>Median</td>
<td>658.4 (582.7 - 736.3)</td>
<td>527.2 (484.0 - 571.6)</td>
<td>0.0001</td>
</tr>
</tbody>
</table>

Figure 1. Box plots of the relative concentration of APOBEC3H protein in breast cancer patients and controls.

Diagnostic accuracy of differentially expressed genes: For early diagnostic of pathogenesis and biomarkers, programs for community awareness and advances in therapeutic technique lead to decrease mortality and reduce side effect prognostic and predictive biomarkers for breast cancer. These biomarkers could provide further information about the status of the tumour and its development. Because of serological and histochemical parameters are not informative enough to predict the outcome of the disease or efficacy of the therapy.

In this study, APOBEC3H has been identified as a potential biomarker, and it has an AUC value of 0.803 with the p-value of 0.0002 on the level of protein (Table 2 and Figure 2). This new finding reveals that APOBEC3H is a good biomarker that could provide diagnostic accuracy that can be efficiently used for early detection, prognosis, and therapy of breast cancer. It has been demonstrated that autoantibodies are present in all stages of tumour progression: carcinoma in situ, primary invasive breast cancer and in metastatic disease, because the level of autoantibodies was significantly higher in the sera from cancer patients compared with the controls. Recent studies identified the autoantibodies to p53 in the serum of breast cancer patients. Additionally, the level of Autoantibodies to specific cancer-associated glycoforms of MUC1 is higher in early stage breast cancer patients than in women with healthy women. The detection of APOBEC3 isoforms and their genetic aberration could provide a potential biomarker for diagnostic, prognostic and therapy in breast cancer, this may be due to the C/G-to-T/A hypermutation in different cancer types such as breast cancer, ovarian cancer, prostate cancer, brain cancer, and head/neck cancer.

Table 2: Rock curve were applied for APOBEC3H on the level of protein, APOBEC3H and miR-103a-2-5p Expression on the level of DNA.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>AUC</th>
<th>S.E.</th>
<th>95% CI</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>APOBEC3H ELISA</td>
<td>0.8030</td>
<td>0.06100</td>
<td>0.6834 to 0.9226</td>
<td>0.0002019</td>
</tr>
</tbody>
</table>

Figure 2. Receiver operator characteristic curve (ROC) was used for APOBEC3H on the level of protein.

Conclusion

This study has investigated for the first time the expression of APOBEC3H on the level of protein in breast cancer patients. The APOBEC3H on the level of protein is differentially expressed in breast cancer patients compared to control group where reduced. Also, APOBEC3H expression can be used as a new biomarker to identify the high risk of breast cancer due to high AUC.
Ethical Clearance: Informed consent was taken from all participants and the study approved by the local ethics committee. Approval number: 02.07.2018/137

Source of Funding: Self-funding

Conflict of Interest: Nill

References


A Study of Complications of Infants of Diabetic Mothers in Babylon Teaching Hospital for Maternity and Pediatrics

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Abstract

Background: Infants born to diabetic mothers are liable for a wide range of systemic & metabolic complications.

Objectives: The aim of this study was to do early detection and early managements of signs and symptoms and complications that happened in infants of diabetic mothers. Also to show the outcome of infants of diabetic mothers.

Materials and Method: Medical history, physical examination, and investigations (biochemical & radiological) were done on 100 infants of diabetic mothers over about 5 months period. Results: we found that 78% of cases delivered by caesarean section, and 55% of them have history of affected baby, 27% history of miscarriage & 9% chronic sibling morbidity & these results might be due to poor glycemic control, bad antenatal care, or maternal & social neglect. Macrosomia was 42%. Congenital anomalies include congenital heart disease 16%, Birth trauma occurs in 5% in form of fracture clavicle & brachial plexus injury. Hypoglycemia presented in 85%. Perinatal mortality, birth injuries, systemic, hematologic & metabolic complications are more encountered in infants born to diabetic mothers.

Conclusion: Infants of diabetic mothers have a lot of risky complications and they need screening even in asymptomatic cases.

Keywords: Complication, infant, diabetic mother.

Introduction

Infants of diabetic mother are those born to a mother who has persistently elevated blood sugar during pregnancy. (1)

Diabetes has long been associated to maternal and perinatal morbidity and mortality (2,3). Since the discovery of insulin; infants of diabetic mothers have experienced an almost 30 fold decrease in mortality and morbidity (3) of mothers with preexisting diabetes, 35% had type 1 diabetes mellitus, and 65% had type 2 diabetes mellitus. (4)

Maternal hyperglycemia causes fetal hyperglycemia, which contributed to that complications on infants of diabetic mother. (5)

Hyperglycemic hyperinsulinemic state leads to fetal macrosomia which causes birth asphyxia, cardiomyopathy, respiratory distress syndrome, polycythemia and iron abnormality which in turn lead to poor neurodevelopmental outcome. (6)

Chronic fetal hyperglycemia and hyperinsulinemia increase the fetal basal metabolic rate and oxygen consumption leading to a relative hypoxic state. The fetus responds by increasing oxygen-carrying capacity through increased erythropoietin production, potentially leading to polycythemia. (7)

Prior to birth, elevated insulin levels inhibit the maturational effect of cortisol on the lung, including the production of surfactant from type 2 pneumocytes. This puts the fetus at risk for developing respiratory distress syndrome. (8)
Other comorbidities include miscarriages, birth defects\(^9\), metabolic disturbances such as hyperglycemia, hypoglycemia, and hypoxia.\(^{10}\) Growth Restriction occurs in pregnancy because of underlying vascular disease\(^{11}\). Hyperinsulinemia results in excessive fetal growth. All organs are involved except the brain and kidney.\(^{12}\)

Birth injuries e.g. shoulder dystocia, brachial plexus injury, and cephalhematoma are also common.\(^{13}\) Hypoglycemia especially occurs in early hours of life which may be asymptomatic or symptomatic like irritability, lethargy, poor feeding, and seizure.\(^{14}\)

Those infants are also liable for pulmonary disease e.g. RDS and primary pulmonary hypertension\(^{15}\), hyperbilirubinemia, polycythemia, hypocalcaemia with or without hypomagnesaemia believed to be secondary to parathyroid hormone suppression.\(^{16}\)

Cardiomyopathy and inter ventricular hypertrophy may occur in these infants and detected by echocardiography.\(^{17}\)

The aim of this study was to do early detection and early managements of signs and symptoms and complications that happened in infants of diabetic mothers. Also to show the outcome of infants of diabetic mothers.

**Materials and Method**

From (3754) neonates admitted to Babylon maternity and pediatrics teaching hospital at period from 1\(^{st}\). April 2009 to 17\(^{th}\). August 2010 we found 100 neonates of pregnant diabetic mothers. We took history from those mothers regarding type of diabetes, its treatment, parity, age, history of affected neonates or miscarriage, and calculated gestational age, also we looked for type of delivery and its events.

We studied in neonates of diabetic mothers, the early moments of life regarding APGAR score, resuscitation, examinations, early investigations needed accordingly and managements.

We look for biochemical and radiographic abnormalities in those neonates as follows:

Serum blood glucose which taken by peripheral venous blood examined by spectrophotometer or by glucometer digital measuring total serum bilirubin taken by heel prick test read by bilirubinometer, packed cell volume taken from peripheral venous sample, serum calcium by non-tourniquet venous sample, blood culture taken via cleaning the punctured area with alcohol and take venous sample for suspected cases of sepsis. Chest X-ray, echocardiograph, electrocardiograph, abdominal ultrasound and brain ultrasound & CT scan of brain as needed.

**Results**

64% of mothers have gestational diabetes, 36% as pre-existing DM, 27% are primigravida & 35% have age less than thirty years, 78% neonate delivered by caesarean section, male neonates 58% & females 42%.

History of affected baby 55% as we regard macrosomia as congenital malformation & history of miscarriage 27%.Sibling with history of chronic morbidity 9%.

Regarding hospital staying: 1\(^{st}\). day discharge 16%, 2\(^{nd}\). day discharge 22%, 3\(^{rd}\). day discharge 46%, & 4\(^{th}\). day discharge 16%.

Perinatal Mortality rate in these one hundred cases are 4% due to (two with complex congenital malformation, one with still birth, & one from respiratory failure), morbidity rate 85% as medical & biochemical abnormalities need intervention only 11% are apparently normal & from those 11% are nine mother with strict glycemic control.

The APGAR score 30% have less than 4 score in 1\(^{st}\) minute & increase to more than 4 score at five & ten minutes as 78% & 93% respectively.

In 1\(^{st}\). day of life 85% have respiratory rate more than 60 breath/minute while at the 4\(^{th}\). day the respiratory rate less than 60 is 68%. The grunting present in 85% in 1\(^{st}\) day & become 20% at 4\(^{th}\). day of life.

The oxygen saturation improve in 9% of patients whom complain of hypoxia at 1\(^{st}\). day to reach 4% at the 4\(^{th}\). day of life.

The heart rate > 160 beats/minute in 1\(^{st}\) day was 10% & only 2% still tachycardia at the end of the 3\(^{rd}\). day of life.

Hypoglycemia improve from the1\(^{st}\). day to the 4\(^{th}\). day as 86% to 4% respectively.

The hematocrit > 65% present only in 9% & only 3 patients need partial blood exchange transfusion.
The respiratory complications was about 33% as hyaline membrane disease & transient tachypnea of newborn 45%, 2% complicated to respiratory failure, 1% pneumothorax, 1% eventration of diaphragm (Figure 1).

![Figure 1: Percentages of respiratory complications proportions](image)

In relation to the cardiac complications seen in 16% as following 6% have murmur in 1st. four day of life, and 7% have heart failure documented by chest X ray and echocardiograph, 3% have VSD, 1% PDA, 1% ASD, cardio myopathy in 2% (Figure 2).

![Figure 2: percentages of cardiac complications](image)

Regarding intestinal complications: 2% have Intestinal obstruction, 1% imperforated anus, 1% had diaphragmatic hernia.

The neurological abnormalities seen in 24% as following: 20% as birth asphyxia, 2% intracranial hemorrhage, 2% neural tube defect, 1% facial palsy as in Figure 3.

The skeletal complications as: 1% congenital dysplasia of the hip, 1% absent left hand & 5% has shoulder dislocation with or without clavicular fractures (Figure 3).

![Figure 3: The neuro-skeletal complications proportions](image)
Genito-renal abnormalities as 2% undescended testes, 1% hypospadias, 1% single kidney.

Neonatal jaundice present in 40%, one fifth of them in 1st day & about half appear in the 2nd day of life & 12 patients (12%) need blood exchange transfusion. The body weight from 2-3.5 kg about 48%, ≥ 4.6 kg about 52%, as in Figure 4.

![Figure 4: percentages of body weight proportions.](image)

Discussion

In our study, we found 78% of cases delivered by caesarean section which is higher than the results found by Cousins which is 45% & this might be due to bad obstetric history, fetal macrosomia, failure of induction of labor, or obstetrical miscalculation (18).

We found 55% have history of affected baby, 27% history of miscarriage & 9% chronic sibling morbidity & these results might be due to poor glycemic control, bad antenatal care, or maternal & social neglect.

Macrosomia is 42% but in Thomas R. Moore (15-45%) & to Charles F. Potter (26%). This might be due to good glycemic control in their study. (19)

Perinatal mortality was 4% which is highly different to results in study of Charles F. Potter which was about 30-50% & specially to infant with gestational diabetes, this might be due to small number of my study as in figure 5. (20)

Congenital anomalies include congenital heart disease 16% which is closer to 16% by Moore & slightly lower than Charles F. Potter 24% & hypertrophic cardiomyopathy 7%. (19) Birth trauma occurs in 5% in form of fracture clavicle & brachial plexus injury which is relatively similar to the result of Thomas R. Moore about 4% this might due to macrosomia, or need of assisted vaginal delivery. (19)

Hypoglycemia present in 85% which higher than the result of Moore where the result about 62%. (19)

Respiratory distress syndrome about 33% which is slightly higher to 26% of Thomas R. Moore & it is statistically significant, this might due to increased incidence of cesarean section or prematurity & this could be supported by about 40% is the percent of prematurity by pediatric examination in this study. (19)

Jaundice was seen in 40% of cases while 25.5% in Moore could be caused by hemolysis or polycythemia. (19)
Polycythemia seen in about 9% which is closest to 5-10% of the result in Thomas R. Moore & this could be the result of fetal hypoxia as in figure 6.\(^{(19)}\)

![Graph showing differences between study and compared study regarding hypoglycemia, respiratory distress syndrome, jaundice & polycythemia.]

Hypocalcemia was seen in 10% in compare to 6% result of Thomas R. Moore\(^{(19)}\). Preterm by clinical examinations are about 40% while show 29% by Charles F. Potter.\(^{(7)}\)

**Conclusion**

There is good relation between strict glycemic control & near normal neonates, so fetal life without hyperglycemic state & without subsequent hyperinsulinemic state lessen complications & vice versa. It is important to screen for neonatal hypoglycemia even in asymptomatic patients because a lot of patient have asymptomatic hypoglycemia. Neonates of diabetic mothers have a lot of risky complications to be screened for. Good dietary techniques & doing caesarean section decrease the risk of birth trauma (in our study we show about 80% of affected neonates with perinatal injury were due to normal vaginal delivery). Most teratogenic complications occur in infant born to mother with diabetes that is poorly controlled.

**Ethical Clearance:** The study was conducted in accordance with the ethical principles that have their origin in the Declaration of Helsinki. The study protocol and the subject information and consent from were reviewed and approved by a local Ethics Committee.

**Conflict of Interest:** None of the authors have any conflicts of interest relevant to what is written.

**Funding Source:** University funding was provided for: data collection, analysis, and interpretation; trial design; patient recruitment. No public funding was received.

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**References**


Impact of Social Support on the Periodontal Health among Population of Pregnant Women in Javanese Ethnic Group

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Abstract

Introduction: The Javanese are the largest ethnic group in Indonesia. 87.84% of Indonesia’s population who suffer from dental disease also experience periodontal abnormalities. Severe periodontal diseases in a pregnant women can produce inflammatory mediators that can threaten the fetal placenta thereby increasing the chance of a preterm birth. Social support provided by the family can bring out a positive attitude and motivation for the mother to maintain oher health during their pregnancy.

Objective: This study aimed to find out the impact of social support from the closest family of a pregnant women on their periodontal health.

Method: This was an observational analytic study with a cross sectional design. The population in this study is pregnant women from Javanese ethnic group in the Pucang Sewu Public Health Center in Surabaya city, Indonesia. Sample calculation was determined using the simple random sampling technique and the sample size was 49 pregnant women. The data were analyzed using the spearman correlation test and multiple linear regression test.

Results: In this study 65.3% of pregnant women had periodontal abnormalities in the form of gingivitis. This study found several predictor factors that linearly related to the occurrence of periodontal problems in pregnant women, these are: oral hygiene status (p = 0.002); the action of pregnant women in maintaining oral health and oral hygiene (p = 0.026); family support (p = 0.012); family knowledge (p = 0.005).

Conclusion: Family support has an impact on the occurrence of periodontal problems in pregnant women.

Keywords: Periodontal diseases, social support, pregnant women, premature birth.

Introduction

The Javanese are the largest ethnic group in Indonesia, which originating from Central Java, East Java, and the Special Region of Yogyakarta. At least 41.7% of Indonesia’s population is Javanese. The results of the household health survey, 60% of the Indonesian population suffer from dental and oral diseases, one of the most common oral disease in Indonesia is periodontal disease with the prevalence of 87.84%. Periodontal disease is a dental and oral disease whose prevalence is still high. Periodontal disease is the second most common disease suffered by people in Indonesia, which is ± 73.50% and 4-5% of the population suffers from advanced periodontal diseases¹,²

The birth of low-birth weight babies (LBW) at this time is still a problem in the reproductive field in both developed and developing countries. According to the World Health Organization (WHO), LBW babies are babies with birth weight less than 2500 grams and born before 37 weeks of gestation. Births of LBW babies are a major contributor to perinatal mortality and the short and long-term illness of neonates²,³

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Factors that can cause LBW are includes maternal infections, malnutrition, history of preterm birth, preterm ruptured membranes, exposed to substances toxic (drugs, cigarettes, alcohol), maternal stress, the low of socio-economic status, lack of prenatal treatment, hypertension, diabetes, genitourinary tract infections, neonatal sepsis, multiple pregnancies, as well as several other unknown factors\textsuperscript{3,4,5}

During pregnancy, support from people who are considered as close and important could motivate the pregnant woman. The husband is the first and foremost person in giving encouragement to his wife compared to the other. The support provided by the husband continuously will certainly bring out a positive attitude and motivation for the mother to maintain their oral health during pregnancy\textsuperscript{4,6}

This family support is expected to encourage a pregnant women to have an interest in maintaining their oral health so as to give rise to a supportive attitude in terms of maintaining oral health\textsuperscript{5,6}

Based on secondary data regarding the visit of pregnant women to dental clinic in PucangSewu Public Health Center, periodontal abnormalities (gingivitis and periodontitis) and pulpitis are the most common oral health problem. Based on this background, this study is aimed to find out the impact of social support from the closest family of a pregnant women on their periodontal health.

**Subjects and Method**

This study was an observational analytic with a cross sectional approach. This research was conducted in the working area of PucangSewu Public Health Center which includes these villages: PucangSewu, Kertajaya, and Baratajaya. The population in this study were all pregnant women with various trimesters included in the work area of PucangSewu Public Health Center, with total population of 92 people. Total sample in this study were 49 pregnant women obtained through simple random sampling technique with a trust value of 90% (Z1-a = x), 75% the value of statistical power, and the possibility of errors of 10%.

The dependent variable in this study is the periodontal health status of pregnant women. The independent variable in this study is the behavior of family support for the efforts of pregnant women to maintain their oral health (knowledge, attitudes, actions), behavior of pregnant women (knowledge, attitudes, actions to clean their teeth, and actions to visit the dentist), and status of the oral cavity of pregnant women. Data collection uses the OHI-S index (Oral Hygiene Index Simplified) and CPI (Community Periodontal Index). The OHI-S index is used to determine the level of oral hygiene, and the CPI index is used to observe the severity and degree of periodontal diseases (gingivitis, periodontitis) in an individual (or in a section of a population).

**Findings**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pregnant mother n = 49</th>
<th>Family of Pregnant Women n = 49</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gestational age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trimester 1</td>
<td>10 20.41</td>
<td>10 20.41</td>
</tr>
<tr>
<td>Trimester 2</td>
<td>18 36.73</td>
<td>18 36.73</td>
</tr>
<tr>
<td>Trimester 3</td>
<td>21 42.86</td>
<td>21 42.86</td>
</tr>
<tr>
<td>Relationship with mother</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Husband</td>
<td>33 67.35</td>
<td>33 67.35</td>
</tr>
<tr>
<td>Parents</td>
<td>7 14.29</td>
<td>7 14.29</td>
</tr>
<tr>
<td>Family</td>
<td>9 18.36</td>
<td>9 18.36</td>
</tr>
<tr>
<td>Level of education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Graduate Elementary/Middle School</td>
<td>24 48.98</td>
<td>24 48.98</td>
</tr>
<tr>
<td>Finish high school/ Vocational school</td>
<td>14 28.57</td>
<td>14 28.57</td>
</tr>
<tr>
<td>Graduate D1/D3/PT</td>
<td>11 22.45</td>
<td>11 22.45</td>
</tr>
<tr>
<td>Occupations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IRT/Entrepreneur</td>
<td>32 65.3</td>
<td>32 65.3</td>
</tr>
<tr>
<td>Private</td>
<td>9 18.37</td>
<td>9 18.37</td>
</tr>
<tr>
<td>Etc</td>
<td>8 16.33</td>
<td>8 16.33</td>
</tr>
<tr>
<td>Insurance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BPJS</td>
<td>39 79.59</td>
<td>39 79.59</td>
</tr>
<tr>
<td>Other insurance</td>
<td>4 8.16</td>
<td>4 8.16</td>
</tr>
<tr>
<td>Personal Fees</td>
<td>6 12.25</td>
<td>6 12.25</td>
</tr>
<tr>
<td>Ethnic Group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Java</td>
<td>49 100</td>
<td></td>
</tr>
<tr>
<td>OHI-S Index</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Well</td>
<td>10 20.4</td>
<td></td>
</tr>
<tr>
<td>Is being</td>
<td>33 67.35</td>
<td></td>
</tr>
<tr>
<td>Bad</td>
<td>6 12.25</td>
<td></td>
</tr>
<tr>
<td>CPI Index</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bleeding</td>
<td>32 65.31</td>
<td></td>
</tr>
<tr>
<td>Pocket</td>
<td>15 30.61</td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>2 4.08</td>
<td></td>
</tr>
</tbody>
</table>
Based on table 1, the result of the gestational age data showed that the respondents were mostly at the third trimester of their pregnancy (42.86%), with the level of education were mostly an elementary/junior high school graduates (48.98%). The results showed that most of the respondents were a housewife (65.30%), most of them have health insurance (BPJS) (79.59%) with all of them were from the Javanese ethnic group (100%). In this study, we found that the majority of those who support pregnant women socially were their husband (67.35%), with the education level of the husband were mostly an elementary/junior high school graduates (48.98%), most of the husband worked as an entrepreneur (65.30%) and used health insurance (BPJS) (79.59%).

Table 2: Prevalence odds ratio (POR) of social support for the periodontal health in the population of pregnant women in the Javanese ethnic group based on spearman’s coefficient and multiple linear regression analysis.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pregnant mother</th>
<th>OR</th>
<th>95% CI</th>
<th>Adjusted R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitudes of pregnant women</td>
<td>0.258</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oral hygiene status of pregnant women</td>
<td>0.286</td>
<td>0.049</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Periodontal status of pregnant women</td>
<td>0.293</td>
<td>0.041</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actions of pregnant women in maintain their oral health and oral hygiene</td>
<td>0.359</td>
<td>0.012</td>
<td>1.053: 0.136</td>
<td>0.376</td>
</tr>
<tr>
<td>OHI-S</td>
<td>0.002</td>
<td>0.42: 1.833</td>
<td>0.158</td>
<td></td>
</tr>
<tr>
<td>Knowledge of pregnant women</td>
<td>0.005</td>
<td>0.112: 0.021</td>
<td>0.278</td>
<td></td>
</tr>
<tr>
<td>Family attitude</td>
<td>0.005</td>
<td>0.652: 3.378</td>
<td>0.327</td>
<td></td>
</tr>
</tbody>
</table>

Based on table 2, variables that have a positive relationship were; (1) Action of family support to enhance efforts for pregnant women in maintaining their oral health and oral hygiene with the respondent’s attitude (coefficient R: 0.528, p-value: 0.000); (2) Respondent’s attitude with respondent’s action to maintain their oral hygiene and oral health (coefficient of R: 0.359, p-value: 0.012), (3) Respondent’s action to maintain oral hygiene and oral health with the level of oral hygiene (coefficient R: 0.286, P value: 0.049); (4) Respondent’s action to maintain oral hygiene and oral health with the periodontal status of pregnant women (coefficient R: 0.293, p-value: 0.041); and (4) Level of oral hygiene with the periodontal status of pregnant women (coefficient of R: 0.438, p-value: 0.002).

In addition, the results of the study also showed that oral hygiene status, respondent’s actions in maintaining oral health and oral hygiene, family attitudes, and family knowledge had a linear relationship to the periodontal health. These all were the predictive factors that could impact the periodontal health in pregnant women. The results of ANOVA test showed that these variables have a significance value of $P < 0.05$, which states that there is a linear relationship between these variables and the dependent variable.

The relationship between the dependent variable and the independent variables is known from the significant value of $P < 0.05$, each independent variable (oral hygiene status: 0.002; respondent’s action to maintain their oral health and oral hygiene: 0.026; family support attitude : 0.012; family knowledge : 0.005).

In pregnant women, social support from family is proven to have a good impact on pregnant women, such as increase the chance for them to give birth to babies with ideal body weight, prevent premature births, and can improve the mother’s quality of life.6,7

Epidemiological research was conducted on 49 Javanese pregnant women in PucangSewu Village, Surabaya City, Indonesia. The results of this study indicated that the most prevalence of dental and oral diseases that experienced by pregnant women in Pucang Sewu Village was periodontal disease. There are many factors that can trigger the problem. Based on the results of the analysis, we found several factors that can influence the periodontal health problems of pregnant women. Based on research conducted at Pucang Sewu Public Health Center, it was found that the knowledge of pregnant women about dental and oral health is related to their periodontal health. This is supported by research by Zhong et al (2015) which showed that there was a relationship between knowledge of pregnant women and oral health status. In addition, in this study it was also found that oral hygiene status was related to the periodontal health status of pregnant women as indicated by the coefficient of R : 0.4387.8,9

Factors of knowledge, awareness, and behavior of the community towards maintaining dental health are influenced by various social demographic factors, including the level of education, environment, economy, tradition, and the presence of dental health service.
facilities in the area. An individual’s education can influence the level of oral hygiene, someone who has a low education has insufficient knowledge to maintain their oral hygiene\textsuperscript{10,11,12}

People who have higher education could have a better oral hygiene level because they pay more attention to the condition of their oral health. Based on the results of the study, 30.6% of families were cared and supported pregnant women to maintain their oral health. The results of data analysis showed that family support has a relationship with the respondent’s attitude (coefficient R: 0.528) and the respondent’s attitude is one of the predictor factors for the occurrence of periodontal problems (P-value : 0.005)\textsuperscript{11,13}

The relationship between the respondent’s actions in maintaining oral hygiene with the periodontal health status can be proven from the significance value (P-value : 0.012). In addition, the respondent’s action has a correlation with the oral hygiene status (R: 0.286) and periodontal status (R: 0.293). Lertpimonchai et al (2017) stated that the act of maintaining good oral hygiene will also affect the oral hygiene status as well. In this study it was also found that a person who has moderate to low OHI-S level will have a risk five times greater to experience periodontal disease than those who have a good OHI–S\textsuperscript{14,15}

**Conclusion**

Based on the results of this study, it was found that family support have a correlation with the attitude of pregnant women in an effort to maintain their oral health and also that the attitudes from family have a linear relationship with periodontal health of pregnant women.

**Conflict of Interest:** Nill

**Acknowledgement:** Department of Dental Public Health, Faculty of Dental Medicine, Universitas Airlangga.

**Source of Funding:** Self funding.

**Ethical Clearance:**

**References**


A Single-Centre Experience Study in Percutaneous Nephrolithotomy (PCNL) at Al-Safeer Surgical Specialized Hospital

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Abstract

Aim: To evaluate our gained experience in PCNL surgery and its effectiveness in treated various cases with renal stones.

Method: A retrospective study compromise 3146 patients underwent PCNL in single center of surgical hospital from 1st January 2013 to 1st January 2018. A questionnaire was used to collected data. Surgical and postsurgical parameters were reported.

Result: Patient’s gender male 56.4%, female 43.6%. PCNL done on 47.9% right sides, 50.5% left and 1.6% bilateral. 71.4% were opaque stones. 9.1% of patients were Pediatrics, 86.8% adult’s and 4.1% Geriatrics. Mean Stone measures (mm)32.9±15.3. Mean operative time (mints) 36.5±17.2. Mean Hospitalization (days) 1.5±0.8. The entrance approach to kidney: upper 64.7%, lower 20.5%, middle 10.7% and multiple in 4.13%. The stone free rate were 96.9%. Intraoperative complication were: Bleeding 0.8%, Pleural injury 1%, and Bowel injury 0.1%. Postoperative complication: Sepsis 1.3% and transient impairment of renal function 0.3%.

Conclusion: For large kidney and upper ureteral stones PCNL is effective procedure with minimal morbidity even in the presence of anatomical variation and experience play important role for good results.

Keywords: Nephrolithotomy, Hydronephrosis, Ureteral stone, Karbala.

Introduction

PCNL is a the procedure of choice for patients with large kidney and upper ureteral stones and it has the greatest success rate for the treatment of large renal stones. Percutaneous trocar nephrostomy for hydronephrosis opened the door of a new technique done by Goodwin WE and coworkers¹ about 50 years ago. Since then, the procedure of percutaneous nephrostomy has been refined and has vastly enriched the armamentarium of the contemporary urologist².

Initially, percutaneous nephrostomy used only for urinary diversion; subsequently it has been used for more complex procedure such as stone extraction³.

The revolution of minimally invasive surgery began in 1976 when Fernström and Johansson performed the first percutaneous nephrolithotomy (PCNL)⁴. Subsequent reports on PCNL from the Mayo Clinic⁵ and the University of Minnesota⁶ and from West Germany⁷ and England⁸ established PCNL. Further refined and advances in technique and equipment have allowed urologists to perform percutaneous stone removal with increasing efficacy and decreasing complications⁹.

Developments in stone fragmentation, newer instruments and improved fluoroscopy have increased the versatility of percutaneous surgery. Flexible, steerable nephroscopes have allowed access to all parts of the kidney¹⁰. The indications for open surgery
in stone disease have thus become greatly reduced. However, in spite of all these developments, PCNL may be complicated by residual stone. Sometimes, complete clearance of stones may not be possible with every effort through a single percutaneous subcostal tract. They can be dealt with second look intervention through a mature nephrostomy tract. However, it prolongs the hospital stay and increases the morbidity. Large stone burden also can be dealt with multiple tracts for complete clearance of stone. Therefore, in case of large stone burden with predictive chance of residual stone or when single percutaneous tract does not offer complete stone clearance, creating multiple tracts may be a useful alternative. Untreated large staghorn calculi had a high 10 year mortality of (28%) in comparison with surgery (7.2%)\(^\text{11}\). In 2005, the clinical practice guideline report for the management of staghorn calculi by the American Urological Association guidelines 4 panel confirmed that percutaneous treatment of staghorn calculi should be first-line treatment for most patients\(^\text{12}\).

**Method**

A retrospective study compromise 3146 patients underwent PCNL in single center of surgical hospital from 1\(^{st}\) January 2013 to 1\(^{st}\) January 2018. When a diagnosis the patient with renal stone that eligible to PCNL surgery by ultrasound, KUB and sometimes with I.V.U or CT scan, an appointment were given for surgery. Once the anesthesia takes effect, the patient putted in lithotomy position and a cystoscopy inserts to inspect the urinary bladder, then a tube (catheter) inserts into the ureter to kidney and injects a special dye through the tube, which travels to the kidneys. This radio-opaque dye highlights the kidney stones on an X-ray. After that patient turned into prone position, once X-ray, a 1.5 cm incision made on patients back, locates the stone and through it, accesses the kidney with an x-ray guided fine needle. With the help of a guide wire, single dilators create an access passage to kidney. Once the passage is created, a hollow tube through which a nephroscope targeting the stones is inserted. Finally, the removal of stones through the scope using a grasper to retrieve stone after fragmentation by pneumatic lithotripsy. For multiple stones in the kidney, this procedure may be repeated through other access sites, if required, until all the stones are removed. Post the operation, a soft tube or catheter is left through the incision for a couple of days to drain the urine directly from the kidney into a drainage bag but sometime the tube were not inserted if un-eventable procedure carried out, also double J stent were inserted into ureter for three weeks. A follow up of patients at one and three months by KUB and ultrasound with complete blood pictures and renal function to assess patient’s wellbeing and stone free rate.

**Result**

The operative time divided into three parts: less than 30 min. in 41.40%, 30-60 min in 49.77% and more than 60 min. in 8.84%, so most of surgeries done in less than 50 min. This time defined as a time from entrance of needle to putting of nephrostomy tube.

The entrance approach to kidney depended on distribution of renal stone were as follow: upper which most common in 64.7%, lower in 20.5%, middle in 10.7% and finally multiple approach which were useful in staghorn stone in 4.13%.

The patients gender were slightly different: 56.4% male and 43.6% female, the age distribution as follow: 9.1% were pediatrics (less than 16 years), 86.8% adults (16-65 years) and 4.1% geriatrics (more than 65 years). PCNL done in 47.9% right, 50.5% left and 1.6% bilateral side, 71.4% were opaque and 28.6% lucent stone in present study, stone measures were from 10mm to 83mm. Finally, hospitalization of patients from one to ten days depend on patients welling and occurrence of complication postoperatively.

In present study PCNL done in abnormal or especial considered kidney like 1.7% Single functioning kidney, 0.9% Horseshoe kidney, 0.8% Double moiety, 0.3% Intra-renal pelvis, 0.1% mal-rotated kidney, 0.1% Kidney with retro-caval ureter and 0.1% Polycystic kidney.

The PCNL were a major surgery so a complication could occurred, the intraoperative complication were 1.9% as follow: 0.6% Bleeding treated by transfusion, 0.2% Bleeding postponed PCNL, 1% Pleural injury and 0.1% Bowel injury.

While postoperative complication were 1.9% as follow: 1.3% Sepsis, 0.2% Transient impairment of renal function and 0.1% death. The stone free rate were 96.9% and residual stone found in 7.1% in follow up of patients. PCNL done in special requirements patients in present study as mention in table above: 9.6% of patients did previous renal surgery, 1.1% required neuro-axial anesthesia, and 0.5% had Hepatitis positive tests.
The distribution of renal stone in present study, which were 36.50% staghorn stone, 33.20% pelvic, 14.60% lower calyx, 8.70% middle calyx, 6.60% upper calyx and 0.40% upper ureteric stone.

**Table (1): Demographic criteria of selected cases in present study.**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency (%)</th>
<th>Mean± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1775 (56.4)</td>
<td>-</td>
</tr>
<tr>
<td>Female</td>
<td>1371 (43.6)</td>
<td>-</td>
</tr>
<tr>
<td>PCNL side</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Right</td>
<td>1506 (47.9)</td>
<td>-</td>
</tr>
<tr>
<td>Left</td>
<td>1589 (50.5)</td>
<td>-</td>
</tr>
<tr>
<td>Bilateral</td>
<td>51 (1.6)</td>
<td>-</td>
</tr>
<tr>
<td>Stone opacity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Opaque</td>
<td>2247 (71.4)</td>
<td>-</td>
</tr>
<tr>
<td>Lucent</td>
<td>899 (28.6)</td>
<td>-</td>
</tr>
<tr>
<td>Pediatrics</td>
<td>286 (9.1)</td>
<td>-</td>
</tr>
<tr>
<td>Age group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adults</td>
<td>2730 (86.8)</td>
<td>-</td>
</tr>
<tr>
<td>Geriatrics</td>
<td>130 (4.1)</td>
<td>-</td>
</tr>
<tr>
<td>Stone measures (mm)</td>
<td>(10-83)</td>
<td>32.9±15.3</td>
</tr>
<tr>
<td>Operative time (mint)</td>
<td>(10-120)</td>
<td>36.5±17.2</td>
</tr>
<tr>
<td>Hospitalization (days)</td>
<td>(1-10)</td>
<td>1.5±0.8</td>
</tr>
</tbody>
</table>

**Table (2): PCNL in patients with anatomical kidneys variation**

<table>
<thead>
<tr>
<th>Anomaly</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single functioning kidney</td>
<td>54</td>
<td>1.7</td>
<td>43.5</td>
</tr>
<tr>
<td>Horseshoe kidney</td>
<td>29</td>
<td>0.9</td>
<td>23.4</td>
</tr>
<tr>
<td>Double moiety</td>
<td>26</td>
<td>0.8</td>
<td>21.0</td>
</tr>
<tr>
<td>Intrarenal pelvis</td>
<td>9</td>
<td>0.3</td>
<td>7.3</td>
</tr>
<tr>
<td>Malrotated kidney</td>
<td>3</td>
<td>0.1</td>
<td>2.4</td>
</tr>
<tr>
<td>Kidney with retrocaval ureter</td>
<td>2</td>
<td>0.1</td>
<td>1.6</td>
</tr>
<tr>
<td>Polycystic kidney</td>
<td>2</td>
<td>0.1</td>
<td>0.8</td>
</tr>
<tr>
<td>Total</td>
<td>124</td>
<td>3.9</td>
<td>100</td>
</tr>
</tbody>
</table>

**Table (3): intraoperative complication during PCNL**

<table>
<thead>
<tr>
<th>Intraoperative Complication</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bleeding treatedby transfusion</td>
<td>19</td>
<td>0.6</td>
<td>32.8</td>
</tr>
<tr>
<td>Bleeding postponed PCNL</td>
<td>6</td>
<td>0.2</td>
<td>10.3</td>
</tr>
<tr>
<td>Pleural injury</td>
<td>31</td>
<td>1.0</td>
<td>53.4</td>
</tr>
<tr>
<td>Bowel injury</td>
<td>2</td>
<td>0.1</td>
<td>3.5</td>
</tr>
<tr>
<td>Total</td>
<td>58</td>
<td>1.9</td>
<td>100</td>
</tr>
</tbody>
</table>

**Table (4): postoperative complication of PCNL**

<table>
<thead>
<tr>
<th>Postoperative Complication</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sepsis</td>
<td>41</td>
<td>1.3</td>
<td>83.7</td>
</tr>
<tr>
<td>Transient impairment of renal function</td>
<td>6</td>
<td>0.2</td>
<td>12.2</td>
</tr>
<tr>
<td>Death</td>
<td>2</td>
<td>0.1</td>
<td>4.1</td>
</tr>
<tr>
<td>Total</td>
<td>49</td>
<td>1.9</td>
<td>100</td>
</tr>
</tbody>
</table>

**Table (5): PCNL in patients need a special requirements.**

<table>
<thead>
<tr>
<th>Special Requirement’s</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did previous renal surgery</td>
<td>302</td>
<td>9.6</td>
<td>86.0</td>
</tr>
<tr>
<td>Neuroaxial anesthesia</td>
<td>34</td>
<td>1.1</td>
<td>9.7</td>
</tr>
<tr>
<td>Hepatitis positive tests</td>
<td>15</td>
<td>0.5</td>
<td>4.3</td>
</tr>
<tr>
<td>Total</td>
<td>351</td>
<td>11.2</td>
<td>100</td>
</tr>
</tbody>
</table>

**Discussion**

In present study, 3146 patients undergo PCNL in single center (Al Safeer surgical hospital), the mean age of patients in present study were 37.7±39.8 years and they distributed as 56.4% male, 43% female from those 9% were pediatric, which comparable to Satyagraha et al which had mean age 42.2 years, 62.9% male and 37% female while in Agbo et al, there were comparable age but higher male to female ratio, larger randomize sample of present study gave more unbiased data. The stone free rate were 92.2%, optimum preparation of patients with good facilities and progression of experience played important role for this high percent, so this agree with Agarwal et al were 87.7% free rate reported. The approach to renal system in present study as follow: 67.7% upper, 30.9% lower and 4.1% multiple tracts, this result were different from others study like Ganpule et al and Agbo et al in which lower approach 98.2%, good experience and assisted of anesthesia team by stopping ventilator at time of entrance were causes for high percent of upper approach, in addition this gave good access to renal pelvis and increase stone free rate which agree with Gupta et al. In present study 71.4% of stone were opaque and 28.6% were lucent which comparable to Pradère et al, while stone distribution were stag horn 36.5%, 33.2% renal pelvis, lower calyx 14.6%, mid calyx 8.7% and upper calyx 6.6%, while in Satyagraha et al stag horn 9.5%, 28.5% pelvis and 23% in lower calyx, in others hand 47.9% of stones were at right side, 50.5% at left side and 1.6% had bilateral renal stones which comparable to Holman et al where 55%
right and 45% left side stone, finally stone measures in present study were 32.9±15.3 mm.

The mean operative time were 36.5±17.2 minutes which was less than Agbo et al14 58.8 minutes and Hegarty et al19 60-100 minutes, the usage of single dilators during surgery, and less complex stones in our study were decrease time of surgery.

The PCNL was major surgery so complications were inevitable, in present study hemorrhage require transfusion 0.6%, this not agree with Lojanapiwat et al20 2.7% required transfusion, another important complication were pleural injuries 1% which more than Agbo et al and Lojanapiwat et al14, 20 due to more frequency usage of supra-costal approach but it was less than Ravichandar et al21 where pleural injuries 7.1%, bowel injuries reported in 0.1%in present study which managed conservatively, also it was less than other study Ravichandar et al21, the avoiding usage of lateral punctures played important role to decrease this complication.

Sepsis occurred in 1.8% despite usage of prophylaxis antibiotics, it was agree with Sukumar22 1.8% but less than Shah et al23 4.1%.

Renal impairment reported in 6.2% of cases, most of these patients already had renal impairment in addition to occurrence of septicemia in patients who has had risk factors like diabetes or steroid depended patients, these data were comparable to Lojanapiwat et al20.

In present study PCNL done in patients with 1.7% Single functioning kidney (1.7%), Horseshoe kidney(0.9%), Double moiety(0.8%), Malrotated kidney(0.1%), Kidney with retro-caval ureter (0.1%) and Polycystic kidney(0.1%).

Also in present study, PCNL done in patients whose needed special requirement as follow: the neuro-axial anesthesia used in 1.1% of patients who has had risk for general anesthesia with inevitable outcome, also 0.5% of patients had hepatitis finally 9.6% did previous renal surgery.

**Ethical Clearance:** Informed written consents were obtained from all participants in the study, and were done in accordance with the Helsinki Declaration of 1975, as revised in 2000. The Medical Ethical Committee of The Iraqi Board for Medical Specializations approved this study [CODE: 20015; date, 24-03-2017].

**Conflict of Interest:** Nil

**Add Source of Funding:** Self

**References**


Evaluating the Vitality of Coccoid form of Helicobacter Pylori by a Transmission Electron Microscope Study

Saba Abdulsalaam Hamid AL-Sultan

Abstract

Most studies, if not all, emphasize that the coccoid form of (Helicobacter Pylori) is the dead form of this bacteria, because of incapability of growing this bacterium in the culture media used in growing the spiral form of the same bacteria. The coccoid form doesn’t have a vital role in infection, so it has no biological or medical importance. Hence, the aim of this study is to evaluate the vitality of coccoid form by using the Transmission Electron Microscope (TEM) technique. The sample consisted of (54) patients attending endoscopy unit at Ibn-Sena teaching hospital in Mosul/Iraq. The Oesophago-gastro-duodenoscopic (OGD) findings of these patients were gastritis, duodenitis, gastric and duodenal ulcer. Two biopsies were taken from all patients, and each was submitted to bacteriological and histological examination by Light microscope (LM) and TEM.

Keywords: Transmission, Oesophago-gastro-duodenoscopic, CO$_2$ and NH$_3$, H. pylori.

Introduction

The common form of H. pylori is the spiral form with circular ends. It seems like a sea-gull in the tissue sections, and at the direct microscopical examination of the homogenized biopsy. However, it is pleomorphic when they are cultured on solid media [1 & 2]. This bacteria can be changed into a coccoid form in certain and improper conditions, among the factors resulting in such changes is starvation in culture media with long period of incubation in addition to the exposure to oxygen, alkaline pH, high temperature, and treatment with the hydrogen ion pump inhibitor and antibiotics [1,3 & 4]. A symptomatic colonization of the spiral form to the mucosal layer of gastric antrum in (50%-60%) of person. At the beginning and if the case was left without treatment, it causes chronic superficial gastritis which may develop into peptic ulcer, lymphoma or chronic atrophic gastritis which will become a risk factor of gastric adenocarcinoma. Such bacteria can tolerate the high acidity of stomach by secreting the enzyme urease which changes urea into CO$_2$ and NH$_3$ in order to balance the acidity. Stimulation of the inflammatory response due to colonization of the gastric tissue can lead to chronic antral gastritis associated with infiltration of inflammatory cells into gastric mucosal layer [5,17].

From the above mentioned characteristics, it is concluded that the spiral form has a very precise feature in colonizing the gastric tissue on special receptors due to its potential vitals in colonization of gastric tissue. The medical and biological importance of the coccoid form, in terms of transporting disease and infection, hasn’t been determined yet. It has not been known whether the coccoid form has the ability to colonize the gastric tissue, to make tissue changes as the spiral form, and to cause the inflammatory stimulation of the gastric tissue. Many questions need to be answered in order to know whether the coccoid form represents an active, inactive or dormant phase. Accordingly, the aim of this study is to evaluate the vitality of coccoid form throughout bacteriological and histological examination using (TEM) technique.

Materials and Method

1. Samples: Biopsies from (54) patients coming to the endoscopy unit at Ibn-Sena teaching hospital in Mosul City/Iraq were taken. According to the endoscopic diagnosis, symptoms of these cases are related to the diseases of digestive system, ranged among gastritis, gastric ulcer, duodenitis and duodenal ulcer, they are treated by the Amoxicillin. These cases have been chosen also depending on the results of Al-Sultan; the positive diagnostic tests of H. pylori, in these cases, have been ranged between
Two biopsies from gastric antrum were taken from each patient. The first was put in a Stuart’s transport medium to be inoculated in culture media for bacteriological tests. The other was put in the Fixative Para Formaldehyde Glutraldehyde (FGA) used in TEM technique[7].

2. Bacteriological Tests:

First: Direct Microscopical examination of homogenized biopsy: Samples were taken to the laboratory, as soon as possible (within two hours), under sterile environment. It is homogenized by putting it in (1.5 cm³) of sterilized phosphate buffer saline PBS (0.9%) which is within a specific sac of Stomaker device, it is treated with this device for five minutes[1]. The first of these tests is the direct microscopical examination of homogenized biopsy, which has been made by preparing membranes fixed on the slides and staining them with gram stain to note the form of bacteria inside the tissue before culturing them. The biopsy mixture is also used in the following bacteriological tests.

Second: Urease test: We did this test depending on the procedure of Lee;6 urea solution (2%) and phenol red reagent are used to detect H. pylori by putting (100 µl) of homogenized biopsy in urea solution.

Third: Culture of H. pylori: Brucella agar was used in this study because it is the best media of growing this bacterium, according to Al-Sultan [1]. This test has been used to show the ability of the coccoid form to grow in the culture media, and then to make a comparism between the results of this test and the histological test.

3. Histological Examination by TEM: Test has been made by putting the biopsy in the FGA for two hours, and then fixed by Osmium tetroxide for another two hours with stirring constantly and then dehydration by forwarding the biopsy in ascending concentrations of acetone (25%, 50%, 75%, and 100%). After that, clearing is made by putting the sample in Xylol. At that time, the sample will be ready for embedding process which is at first in Durcopan 1, and then embedding and polymerization it in a mixture of Durcopan [2 & 7]. At this time, the plastic block will be ready to be prepared. The plastic sections are of two types: thick and ultrathin one. (The biopsies have been treated to make the plastic block, and to stain the thick section and the ultrathin one in Mosul College of Medicine/ University of Mosul. The Electron Microscopical examination and microphotography, has been done in the Unit of Electron Microscope in the College of Science / University of Irbid /Jordan).

Preparation of the thick and ultrathin plastic sections: The thick plastic section (0.5–2 µm), is stained with Toluidine-blue and examined with Light Microscope (L.M.), and the ultrathin plastic sections (600-900ºA),were stained with uranyl acetate and lead citrate, and examined with (TEM) [7].

Results

Urease test was positive in 96.3% (52/54), whereas the results of direct microscopical examination were less positive 75, 93% (41/54). This difference owing to the nature of spotty colonization of bacteria; they do not exist in the excised biopsy, despite their infection to the gastric mucosa. It is to be noted that both forms are observed during the direct microscopical examination of homogenized biopsies.

The histological study of the thick plastic with (LM) and the ultrathin plastic sections with (TEM), showed that both coccoid and spiral forms were existed in all (100%) control samples (fig. 1), whereas in the samples of negative culture, the results showed the spiral form in only two biopsies out of eighteen (11.11%), and the coccoid form in 15 (83.33%) (fig. 2).

The following findings are also shown in figure 2:

First: Vacuoles have been formed in the epithelial cell of gastric antrum infected with the coccoid form (fig. 2,a). The TEM pictures in (fig. 2,b & f) shows vacuoles existing within the epithelial cell and the coccoid form existed within these vacuoles.

Second: The mucosal layer has been eroded and exfoliated, as it is shown in (fig. 2,c & e),it also shows that there is a structural deformity and changing in the glandular form of the patient’s tissue infected with the coccoid form. In addition, we can see destruction in the glandular tissue containing the coccoid form.
Third: Stimulation of the infiltration of the inflammatory cells (fig. 2,d), there are chronic inflammatory cells in the gland pit, like plasma cell and lymphocyte accompanied with the existence of coccoid form which probably proves that the bacteria created an immune response causing the chronic active gastritis.

Fourth: Infiltration of the coccoid form into the cytoplasm of epithelial cell adjacent to the nucleus, as shown in (fig. 2, f). In this figure, we also see a contraction of the infected cell with the coccoid form, a contraction of its nucleus and a change in the form of its nuclear material existing inside the nuclear membrane of the genetically active Euchromatin to the genetically inactive Heterochromatin. That has been known by condensation of nuclear material.

In addition to infiltration of bacteria inside the epithelial cell, in figure (3,a) of TEM and (fig.3, b & c) of L.M. we can observe the infiltration of coccoid form inside the glandular tissue and beyond the epithelial cell and their basement membrane in the lamina properia.

Third form of H. pylori had been discovered in this study as shown in (fig. 4), it is between the spiral and the coccoid; (transformant form). As shown in its first phase (fig. 4,a), the bacteria are shortened and changed the spiral form into a form similar to vibrio. In the second phase, the bacterium is C-shaped connected at their ends with a common filament representing the form before the coccoid, as shown in (fig. 4, b & c).

Figure 2: Coccoid forms of Helicobacter pylori in different positions within the gastric antral mucosa:

a. Numerous of coccoid form of H.pylori is attached to the surface of epithelium and vacuoles formation inside the epithelial cell (1500X)*. b. Coccoid form of H.pylori inside the vacuoles within an infected epithelial cells (25000X)**. c. Rupture and exfoliation of
the infected epithelial cells by H. pylori (1500X)*. d. Severely diffused chronic inflammatory cell infiltration of H. pylori infected gastric epithelium (1500X)*. e. Destruction and deformation of antral gland infected with coccoid form of H. pylori (1500X)*. f. Intracellular localization of the coccoid form of H. pylori within the cytoplasm of a gastric mucous cell. The adjacent cell shows coccoid form of H. pylori within cytoplasmic vacuole (5000X)**.

(*: Light microscope micrographs, stained with Toluidin-blue. **: TEM micrographs stained with lead citrate and uranyl acetate.)

Figure 3: Coccoid forms of Helicobacter pylori in the lamina propria:
 a. TEM micrograph stained with lead citrate and uranyl acetate (3000X), b. and c: Light microscope micrographs, stained with Toluidin-blue (1500X).

Figure 4: Curved and C shaped (transformant form) of Helicobacter pylori between spiral and coccoid form:
 a. (25000X), b. (16000X), and c. (25000X) TEM micrographs stained with lead citrate and uranyl acetate.

Figure 5: Adhesion of spiral and coccoid form of Helicobacter pylori show the bacteria cell wall seem to be fused with gastric epithelial cell membrane by fibrillar adhesine (FA) and Adherance pedestal (AP).
 a., b., d., and e. Light microscope micrographs, stained with Toluidin-blue (1500X), c., and f: TEM micrograph stained with lead citrate and uranyl acetate (16000X).
Discussion

Many methods were used to evaluate the vitality of coccoid form in keeping its capability of colonizing the gastric tissue and creating the infection, like the capacity to synthesize protein, cultivability, integrity of DNA, nucleic acid content, urease activity, vacuolating cytotoxin (Vac A) activity and capability of adhesion on the epithelial cells. The gastric tissue is one of the hardest organs in the human body from the point of its colonization by bacteria, due to the peristaltic washing which make it resistant to adhesion of bacteria and the thick layer of mucus and the gastric acidity being near to (pH=2). However, the spiral form could overcome these difficulties, colonize and damage the gastric tissue due to having many virulence and maintenance factors representing in producing the urease enzyme, which balance the gastric acidity in the micro environment surrounding the bacteria and (Vac A), that participates in damaging the mucosal layer defense, as well as the phospholipase enzyme, which destroys the phospholipids bi-layer, and the mucinase enzyme, responsible on digesting the mucus layer. But, one of the most important requirements of infecting the epithelial cell and then the gastric tissue is its capability of adhering on the epithelial cell.

The results of histological examination in this study, according to the cases with negative cultures were 83.33% (15/18) treated by amoxicillin have the coccoid form (fig. 2). This has been also proved by Berry and his group in an in-vitro study when he treated the spiral form with a low concentration (0.05mg/ml) of amoxicillin and he noticed that the bacterial form changed from the spiral to coccoid. The vacuole formation within the epithelial cells accompanying with the coccoid form in our results (fig. 2,a,b & f) was similar to the vacuoles resulted from the infection with the spiral form. This is an evidence for the ability of the coccoid form to produce (Vac A), as Wang and his group confirmed throughout his genetic analysis of the gene responsible for producing (Vac A) in both forms. He noted the correspondence of sequences of nitrogen base of the gene in coccoid and spiral forms are equal, in addition, he got the point that there is no influence on the structure of DNA of H. pylori, after treatment with antibiotics. In other research, he proved that changing into coccoid form in liquid media after incubation of 31 days despite the decreasing levels of DNA and RNA in the H. pylori, and the bacteria still have the activity of (Vac A) and Urease genes. According to urease enzyme, as shown in the result of this study, it gives a high rate of positivity which is 96.3%, for the samples of study involving the sample of negative culture.

It has been seen documented that there is a numerous number coccoid form in human stomach in patients with Adenocarcinoma. It is to be known that the Adenocarcinoma is a pathological development of infection with such bacteria, in case of treatment failure. In other words, it can be said that the coccoid form may be a potential disease phase with unexplored high risk probably it uses an unexpected and unknown mechanism in stimulating the inflammatory response and in developing the gastric adenocarcinoma. Despite the ambiguous role of the coccoid form, we can confirm that it is a vital and disease phase, in addition to its high biological importance. According to the stated results of this study and the others, the infection of the coccoid form has successfully occurred in mice.

Conclusion

Results 96.3% (52/54) were positive for urease test, H. pylori existed during the direct microscopic examination of homogenized biopsy in 75.93% (41/54). We were able to isolate H. pylori on Brucella agar media in two-third of cases 66.67% (36/54) of biopsies, however, the rest of biopsies 33.33% (18/54) were negative. Those 18 biopsies have been specifically studied in this research for the coccoid form. The results showed the ability of coccoid form to adhere in certain positions of the surfaces of the epithelial cells, by forming pedestal, and then making the histological changes in cases mentioned above gastritis, duodenitis and peptic ulcer. The coccoid form of H. pylori has a vital pathological role similar to the spiral form. It is a viable dormant form, and it has a biological and medical importance, in addition to its responsibility for transmission of infection and disease reoccurrence.

Conflict of Interest: Nil

Source of Funding: Self

Ethical Clearance: Not required.

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The Effect of Using Healthy Programmed Education on Learning the Basic Skills of Futsal in the Republic of Iraq

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Abstract

Education in Iraq experiences a period of development based on the nature of the age, which is committed to changing the curriculum and its objectives and means. Education today depends on the useful function of what we learn as the facts of science could be applied in the real life. Understanding the nature of the learning process is one of the problems faced by workers in that field. The same is one of the most important problems addressed by the teacher of education as it interferes in all educational means, education is a process through which the one may acquire new experiences based on the old experience it could change the mind of the learner according to the previous experience and make a new change. Football became one field in the scientific research which tries to find the best way for learning. The researcher offers the use of programmed education in the learning of football for the gymnastums where the sports activity using the educational programs has an important impact on the learning process.

Keywords: Healthy programs, learning mental skills, physical education.

Research Problem

Sports activities are so different, including individual, collective and Futsal activities, which occupies a prominent position among the various sports and being taught in all faculties of physical education and sports science as a basic course, which requires submission to the educational and educational method approved by the scholars of education, and the two researchers to teach football For the halls, teaching and mastering skills requires more than this time, which leads to the delivery of information to students without mastery. It is also through teaching the traditional way of explaining and modelling through the teacher and applying by the students without any effort from Before the students in the attempt to improve and gain led to the attention of the teacher in the technical aspects of education to be able to end the teaching of skill on time without consideration of the educational and social aspects in the lecture, and it follows that the contact between the teacher and the student limited to give instructions, in addition to the traditional method with narrow The time has led to a lack of attention to the level of low-level students in an attempt to reach them to the required level, as well as the distinguished ones as an attempt to upgrade their level to reach the highest level of their abilities, due to the lack of taking into account individual differences between students in this way used e.

Research Objectives: The research aims at learning some of the basic skills of Futsal using programmed education through:

1. Preparing a booklet for teaching the basic skills of Futsal.
2. To understand the effect of programmed education in learning the basic skills of Futsal.

Research Hypotheses:

1. There are statistically significant differences between the pre and post-tests of the control group members for the benefit of the post-test.
2. There are statistically significant differences between the pre and post-tests of the experimental group members in favour of the post-test.
3. There are statistically significant differences between the effect of programmed education and traditional education in all tests in favour of programmed education.

Research Keywords:

Programmed Instruction: Is a tool which enables the individual to self-teach by means of a program designed in a way that allows the information to be divided into small parts and arranged in logical and behavioural order so that the learner responds gradually
and immediately verifies the validity of his response until he finally reaches the desired behaviour.

**Research Methodology:** The researchers used the experimental approach in the design of the first experimental group and the other control using pre and post-tests, in order to suit the type and nature of the research.

**Research Population:** The research population consists of students in the second stage of the Faculty of Physical Education and Sports Sciences at the University of Maysan, Republic of Iraq for the academic year 2017-2018 - including (65) students.

**Research Sample:** The sample of the research was randomly selected from the students of the second stage in the Faculty of Physical Education and Mathematical Sciences at the University of Missan, Republic of Iraq for the academic year 2017-2018. The number of students was 40, divided into two groups (control group and experimental group).

**Types of programming:** In short, programming can be considered as the process of ordering instructional material in a series of steps that leads the learner to self-learn from one goal to another, a new unknown object that is more difficult and complex. Thus, the learner starts from an initial goal until it reaches a definite final goal through small steps called each the types of programming are:

1. **Linear Program:** It is one of the contributions of Skinner and his collaborators. It is based on analysing the study material into separate parts, each called a frame. The lines are followed in a straight horizontal line, and the questions are presented directly in the linear program so that the student thinks and writes his answer based on what he studied in previous tires.

2. **Skipping Program:** This type depends on the tires of the pope asking the student about a particular subject or ask him to perform a certain skill if the response is correct to ask him to skip or jump a group of tires that explain this subject or skill and accurately to another frame provides a next step or new material and here does not walk student In a straight line it is not related to the tires within the program, but the extent of his understanding of the subject and ability to performance and the speed of compatibility and linking topics, and therefore characterized by this type that does not disrupt the excellent student does not re-explain the skill or subject possible performance, but the weak student is walking in the program without jumping From frame to socket.

3. **Intrinsic Programme:** This method of programming developed by (1), called the real program intrinsic programme and frames in this method related to sub-frames of more than one idea may be up to three ideas, and the question is usually a choice of multiple, and the student chooses to answer if it is correct takes the following frame In the main sequence, if it is wrong, it takes the frame that explains the error from the sub-frames. It may give examples or comparisons and then draw a new frame to make another attempt to choose the correct answer, so the sub frame here is called the Remedial Frame and then the learner returns to the program President To create a new attempt and thus puts the program in front of the student several alternatives to walk in accordance with the rate or direction.

**Steps To Prepare The Program:** It is stated by (2) that there are some scientific steps that contribute to the construction of the educational program, can be referred to in the following:

1. Fit the program to the target sample.
2. Taking into account the characteristics and number of the sample.
3. Serve and develop the required expertise.
4. Be in line with material and human potential and time.

While (4) confirms that the steps to build the program are summarized as follows:

1. Define the objectives of the program to be prepared and they must be clear, specific and detailed.
2. Determine the starting point of the program.
3. Identification of the scientific material to be presented in the program in the light of the objectives already identified.
4. Determine the system in which the skill will be presented in the program.
5. Writing the program tires.
6. Experimenting and modifying the program.

**Building the program:** It is pointed out by (5) that the foundations of building the program are:
1. Taking into account the characteristics and growth of the Sunni stage of learners.
2. Taking into account the capacities and individual differences
3. Ease and variety and simplicity of the program
4. Mechanisms for stimulating learners
5. Distribution of work to the appropriate extent (activity and rest).
6. Provide the appropriate time and place to implement the program.
7. Content is consistent with the program objective.
8. Accountability of security and safety factors.

**Football in Halls:** Sports in our modern era are no longer just a means of playing and recreation in leisure time, but it is a basic need for man in this age\(^6\). Physical education plays an effective and effective role in the development of the individual’s abilities in all its various aspects of mental, psychological, social and kinetic as a meaningful educational activity with direct effects. In view of the development of science and knowledge in many areas of sports, including football, the game has received a large share of the attention of researchers, which reflected the development of method of play and plans and The rules that contributed to give aesthetic in the performance of players and increase the enthusiasm of the public, and among those method is the game of Futsal, which is one of the method of the game as a cornerstone for the development, as well as the skills and plans and events and unexpected positions in the game\(^7\). Everyone wants to practice and watch because of the ease of their law, the small space of the stadium and the small number of players and similar skills with the basic skills of football (Soccer), which led to the practice by a large number of players.

**Conclusions**
1. The educational program using the programmed education applied to the experimental group led to a significant improvement in the level of skill performance in favour of dimension measurements.
2. The method used to explain the basic skills of football to the gyms has partially influenced the improvement of the skills of the control group.

**Recommendations:** In light of the research objectives and results, followed by the conclusions, the researchers recommend the following:

1. The need to use programmed education because of its positive impact on increasing the output of the educational process.
2. Direct the results of this research to the staff of the Iraqi Olympic Committee to benefit from these results.
3. Conduct more studies and scientific research using different educational method when teaching the basic skills of all activities in general and the futsal in particular.

**Conflict of Interest:** Nil

**Source of Funding:** Self

**Ethical Clearance:** Not required

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Prevalence of Anxiety Disorder among Medical Student of Mosul University Iraq

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Abstract

Background and aims: Medical education and profession are among the most challenging and most worrying ones. Anxiety represents an escalating public health problem among medical students. The objective of this study was to verify the prevalence & predictors of anxiety disorder among medical students in Mosul University/Mosul/ Iraq.

Material and Method: So a cross-sectional study was carried out during December 2017. A random sample method was used to select 225 medical students. A confidential & self-administered questionnaire included Standardized Taylor scale of honest anxiety was used.

Results: Among 200 respondent students, 129 (64.5%) were female and 71(35.5%) were male. (37%) of participants aged 18 & 19. Among these participants 7 (3.5%) were smoker, 4 (2%) of them are smoke hookah. Among the participants 63 (31.5%) had no anxiety while 37 (18.5%) had panic state. 109 (54.5%) see dreams cannot told anyone, and 151 (75.5%) are want to be glad like others.

Conclusion: Medical students in Mosul university had high prevalence of anxiety in comparison with others. educational problems and major life events were the main predictors.

Keywords: Anxiety in medical student, stress in medical student.

Introduction

Anxiety disorder is one of the most frequent mental disorders of community that affects the quality of life (1). Anxiety causes exaggerated effects on the economy of society. It impairs the physical and psychological aspects of human being (2). Hospitals are associated with human’s life and death, their environment is very stressful (3). Several studies have been approved that there are different stressors that can increase the prevalence of anxiety state among medical students (2,3). Studies have shown that several stressors such as vast amounts of new information, alterations in study method and longtime period of medical education, extreme working hours, difficult types of exams, sleep deprivation, difficulties of finding a job, in addition of social, emotional and family factors can pressure their learning ability and lead to college failure were affect students’ lives and lead to anxiety state and other mental disorders of medical school education (1,3). The atmosphere of medical schools and colleges is a stressful work place that considerably affects the educational performance, psychosomatic health of the students (3,4). These stressors in addition to negative effects on the educational performance can affect their personality pattern (3,5). Depression and suicide may be seen in physicians and medical students (2,5). Medical education across the globe is seeming as being obviously stressful (1,2,4). Over burden of information provides a reduced chance to relax and restore and leads to disturbance in sleep pattern, reduced concentration, decrease in self-esteem, along with mental health status like increased anxiety and depression. A medico encounters various stressors in terms of academic pressures and its resultant outcome measured in terms of success in the evaluation process and long term objective to settle down in the coming future as well as adjustment to the new environ in the medical school was necessary (1,3,4,5). Therefore it becomes very important to study the overall mental health status and mainly prevalence of anxiety among medical students as these comprise neglected public health problems in Iraq. It is very significant to prevent the ill sequel of anxiety on one’s academic achievement...
through early detection and effective intervention actions. For that reason, the present study was undertaken with the aims of this study to assess the overall anxiety state in medical student, to determine any history of drug abuse taken during examinations and smoking state and to describe some factors influencing anxiety among medical students at Mosul University.

**Methodology**

A cross-sectional study was conducted at Mosul medical college, from 1st of December 2017 to 1st of January 2018. Medical students of all academic semesters from 2013-2018, from Mosul medical college were incorporated in the study. There were a total of 225 students in the 1st, 2nd, 3rd, 4th, 5th and 6th year. Students who were accessible at the time of data gathering and who were fulfill the selection criteria were give details about the study and taking oral consent was established by the students at time of data gathering. Any students enrolled in Mosul medical college may be incorporated mean there is no exclusion criteria. Two hundred students outside 225 may had the questionnaire with self administered and after finishing point of questionnaire they were convey them to the investigator. Therefore, 200 students were incorporated in the study with a response rate 88.9%. The chosen student were included by random sampling technique in which any student may be included in study. Then all information of questionnaire were considered which comprised of socio-demographic and educational variables, smoking condition. In addition to that all the information needed to evaluate the different levels of anxiety were collected through the use of questionnaire form and Taylor scale of personality\(^6\) and Taylor scale of Honest Anxiety (Arabic version)\(^7\) which sought information about each system. After correction of scale; deficiency areas were detected & taken as a sound base for the construction of the final form of the questionnaire. A 50 questions that was needed to assess anxiety state. Computer feeding and statistical analysis were carried out. The descriptive numbers was analyzed as proportion of anxiety condition among the medical student. The indicators were weighted, and the anxiety scores were computed for each student in the survey.

**Results**

During one month period spend on data collection from Mosul Medical College. Two hundred students are collected to represent all grades of the college.

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<th>Table (1): Demographic Characteristics of Study Sample</th>
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Table (1) shows the age distribution of students more than third (37%) of study sample was in age group 18 & 19 years, About two third are female (65.5%).

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<th>Table (2): Distribution of Smoking among Study Sample</th>
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</thead>
<tbody>
<tr>
<td>Variables</td>
</tr>
<tr>
<td>Smoking</td>
</tr>
<tr>
<td>Not Smoker</td>
</tr>
<tr>
<td>X smoker</td>
</tr>
<tr>
<td>Smoker</td>
</tr>
<tr>
<td>Total</td>
</tr>
<tr>
<td>No. of Cigarettes</td>
</tr>
<tr>
<td>Not smoker</td>
</tr>
<tr>
<td>&lt;= 5</td>
</tr>
<tr>
<td>&gt;5 &amp; &lt;=10</td>
</tr>
<tr>
<td>&gt;10 &amp; &lt;=20</td>
</tr>
<tr>
<td>&gt;20 &amp; &lt;=30</td>
</tr>
<tr>
<td>&gt;30 &amp; &lt;=40</td>
</tr>
<tr>
<td>Total</td>
</tr>
<tr>
<td>Years of Smokers</td>
</tr>
<tr>
<td>Not smoker</td>
</tr>
<tr>
<td>&lt; 1 year</td>
</tr>
<tr>
<td>1- 2 year</td>
</tr>
<tr>
<td>2-3 year</td>
</tr>
<tr>
<td>3-4 year</td>
</tr>
<tr>
<td>4-5 year</td>
</tr>
<tr>
<td>&gt; 10 year</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>
Table (2) portrays that the behavior of smoking emerged among (3.5%) of medical students, (2%) smoke hookah and (2.5%) of student are drug abusers.

Table (3): Point Prevalence of Anxiety Levels among Study Sample

<table>
<thead>
<tr>
<th>Anxiety Level</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Anxiety</td>
<td>63</td>
<td>31.5</td>
</tr>
<tr>
<td>Mild Anxiety</td>
<td>27</td>
<td>13.5</td>
</tr>
<tr>
<td>Moderate Anxiety</td>
<td>54</td>
<td>27</td>
</tr>
<tr>
<td>Severe Anxiety</td>
<td>19</td>
<td>9.5</td>
</tr>
<tr>
<td>Panic Anxiety</td>
<td>37</td>
<td>18.5</td>
</tr>
<tr>
<td>Total</td>
<td>200</td>
<td>100</td>
</tr>
</tbody>
</table>

Table (3) depicts the point prevalence of anxiety that there is (31%) of student has no anxiety followed by moderate anxiety (27%).

Table (4): Point Prevalence of Sleep Disturbance in Study Sample

<table>
<thead>
<tr>
<th>Sleep Question</th>
<th>Disturbed</th>
<th>Not Disturbed</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Interrupted sleep</td>
<td>81</td>
<td>119</td>
<td>200</td>
<td>100</td>
</tr>
<tr>
<td>2. Have had periods in which lost sleep over worry</td>
<td>81</td>
<td>119</td>
<td>200</td>
<td>100</td>
</tr>
<tr>
<td>3. Night terrible terrors</td>
<td>65</td>
<td>135</td>
<td>200</td>
<td>100</td>
</tr>
<tr>
<td>4. Sometimes so excited that find it hard to get to sleep</td>
<td>81</td>
<td>119</td>
<td>200</td>
<td>100</td>
</tr>
<tr>
<td>5. Had dreams not tell anyone about them</td>
<td>109</td>
<td>91</td>
<td>200</td>
<td>100</td>
</tr>
</tbody>
</table>

Table (4) illustrates point prevalence of sleep disturbance in study sample, (54.5%) see dreams cannot told anyone about it.

Table (5): Point Prevalence of Nervousness among Study Sample

<table>
<thead>
<tr>
<th>Nervous Question</th>
<th>Nervous No.</th>
<th>Nervous %</th>
<th>Not Nervous No.</th>
<th>Not Nervous %</th>
<th>Total No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Feel anxious about something or someone almost all of the time</td>
<td>94</td>
<td>47</td>
<td>106</td>
<td>53</td>
<td>200</td>
<td>100</td>
</tr>
<tr>
<td>2. Frequently find himself worrying about money &amp; work</td>
<td>89</td>
<td>44.5</td>
<td>111</td>
<td>55.5</td>
<td>200</td>
<td>100</td>
</tr>
<tr>
<td>3. Waiting makes nervous</td>
<td>131</td>
<td>65.5</td>
<td>69</td>
<td>34.5</td>
<td>200</td>
<td>100</td>
</tr>
<tr>
<td>4. More sensitive for anything stress me</td>
<td>73</td>
<td>36.5</td>
<td>127</td>
<td>63.5</td>
<td>200</td>
<td>100</td>
</tr>
<tr>
<td>5. Wish feel glad like others</td>
<td>151</td>
<td>75.5</td>
<td>49</td>
<td>24.5</td>
<td>200</td>
<td>100</td>
</tr>
<tr>
<td>6. At times think I am not good at all certainly feel useless at times</td>
<td>54</td>
<td>27</td>
<td>146</td>
<td>73</td>
<td>200</td>
<td>100</td>
</tr>
<tr>
<td>7. Feel will burst from stress</td>
<td>108</td>
<td>54</td>
<td>92</td>
<td>46</td>
<td>200</td>
<td>100</td>
</tr>
<tr>
<td>8. Life in my view only tire and problems</td>
<td>91</td>
<td>45.5</td>
<td>109</td>
<td>54.5</td>
<td>200</td>
<td>100</td>
</tr>
</tbody>
</table>

Table (5) describe study sample that (75.5%) are want to be glad like others.

Discussion

Youthful is a point of an identity-forming time in which individuals practice societal and bodily changes, as well as a variety of conflicts in behavioral, academic, economic and sexual areas. A numeral studies have paying attention on the mental health of medical students as a higher medical school is well thought-out to be a point of considerable psychosomatic distress for physicians in training. Some aspects of training may have inadvertent harmful effects on medical students’ emotional & mental wellbeing. Several studies show a high prevalence of anxiety conditions among medical students with levels as an in general psychological distress consistently higher than in the universal population and age harmonized peers. This study was conducted to assess an anxiety state in students of Medical college in Mosul University. In this study, 68.5% of the medical students had anxiety, which was steady with more than that in other studies.
conducted in the USA (49%) (11), Brazil (40.2%) (12), Pakistan (43.89%) (13) but similar to the University of Beirut (69%) (14) and undergraduate Chinese medical students 60% (15) according to that Pakistani studies. alternatively, the prevalence of anxiety in medical students was higher than that of the UAE (28.7%) (16), Turkey (27.1%) (17), Sweden (12.9%) (18). In Indian study anxiety symptoms were present in 66.05% which is go in parallel with the current study (19). The difference from other studies may contribute to many reasons like might be the variation of instrument used to appraise anxiety or that the stressors in our country such as lack of security conditions is a major cause of anxiety. Regarding, female gender was significant with progress of anxiety analogous to western studies which reported that many psychological distresses were higher among female students (20-25). This can be due to the basis that females have a higher proportion of psychiatric illnesses or there was a high entitlement of female students in the present study 64.5%. Moreover, smoking behavior and drug abuse were also considered affect the prevalence of anxiety (26,27). As far as educational stressors are concerned, educational performance, oral examination & theory test criteria dissatisfaction and being overburdened with test program were extensively related with anxiety, suggesting educational stressors as being a source of mental distress among medical students (13,15,28,29). Most frequent source of stress in Nepal study were staying in a hostel and vastness of curriculum and tests/exams (25), while a study conducted in Pakistan found dissimilar stress factors such as drug misuse and presence of major psychiatric disorders in first degree relatives in a family (5,30). On the converse, in this study only 5 students which representing (2.5%) were found to have a drug abuse. In this study, the investigator was study the categories of Taylor scale of Honest Anxiety which sought information about each system including sleep pattern, fear, nervousness, physical and cognitive symptoms. on the other hand, this finding cannot be supported by other studies as this categories are not been studied in this details.

Conclusion

Medical students in Mosul university had high prevalence of anxiety in comparison with others. educational problems and major life events were the main predictors. Enhancing facility for preventive & curative mental health services is suggested by beginning of stress management courses & enhancing educational advising services are essential when the medical education is established.

Ethical Clearance: The research made within the same university (mosul university).

Source of Funding: Self fund

Conflict of Interest: Nil

References

7. Taylor scale of personality and Taylor scale of Honest Anxiety 1989; (Arabic version) .


The Burden in Providing Caregiving Service to Mentally Illed Patients in Ponorogo

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1Faculty of Health Sciences Universitas Muhammadiyah Ponorogo, 2Faculty of Nursing Sciences Universitas Airlangga Surabaya, 3Faculty of Public Health Universitas Airlangga Surabaya, 4Faculty of Nursing Stikes Ngudia Husada Madura East Java Indonesia

Abstract

Introduction: The provision of caregiving to patients with a mental illness are under the burden of continuous and difficult processes. Some factors are responsible for this burden and the determination of these factors will help to address it. The objective of this study is to investigate the caregiver burden of patients with mental illness in Ponorogo.

Method: Sixty-seven caregivers of patients with mental illness in Paringan village were included in the study. Socio-demographic data, level of knowledge about mental disorders and caregivers burden were measured and observed.

Results: The socio-demographic variables show the average age of the respondents to be 50.0597, 57% of caregivers are women, as much as 100% caregiver Javanese, 37% of the caregivers are farmers, and 54% of these caregivers only have elementary school education. Total caregiver burden shows a mean of 23.28 (SD = 9.224). Findings on the level of burden of these caregivers revealed that 18 respondents were on the light burden level, the intermediate burden level had 4 respondents, while the level that did not experience any burden had 45 respondents. Caregiver burden was positively correlated with the age of caregivers (p = 0.000), employment of caregivers (p = 0.001), and level of education (p = 0.000).

Recommendation: Since these caregivers who care for people with mental disorders showed a higher financial burden compared with other types of caregiver burden, these findings suggest that a model of nursing intervention is needed to prevent the occurrence of a community-based caregiver load increase.

Keywords: Caregivers burden, mental illness, Paringan village, nursing.

Introduction

The increase in the prevalence of mental disorders will be followed by the need for additional caregivers who provide care in various homes. The ability of caregivers to provide care depends on the caregiver’s health status. However, it has been discovered that caregivers often neglect their physical and mental health, prioritizing the health of their patients. Consequently, chronic stress has been identified as the main risk factors of poor health state of most caregivers. Interventions to reduce the severity will increase repair process and in turn improve the quality of life of patients a caregiver attends to. A caregiver provides care for a spouse, parent, or his loved ones having chronic diseases such as mental disorders and the likes. Thus, understanding the function and presence of a caregiver mainly nurses at home is very important.

An estimated number of 43.5 million Americans need the services of caregivers on a average of 19 hours per week. In the United Kingdom, approximately 1% of the population are diagnosed with mental disorders. Iran has about 7 million people suffering from mental disorders. The prevalence of severe psychiatric disorders in Indonesia is at 1.7 per million; that is 1 to 2 people out of 1,000 inhabitants of Indonesia suffered severe mental disorders. Caregiver burden is simply the perception that the caregiver has in relation to his/her physical health, social life, emotion and status, as a result of caring for a family member, resulting in the concept of burden as the product of a specific, subjective and
interpretive process of chronic disease. A high caregiver burden, if left untreated, will affect the caregiver’s life quality. And decrease in the quality of life of a caregiver will have a direct negative impact on the quality of care rendered to the patient with mental disorder.

Various problems caregivers face with patients/family members suffering from mental disorders include: 1) inability to understand the behavior of people with mental disorders, how to manage them, and their erratic behavior, making the caregiver helpless; 2) sadness, mental tension and loss of sense; 3) future concerns of sufferers and other family members; 4) financial problems. The family as a source of the most important supporters of patients with schizophrenia, which caused an increase in burden and responsibility. Caregiver burden negatively impact the families of patients with mental disorders. An estimated 50-90% of patients with chronic mental illness live with their families. The impact on family members of those who have mental disorders are so bad that it affects the lives of clients and caregivers, socially and work.

**Method** This study design was a descriptive cross-sectional study. A purposive sampling method was employed to obtain the needed sample which were 67 caregivers caring for people with mental disorders. Variables of the research include sociodemographic characteristics (age, gender, ethnicity, employment status, educational level) and caregivers’ burden. The research instrument employed is the modified version of Zarit Burden Interview (ZBI), which consists of five Likert-scale points with 22 questions. There are four sub-variables of caregiver burden which are mental burden, physical burden, the burden of social and financial burden. Each question has five points burden level and the criteria are: a score of 0 = never; a score of 1 = rarely; 2 = sometimes; 3 = rather often; and then 4 = almost always. Based on the total value of ZBI, there are four levels of burden: 1) score ≤21 = no burden; 2) score 21-40 = light; 3) score of 41-60 = moderate; 4) score 61-88 = weight.

**Result**

A total number of 67 caregivers who treated people with mental disorders participated in the study. The average age of the subjects was 50.0597, the youngest caregiver was 30 years old while the oldest was 69 years old. Majority of the 67 respondents were women. All these caregivers are from Javanese. of these 67 caregivers, 25 are farmers. And as many as 36 respondents have elementary education. The descriptive statistics for all the variables used are presented in Table 1.

| Table 1. Characteristics of Statistics in Sociodemographic Variabl |
|---------------------------------|----------------|
| **Variable** | **SUM (%)** |
| **Age** | |
| 30 - 50 | - |
| 51 - 70 | - |
| **Gender** | |
| Male | 30 (45) |
| Female | 37 (55) |
| **Ethnicity** | |
| Javanese | 67 (100) |
| Non Javanese | 0 (0) |
| **Employment** | |
| Civil servants | 4 (6) |
| Farmer | 25 (37) |
| IRT | 22 (33) |
| Private | 16 (24) |
| **Education** | |
| No school | 10 (15) |
| SD | 36 (54) |
| SMP | 8 (12) |
| SMU | 12 (18) |
| PT | 1 (1) |

The Total Caregiver Burden of the 67 respondents has an average of 23.28, with a minimum value of 12 and a maximum value of 47. Sub-variables Caregiver Burden due to mental issue has an average value of 9.8806 with a least value of 3 and a maximum of 22. Sub-variables Caregiver burden due to physical issues has an average value of 5.8060 with a lowest value of 0 and a maximum of 11. Sub-variables Caregiver burden as a result of social stress has an average value of 1.5075 with a minimum value of 0 and a maximum of 2. Sub-variables Caregiver burden due to financial issues has an average value of 4.7313 with a minimum value of 2 and a maximum of 7. of all the sub-variables caregiver burdens, mental burden has the highest valu. The descriptive Statistics for Caregiver Burden is presented in Table 2.

| Table 2. Descriptive Statistics for Caregiver Burden |
|---------------------------------|----------------|
| **Variable** | **Mean** | **SD** | **Min** | **Max** |
| Total Caregiver Burden | 23.28 | 9224 | 12 | 47 |
| Mental burden | 9.8806 * | 5.12428 | 3.00 | 22.00 |
| Physical burden | 5.8060 * | 2.59509 | .00 | 11.00 |
| Social burden | 1.5075 | 2.53684 | .00 | 2 |
| Financial burden | 4.7313 * | 1.33237 | 2.00 | 7.00 |

* +
Considering the correlation between the levels of burden with sociodemographic variables from the gender point of view shows that among the males, 4 respondents have medium burden level, 9 have a light burden level and 17 respondents did not experience any burden. Among the females, 9 respondents experienced light burden level while 28 respondents did not experience any burden. The result of Chi-square statistics test shows that there is a relationship between the burden level and gender (p = 0.49). While the burden level did not show any significant relationship with employment (p = 0.758) and education (0.087). The correlation of the Burden Levels of Caregivers and Sociodemographic Variables are presented in Table 3.

Table 3. Correlation between Burden Levels of Caregiver and Sociodemographic Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Level Burden</th>
<th>Chi Square (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30-50</td>
<td>22</td>
<td>8</td>
</tr>
<tr>
<td>51-70</td>
<td>23</td>
<td>10</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>17</td>
<td>9</td>
</tr>
<tr>
<td>Female</td>
<td>28</td>
<td>9</td>
</tr>
<tr>
<td>Employment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Civil servants</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Farmer</td>
<td>16</td>
<td>8</td>
</tr>
<tr>
<td>IRT</td>
<td>16</td>
<td>5</td>
</tr>
<tr>
<td>Private</td>
<td>11</td>
<td>4</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No school</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>SD</td>
<td>26</td>
<td>9</td>
</tr>
<tr>
<td>SMP</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>SMU</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>PT</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

* P <.05

Discussion

This study shows the burden level of caregivers providing care for people with mental disorder. These burden experienced by the caregivers include the following: mental burden, physical burden, social burden, and financial burden. The results of this research showed that of the four types of burden, caregivers experienced only mental, physical, and financial burden (Table 2). And the correlation between the burden levels of caregivers and sociodemographic variables showed that these sociodemographic variables: age (p = 0.000), occupation (p = 0.001), and education (0.000) are related to the burden level (Table 3).

Mental Burden: The relationship between caregiver burden and age is significant (p = 0.000). Caregivers with age more than 51 years (51-70) are more likely to experience caregiver burden than those within 30 and 50 years. Caregiver with mental disorders had the feelings that despite having to care for patients with mental disorders with a vengeance, but still felt it should still be and need to do more to treat these patients. This simply means that these caregivers were experiencing mental burden.

Caregiver with less social support manifested an increase in the prevalence of burden experienced. Based on the length of treatment time caregivers give their patients, 32% had higher caregiver burden and 19% had lower caregiver burden. The level of burden experienced by these caregivers that treat people with mental disorders are in the mild and moderate region. Caregivers experiencing caregiver burden had the risk of experiencing depression. We can use the concept of family caregiver burden model to explain this, the family caregiver burden as an output is affected by the process of reciprocity in the variable coping, spiritual health, social support, and the quality of relationships, as antecedents a variable dependency needs activity daily living sufferers.

Caregivers are not ashamed to care for people with mental disorders. As a matter of fact, they constantly care for people with mental disorders and rarely get angry. When the members of the family of the patient with mental disorder care for him or her properly, such person can recover in no time and the patient can experience a bright future with that stable condition. Caregivers implement an active communication process, and feel their privacy is not hampered in any way. Caregivers feel that with good care, activity daily living (ADL) of those suffering mental disorders would be good. ADL dependent increase in association with increase in the incidence of caregiver burden. The ability is always there to care for people with mental disorders. Caregivers while treating these patients need to provide enough emotional support and comfort. Even though mental disorders including chronic illnesses, comprehensive treatment, that is, balancing the biological, psychological, social, and spiritual treatment in accordance with the standard procedure then it will be discovered that the condition of people with mental disorders will be stable and the recovery process will be faster. Existing social support ranging from the members of the family, and friends who are also family members suffering from mental...
disorders, as well as cognitive therapy from professional nurses will give these caregivers no trouble in seeking needed medical help. Caregivers who have strong spiritual beliefs always assume that the mental disorders experienced by members of his or her family are tests which must go and so they are not overwhelmed when it comes to giving them adequate care.

Physical Burden: Caregivers with mental disorders feel that since family members suffer from mental disorders and the condition are not stable, people with mental disorders more often ask the caregivers for help at every point and more rely on the caregiver. All these in a way have various physical impacts on the caregivers and these include: inadequate sleep or sleep disturbances, feeling more tired, and body aches just to mention few.

Caregiver Burden also result in the loss of weight of the caregiver\textsuperscript{12}. Nevertheless, caregivers with the profession of civil servants, as well as the private sector are able to manage their time properly as they can divide their time between when to care for people with mental disorders and when to take care of other activities, including time for themselves like resting.

Financial Burden: The various jobs of these caregivers are: 1) civil servant; 2) private; 3) farmers; 4) IRT. And statistically, the incidence of burden caregivers was related to the caregivers job (p = 0.001). Caregivers who care for people with mental disorders for a long period of time experience lack or insufficient funds to support and cater for the cost incurred while taking care of these people with mental disorders. In addition to being used for financing the daily needs of the patients, daily activities involving finance in the life of the caregivers are also affected as there are no adequate funds.

If assessed economically, it is seen that caregivers treat patients with chronic illness beyond the care of patients in health care facilities\textsuperscript{17}. The cohort study shows that caregivers treat dementia for $56,290 per year for each patient, which is far beyond what the patients can afford considering their conditions\textsuperscript{13}. Caregivers with peasant work, when compared to other better professions, experience more financial burden. The community where the research was carried out is a community in which the majority of the caregivers are farmers by profession. And the major way of carrying out their farming activities is through the traditional ways and they rely mainly on legumes. Even if they harvest for four months, it is not enough to compensate for the needs of caregiving.

Limitation: Several limitations were required in this study which assist in interpreting the results. These are: 1) the research was only conducted on a small area, so it could not be generalized; 2) the subjects of this research are caregivers with impaired psyche, without comparison.

Implication: When compared with a non-caregiver, the caregivers of patients with mental disorder indicate the existence of financial burden. The emergence of burden on the caregivers with those people with mental disorders will affect the caregivers capabilities in running the treatment of mental disorders, thereby affecting the behavior of caregivers towards discharging their duties adequately. This burden on these caregivers simply means that they need adequate intervention in order to cope and be effective in their primary duties.

Conclusion

In this particular study, considering the fact that the level of caregiver burden in the light region is 25\%, as much as 5\% at the level of moderate, and the majority, which is 70\% of the caregivers are at the level in which they experience no burden, we can thereby conclude that the caregiver burden experienced by caregivers did not differ according to the patient’s status. The caregiver burden was positively correlated with the age of caregivers, employment of caregivers, and level of education.

Model of nursing interventions are required to prevent further escalation of community-based caregiver burden.

Ethical Clearance: The study was given ethical approval from health research ethics committee Faculty of Nursing Universitas Airlangga number 1040-KEPK.

Conflict of Interest Statement: The authors declares that there is no conflict of interest.

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Reference


Organized Activities in Peer Groups Improve Mental and Social Well-Being in Adolescents: A Qualitative Study

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Abstract

Introduction: Mental and social well-being in adolescents can be improved by organized activities in peer groups. This qualitative study aimed to explore organized activities in peer groups related to mental and social well-being in adolescents.

Method: Five focus groups were carried out with 30 adolescents aged 12–24 in Surabaya, Indonesia. Participants were purposively selected and had all experienced organized activities. A thematic approach was used for analysis and data collection was completed at the point of data saturation.

Results: Four interconnected themes emerged from the data; (a) self-esteem and self-regulation, (b) resilience, hardiness and mental toughness, (c) social adjustment and (d) social support in organized activities. Adolescents who involve in sports, arts, and clubs have high confidence, easiness to control their emotion, stronger in facing various problems. They also felt more adapt, respect, tolerant of others and get social support.

Conclusions: This study demonstrates that organized activities in peer groups improve mental and social well-being. Adolescents can have good self-esteem, self-regulation, resilience, hardiness and mental toughness. Adolescents also can have good social adjustment and social support. One of the efforts to prevent a mental and social problem is early recognition or detection in adolescents.

Keywords: Organized activities, peer groups, mental and social well-being, adolescents, qualitative research, focus groups.

Introduction

Mental and social health is one of the health problems in the world, including in Indonesia. One population that has a risk for mental and social health disorders is adolescents. Mental disorders in adolescents include anxiety and depression, while social disorders that occur are social isolation and loneliness.¹

Adolescence is a transitional period of development between childhood and adulthood. The development of adolescent social life is characterized by the influence of peers in adolescent life.² Peer groups are a place for adolescents to socialize with peers and they gain social support.³,⁴,⁵ Activities undertaken by adolescents with peers include activities such as sports, arts and clubs and impact on social and mental well-being.⁵

World Health Organization states that health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.⁷ Mental health is a state of well-being in which every individual realizes his or her own potential, can work productively and able to make a contribution to the community. A social well-being manifests if one is able to relate to another person or group well.

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Criteria of mental well-being as follows mental efficiency, control and integration of motives, control of conflicts and frustrations, positive and healthy feelings and emotions, the tranquility of peace of mind, healthy attitudes, healthy self-concepts, adequate ego identity and adequate relation to reality. Mental well-being enhances our cognitive process, and to deal with simple as well as complex task. It also helps us in developing intrinsic motivation.

Social well-being concerned with social support and interpersonal relationship. Social support was simultaneously related with health and personal control beliefs in relation to well-being. Close support figure can be sufficient to promote well-being. The high social well-being is a positive significance in coping with the stresses of life and developed high productivity to make an effective community. One factor that related to well-being among adolescents was organized activities involvement.

The purpose of this study is to explore organized activities in peer groups related to mental and social well-being in adolescents.

Materials and Method

Study design: This study used qualitative description as a design and focus group for information gathering to explore organized activities in peer groups related to mental and social well-being in adolescents. This study chose focus groups because this method possible to acquire valuable data. Ethical approval was granted by The Faculty of Public Health Airlangga University Health Research Ethics Committee (No: 69-KEPK).

Recruitment process: Participants were male and female students who attend organizations in schools with peer groups. We used a purposive sampling technique, aiming to be inclusive of experiences of boys and girls from diverse backgrounds. Recruitment ended once theoretical saturation was achieved. In total, 30 adolescents ranging in age from 12 and 21 years, 12 participants were girls (40%) and 18 (60%) were boys.

Conduct of focus groups: Data collection was carried out by the main researcher from January-December 2017. Focus group were conducted with pupils in same year group to get naturalistic discussions. We designed a questioning route informed by existing mental and social well-being literature and guidance on focus groups. Focus groups lasted 50-60 minutes and were digitally audio recorded. The researcher assistant took field notes including verbal and non-verbal communication. Audio recordings were transcribed verbatim.

Data analysis: All data emerging from interviews and field notes helped inform the data-analysis process, were reviewed and coded by the researcher. This study using a thematic analysis approach. Pupils were given the opportunity to feedback on results to encourage participation validation.

Results

Five focus groups were conducted in this study with 30 participants. Four interconnected themes emerged from the data; (a) self-esteem and self-regulation, (b) resilience, hardiness and mental toughness, (c) social adjustment and (d) social support in organized activities.

Self-esteem and self-regulation along join an organized activities: Participants reported about self-esteem and self-regulation along join an organized activity in peer groups. Self-esteem and self-regulation are part of mental well-being.

Pupil A.2: “I feel more confident after meeting peer groups because they always support positive things I do like sports and arts activities.”

Pupil B.3: “I feel valuable when with them because I am more recognized in the group if I follow the activities of peer groups.”

Pupil C.15: “Before I joined the peer groups, I had difficulty controlling the behavior, but after joining the peer groups, I found it easier to control my behavior for the better.”

Participants felt more confident and valuable after following organized activities in peer groups. They can control behavior after joining organized activities. It can be concluded that adolescents have higher self-esteem and self-regulation than before following peer groups activities.

Resilience, hardiness and mental toughness in organized activities

Participants also reported about resilience, hardiness and mental toughness in peer groups activities. Mental well-being in adolescents can be identified by resilience, hardiness, and mental toughness.
Pupil E.19: “I become easier to control feelings of anxiety and stress, after joining the peer groups because we always discuss the problem of group members and find the solution.”

Pupil A.2: “I feel stronger in facing various problems both at school and at home because there is a place to store and solve the problem that is peer groups activities.”

Pupil D.13: “After I attended peer groups activities, I was more able to control my emotions, especially control anger, because my friend reminded me of a patience.”

Participants reported that they felt easier to control their feelings of anxiety and stress than before joining organized activities. They also reported that they felt stronger in facing various problems and easy to control their emotions. It can be concluded that adolescents have better resilience, hardiness, and mental toughness after following peer groups activities.

Social adjustment in organized activities: Interviews related to a social adjustment in peer groups activities, participants reported that they have a good social adjustment along following organized activities in peer groups.

Pupil D.27: “I am more able to adapt and respect others since I join this activity (study club, sports).”

Pupil C.8: “I am more tolerant of my friends in peer groups activity because they come from various backgrounds, such as different in tribe and religion.”

Participants said that they feel more adept, respect and tolerant with others since joining organized activities. This study can be concluded that adolescents have a good social adjustment withthe following peer groups activities.

Social support from peers: Participants reported that they get social support from peers along following peer groups activities.

Pupil 3: “My friends give me attention and support if I have a problem, and she/he always help me to solve my problem.”

It can be concluded that adolescents get social support from peers in peer groups activities. This social support important for them to help solve a problem.

Discussion

This qualitative study used focus groups to provide a naturalistic setting in which to explore organized activities in peer groups related to mental and social well-being in adolescents. This study has shown that organized activities (sports, arts, clubs) has consistently been associated with well-being. Mental well-being in the adolescent can be identified by self-esteem and self-regulation. Self-esteem is an individual’s judgment of self-respect. Self-esteem contributes in healthy functioning. There is an association between organized peer groups activities and high self-esteem. High self-esteem has been linked to mental and social health outcomes. Lower externalizing and internalizing problems as well as increased self-regulation, social skills and academic performance. Someone who participated in organized activities demonstrated significantly higher self-regulation. Self-regulation contributes to social and mental well-being. Self-regulation promotes harmonious interactions with others and poor self-regulation can contribute to crime and health risk behavior.

This study has shown that adolescents have a good resilience, hardiness, and mental toughness after following organized activities in peer groups. Resilience is the ability to adapt in life and related to health. School connectedness may provide a role in promoting resilience for mental health for adolescents. Resilience was positively associated with psychological well-being and negatively associated with psychological distress, depression and anxiety. Hardiness is a personality style characterized by a commitment, control, and perception of problems as a challenge. High hardiness is associated with lower psychological distress, higher quality of life and a high level of mental health. Hardiness is a psychological style associated with resilience, mental and social well-being. Hardiness was negatively correlated with physiological responses of systolic blood pressure, diastolic blood pressure, and respiratory rate. Resilience and hardiness were positively associated with psychological well-being, and negatively associated with psychological distress. Mental toughness was a multi-dimensional construct and positively correlated with mental and social well-being.

This study also has shown that adolescents have a good social adjustment with following organized activities in peer groups. Self-adjustment is the harmony between individuals and the environment in which individuals...
can interact, socialize and behave appropriately with the environment. There is a relationship between social adjustment and social well-being. Organized activities have consistently been associated with adjustment and well-being.

This study has shown that adolescents get a social support in peer groups activities. Peer interactions play an important role and related to social support. Organized activities involvement related to social support and adolescent wellbeing.

**Conclusions**

This study has shown that organized activities in peer groups improve mental and social well-being. Adolescents who involve in sports, arts, and clubs have high confidence, easiness to control their emotion, stronger in facing various problems. They also felt more adapt, respect, tolerant of others and get social support. Adolescents can have good self-esteem, self-regulation, resilience, hardiness and mental toughness. Adolescents also can have good social adjustment and social support. One of the efforts to prevent a mental and social problem is early recognition or detection in adolescents.

**Conflict of Interest:** The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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mental toughness. Mental Health and Physical Activity 2012;5:35-42.


The Effect of Psychosocial Stimulation Assistance, Child Feeding and Children Health Care to Growth, Motor Development and the Decrease Frequency of Upper Respiratory Tract Infections for Stunting Children 2-3 Years of Age

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Abstract

Background: Basic Health Research 2018 showed that the prevalence of national stunting is still high at 30.8%. That is, the growth problem suffered by around 8.9 million Indonesian children, or one in three Indonesian children.

Objective: to explain the effect of psychosocial stimulation, child feeding assistance and child health care on growth, motor development and prevention of respiratory infections over Stunting under-fives aged 2-3 years.

Method: Experimental research, consists of two stages. The first stage is the in-depth interview method. The results of the first phase of the study form the basis for the making of psychosocial modules. The second stage is intervention, namely the implementation of modules in the field. The sample was stunting children aged 2-3 years, the sample size was 30 children consists of 15 children as a intervention group and 15 children in the control group. Statistical analysis used was the T test and the Man-Whitney test at 95% confidence.

New Results: Psychosocial stimulation interventions, child feeding assistance and child health care influenced the increase in height, weight, head circumference, gross motoric, smooth motor, frequency of Upper Respiratory Tract Infection in stunting children, and statistically significant influence, except the variable weight.

Conclusion: Psychosocial stimulation interventions, child feeding assistance and child health care affect the increase in height, weight, head circumference, gross motor, fine motor, frequency of Upper Respiratory Tract Infection in stunting children.

Keywords: Psychosocial stimulation, stunting, children aged 2-3 years.

Introduction

Basic Health Research 2018 noted the prevalence of stunting is still high national 30.8% in 2013 i.e. 37.2%. That is, not the maximum growth of about 8.9 million suffered by the children of Indonesia, or one of the three children of Indonesia. The prevalence of stunting in Indonesia are higher than other countries in Southeast Asia, such as Viet Nam (23%), and Thailand (16%).$^{1,2}$
The Results of The Monitoring Status of nutrition in the last three years shows the percentage of children children stunting, the year 2015, 2016 and 2017 in South Sulawesi was 34.1%, 35.6% and 34.8%. It takes an effort to prevent the bad impact of stunting in children, so can be prevented it goes either physical or psychosocial.3

Stunting is finally becoming a public health problem in Indonesia because of the direct impact and also the long-term impact on the development of human resources. Prevent and cope with the impact of the problem of stunting is important and urgent is done considering the breadth and magnitude of the problem is always increased every year. Approach based on the framework of the concept of perbaikian nutrition in Indonesia is the approach towards improvements to access food intake and improvement approach against access decreased chance of infectious diseases.2,4

Based on the results of the research Walker, demonstrated that children are stunting can be intervened with a psychosocial approach and feeding of children as well as children’s health care to maximize the kognitifnya competence in the period the next life. Psychosocial approaches with mentoring that involves the mother as the primary responsible granting of stimulation in the form of play, the feeding of children, care of the health of child stunting will be examined in this study.5

The purpose of the research was explain the pengaruh mentoring stimulation of psychosocial, the feeding of children and children’s health care against increases in height, weight, head circumference, motor development, and a decrease in the frequency of diseases of upper respiratory tract infections child children stunting aged 2-3 years.

**Subjects and Method:** Types of research: Experiment with Architecture Randomized Pre Test Post Test Control Group Design. Research implemented in the area of employment Clinics Sudiang Kingdom City of Makassar.

Conducting research may 2018 until March 2019. Samplein the Research thet the older children stunting 2-3 years of age andnotina State of pain. A large sample of 30 children composed of 15 childrenas a group treatment given intervention mentoring psychosocial stimulation, the feeding of children, and the children’s health care, and 15 children as a control group not given the intervention. Mentoring is done 3 times a week for 6 months. The implementation of psychosocial stimulation in the form of play activity about 1 hour each time mentoring. Statistical analysis used was the T test and the Man-Whitney test at 95% confidence.

Data collection was performed before and after the intervention. Primary Data collected is Height, Weight, head circumference, the frequency of upper respiratory tract infections disease (RESPIRATORY), intake of carbohydrates, protein and zinc, the characteristics of the children, and family characteristics. Height, weight, and Anthropometry measurements collected by the head circumference. Data intake of carbohydrates, protein, and zinc are obtained by using the method of food recall 2x24 hours.

### Results

**Table 1: Average Children’s Height Change Stunting in the Work Area Puskesmas Sudiang Raya M**

<table>
<thead>
<tr>
<th>Groups</th>
<th>Height (cm)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Before Intervention</td>
<td>After Intervention</td>
<td>Deviation (∆)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 Months</td>
<td>6 Months</td>
<td>1-3 Months</td>
<td>3-6 Months</td>
<td>1-6 Months</td>
</tr>
<tr>
<td>Treatment (n=15)</td>
<td>81,52 ± 1,94</td>
<td>83,38 ± 1,75</td>
<td>85,69 ± 2,11</td>
<td>1,86 ± 0,56</td>
<td>2,31 ± 1,02</td>
<td>4,17 ± 1,02</td>
</tr>
<tr>
<td>Control (n=15)</td>
<td>81,26 ± 1,64</td>
<td>81,47 ± 1,76</td>
<td>81,93 ± 1,88</td>
<td>0,21 ± 0,18</td>
<td>0,46 ± 0,34</td>
<td>0,67 ± 0,43</td>
</tr>
<tr>
<td>T Independent (p)</td>
<td>Homogen (0,34)</td>
<td>0,00</td>
<td>0,00</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

The results of the T independent test analysis before the intervention in the treatment and control group is (P = 0.34) meaning the Homogeneous sample in terms of height. The results of the T independent test analysis after 6 months with the value (P = 0.00), which means there is a significant height difference between the treatment group and the control group.
Table 2 Average Weight Loss Children’s Child Stunting in the Work Area Puskesmas Sudiang Raya Makassar Year 2019.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Before Intervention</th>
<th>After Intervention</th>
<th>Deviation (Δ)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>3 Months</td>
<td>6 Months</td>
</tr>
<tr>
<td>Treatment (n=15)</td>
<td>10.35 ± 1.61</td>
<td>10.90 ± 1.29</td>
<td>11.60 ± 1.22</td>
</tr>
<tr>
<td>Control (n=15)</td>
<td>10.12 ± 0.78</td>
<td>10.99 ± 1.21</td>
<td>11.06 ± 1.07</td>
</tr>
<tr>
<td>T Independent (p)</td>
<td>(0.03)</td>
<td>0.85</td>
<td>0.21</td>
</tr>
</tbody>
</table>

The result of the T independent test analysis before the intervention in the treatment and control group was (P = 0.03). The results of T independent test analysis after 6 months with the value (P = 0.21) both above (P = 0.05) mean a homogeneous sample in terms of weight.

Table 3 Median Change of Children’s Head Circumference Stunting in the Work Area Puskesmas Sudiang Raya Makassar Year 2019

<table>
<thead>
<tr>
<th>Groups</th>
<th>Before Intervention</th>
<th>After Intervention</th>
<th>Deviation (Δ)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>3 Months</td>
<td>6 Months</td>
</tr>
<tr>
<td>Treatment n=15</td>
<td>46.04 ± 1.35</td>
<td>46.74 ± 0.95</td>
<td>47.14 ± 0.92</td>
</tr>
<tr>
<td>Control (n=15)</td>
<td>45.36 ± 1.74</td>
<td>45.72 ± 1.50</td>
<td>45.97 ± 1.41</td>
</tr>
<tr>
<td>T Independent (p)</td>
<td>Homogen (0.45)</td>
<td>0.03</td>
<td>0.01</td>
</tr>
</tbody>
</table>

The result of the T independent test analysis before the intervention in the treatment and control group was (P = 0.45) meaning the Homogeneous sample in terms of head circumference. The results of the T independent test analysis after 6 months with the value (P = 0.01) means there is a significant head circumference difference between the treatment group and the control group.

Table 4 Median Change of Children’s Head Circumference Stunting in the Work Area Puskesmas Sudiang Raya Makassar Year 2019

<table>
<thead>
<tr>
<th>Groups</th>
<th>Before Intervention</th>
<th>After Intervention</th>
<th>Deviation (Δ)</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>3 Months</td>
<td>6 Months</td>
</tr>
<tr>
<td>Treatment (n=15)</td>
<td>46.04 ± 1.35</td>
<td>46.74 ± 0.95</td>
<td>47.14 ± 0.92</td>
</tr>
<tr>
<td>Control (n=15)</td>
<td>45.36 ± 1.74</td>
<td>45.72 ± 1.50</td>
<td>45.97 ± 1.41</td>
</tr>
<tr>
<td>T Independent (p)</td>
<td>Homogen (0.45)</td>
<td>0.03</td>
<td>0.01</td>
</tr>
</tbody>
</table>

The result of the T independent test analysis before the intervention in the treatment and control group was (P = 0.45) meaning the Homogeneous sample in terms of head circumference. The result of T independent test analysis after 6 months with value (P = 0.01) means there is a difference in the head circumference between treatment group and control group.
Table 5 Average Fine Motor Score Children of Children Stunting in the Work Area Puskesmas Sudiang Raya Makassar Year 2019

<table>
<thead>
<tr>
<th>Groups</th>
<th>Before Intervention</th>
<th>After Intervention</th>
<th>Deviation (Δ)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>3 Months</td>
<td>6 Months</td>
</tr>
<tr>
<td>Treatment (n=15)</td>
<td></td>
<td>5.07 ± 0.70</td>
<td>7.60 ± 0.82</td>
</tr>
<tr>
<td>Control (n=15)</td>
<td></td>
<td>5.40 ± 0.98</td>
<td>6.13 ± 0.83</td>
</tr>
<tr>
<td>Mann-Whitney (p)</td>
<td>Homogen (0.21)</td>
<td>0.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

The results of the Mann-Witney test analysis before the intervention in the treatment and control group were (P = 0.21) meaning the Homogeneous samples in terms of fine motor scores. The results of the Mann-Witney test analysis after 6 months with the value (P = 0.00) means there is a significant difference in fine motor development between the treatment group and the control group.

Table 6 Average Distribution Frequency of Diseases of Upper Respiratory Tract Infections Children of Children Stunting in the Work Area Puskesmas Sudiang Raya Makassar Year 2019

<table>
<thead>
<tr>
<th>Groups</th>
<th>Before Intervention</th>
<th>After Intervention</th>
<th>Deviation (Δ)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>3 Months</td>
<td>6 Months</td>
</tr>
<tr>
<td>Treatment n=15</td>
<td></td>
<td>2.53 ± 0.64</td>
<td>1.20 ± 0.56</td>
</tr>
<tr>
<td>Control (n=15)</td>
<td></td>
<td>2.67 ± 0.61</td>
<td>2.73 ± 1.27</td>
</tr>
<tr>
<td>T Independent (p)</td>
<td>Homogen (0.79)</td>
<td>0.00</td>
<td>0.00</td>
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</tbody>
</table>

The results of the T Independent test analysis before the intervention in the treatment and control group was (P = 0.79) meaning a homogeneous sample in terms of frequency of Infections incidence. The results of the T Independent test analysis after 6 months with the value (P = 0.00) of this value below (P = 0.05), meaning there is a significant incidence of the frequency of upper respiratory tract infections between the treatment group and the control group.

Discussion

In this study mentoring psychosocial stimulation, child feeding and child health care, effect on increase in height, weight gain, head circumference, crude motor, fine motor and decrease in infectious diseases of the tract Upper breathing. These results were backed by the results of previous research by Walker, the year 2005 in Jamaica, research with nutritional supplementation and psychosocial stimulation of the growth of 9-24 month-old stunting children as many as 129 samples randomly. The results of the study are psychosocial stimulation of the effect on height, weight and head circumference in children aged more than 12 months.5

Psychosocial stimulation assistance gives a positive response, increasing the activity of children’s motor movements. Children activities in the form of skipping activities are able to increase bone mass stimulate the growth of long bones. The pressure response to the more scientifically active bone has been proven that the regenerate bone is stimulated by the load pressure while playing, which stimulates the growth of long-bone epiphyses, further increasing the child’s height. On the other hand by playing, the child will be pleased to cause the child’s appetite increase, then will increase food intake.

Child health Care, able to lower the frequency of diseases of upper respiratory tract infections. In this study, with decreased frequency of upper respiratory tract infections causing the child’s immune system to increase and appetite for children to be good so that food intake increased, thereby improving the growth of height, weight and head circumference. These results provide strong support that zinc is important to suppress the incidence of infectious diseases.7 The results of the study8 that zinc and protein were able to lower the prevalence of infectious diseases.9

In fulfilling the cell needs of this mineral zinc in the serum binds with some of the more commonly known proteins with a protein that works in the growth and metabolism of all cells one of them stimulates the
growth of T cells holding Important role of thymus function. The thymus is where the T.T cell maturation is the cell where the Timulin produces. Timulin is the hormone needed for the formation of the immune system. Adequate intake of zinc and protein, the immune system in the body increases, the growth of height, weight, head circumference, and the development of crude motor and optimal fine motor.

Factors that make increased head circumference follow the growth of normal child head circumference because of the high integration process that occurs due to psychosocial stimulation. Stimulation is received and transmitted through the nerves to the brain and the spinalis cord, where those messages are analyzed, combined, compared to and coordinated by a process called integration. Once selected, the messages are forwarded by nerves to the muscles and glands of the body, causing the muscles to contract or relaxation. This process stimulates child brain growth and development. The growth of nerve fibers and branches, resulting in complex neural and brain tissues. Growth and development of the brain together with the growth of the skull bones protecting it.

Psychosocial stimulation in this study significantly affected the development of crude motor and fine motor. Psychosocial stimulation gives a positive response to the child’s motor movement. The study was backed by research conducted by Rahmini Sabariah, that if the head circumference increased then motor motion improved. In this study have been reported earlier that the head circumference increased so that it will directly increase the crude motor motion score and fine motor. Physical development is closely related to the child’s motor development. Motor is the progression of body movement control through coordinated activities between neural, muscular, brain, and spinal cord, Dynamic System Theory.

The conclusion of this research is, the treatment of psychosocial stimulation, child feeding and child health care affects increase in height, weight, head circumference, crude motor, fine motor and lower frequency of disease Upper respiratory tract infection.

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Conflict of Interest: There are no conflicts of interest

Ethical Clearance No: 430-KEPK

References


The Feeling of Surrender: 
Patients’ Perceptions of their Interactions with Nurses

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Abstract

Background: Meaningful nurse-patient interaction is crucial to achieving better health outcomes. A nurse should understand the importance of tailored effective communication to understanding how each patient prefers to be treated. Nurse-patient interaction is a potential resource to promote hope, meaning and purpose in life, which results in harmony and healing environment. Previous studies have shown a variety of aspects of nurse-patient interaction, however the process of interaction have not been thoroughly investigated from the patients’ viewpoint. This qualitative study aimed to investigate patients’ perceptions of their interactions with nurses in the hospital wards.

Method: A phenomenological approach was undertaken in one public hospital in Indonesia. 10 participants were recruited from general wards by purposeful sampling method. The data were collected through observations of nurse-patient interaction, the ward atmosphere as well as the activities by semi-structured interviews. Transcripts were then examined and analyzed by Interpretive Phenomenological Analysis (IPA) approach.

Result: Three themes were extracted from data analysis including saying sorry for neglecting me, calming the atmosphere for nurses’ openness and feeling surrender to destiny.

Discussion and Conclusion: Based on the results, issues such nurses’ openness and positive atmosphere in the hospital wards are shown to be important in maintaining the best quality of nurse–patient interactions. Nurses should be aware of these factors during interactions with patients.

Keywords: Feeling of surrender, surrender, patients’ perception, interactions, nurses.

Introduction

Meaningful nurse-patient interaction is crucial to achieving better health outcomes. A nurse should understand the importance of tailored effective communication to understanding how each patient prefers to be treated. Nurse-patient interaction is a potential resource to promote hope, meaning and purpose in life, which results in harmony and healing environment.1 Patients expressed that the nurse–patient relationship was a fundamental aspect in nursing care which empowers patients’ abilities to engage in overall well-being practices. Previous studies identified that there was no connection between nurses and patients, thus patients felt difficulties to connect with certain nurses. Strong connection is an important aspect of nursing care created by a sense of trust and it is essential for the development of nurse–patient interactions.
Personal beliefs, values, perceptions, expectations and personal expression and behavior was stated as factors that influence the development of trust between nurse-patient.

Nurse-patient relationship develops after several interactions in a relatively short period of time. Studies showed that patients believed the importance of nurse-patient relationship in their care. Being a genuine, being open and honest and also being present when they need them were considered as essential keys in sustaining the relationship. Patients stated that they need to feel valued, respected as individuals and should be treated as if they were humans. Social interaction between nurse-patient has been described as a therapeutic and intervention process to achieve health outcomes. In addition, the interactions should be developed based on mutual trust and respect, it was part of a cognitive and psychomotor process.

Patients’ centered care and patients’ experiences of using health services are current health issues. Improving high quality of patient care requires more than clinical skills, it requires a deep understanding patients’ experiences encompass the range of interactions that patients have with hospital. Effective social interactions are designed as opportunities to develop a strong connection, mutual trust and understanding in a relationship. There were two key factors in social interaction: ‘developing and maintaining relationships’ and ‘caring and motivational interactions’. Promoting these factors could promote a long-lasting relationship.

Previous studies have shown a variety of aspects of nurse-patient interaction, however the process of interaction have not been thoroughly investigated from the patients’ viewpoint. This qualitative study aimed to investigate patients’ perceptions of their interactions with nurses in the hospital wards.

**Material and Method**

A phenomenological approach was undertaken in one public hospital in Indonesia. 10 participants were recruited from general wards by purposeful sampling method. The data were collected through observations of nurse-patient interaction, the ward atmosphere as well as the activities by semi-structured interviews.

Open-ended questions allowed participants to share their experiences of interactions. It was started with opening questions, “How would you describe yourself as a person?”, “How many days have you been staying in this hospital?”, “How would you describe your interactions with nurses?”.

Transcripts were then examined and analyzed by Interpretive Phenomenological Analysis (IPA) approach. Several steps in IPA analysis: (1) Read and re-read the transcripts and pick up the messages, (2) Re-read the whole transcripts and examine prospective themes, (3) Pay attention to the emergent themes and create a link between themes and (4) Organize themes and interpret the meaning of themes.

**Findings:** Nurses are exposed to many challenges and issues in the workplace that may influence the quality of nursing care. Improving the outcome of nursing care based on the experiences of patients, we need to consider patients’ perception to the care they received in the wards. Three themes were extracted from data analysis including saying sorry for neglecting me, calming the atmosphere for nurses’ openness and feeling surrender to destiny.

**Table 1. Themes and sub-themes**

<table>
<thead>
<tr>
<th>Themes</th>
<th>Sub-Themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saying sorry for neglecting me</td>
<td>Disregard patient concerns</td>
</tr>
<tr>
<td></td>
<td>Feel sorry for the missed care</td>
</tr>
<tr>
<td>Calming the atmosphere for nurses’ openness</td>
<td>Being humorous</td>
</tr>
<tr>
<td></td>
<td>Being polite</td>
</tr>
<tr>
<td></td>
<td>Hoping openness</td>
</tr>
<tr>
<td>Feeling surrender to destiny</td>
<td>Being restricted</td>
</tr>
<tr>
<td></td>
<td>Being surrendered</td>
</tr>
</tbody>
</table>

**Saying sorry for neglecting me:** Patients stated that nurses ‘saying sorry for neglecting them’, it was developed from two sub-themes: ‘disregard patient concerns’ and ‘feel sorry for the missed care’. Patients felt that nurses sometimes missed response to call alarms, administer the medication, and assist in bathing. However, nurses also said they were sorry for prioritizing another patient. Patients stated that: ‘I haven’t taken a bath in three days’, ‘I have tried to call them to help me, yet they were so busy and came late’, ‘…..but, they said sorry for neglecting us, they were only trying to help another patient’, ‘They said to us, just be patient, we will help you later after another patient’, ‘They seem so busy…..but….somehow my family could not find them in nurses’ station’. Nurses are important human resources in determining the quality of care in the hospitals as well as the nature of health outcomes. More than half of
respondents felt that there were not enough nurses in the wards. Nurses also admit that they did not have enough time to properly care for their patients. Studies showed that insufficient staff or time to carry out their work directly influence the patient outcomes and increase the risk of patient safety. Yet, hospital management should improve the policies for dealing with missed nursing care and its consequences for patients, health providers and the hospital.10–11

**Calming the atmosphere for nurses’ openness:**
Hospital environment provide an effective stimulation and adequate support for healing capacity of patients, families, and health providers. Patients expressed that they have been trying to ‘calming the atmosphere for nurses’ openness’. This theme came from three sub-themes: ‘being humorous’, ‘being polite’ and ‘hoping openness’. They knew that nurses seemed so busy in the wards, thus they tried to create a calm atmosphere by being humorous individuals, being polite during interactions and hope that nurses will be more motivated to help them. Patients stated that: ‘We have tried to create a humour while we communicate with them, so they will feel relax’, ‘We have to be polite when we need help from nurses’, ‘We do that for their openness’, ‘We have to help them, so they also help us, yaaaa….by being humorous like this’. Humour played a significant role in developing nurse-patient relationships and supporting nurses to provide adequate treatment to patients and their families. It helps patients to make a strong connection with health providers, provide a continuum of care and mutual support.12–15

**Feeling surrender to destiny:** Patients explored the ‘feeling surrender to destiny’ which was developed from two sub-themes: ‘being restricted’ and ‘being surrendered’. Patients said that: ‘I felt like surrender….may be it is what we should get’, ‘This ward you know, it feels so hot, even we cannot bring any fan in the hospital’, ‘We cannot ask for further questions, they just said to us, just be patient in this hospital’, ‘You know, it’s just we have to feel like this….surrender….what can we do, we are the one who need helps from them’, ‘Just be patient, that is all you need’. Being surrendered means as having no other options than to relent, this happened when patients could no longer help themselves during hospital stays. They rely on nurses for comfort, reassurance, advice, and support. Dependence on other people means that they trust others to help and manage the situation. During communication with nurses, patients have to be a cooperative person and doing as nurses requested. Nurses should also be present for their patients during the nursing shift, active listening and maintain a good eye contact while interacting with patients. A mutual trust and respect during interactions was developed when the patients were invited to take part in the nursing care.16–17

This study highlights the perspectives of patient during interaction with nurses. The results of this study may have implications for nurses to manage their care and improve their relationships to achieve high quality of patients’ outcomes.

**Conclusion**

Based on the results, issues such nurses’ openness and positive atmosphere in the hospital wards are shown to be important in maintaining the best quality of nurse–patient interactions. Nurses should be aware of these factors during interactions with patients.

**Conflict of Interest:** None.

**Source of Funding:** Self-funded.

**Ethical Clearance:** Ethical approval was granted by Faculty of Public Health in Universitas Airlangga, Surabaya with number 1360-KEPK.

**References**


Physiologically Justified Rehabilitation of the Children Who Underwent an Operation for Congenital Heart Disease, Including Tourism Elements

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Abstract

One of serious problems of health care is the high prevalence of congenital defects of a cardiovascular system. After carrying out operation at such children changes in a cardiovascular system, disturbances of their physical and psychological development often remain, there is a decrease in resistance of their organism. It is clear, that will be more elaborately rehabilitation of such children, the higher at them chances of long, full-fledged life. The author’s technique of physical rehabilitation of such children was capable to provide more expressed positive effect, than traditionally applied at these patients. Against the background of use of an author’s technique there occurred optimization of the general functional condition of children and their tolerance to an exercise stress increased. At children is after passing of a course of author’s rehabilitation the functional condition of cardiovascular and respiratory systems reached the level of control. It exceeded effect in group of the children receiving traditional rehabilitation. Thus, the author’s technique of physical rehabilitation of the children who underwent an operation for heart disease is more effective, than the traditional scheme that it gives the grounds to recommend it for broad practical application

Keywords: Rehabilitation, children’s age, heart diseases, physiology, tourism.

Introduction

One of the most important problems of health care is the high prevalence of congenital malformations, especially in a cardiovascular system1,2. This pathology is high on the list in structure of all congenital pathologies3 and is one of the main factors of risk of development of complications and mortality from cardiovascular violations among children4,5.

In surgical treatment of congenital defects of a cardiovascular system at children serious success is achieved. At the same time, improvement of rehabilitation actions at the children operated concerning congenital heart diseases still needs improvement6,7.

It becomes clear that an integrated approach is necessary for successful rehabilitation of children with heart diseases8,9. Only the complex technique of rehabilitation allows to reduce consequences of congenital heart diseases and surgery, will help to prevent violations in development of children and will reduce risk of their invalidization10.

Need of improvement of method of physical rehabilitation of children after surgical intervention concerning heart diseases sets for researchers tasks of assessment of efficiency of different options of
improvement at this disease. Admits that powerful improving potential in this plan improving tourism as a result of the strong optimizing action on an organism of walking and natural forces of nature has\textsuperscript{11,12}. Options of sports tourism traditionally are campaigns, excursions, walks, tourist meetings, competitions and local history activity. At the same time at all options of improving tourism physical activity has to increase gradually, reaching peak to the middle of the period of activity taking into account a land relief, the mass of equipment and speed of movement\textsuperscript{13,14}. The great improving value of tourist rest is also connected with powerful positive action on an organism of children of weather climatic conditions and a landscape\textsuperscript{15,16}. Considering the expressed improving opportunities of improving tourism, it was decided to estimate its influence on a cardiovascular system at the children who underwent an operation for congenital heart disease.

The work purpose - to develop a complex technique of physical rehabilitation of the children operated concerning heart disease and to estimate its efficiency.

**Materials and Method**

The conducted research is approved by local ethical committee of the Russian state social university on September 15, 2017 (Protocol No. 11). In researches 30 children, 18 boys and 12 girls with average age of 11.4±1.42 years took part. All of them were taken in a research in 6 months after operation for congenital heart disease – defect of an interatrial partition. At the time of capture in a research all children had normal indicators of ultrasound examination of heart and the electrocardiogram. 2 groups – the main and experimental on 14 and 16 people, respectively were in a random way created from them. The main group received traditional rehabilitation, the experimental group underwent rehabilitation by a technique with elements of recreational tourism. The group of control is provided by 20 clinically healthy children of the same age.

In experimental and control groups within 6 months the identical complex of exercise stresses was applied. It included the daily dosed walking, gradually increasing duration within a month from 30 minutes to 90 minutes, four times a week run, lasting from 5 minutes up to 15 minutes at free speed with gradual after 1 month of occupations, transition from jogs on the horizontal plane on jogs on the surface having the ascending bias no more than 30\textdegree\textsuperscript{17,18}. In experimental group in addition once a week in 2 months of occupations until the end of observation group classes were given by recreational tourism. In cold season they were conducted at a temperature not below –10\textdegree C in the form of ski walks across the Moscow region on a distance not less than 2 km. During lack of snow cover pedestrian one-day campaigns across the territory of the Moscow region with a total length of 5 km were carried out. During ski or a hike the rest interval each 30 min. on the low-cross-country terrain and each 15-20 min. on rises in the conditions of the hilly area was observed\textsuperscript{19}.

The status of the children who made experimental group and the main group was evaluated daily. Their examination was conducted by the method given below dvoyekratno – when taking under observation and in its end. The group of control was inspected once.

For assessment of a functional status of cardiovascular and respiratory systems the heart rate and frequency of respiratory movements were evaluated\textsuperscript{20,21}. Also orthostatic test\textsuperscript{22}, Martin-Kushelevsky\textsuperscript{23} test, the Harvard step test\textsuperscript{24} and the tredmill-test were applied\textsuperscript{25}. Statistical data processing happened to the help of a t-student criterion.

**Results of a research:** Application of both options of physical rehabilitation provided comparable decrease in heart rate and frequency of respiratory movements to the level of control (table 1) in both groups.

The other considered indicators of a functional status of the children receiving rehabilitation according to the author’s program improved more in comparison with indicators of the children of the main group receiving a traditional technique of rehabilitation.

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Main group; n=14, M±m</th>
<th>Experimental group; n=16, M±m</th>
<th>Control group; n=20, M±m</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>at the beginning of observation</td>
<td>at the end of observation</td>
<td>at the beginning of observation</td>
</tr>
<tr>
<td>Heart rate, beats/min</td>
<td>89.6±0.76 p&lt;0.05</td>
<td>81.9±0.86 p&lt;0.05</td>
<td>90.6±0.92 p&lt;0.05</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indicators</td>
<td>Main group, n=14, M±m</td>
<td>Experimental group, n=16, M±m</td>
<td>Control group, n=20, M±m</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-----------------------</td>
<td>-----------------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td></td>
<td>at the beginning</td>
<td>at the end of</td>
<td>at the beginning</td>
</tr>
<tr>
<td></td>
<td>of observation</td>
<td>of observation</td>
<td>of observation</td>
</tr>
<tr>
<td>Frequency of respiratory</td>
<td>29.2±0.78</td>
<td>25.6±0.71</td>
<td>24.2±0.71</td>
</tr>
<tr>
<td>movements, movements/min</td>
<td>p&lt;0.01</td>
<td>p&lt;0.01</td>
<td>p&lt;0.01</td>
</tr>
<tr>
<td>Orthostatic test, blows/min</td>
<td>24.1±0.45</td>
<td>19.2±0.43</td>
<td>14.6±0.52</td>
</tr>
<tr>
<td>Martin-Kushelevsky’s test,</td>
<td>70.2±0.62</td>
<td>39.9±0.22</td>
<td>24.2±0.45</td>
</tr>
<tr>
<td>conventional unit</td>
<td>p&lt;0.01</td>
<td>p&lt;0.01</td>
<td>p&lt;0.01</td>
</tr>
<tr>
<td>Harvard step test, conventional</td>
<td>56.7±0.55</td>
<td>70.1±0.31</td>
<td>82.6±0.48</td>
</tr>
<tr>
<td>unit</td>
<td>p&lt;0.01</td>
<td>p&lt;0.01</td>
<td>p&lt;0.01</td>
</tr>
<tr>
<td>Tredmil-test, mets</td>
<td>3.8±0.15</td>
<td>6.0±0.21</td>
<td>8.2±0.19</td>
</tr>
<tr>
<td></td>
<td>p&lt;0.01</td>
<td>p&lt;0.01</td>
<td>p&lt;0.01</td>
</tr>
</tbody>
</table>

Symbols: p – reliability of distinctions of indicators with control level.

So the result of orthostatic test in the main group receiving traditional rehabilitation improved for 25.5% in comparison with an outcome. Results of test of Martin-Kushelevsky in this group also improved, having decreased by 75.9%. Indicators Harvard a step test improved at them for 23.6%, in the tredmil-test for 81.8%. At the same time at the children of experimental group receiving rehabilitation with tourism elements, results of orthostatic test improved for 73.3% and reached control level. They also had dynamics of result of test of Martin-Kushelevsky Bol expressed, being 3.1 times that also provided reaching of this indicator the level of group of control.

On indicators Harvard a step test at children of experimental group after passing of an author’s rehabilitation course it was observed more expressed, than in the main group improvement (for 39.5%) with reaching the level of indicators of group of healthy children.

After carrying out physical rehabilitation by a technique with tourism elements the tredmil-test indicator also exceeded result in the main group (for 36.7%). It approached values of control group, having improved by 2.5 times.

Having considered the received results, it becomes clear that application of a technique of rehabilitation with tourism elements influences an organism of the children who underwent an operation for congenital heart disease more positively. The achieved result was provided with their bigger physical fitness and achievement by higher tolerance to physical activity.

### Conclusion

One of the most important problems of health care is the high prevalence of congenital defects of a cardiovascular system. After operation at such children changes in a cardiovascular system often remain that demands carrying out from them systematic rehabilitation actions. It is recognized that what will think more over rehabilitation of such child, that chances are higher at him to live long and full-fledged life. The author’s technique of physical rehabilitation with elements of tourism provided at the children operated concerning heart disease, more expressed effect, than traditionally applied at this contingent of patients. As a result of its application for children big optimization of the general functional state and higher tolerance to physical activity was reached. It becomes clear that the author’s technique of physical rehabilitation of the children who underwent an operation for heart disease is more effective, than traditional that it gives the grounds widely to recommend it for practical application.

### Conflict of Interest:
No conflict of interest is declared.

### Sources of Financing:
The study was conducted at the expense of the authors.

### Ethics Committee Resolution:
The study was approved by the local ethics committee of the Russian State Social University on September 15, 2017 (Protocol No. 11).
References


Relationship between Job Satisfaction with Employee’s Turnover Intention in Petrokimia Gresik Hospital

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Abstract

During the 2016-2017 period, employee turnover rates at Petrokimia Gresik Hospital showed an increase, with figures of 12.54% in 2016 and 13.49% in 2017. Of the total employee turnover in 2017, 57% were types of labor medical and 96% are voluntary turnover. This is a serious problem, so it is important to do an analysis with the aim of knowing the causes and can develop solutions to anticipate the future so as not to continue to increase. This turnover can be predict by analyzing the tendency of employees to leave work, using turnover intention analysis. One of the factors causing high employee turnover is job satisfaction. This research is an observational quantitative study conducted at Petrokimia Gresik Hospital, with a total sample of 172, using primary data obtained directly from the employees of Petrokimia Gresik Hospital by simple random sampling (including medical, supporting, and administrative personnel). Data collection used a valid and reliable questionnaire, namely JSS (Cronbach’s Alpha 0.910) and Turnover intention scale of 6 items-TIS-6 (Cronbach’s Alpha 0.677). Data analyzed using the Spearman correlation test. The result of the Spearman correlation test is that there is a significant relationship between JSS and TIS-6 (p 0.000 <0.05) with a negative correlation direction (correlation coefficient -0.507). These results indicate that the higher the JSS value, the lower TIS-6 will be. The conclusion of this study is Job satisfaction is related to Turnover Intention on employees at Petrokimia Gresik Hospital.

Keywords: Job satisfaction, turnover intention.

Introduction

Turnover is defined as the movement of employees from their current job¹. Turnover is also defined as the cessation of a permanent working relationship between the company and its employees². Turnover can also be a separation between the company and the worker³, whereas Scott (1977) defines the symptoms of turnover as the transfer of labor from and to a company⁴. Mobley (1986) an expert in the issue of employee turnover gives a turnover limit as an individual stops from an organization accompanied by the provision of financial rewards by the organization concerned⁵. Turnover is the entry of labor into a company within a certain period of time⁶. If in a hospital the level of entry and exit of employees rises from before, this is an indication of a motivation, enthusiasm and passion for work. Beside that it will reduce productivity can also lead to the continuity of the running of a hospital and the amount of costs incurred during the process of employee recruitment, training, until the placement⁷.

The impact of turnover for organizations includes: (a) employee withdrawal costs, concerning the time and facilities for interviews in the selection. withdrawal and learning of changes. (b) training costs, involving the time of the supervisor, personnel department and trained employees. (c) what is issued to employees is smaller than that produced by the new employee. (d) the level of accidents and errors of new employees, usually tends to be high. (e) production lost during the employee turnover period. (f) production equipment that cannot be used fully. (g) a lot of waste due to new employees. (h) need to do overtime work, otherwise it will experience production delays. High turnover in the organization indicates the need to improve working conditions and how to develop it.

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Mobley and Seashore, et al (1986) state that many factors cause employees to move from their workplaces but the determinant factors of desire to move include: (1) Job satisfaction, (2) Organizational commitment from employees. There have been various studies on job satisfaction and organizational commitment from employees, but in relation to employee turnover there is still little research. Based on the above background, the problem raised in this study is the increasing trend of employee turnover rate in Petrokimia Gresik Hospital in 2016-2017 by 12.54% -13.49%, which is dominated by voluntary turnover (96%) and from the class of medical personnel (57%). Thus it is necessary to analyze turnover on employees and make efforts to overcome them.

**Method**

This research is a quantitative research using cross sectional design to determine the relationship between Job Satisfaction and Turnover Intention. The sample in this study were employees at Petrokimia Gresik Hospital, which consisted of 172 medical, supporting and administrative or general personnel. Employee participation in this research is voluntary. Health workers who are not employees (interns, guest doctors) are not included in the study.

Sampling in this study was carried out by simple random sampling for each type of hospital staff. The sample size is calculated using a formula and obtained a minimum number of samples of 172 people for the confidence value of $p <0.05$ in the hospital employee population of 340 people.

Collecting data using a questionnaire that has been tested for validity and reliability. Independent variables namely Job Satisfaction are measured using a questionnaire adopted from JSS consisting of 9 dimensions, consisting of a total of 36 questions. The scale is 4 points Likert scale (4 = very satisfied, 1 = very dissatisfied). While the dependent variable is Turnover Intention measured using a questionnaire adopted from TIS-6 consisting of a total of 6 questions. The scale is 4 points Likert scale (4 = strongly agree, 1 = strongly disagree). The collected data processed and analyzed using the SPSS version 21.0 for Windows program. Descriptive analysis used to describe the characteristics of respondents, Job Satisfaction Scale, and Turnover Intention for employees at Petrokimia Gresik Hospital. The relationship between Job Satisfaction Scale and Turnover Intention analyzed using the Spearman correlation test.

**Results**

**Respondent Demographic Data:** The majority of respondents were women (59.3%), and young people aged 20-30 years (73.8%). Based on their marital status, 55.8% are married. Respondents who live in the Gresik area are more dominant(69.8%). Respondents with contract employee status were more than permanent employees(59.3%). The majority of respondents have a working period of less than 10 years, 90.7%, and 48.3% is 1-3 years. Respondents consisted of medical personnel (50%), supporters (29.1%), and administrative or general personnel (20.9%). Medical personnel who become respondents consist of doctors, nurses and midwives. Supporting staff consists of pharmacists, pharmacist assistants, laboratory analysts, radiographers, nutritionists, medical recorders, physical firepower, and environmental health workers. While administrative or general staff consists of cashier, lobby, finance, secretariat and personnel. The majority of respondents are executors (94.2%), with S1 education (44.2%), no children (57%), have a partner (husband or wife) who also work (44.2%) and have work experience in other places before (69.8%).

**Employee Job Satisfaction:** Variable Job Satisfaction is explained through 9 dimensions, namely salary, promotion, supervision, additional benefits, agreed rewards or rewards, operational conditions, co-workers, work and communication characteristics, with 36 questions submitted to health workers, but after passing validity test 31 just question.

The total JSS score is in the range 31-124. Descriptively, JSS categorized as being dissatisfied, less satisfied and very satisfied. The total score of respondents’ JSS as shown in table 1. It turns out that the majority of JSS data is not satisfied (86.6%) then very satisfied (11%) and dissatisfied (2.3%). Dissatisfied perceptions of health workers who were categorized as unsatisfied (n = 149) towards each dimension of JSS are shown in table 2. Respondents who answered dissatisfied were related to the dimensions of salary (37.6%), operational conditions (28.2%), promotion (22.1%), additional profits (20.1%), agreed rewards (17.4%), communication (10.7%), supervision and co-workers (6.7%), as well as the nature of work (1.3%).

<table>
<thead>
<tr>
<th>Employee Satisfaction Level</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dissatisfied</td>
<td>4 (2.3)</td>
</tr>
<tr>
<td>Less Satisfied</td>
<td>149 (86.6)</td>
</tr>
<tr>
<td>Very Satisfied</td>
<td>19 (11)</td>
</tr>
</tbody>
</table>
Table 2. Dimensions of employee satisfaction which are categorized as satisfaction levels are less satisfied with their work

<table>
<thead>
<tr>
<th>Employee Satisfaction Dimension Category</th>
<th>Less Satisfied</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dissatisfied n (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salary</td>
<td>56 (37.6)</td>
<td>149 (100)</td>
</tr>
<tr>
<td>Promotion</td>
<td>33 (22.1)</td>
<td>149 (100)</td>
</tr>
<tr>
<td>Supervision</td>
<td>10 (6.7)</td>
<td>149 (100)</td>
</tr>
<tr>
<td>Additional benefits</td>
<td>30 (20.1)</td>
<td>149 (100)</td>
</tr>
<tr>
<td>Rewards</td>
<td>26 (17.4)</td>
<td>149 (100)</td>
</tr>
<tr>
<td>Operational Condition</td>
<td>42 (28.2)</td>
<td>149 (100)</td>
</tr>
<tr>
<td>Team Partner</td>
<td>10 (6.7)</td>
<td>149 (100)</td>
</tr>
<tr>
<td>Type of Work</td>
<td>2 (1.3)</td>
<td>149 (100)</td>
</tr>
<tr>
<td>Communication</td>
<td>16 (10.7)</td>
<td>149 (100)</td>
</tr>
<tr>
<td>Very Satisfied n (%)</td>
<td>61 (40.9)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>60 (40.3)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>100 (67.1)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>104 (69.8)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>57 (38.3)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>45 (30.2)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>32 (21.5)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>91 (61.1)</td>
<td></td>
</tr>
<tr>
<td>Very Satisfied n (%)</td>
<td>32 (12.8)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>79 (53)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>19 (12.8)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>19 (12.8)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>42 (28.2)</td>
<td></td>
</tr>
</tbody>
</table>

Employee Turnover Intention: The majority of Gresik Petrochemical Hospital employees turnover intention is high (47.1%). This is shown in table 3. Based on the demographics of the respondents, a comparison of the average turnover intention score was used by using mann-whitney test and kruskal-wallis test, with the results shown in table 4. There were significant turnover intention differences on variables of children, education and partners work with a value of p <0.05. The S1 education group has the highest average turnover intention (97.14) compared to other education groups (p 0.034). Respondents who do not have children have a higher average turnover intention (94.96) than those who have children (p 0.010). Employees who do not have a working partner have higher turnover intention (93.28) than employees who have a working partner or do not work (p 0.025). Meanwhile, there were insignificant differences in the variables of gender, age, occupation, length of employment, employment status, position, place of residence, marital status, and work experience.

Relationship between Job Satisfaction and Turnover Intention of Employees The results of the JSS questionnaire are scored and sum up, as well as the TIS-6 score. Because the result of normality test is TIS-6 distribution was not normal, then the relationship between JSS and TIS-6 was analyzed using Spearman correlation test. The test results are shown in table 5. The results of statistical tests show that there is a significant relationship between JSS and TIS-6 with a p value of 0.000 (<0.05). The correlation direction is negative (correlation coefficient -0.507), which means the higher the JSS, the lower the TIS-6.

Table 3. Employee Turnover Intention

<table>
<thead>
<tr>
<th>Employee Turnover Intention</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>59 (34.3)</td>
</tr>
<tr>
<td>High</td>
<td>81 (47.1)</td>
</tr>
<tr>
<td>Very High</td>
<td>32 (18.6)</td>
</tr>
</tbody>
</table>

Table 4. Results of the relationship between Employee Satisfaction on Employee Turnover Intention

<table>
<thead>
<tr>
<th>Variabel</th>
<th>TIS-6</th>
<th>Sig.</th>
<th>CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>JSS</td>
<td>0.000</td>
<td>-0.507</td>
<td></td>
</tr>
</tbody>
</table>

Discussion

From the results of the study, it appears that JSS employees at Petrokimia Gresik Hospital showed only a small number of dissatisfied categories (2.3%). Even so, it turns out that there are several dimensions that are dissatisfied that require attention. This is because there are categories of JSS that are not satisfied with the large number (86.6%) and those who are very satisfied (11%), of course the less satisfied category can later move to a dissatisfied category. Organizational factors that can be analyze are regarding organizational policies and recruitment. Organizational policy and recruitment were measured using the dimensions of operational conditions within the JSS where 28.2% of respondents said they were not satisfied. The reason is that organizational policies often change, causing employees to experience confusion in work, as well as a recruitment process that has not been balanced with sufficient orientation.
Then from the reward factor, this is measured using the salary dimension, additional benefits and agreed rewards. Regarding salaries, the causes of dissatisfaction factors include the difference in salary between several insignificant occupational classes, for example S1 contract nurses who are in work class 8, only <100,000 IDR, - from contract administration officers of DIII graduates who are in grade 9.

Then the reward system that has not been owned, causing employees to feel dissatisfied in showing their achievements. In career development factors, this is measured by the dimensions of promotion, the factor that causes is the opportunity to get a promotion or career path requires a long time. In the job design factor, the dimensions used are the nature of the work, the contributing factor is that workload analysis has never been carried out, while employees feel that the work to be done at work is very large, the personnel division does not have a human resource research program related to workload. From the literature states that turnover that occurs in employees will lead to reduced workforce, which then affects morally, and cause stress from employees who are still left because there is an increase in workload. Then it is related to the work affiliation factor, here is measured by the dimensions of co-workers. Frequent employee turnover due to high turnover causes employees to often adapt again to their co-workers. This can hamper performance. From the supervision factor, it is measured by the dimensions of supervision. In the implementation of supervision, it is still rarely carried out. This is due to the large number of concurrent positions and tasks that occur in management, especially since there has never been a workload analysis and work design evaluation by personnel. The leadership factor can be measured by the dimensions of communication. There is often an inability of superiors to communicate well to subordinates, and there is a culture of blaming management.

**Conclusion**

Based on the results of the analysis and discussion of the relationship between JSS and TIS-6 for health workers at the Petrokimia Gresik Hospital, the following conclusions were obtained.

1. JSS employees at Petrokimia Gresik Hospital obtained JSS data, the majority were less satisfied. The majority of respondents in the unsatisfied category who answered dissatisfied were related to the dimensions of salary and operational. Need to follow up to improve the factors that are considered as lacking factors in the organization.

2. The majority employees have turnover intention from Petrokimia Gresik Hospital. The Bachelor degree education group has the highest average turnover intention compared to other education groups. Respondents who do not have children have a higher average turnover intention than those who have children. Employees who do not have a working partner have higher turnover intention than employees who have a working partner or do not work.

3. The results of statistical tests show that there is a significant relationship between JSS and TIS-6. The correlation direction is negative, which means the higher the JSS, the lower the TIS-6.

**Ethical Clearance**: Taken from ethic committee of faculty of Public Health, Airlangga University.

**Source of Funding**: Self funding.

**Conflict of Interest**: There aren’t any relevant conflict of interest.

**References**


The Effect of Exercise on Activity Daily Livings and Happiness Level amongst the Elderly Population in Thailand

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Abstract

Objective: The purpose of this research was to study whether exercise affected the practice of daily activities of the elderly population and their happiness levels.

Method: A sample of 35,896 elderly individuals were taken nationwide, consisting of those aged 60 years and older who were in the 2014 Statistical Database at the National Statistical Office (NSO).

Results: The results of the chi-square test was used to analyze the relationship between the daily activities of the elderly population that affected their exercise abilities. In addition, it was discovered that their activities of daily living and their happiness level correlated significantly with regular exercise (p-value < 0.05).

Conclusion: This research found that the practice of daily activities by the elderly population and its associated happiness, affected their exercise ability. Therefore, the elderly should be encouraged to exercise so as to relieve stress and stimulate their normal performance of routine activities.

Keywords: Exercise, happiness level, activity daily living, ADL, Thai elderly.

Introduction

Most major problems of senior citizens are often related to their health. This is mainly due to the effect of bodily changes over the functioning of organs.[1] Some examples include reduced endurance, agility and strength as well as inferior performances of daily activities due to a higher rate of deteriorated fitness from aging.[2] Without proper health rehabilitation, the elderly may suffer chronic illnesses and less physical fitness.[3] Hence, the elderly population should recognize the importance of exercises in order to live a quality aging life.[4]

Exercise promotes health and physical performances while slowing bodily decay.[5] In addition, exercising also increases the physical abilities of the elderly as they are able to maintain the effectiveness of muscular strength, relieve tension and stimulate the lung muscles. Interventions that include moderate physical activity levels with high mental, physical, and social demands may produce the greatest benefits on ADL physical performance. Furthermore, exercise can help the elderly in focusing, decreasing their anxiety and allowing them to experience positive emotions.

The determinants of happiness is mainly associated with factors such as socio-economic status, marital status, mental health etc. In addition, fundamental components of happiness such as health, family, community, and economic equity have been noted by researchers in Thailand.[6] Furthermore, the key planning body in Thailand, the National Economic and Social Development Board, has recently adopted the Gross National Happiness concept for a more holistic path to health and development which is termed as the Green and Happiness Index (GHI) of Thailand.[7]

Recently, it has been reported that Thailand ranked no. 46 out of 156 countries in the world in terms of...
happiness levels as indicated by the World Happiness Report 2018.\(^{(8)}\) Population Ageing is now recognized as a 21\(^{st}\) century phenomenon affecting all countries around the globe. It was estimated that the population of Thai individuals aged 60 years and over will reach over 17 million by the year 2030.\(^{(9)}\) Hence, the happiness of the elderly population may be significant for the future of the country.

Therefore, this research aims to show how the practice of daily activities amongst the elderly population and their happiness level can be affected by exercise. The results obtained in this research will be further used to design appropriate exercise patterns for the elderly which can help them in maintaining their happiness levels.

**Materials and Method**

**Design and Instruments:** This research utilized a descriptive study design in the form of survey in order to evaluate the characteristics of healthy ageing among the elderly population aged > 60 years in Thailand. With a survey of 35,896 elderly individuals nationwide in 2014, the report was taken from the database of the National Statistical Office (NSO).\(^{(10)}\) SPSS version 17 (IBM, USA) was used for all data analyses and \(p\)-values < 0.05 were considered statistically significant.

**Activities of Daily Living (ADLs):** The Activities of Daily Living (ADLs) area set of basic tasks necessary for completing fundamental physical needs on a day to day basis such as, movement in bed (being able to sit, rise and move around in bed), transfers (shifting from one place to another in a small distance), locomotion (walking around), dressing, personal hygiene, and feeding.\(^{(11)}\) This scale was derived from two classical instruments, the Lawton Scale\(^{(12)}\) and the Barthel Index\(^{(13)}\).

**Happiness level:** Happiness is an emotional or effective state that is characterized by feelings of enjoyment and satisfacton. In the instance of aging, happiness is often equated with morale, contentment, well-being, life satisfaction, successful aging, quality of life, and having “the good life”.\(^{(14)}\) The scale used to measure happiness levels in this study is adapted from the study above and refers to the self-reported feeling at the time of the survey with an eleven-point scale (0-10). The following scales of measurement were used to evaluate the meaning of the results: 0 means being “unhappiest,” 5 means being “not unhappy and not happy,” and 10 means being “happiest.” In addition, the participants were asked to provide information on whether they exercised “never”, “sometimes” or “regularly”.

**Data Analysis:** The data obtained from the survey was analyzed in the form of descriptive statistics such as frequency distributions and percentage. In addition, the effects of exercise on the activity ADLs and happiness levels among the elderly population in Thailand were also determined using the chi-squared test.

**Results**

**Demographics:** This retrospective study was conducted in the form of a survey obtained from the NSO. The total number of the elderly population aged > 60 years surveyed were 35,896 individuals from all provinces in Thailand. Table 1 shows the demographic profiles of the participants where 20,034 (55.8%) were female and 15,862 (44.2%) were male. In addition, most of the participants were Buddhists (95.6%) followed by Muslims (3.6%) and Christians (0.7%). Furthermore, most of the participants were married (61.8%) followed by those that were widowed, divorced or separated (34.1%) and those that were single (4.1%).

**Table 1: Baseline characteristics of the participants**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Frequency (n)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>15862</td>
<td>44.2</td>
</tr>
<tr>
<td>Female</td>
<td>20034</td>
<td>55.8</td>
</tr>
<tr>
<td><strong>Religion</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buddha</td>
<td>34332</td>
<td>95.6</td>
</tr>
<tr>
<td>Islamic</td>
<td>1298</td>
<td>3.6</td>
</tr>
<tr>
<td>Christ</td>
<td>261</td>
<td>0.7</td>
</tr>
<tr>
<td>Other</td>
<td>5</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>Marital status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>1455</td>
<td>4.1</td>
</tr>
<tr>
<td>Married</td>
<td>22212</td>
<td>61.8</td>
</tr>
<tr>
<td>Divorced/Widowed/Separated</td>
<td>12229</td>
<td>34.1</td>
</tr>
</tbody>
</table>

**Activities of Daily Living (ADLs):** The ADLs represents a set of task that can be accomplished by an individual without any assistance. Results show that elderly who exercised regularly 17,614 (65.6%) had clear visibility without glasses/lens \(p\)-value < 0.05. In addition, elderly individuals undergoing regular exercise had clearer hearing ability without hearing aid/s instrument, had the ability to restrain urinating and could constrain their defication in 25,272 (94.1%), 24,002 (89.5%) and 24,358 (90.8%), respectively \(p\)-value < 0.05.
Furthermore, regular exercise was also seen to be beneficial in terms of elderly individuals not contracting illnesses, could eat by themselves and had the ability to take routine medicine correctly and completely by one selves, as much as 22,694 (84.5%), 26,794 (99.7%) and 26,502 (98.6%), respectively (p-value < 0.05).

Similarly, the ability to lift 5kgs of weight by themselves, to walk 200-300 meters, climb 2-3 flights of stairs, get on/off the bus and count change was significantly increased in those elderly individuals that exercised regularly (24,510 (91.2%), 25,917 (96.5%), 26,016 (96.8%), 24,962 (92.9%) and 26,541 (98.8%), respectively) in comparison to those who never exercise.

**Happiness level:** According to Table 2, the total number of participants that have never exercise was 13,041. Out of those, only 43 (0.3%) self acclimated themselves as being unhappy while most of the people who sometimes exercised (0.1%) and regularly exercised (0.1%) were less unhappy in comparison. The tread of happiness was seen to increase from unhappy (level 0) to happiest (level 10) in all the categories of physical exercise. However, the happiness level was still the highest for those that exercised regularly with peak happiness seen at level 8 with 3415 (26.2%), 9197 (35%) and 8476 (36.2%) in those that never, sometimes and regularly exercised, respectively with a significant p-value < 0.05

**Discussion**

Through this study, we were able to establish the positive effect of exercise for elderly populations. The ability to conduct their ADLs was seen to significantly increase with those individuals that exercised regularly in comparison to those that never exercise (p-value<0.05).

A study on the development of exercise innovation was conducted in Nakhon Si Thammarat.(15) The results showed that 96%, 2.75% and 1.25% of those surveyed were social-bound, home-bound and bed-bound, respectively. Upon implementation of an 8 weeks exercise regimen which included lifting a pulley, arm swinging, pulling of resistance bands, pedal exercise and kicking in the air for a period of 30 minutes, the authors noted that, the elderly could significantly conduct their ADLs better as compared to before the exercise routine with (p-value of < 0.01).

Recently, Jafari and Behboodi(16) evaluated the effect of aerobic exercise on reducing lonliness and promoting happiness in 30 elderly individuals. The results showed that aerobic exercise could significantly reduce loneliness and happiness of elderly individuals (p-value< 0.01). Similarly, Suwanrada(17) investigated factors affecting the happiness level of 4,036 elderly population in Kanchanaburi province of Thailand. The author observed that the three main factors which contributed significantly to the happiness level of the elderly were perceived trust in family, the number of people with whom it is pleasant to talk and their perceived health. The research also found that the elderly’s ADLs and the happiness affected their exercise. Therefore, they should be encouraged to exercise for relieving stress and stimulating their normal performance of routine activities.

**Conclusion**

The survey conducted herein has provided evidence that the elderly population need some form of physical activity in their life as their happiness level is affected. ADLs are also improved in those who exercise regularly and sometimes as compared to those that do not exercise. Thus, the elderly population should be encouraged to work out in the form of walking or a routine exercise regimen suited to their lifestyle and needs. This practice could also help in slowing their ageing process and the early onset of cognitive illnesses such as Alzheimer’s.

**Conflict of Interest:** The authors declare that there are no conflicts of interest.

**Table 2: Effect of exercise on the happiness level of Thai elderly population**

<table>
<thead>
<tr>
<th>Happiness level</th>
<th>Physical Exercise N (%)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Never</td>
<td>Sometimes</td>
</tr>
<tr>
<td>Level 0 (Unhappy)</td>
<td>43 (0.3)</td>
<td>24 (0.1)</td>
</tr>
<tr>
<td>Level 1</td>
<td>10 (0.1)</td>
<td>6 (0.0)</td>
</tr>
<tr>
<td>Level 2</td>
<td>26 (0.2)</td>
<td>21 (0.1)</td>
</tr>
<tr>
<td>Level 3</td>
<td>124 (1.0)</td>
<td>80 (0.3)</td>
</tr>
<tr>
<td>Level 4</td>
<td>207 (1.6)</td>
<td>144 (0.5)</td>
</tr>
<tr>
<td>Level 5</td>
<td>1247 (9.6)</td>
<td>1603 (6.1)</td>
</tr>
<tr>
<td>Level 6</td>
<td>1511 (11.6)</td>
<td>2635 (10.0)</td>
</tr>
<tr>
<td>Level 7</td>
<td>3209 (24.6)</td>
<td>6891(26.2)</td>
</tr>
<tr>
<td>Level 8</td>
<td>3415 (26.2)</td>
<td>9197 (35.0)</td>
</tr>
<tr>
<td>Level 9</td>
<td>2813 (21.6)</td>
<td>4598 (17.5)</td>
</tr>
<tr>
<td>Level 10 (Happiest)</td>
<td>436 (3.3)</td>
<td>1115 (4.2)</td>
</tr>
</tbody>
</table>
**Ethical Clearance:** Not needed as determined by the University ethical boards since the survey is a secondary form of data.

**Source of Funding:** Self funded. No scholarship provided.

**References**

15. Tunyarak H. The development of exercise innovation for enhancing the daily living abilities of the elderly in Nakhon Si Thammarat. 2016.
Assessment of Pre and Post Training Nursing Documentation Program for Nurses in Accident and Emergency Hospital

Delan J. Qader¹, Faruk H. Faraj²

¹Department of Adult Nursing, College of Nursing, ²Department of Surgery, College of Medicine, University of Sulaimani, Kurdistan Region, Iraq

Abstract

The study aimed to assess nursing care record tools in the Accident and Emergency Hospitals. A quasi-experimental study was carried out recently by using quantitative design for measuring the effectiveness of the program and new tool documentation. Sixty-five nurses participated and were selected from the hospital along with Nurses from other hospitals as control group to collect data using a self-questionnaire. The result was almost 75.29% and 24.71%. The shortcomings remain undocumented due to the barriers.

Keywords: Nursing record tool, nursing practice, documentation program.

Introduction

Nursing documentation is referred to design nursing care that offered to patients by qualified nurses and also used for the purpose of quality assurance(1). Although conformable advice from quality-improvement programs and professionals are employed for a long time, the health profession has still faced the problem of earning and maintaining applicable standards of clinical documentation (2).

Keeping the patients’ clinical records is considered as one of the most critical functions of nurses; however, there are no universal rules and standards for saving individual records. Thus, documentations can be completed accurately to solve this problem in which qualified nurses have been trained well about the rules of charting, while the style and frequency are generally left to facility and institution to impose (3).

Therefore, the aim of the present study was to improve nursing care documentation, check the acceptability of new tools after documentation program, and assess documentation barriers in hospitals of Sulaimani City.

Materials and Method

Designing and setting of the study: A quasi-experimental study was carried out from June 2016 to November 2017 using a quantitative design in order to measure the effectiveness of a documentation program and the acceptability of a documentation tool. Two groups and a pretest-posttest design were used in the evaluation section. The study was conducted on experimental groups of nurses that working in the Accident and Emergency (A & E) Hospital and those working in maternity, surgical, medical, and oncology hospitals as the control group. Accordingly, 130 nurses working in inpatient wards at hospitals of Sulaimani have recruited the study sample.

Study Instruments: For the purpose of the present study, the questionnaire consisted of 3 sections. The first section was Socio-demographic data which included 11 items. The second section was information related to satisfaction with the recording tool that consists of 10 items measured by a 5-point Likert scale. The level of acceptability of the nursing care documentation was measured using 10 questions with their responses. Simultaneously, the level of knowledge was collected and grouped into two planes of good documentation of nursing care practice for a score greater than or equal to the mean and poor documentation of nursing care practice for a score smaller than the mean.

Data collection: To facilitate data collection, assessment and interviewing were utilized as the data collection method. For the experimental data, collecting
and assessment (the pre-test) were carried out in the A & E Hospital. Pre- and post-tests were conducted for the control group in similar hospitals. Data collection from both groups was held. The data were collected by utilizing an adapted and constructed standardized questionnaire through interviewing technique. The nurses completed the structured questionnaires which were administered at two times; once 3 months before the program and then 3 months after the program.

The documentation program: A documentation program was constructed and oriented with the right documentation to the nurses by the researcher toward improving recording tool. The program was generated based on Trauma nursing care flow sheet (extensive review of the literature and relevant previous studies), which are basic and advanced trauma live support (BLS) (4). 1 week of training course and Nursing process and how to do the right documentation with a new tool in the A and E Hospital: 1 day of training course.

Data analysis: The data were analyzed using the Statistical Package for the Social Sciences (SPSS) version (22.0). Different statistical instruments were used in order to achieve the objectives of the study.

Results

Table 1 indicates that there are no significant associations between the experimental and control groups in terms of their demographic characteristics. There was no statistically significant difference between the two groups regarding their demographic variables (P>0.05) while table 2 indicates that the acceptability of the new documentation tool was good (75.3%) and bad (2.2%) in the experimental group.

Table 1. Distribution of sample according to their socio-demographic data

<table>
<thead>
<tr>
<th>Variables</th>
<th>Experimental</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>%</td>
<td>F</td>
</tr>
<tr>
<td>Age groups</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-30 years</td>
<td>46</td>
<td>52.9</td>
</tr>
<tr>
<td>30-40 years</td>
<td>17</td>
<td>53.1</td>
</tr>
<tr>
<td>40 &amp; more years</td>
<td>2</td>
<td>18.2</td>
</tr>
<tr>
<td>$X^2=4.4867$</td>
<td>$P=0.092$</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>43</td>
<td>48.9</td>
</tr>
<tr>
<td>Male</td>
<td>22</td>
<td>52.4</td>
</tr>
<tr>
<td>$X^2=0.141$</td>
<td>$P=0.851$</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>secondary school</td>
<td>5</td>
<td>83.3</td>
</tr>
<tr>
<td>Nursing Diploma</td>
<td>23</td>
<td>42.6</td>
</tr>
<tr>
<td>BSc Nursing</td>
<td>36</td>
<td>54.5</td>
</tr>
<tr>
<td>MSc Nursing</td>
<td>1</td>
<td>25.0</td>
</tr>
<tr>
<td>$X^2=5.397$</td>
<td>$P=0.135$</td>
<td></td>
</tr>
</tbody>
</table>

Table 2. Distribution of sample according to their socio-demographic data

<table>
<thead>
<tr>
<th>Variables</th>
<th>Experimental</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family income</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sufficient</td>
<td>13</td>
<td>39.4</td>
</tr>
<tr>
<td>barely sufficient</td>
<td>25</td>
<td>48.1</td>
</tr>
<tr>
<td>Insufficient</td>
<td>27</td>
<td>60.0</td>
</tr>
<tr>
<td>$X^2=3.362$</td>
<td></td>
<td>$P=0.182$</td>
</tr>
<tr>
<td>Position</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Head Nurse</td>
<td>8</td>
<td>42.1</td>
</tr>
<tr>
<td>Supervisor Nurse</td>
<td>47</td>
<td>50.5</td>
</tr>
<tr>
<td>Nurse</td>
<td>8</td>
<td>50.0</td>
</tr>
<tr>
<td>Assistant Nurse</td>
<td>2</td>
<td>100</td>
</tr>
<tr>
<td>$X^2=2.484$</td>
<td></td>
<td>$P=0.478$</td>
</tr>
<tr>
<td>Years of work in a hospital</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥5</td>
<td>50</td>
<td>54.3</td>
</tr>
<tr>
<td>5-10</td>
<td>9</td>
<td>42.9</td>
</tr>
<tr>
<td>10&lt;</td>
<td>6</td>
<td>35.3</td>
</tr>
<tr>
<td>$X^2=2.595$</td>
<td></td>
<td>$P=0.305$</td>
</tr>
<tr>
<td>Did have to participate in our training course</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>65</td>
<td>59.1</td>
</tr>
<tr>
<td>No</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>$X^2=23.6$</td>
<td></td>
<td>$P=0.0001$</td>
</tr>
</tbody>
</table>

Table 3. Distribution of sample according to the acceptability of nursing documentation in two groups

<table>
<thead>
<tr>
<th>Variables</th>
<th>Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Experimental</td>
</tr>
<tr>
<td>Accepted as bad</td>
<td>1(2.2%)</td>
</tr>
<tr>
<td>Accepted as good</td>
<td>64(75.3%)</td>
</tr>
<tr>
<td>Total</td>
<td>65(50.0%)</td>
</tr>
</tbody>
</table>

About the documentation acceptability of nursing practice regarding the place of work, table 4 reveals that both Accident and Emergency and oncology had good documentation, while other hospitals had bad nursing documentation, and there was a highly significant difference between working place and accepted nursing documentation practice.
Table 4. Distribution of the sample according to the acceptability of the nursing documentation and place works.

<table>
<thead>
<tr>
<th>Place of work</th>
<th>Documentation acceptability</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Good F (%)</td>
<td>Bad F (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accident and Emergency</td>
<td>66 (98.5)</td>
<td>1 (1.5)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical</td>
<td>0 (00)</td>
<td>15 (100)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surgical</td>
<td>5 (26.3)</td>
<td>14 (73.7)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maternity</td>
<td>0 (00)</td>
<td>15 (100)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oncology</td>
<td>14 (100)</td>
<td>0 (00)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>85 (65.4)</td>
<td>45 (34.6)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 5 shows that there was a highly significant relationship between the level of education and acceptability of the nursing documentation. Thus, documentation barriers of nursing practice in hospitals of Sulaimani, regarding item 1, the majority of the nurses (79.2%) believed that nursing documentation was advantageous to the work, less than half (44.6%) said that benefit of nursing documentation had a limited benefit to them, while less than half (44.6%) believed that a standard nursing documentation is an alternative verbal shift write up and physicians use nursing documentation.

Table 5. Distribution of the sample according to the acceptability of nursing documentation and level of education.

<table>
<thead>
<tr>
<th>Level of education</th>
<th>Documentation acceptability</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Good F (%)</td>
<td>Bad F (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary School</td>
<td>5 (83.3)</td>
<td>1 (16.7)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nursing Diploma</td>
<td>29 (53.7)</td>
<td>25 (46.3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BSc Nursing</td>
<td>50 (75.8)</td>
<td>16 (24.2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MSc Nursing</td>
<td>1 (25)</td>
<td>3 (75)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>85 (65.4)</td>
<td>45 (34.6)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Moreover, regarding item 6, more than half of the nurses (53.8%) said that the implementation of nursing documentation is strongly supported by department supervisors, while most of them (55.4%) believed that they have adequate knowledge on documentation work to record nursing care in good order, and more than half (55.4%) stated that the nursing process is quite reasonable to document the nursing care (Table 6).

Table 6. Distribution of the sample according to documentation barriers.

<table>
<thead>
<tr>
<th>Barrier to documentation</th>
<th>Both groups</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes (%)</td>
<td>To the Same Degree (%)</td>
<td>No (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effects on daily practice</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you believe nursing documentation is advantageous to you in your work?</td>
<td>103(79.2)</td>
<td>20(15.4)</td>
<td>7(5.4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you see the benefits of nursing documentation in your daily work?</td>
<td>58(44.6)</td>
<td>55(42.3)</td>
<td>17(13.1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does nursing documentation have a limited value to you?</td>
<td>58(44.6)</td>
<td>62(47.7)</td>
<td>10(7.7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can well-written nursing documentation replace oral shift report?</td>
<td>42(32.3)</td>
<td>58(44.6)</td>
<td>30(23.1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physicians use the nurses’ documentation?</td>
<td>42(32.3)</td>
<td>55(42.3)</td>
<td>33(25.4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organization and leadership</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Department supervisors actively support the implementation of nursing documentation?</td>
<td>38(29.2)</td>
<td>70(53.8)</td>
<td>22(16.9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you have enough knowledge of documentation procedures to document nursing care properly?</td>
<td>36(27.7)</td>
<td>83(63.8)</td>
<td>11(8.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nursing process</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is the VIPS and nursing process model well-suited to document the nursing care?</td>
<td>48(36.9)</td>
<td>72(55.4)</td>
<td>10(7.7)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Discussion

As indicated in this study, a comparative study between two groups of nurses was performed to obtain information on the outcome of a systematic application program on nursing documentation. Actually, all nurses in both groups earned simple knowledge about the documentation before implementation and commencement of the program. After the program was applied to the experimental group, nursing documentation practice was clearly changed in this group. The two groups were equivalent regarding their demographic data, and the present work gave positive insights in general.
The present work tried to address the satisfaction of nursing care documentation practice and barriers related causes. It was revealed that nursing care data at the hospital in question in Sulaimani is incomplete, and almost all of the provided nursing care is not documented. Intervention with the two groups showed that the majority of the nurses in the experimental group (75.29%) accepted it as a good new tool, and most of the control nurses (98.78%) reported the old tool as a bad documentation tool. The results also showed that the nurses in the A and E Hospital in Sulaimani, Iraq were satisfied with the new tool.

In the present study, the nursing care documentation practice in the control group was lower than the study carried out in Jamaica 98% (5) but it is inconsistency with the experimental group and hospitals of England 47% (6). This might be due to the differences in organizational structures (5), the number of patients belong to registered nurse, closeness of the nurses with the needed documentation plan, poor hospital policy, lack of interest in work, lack of sense of responsibility at work, lack of training courses related to documentation, and lack of motivation and punishment. On the other hand, the effect of the documentation program was satisfactory because, after documentation program, the nurses accepted the new tool and improved the objective of the present study. Simultaneously, incomplete nursing care documentation was mentioned by Felege Hiwot in Ethiopia hospital that indicated about 87% of the given medicines to the patients were related to erroneous documentation (7).

On the other hand, the recorded nursing care documentation in this current study was higher than studied 488 hospitals across 12 European countries (20) and some teaching hospitals of Iran (8) which were about 28% and 22.9% respectively. The possible reasons for this could be hospital policy, culture, number of the studied samples and the number of hospitals covered for the study. For this present study, almost all available hospitals in the Sulaimani City were included, in line with the study’s aims. Whereas, the study conducted in Iran was only from patients at medical-surgical wards of four teaching hospitals in which these hospitals were under high workloads that could be a leading cause for lower nursing care documentation practice (8).

In this study, we identified that too many factors are significantly related to proper nursing care documentation practice such as place of work. In this regards, we realized that the electronic system in the oncology unit improved documentation practice while the Accident and Emergency Hospital applied the proposed, which was considered as an adequate documentation practice. This observation was in line with the studies outcome carried out in Jamaica (5, 9) which might be due to that nurses did not have sufficient time for documentation as well as the tendency to use the standard nursing care documentation program.

Moreover, we also confirmed that the documentation program was significantly associated with proper nursing care documentation practice in which the participants that included in the proposed program seemed to have adequate nursing care documentation practice compared to those that were not included. This outcome is in agreement with studies performed in Sweden (10) and Iran (11, 12) in which they also mentioned that training improved motivation and teamwork improved the nursing care documentation practice (11).

Regarding documentation barriers and whether well-written nursing documentation can be replaced with verbal shift reports, some nurses choose ‘Yes’ and others ‘To some degree’ which is in disagreement with nurses suggestion in a research conducted in Ehrenberg (13) in which the oral shift report was well- advised than the written documentation. Again, Lamond reported that nurses promote verbal information than documenting of data by written (14). All these differences in this issue might be due to the differences in the level of knowledge about as in our study the majority of the nurses addressed that they were more knowledgeable than those in Ehrenberg. This result is in consistent to that of Dowding result which stated that oral records are not enough to communicate with patients to enable patient care (15).

This is in agreement with the researches conducted in Nigeria, Iran, Jamaica (5), Australia, Sweden, and the United States in which comprehensively explained that keen knowledge of nursing care documentation improves familiarity with documentation guidelines and manuals, hospital policy, the adherence to exchangeable nursing practice and nursing professionalism. On the other hands, nurses with a great attitude toward nursing care documentation had adequate documentation practice when compared to those with an improper attitude. This result is in line with the results conducted in Sweden (10, 16) which might be related to the fact that a good attitude toward nursing care documentation improves the motivation of nurses to document nursing care.
It was realized that the included nurses practiced a high degree of support from management which is considered as a prerequisite for optimal documentation according to the VIPS model (17). In the present study, the experimental nurses had a powerful perception of support that might be due to receiving a special training practice.

**Conclusion**

We concluded that practicing good nursing care documentation is very inferior and the implementation of improved program had a positive impact on nursing documentation and understanding of the nursing process. Thus, we confirmed that this study might have broad necessitate for education, practice, and research. Additionally, we revealed that it is necessary to educate almost all nurses in the ward to make the desired changes as they need to spirit that both ward and hospital management support the efforts made to change the documentation system. Additionally, applying the documentation program can be used as a clinical experiment in order to improve the patient outcomes as well as to introduce new technology without proper scientific evaluation.

**Conflict of Interest:** None.

**Funding Sources:** This research received specific grant from University of Sulaimani, Kurdistan Region-Iraq.

**Ethical approval details:** As soon as approval was issued for the instrument of the study, official permission was obtained from the College of Medicine, Sulaimani-Iraq. Another approach was issued from the Health Directorate of Sulaimani and an official permission was granted from the Accidental and Emergency Hospital.

**References**

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Relationship between Training on Employee Performance

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Abstract

Training is an effort to develop human resources, especially to develop intellectual ability and personality. Performance is the appearance of the work of personnel both quantity and quality within an organization. This study aims to determine the relationship of training on employee performance at the Clinic Miftachul Munir Medika Surabaya. This research was conducted at Miftachul Munir Clinic, Medika Surabaya. The type of research used is quantitative research using cross sectional study. The population is employee Clinic Miftachul Munir Medika Surabaya with a large sample of 18 people. The statistical test used is chi square test. This research was conducted in December 2017. The result of the research shows that there is no correlation between training on the performance of clinical employees of Miftachul Munir Medika Surabaya with p value of 0.341 (> 0.05).

Keywords: Training, employee performance and clinic.

Introduction

The development of increasingly sophisticated technology requires everyone to be able to keep up with these developments, not to mention the human resources in a company. This is because many companies are already based on technology. The rapidly changing technology demonstrates that technological innovation will continue to accelerate the company’s future work processes.

Institution of health service for society with its own characteristic and influenced by the development of health science, technological progress and socio-economic life of society which must still be able to improve service more quality and reachable by society to realize the highest health degree².

These changes require individuals to think creatively, quickly, and appropriately to become competing individuals. Training is often regarded as the most visible and most common activity of all staffing activities. Superiors support the training because through training the employees will become more skilled, and therefore more productive, even if those benefits must be taken into account with the time that will be spent when the employees are being trained. Therefore, with the training provided by the company can lead to the ability to employees.

Basically performance is the level to which employees reach job requirements. If the execution of the work has been appropriate or even beyond the job description, this means the work is done well, and vice versa. Through training, employees will know to where and how their work performance is assessed by superiors. The advantages and disadvantages that occur will be a capability for their development in the future.

The results of previous research by Farooq and Khan (2011) show that training and feedback can improve employee work skills. Suggests that training is a key element for improving performance, which can increase the level of individual and organizational competencies. While research Yuliati (2009) showed that there is no significant influence between training on employee performance.

Based on the description above, the researchers wanted to know how the relationship of training on employee performance at the Clinic Miftachul Munir Medika Surabaya.
Literature Review

**Training:** Training as a motivational tool that encourages employees to work with the optimal ability, which is intended to improve the performance of these employees. The provision of training is intended to meet the work standards set by the company. Training can be defined as a planned effort to facilitate learning about work related to employees’ knowledge, expertise and behavior.

According to Mathis, “Training is a process whereby people achieve certain abilities to help achieve organizational goals”. Therefore, this process is tied to various organizational goals, training can be viewed as narrow or broad. In a limited way, the training provides employees with specific, knowable knowledge and skills employed in their current work.

Training according to Dessler is “The process of teaching new or existing employees, the basic skills they need to carry on their work”. Training is one effort to improve the quality of human resources in the world of work. New or existing employees need to attend training due to job demands that may change due to changes in work environment, strategy, and so on. So according to the opinions of the experts above can the authors conclude, that the Process teaches new or existing employees by achieving certain abilities to help achieve the goals of the organization or company. Through training, workers will become more skilled and therefore more productive, and achieve new capabilities that are useful both for their current and future work, even if they should be taken into account with the time consumed while the worker is being trained.

**Employee performance:** Every human being has the potential to act in various forms of activity. The ability to act was acquired by humans either naturally (at birth) or studied. Although humans have the potential to behave certain but the behavior is only actualized at certain times only. The potential for certain behaviors is called ability, while the expression of this potential is known as performance. Operationally performance can be defined as an action or execution of a task that has been completed by a person within a certain time and can be measured.

Performance is “a work achieved by a person in carrying out the tasks assigned to him based on his skills, experience, and sincerity and time”. There are 3 (three) main factors that affect the performance of the individual (work ability), business work (desire to work), and organizational support (opportunity to work). In other words that performance is the work achieved by a person in carrying out the task assigned to him in accordance with the criteria set.

Another term of performance is measurable human output of productivity, absenteeism, turnover, citizenship, and satisfaction.

“There are 4 (four) elements contained in the performance are the results of the job function, the factors that affect the achievement of employees, the achievement of organizational goals, and certain period of time.”

From some sense that has been mentioned above, it can be concluded that performance is an action that affects the performance of the individual (work ability), business work (desire to work), and organizational support (opportunity to work) completed in a certain time so that can be measured the performance of the individual.

Material and Method

This research is an analytic observational research with cross sectional study design. Data collection is done in December 2017. Population is the entire subject of research to be studied. The population in this study was all employees of clinic which amount to 18 people. Respondents were interviewed with a kuisoner tool. The questionnaire contains questions about employee training and performance at the Miftachul Munir clinic in Surabaya. Independent variable in this research is training, while the dependent variable of this research is performance of clinic employee. The data obtained will be processed and presented in the form of cross tabulation, and then analyzed using Chi-Square test relationship.

Results and Discussion

Based on the results of interviews with the help of questionnaires instruments to 100 respondents who are all employees at the Clinic Miftachul Munir Medika Surabaya with a large population of 18 people.

| Table 1. Distribution of training frequency clinic employee Miftachul Munir Medika Surabaya in December 2017 |
|---|---|---|
| Category | Frequency (n) | Percentage (%) |
| Good | 14 | 77,8 |
| Not Good | 4 | 22,2 |
| Total | 100 | 100 |
Based on table 1 it can be seen that there are employees who received good training as many as 14 respondents (77.8%) and poor minority training as many as 4 respondents (8.3%). According to the researcher’s assumptions, the better and often the training will increase the employee’s knowledge in performing their daily performance.

Training is an effort to improve the technical, theoretical, conceptual and moral skills of employees. Training is a process in which people gain the ability to help achieve the goal organization. And training is a systematic process changes in employee behavior to achieve organizational goals.

Based on Presidential Instruction no. 15 of 1974 on the principle of the implementation of education and training, that training is the process of teaching and learning to acquire and improve skills outside the education system in force, in a short time, and with method that prioritize practice rather than theory. Training is a systematic process that changes employee behavior in a direction to improve organizational goals.

Training is a planned business in facilitating employee learning to improve competence that suits the needs of the job. There are three conditions that must be met in training activities. A third requirement is that training should help employees improve their knowledge in performing their duties; training should lead to changes in work habits of employees, work attitude, information and knowledge applied in the task; and training should be linked to a particular job.

Table 2. The following frequency distribution Performance employee clinic Miftachul Munir Medika Surabaya in December 2017:

<table>
<thead>
<tr>
<th>Category</th>
<th>Frequency (n)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>13</td>
<td>72.2</td>
</tr>
<tr>
<td>Low</td>
<td>5</td>
<td>27.8</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Based on the results in table 2 that the category of high employee performance is high as many as 13 respondents (72.2%) and minority that is 5 respondents (27.8%). Employees in the healthcare world are required to provide professional services in services to the community called performance. Performance is the appearance of the work of personnel both quantity and quality within an organization. Performance can be an individual appearance as well as a working group of personnel, unlimited performance of work to personnel holding functional or structural positions, but covering the whole range of personnel within the organization.

The following table shows the results of statistical analysis of the relationship of training on the performance of clinical employees Miftachul Munir Medika Surabaya in December 2017.

Table 3. Relationship Training on Performance of clinic employee Miftachul Munir Medika Surabaya in December 2017

<table>
<thead>
<tr>
<th>Variable</th>
<th>Performance</th>
<th>Total</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Good training</td>
<td>10</td>
<td>71.4</td>
<td>4</td>
</tr>
<tr>
<td>Not good training</td>
<td>4</td>
<td>75</td>
<td>1</td>
</tr>
</tbody>
</table>

In the result of bivariate analysis test results obtained that there is no relationship training on employee performance in Clinic Miftachul Munir Medika Surabaya. This can be seen from the result of p value 0.341 (> 0.05) indicating that training does not have significant relation to employees performance.

Can be explained that the training has not become a variable affecting employee performance and there are other variables that can affect or improve the performance of clinical employees Miftachul Munir Medika Surabaya.

This is because the training given to the employees of Miftachul Munir Medika Surabaya clinic will be the same, because the training is not all employees. So not all employees who can feel the impact, so it shows the influence is not significant.

This is also evidenced by respondents’ answers in accordance with the field being worked on. Employees desperately need special potential that supports job description.

The above results are in accordance with Yuliati study which explains that there is no significant influence between training on employee performance because the training is aimed to improve the present work performance only. But not in accordance with research conducted by Sultana et al, which explains that training is a key element to improve performance. Explain that organizational success depends on the skills and abilities of their employees, so it takes a lot of training as the development process.
Conclusions

Based on the results of research and discussion as has been stated in the previous section, then at the end of the results of this study can be drawn conclusion as follows:

1. There are 22.2% of Miftachul Munir Medika Surabaya clinic employee in December 2017 which is not good in training.
2. There are 27.8% of Miftachul Munir Medika Surabaya clinic employees in December 2017 who have low performance.
3. There is no relationship between training on employee performance Miftachul Munir Medika Surabaya in December 2017 ($p$-value = 0.341).

Ethical Approval: Related departments should be assured about the confidentiality of the results of questionnaires.

Conflict of Interest: The authors report no conflict of interest.

Source of Funding: Self

References

Premarital Screening to Determine High-Risk Pregnancy: A Systematic Review

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Abstract

Introduction: Maternal Mortality Rate (MMR) in Indonesia was 305 per 100,000 live births in 2015. In fact, the Millennium Development Goals (MDGs) target was 105 per 100,000 live births. That’s why MMR becomes the highest priority in this country. There are many evidences about high-risk pregnancy. Etiology of MMR is determined by two categories. They are direct cases and non-direct cases.

Method: Primary studies to be included in this systematic review were searched from electronic databases such as Pub Med and EBSCO. Hand searching through Journal of about premarital screening with high-risk pregnancy was also conducted. The findings of the included studies were extracted using article finding extraction form and appraised based on the journal level of credibility. The analysis of the study was presented in narrative form.

Results: This review produced ten quantitative studies using that method. A total of 10 papers are found the inclusion criteria included in this systematic review. Ten synthesis findings of the challenges in determining high-risk pregnancy and possible solutions were identified in the literature: about premarital screening hepatitis B, C dan degenerative sick, gestational diabetes mellitus, social condition, screening β thalassemia, screening chlamydia trachomatis and screening HIV.

Conclusions: The evidence of determining high pregnancy in developing countries is limited. However, the challenges in screening about determining high-risk pregnancy in developing countries are remain similar to those faced by developed countries. This can be guidance for developing countries to plan, initiate, and implement determine high pregnancy for premarital screening. Future studies about determining high pregnancy of premarital screening in developing countries are highly recommended.

Keywords: Premarital, screening, high-risk pregnancy.

Introduction

Maternal Mortality Rate (MMR) in Indonesia was 305 per 100,000 live births in 2015. In fact, the Millennium Development Goals (MDGs) target was 105 per 100,000 live births. That’s why MMR become the highest priority in this country1.

Etiology of MMR is determined by two categories. They are direct cases and non-direct cases. The percentage of non-direct cases was getting higher along 2010-2013. It increased from 32.2% to 40.8%. It consisted of communicable and non-communicable disease (degenerative disease), such as hepatitis, cancer, chronic kidney failure, heart disease, tuberculosis (TBC), HIV/AIDS, etc. All of those diseases could be screened before marriage2. A systematic review for those diseases has not existed yet. There were only 2 (two) systematic review before. They were systematic review for premarital hepatitis screening3 and spectrum of mutation of cystic fibrosis in the 22 Arab Countries4. Systematic review for premarital such as age, municipality of origin, year of follow-up, gestational
age, prenatal risk, number of visits performed during prenatal care, previous obstetric and clinical history, intercurrences during pregnancy or delivery, beginning of sexual life, number of partners, gestational outcome, and specific variables such as history of vaccination for hepatitis B and the results of viral markers for hepatitis B and C.\(^4\) And systematic review about from EBSCO about premarital screening such as Age, Race, Marital Status, Paritas, Physical Fitness Test Performance, Pregnancy Diagnoses and Pregnancy Characteristics, HIV testing, pregnancy screening, assess the knowledge among parents of thalassemia major patients about prenatal diagnosis, premarital screening for carrier detection and impact of consanguineous marriage on disease transmission, Diabetic fetopathy; Gestational diabetes; Overweight/obesity, Chlamydia trachomatis-infected pregnancy.

**Method**

This study used a systematic review as the study methodology to answer the research question of: “What is the determine high-risk pregnancy?” The studies included in this review are primary research in a quantitative design that evaluates the determine high-risk to used premarital screening. These studies include cohort study, and other method of quantitative research. This review considered the population of interest, which includes women who know about premarital screening for preventive high-risk pregnancy. The exclusion criteria of this systematic review are studies that did not concern about premarital screening for pregnant women, and non-primary studies, including reviews, commentaries, opinion articles, and editorials. The search strategy found both published and unpublished studies that are limited to English language and full texts only. Electronic databases such as PubMed, and EBSCO were searched using several combinations of terms to identify any relevant studies (Table 1). Hand search to find the relevant unpublished studies through Journal of Inter-professional care was also conducted, but it resulted in similar articles as those found in PubMed and EBSCO. The title and abstract of the studies produced from the search were assessed based on the inclusion criteria.

### Table 1: Search strategy

<table>
<thead>
<tr>
<th>Search Number</th>
<th>Search Terms</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>PubMed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Premarital Screening</td>
<td>6320</td>
</tr>
<tr>
<td>2</td>
<td>High-Risk Pregnancy</td>
<td>45585</td>
</tr>
<tr>
<td>EBSCO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Premarital Screening</td>
<td>6377</td>
</tr>
<tr>
<td>2</td>
<td>High-Risk Pregnancy</td>
<td>47279</td>
</tr>
<tr>
<td>3</td>
<td>1 AND 2</td>
<td>92</td>
</tr>
<tr>
<td>4</td>
<td>Potentially relevant article</td>
<td>16</td>
</tr>
<tr>
<td>5</td>
<td>Paper rejected at the title</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>Total full papers screened</td>
<td>13</td>
</tr>
<tr>
<td>7</td>
<td>Full papers excluded</td>
<td>6</td>
</tr>
<tr>
<td>8</td>
<td>Total full papers accepted</td>
<td>6</td>
</tr>
</tbody>
</table>

The data extraction tool used in this review is to use a meta-analysis which combines the results of statistical quantitative research.\(^5\) This tool is used to collect information by setting inclusion and exclusion criteria from selected research results in a meta-analysis with the same variables and method. This systematic review uses an 8-step quantitative meta-analysis assessment tool. This has been chosen rather than other critical assessment tools because each item in the checklist is presented very clearly and includes all the information needed to assess quantitative research, including the nature and suitability of methodological approaches and specific method.\(^5\) A meta-analysis was carried out for papers included in the statistical form. Findings from quantitative research were collected using the meta-analysis method. Findings were collected according to inclusion criteria. Identifying research questions, developing protocols for meta-analysis research, selecting relevant research results, selecting quality research results, extracting data from individual studies, synthesizing research results with meta-analysis method (funnel plot and forest plot) and presentation of research results in the research report from the meta-analysis.

**Results**

The search strategy produced in 39 potentially relevant papers to be examined. After examining the abstracts, 10 studies were selected. See the inclusion criteria and the 4 papers that were included in this systematic review from PubMed: 6 papers from Ebsco. A meta-analysis was conducted for ten included papers (Barros, et al, 2018; Al Rubeaan K, et al, 2014; Bundey...
S, et al., 1990; Anjum Q, et al, 2016; Michael J Miller, et al., 2017, Fielder O, et al., 2005, Amani A, et al, 2016, Abid H, et al, 2012, Bancher, et al, 2016, Das B, et al, 2016) in accordance with the framework provided for quantitative meta-analysis. Ten findings and illustrations were taken from quantitative studies, and each finding was given a level of credibility according to the criteria of quantitative meta-analysis. The findings were then identified according to the purpose of a systematic review to produce eleven categories, and the similarity of findings in a sense. The ten categories were then treated with a meta-analysis to produce several synthesized findings that could potentially be used as a basis for evidence-based practices related to determinants in high-risk pregnant women. The synthesized findings are: determinants that can affect high-risk pregnant women who can be used in prevention in premarital women;

Discussion

Screening of Pregnant Women About Hepatitis B, C, and Degenerative Disease: In screening the association of degenerative diseases according to Baroos et al. (2018), Twelve cases with positive HBsAg (1.9%), 189 cases with positive anti-HBs (35.9%) and seven positive anti-HCV patients (1.3%) were observed. There was no significant association between age and positivity for HBsAg, anti-HBs, and anti-HCV ($P = 0.205, 0.872$ and $0.676$, respectively). There is a direct relationship between the anti-HBs positivity and the last four years of the study ($P<0.0001$). So that a high prevalence of HBs is observed, higher than expected for the evaluated region; there was a prevalence of anti-HCV, consistent with the current Brazilian reality; and it is likely to be a low rate of hepatitis B immunization, with a relatively high rate of susceptibility to infection and no case of infection between B and C viruses and HIV. It is emphasized not only the need to trace hepatitis B and C, without exceptions, during prenatal care, since even though the current advances in therapy may not cure, at least they may allow you to have a chronic disease and the mandatory completion of immunoprophylaxis in all newborns. Particular attention should be given to those patients who are susceptible to HBV, with prompt diagnosis and referral for specific vaccination.

In screening about HBsAg, the results of the Amani et al. (2016) study followed a positive HBSA patient in Germany. In 78.3% of women, the diagnosis was made during pregnancy screening, which is the only reinforced screening procedure in Germany. Of the total cohort, 15% developed at least one severe liver-associated complication. By multivariate analysis, the prognosis was associated with high age and cirrhosis, but not with sex.

Screening of diabetes mellitus: Pregnant women within screening the association of diabetes mellitus according to Al Rubea et al. (2014) regarding the survey of differences in abnormal metabolic sugar in pregnant women with the results study that the overall GDM prevalence was 36.6%, categorized into 32.4% new cases and 4.2% known cases. Another 3.6% had preconception type 1 or 2 diabetes. GDM cases were older and had a higher body mass index, a higher rate of macrocosmic baby, and a history of GDM. Monthly incomes, educational level, living in urban areas are not significantly different between normal and GDM cases. The most important and significant risk factors for GDM were the history of GDM, macrocosmic baby, obesity, and age> 30 years. However, according to Anjum Q et al. (2016) regarding primary care management in cases of gestational diabetes mellitus with research results, according to Anjum Q et al. (2016), the family history of diabetes and increased triglycerides. An important issue for the importance of multiple criteria for diagnosing and screening GDM. There is a need for a single guideline globally to avoid confusion for primary care providers. Primary care centers can be used to screen for GDM at early stages. This will also improve continuity of care, and according to Bancher et al. (2019) about gestational diabetes mellitus with the results of the study that all women with GDM should receive nutritional counseling, be instructed in self-monitoring of blood glucose and increased physical activity to moderate intensity levels, if not contraindicated. Maternal and fetal monitoring is required in order to minimize maternal and neonatal morbidity and perinatal mortality.

Social Conditions of Pregnant Women: In screening about social conditions that can affect pregnancy, according to Bundey S et al (1990) regarding the existence of race, kinship and social baby, according to Miller MJ et al (2017) about the effects of pregnant women on standard physical fitness tests the results of the study showed that 142 women were included in the case-control portion. Muscular strength was reduced postpartum; the mean number of sit-ups was 73.4 and 67.1 ($p \leq 0.001$), and the mean number of pushups was 38.5 and 35.2 ($p = 0.002$) pre-pregnancy and postpartum, respectively. Sixteen women failed PP1 compared with 5 women failing before pregnancy; odds ratio (OR) 3.2.
Women who failed PP1 were significantly older compared with women who passed PP1, mean age 31.4 and 27.3 (p = 0.02); respectively. Significantly more women failing PP1 had a diagnosis of gestational diabetes OR 5.4 (1.1, 27.4) and anemia in pregnancy OR 11.9 (1.2, 164.5)\(^7\).

**B-Thalassemia Disease Screening β-Thalassemia:** Disease screening where according to Abid H (2012) about parental awareness in β-Thalassemia major disease in detecting pregnancy and premarital screening. The results of the study were 74 male (64.3%) and 41 female (35.7) patients with mean age of 9.5 ± 5.1 years. Eighty-eight patients (76.5%) were accompanied by mothers and the rest by their fathers. Seventy-four parents (32.1%) were illiterate; among the literates only 7 were highly educated (3%). Ninety-four couples (81.7%) had consanguineous marriage. Fifty-two parents (44.6%) knew that thalassemia was an inherited disorder. Thirty-eight (33%) had heard about the test for detecting thalassemia carriers. Premarital screening and prenatal diagnosis were known to 97 (84.3%) and 88 (76.5%) parents respectively. Ninety-nine parents (86.1%) knew it was acceptable religiously (60%). Major sources of information are parents\(^9\).

**Screening of Trachomatic Chlamydia Disease:** Screening of chlamydia trachomatis according to a study by Das B et al (2016) on the effects of chlamydial trachomatis treatment during pregnancy with the results of a study that Among the 350 pregnant women were controlled initially for the study, C. trachomatis positivity was found to be 18.8% (n = 66) in the endocervix by DFA and PCR assay. Co-infection with Candida spp., Bacterial vaginosis, T. vaginalis and T. pallidum were 2.0%, 1.7%, 1.7% and 0.5%, respectively. None of this is infected with N. gonorrhoeae. Pregnant women at increased risk of pregnancy infection included those who had multiple births and were second trimester of pregnancy. Fifteen patients of group I became Chlamydia-negative following treatment. Data on obstetric outcomes were recorded in 11, 26 and 127 patients of groups I, II and III, respectively. The mean duration of gestation for premature is significantly higher in groups I in comparison with group II [35.5 vs. 33.1 weeks (P <0.05)], the current showing the improved effect of treating on pregnancy outcomes.\(^{14}\)

**Screening for HIV infection:** Screening for HIV infection, according to Fielder O et al. (2005) study of attitudes and beliefs of pregnant women about HIV testing and HIV testing policies in infants during the use of taking HIV drugs. That with the results of the study Quantitative Longitudinal Cohort Studies of the 610 drug users interviewed in two long-term cohort studies conducted from 1997 to 2001, nearly all (89 percent) all subjects (91 percent) believed that women should be tested for HIV. More subjects who have prior HIV testing are believed to be tested for HIV (92.9 percent versus 82.6 percent, p = 0.008). Although 86 percent of the subjects agreed that all newborns should be tested, only the percent of all subjects believed to be mandatory. However, more injectors than non-injectors would avoid prenatal care if HIV testing was required during pregnancy (16.2 percent versus 6.1 percent, p <0.01. The concern for a baby’s health is the primary reason for supporting mandatory testing. Perceived discrimination by the healthcare system is a barrier to acceptance of testing strategies, as it was in the structured interviews\(^{11}\).

**Conclusion**

Systematic review shows that in prevention of prematual it is necessary to pay attention to several indicators in checking before going through the marriage phase, where screening is important with screening for hepatitis B, C, and degenerative diseases, and screening for regulating blood sugar metabolism so that it does not become diabetes mellitus, screening the importance of physical training in preparation later for a healthy pregnancy, as well as the need for parental support in recognizing β thalassemia disease because parents who respect it will be for the prevention of β thalassemia disease, and also screening for Chlamydia trachomatis treatment because every pregnancy is likely to occur chlamydial trachomatis infection, as well as screening for HIV infection to prevent transmission to the baby. So it’s highly recommended once in preparation for prematual screening.

**Acknowledgment:** Indonesian Research Directorate (DRPM) for sponsoring this research from Midwifery program of University of Muhammadiyah Semarang.

**Ethical Clearence:** The ethical issue of the Medical Research Bioethics Commission of Medical Faculty of Medicine University Sultan Agung Semarang Central Java Indonesia

**Conflict of Interest:** Nothing conflict of interest.
References

Different Grades of BMI is Correlated with Left Atrium and Ventricle Structure in Patients with Hypertensive Heart Disease

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Abstract

Background: Hypertensive Heart Disease (HHD) is usually followed by cardiac remodeling. Different grades of Body Mass Index (BMI) also influence the cardiac structure. Hence, we evaluate the cardiac structure of HHD patients with various BMI grades.

Materials and Method: This cross-sectional study involves 50 consecutive patients with HHD (hypertensive heart disease) from the Cardiology and Vascular Medicine Department, Soetomo General Hospital Indonesia. Echocardiographic examination was done using GE vivid 7. Statistics were evaluated with SPSS 25.0.

Results: The research showed that the grades of BMI (body mass index) was positively correlated with LA major (r=0.335), RA Major (r=0.371), LVD Mass (r=0.341), LVS Mass (r=0.303), LVPWD (r=0.369), LVPWS (r=0.391), and inversely correlated with LVSI Dopp (r=-0.376). Obese (BMI>30) patients have significantly lower ejection fraction compared to normoweight (BMI<25) patients (64.3±3.67% vs 62.12±0.98%, p=0.046).

Conclusions: The grades of BMI in the HHD patient is associated with an increased volume of the left atrium and ventricle. This suggested that obese patient with HHD should be assessed carefully for atrial and ventricle enlargement.

Keywords: Cardiac Structure, Echocardiography, Hypertension, Obese, Remodelling.

Introduction

Hypertensive heart disease (HHD) can be manifested as asymptomatic cardiac hypertrophy to clinical heart failure. Alteration of blood vessel and cardiac structure in the HHD was caused by the chronic elevation of the blood pressure.¹ This remodelling subsequently contribute to the pathophysiology of circulatory disorders in the HHD patient.² The progression of cardiac structure remodelling in the HHD patient is influenced by various factor such as type of overload, neurohormonal activation, co-existence with other diseases and genetic factors.³

Obesity rates are rising worldwide. Obesity is defined as abnormal or excessive fat accumulation that may impair health, including increased risk of cardiovascular disease and hypertension that may induce some changes in cardiac structure and function. World Health Organizations (WHO) and National Institute of Health defines Normal weight as BMI 18.5-24.9, Overweight as BMI 25-29.9, Obesity as...
BMI ≥ 30 kg/m², severe obesity as BMI ≥ 40 kg/m², and super obesity as BMI ≥ (50 kg/m²). Obesity may also induce several modifications in cardiac structure and function in the absence of other atherosclerotic risk factors, to the extent that some authors have suggested the specific form of “obesity cardiomyopathy,” which resulted in left ventricular (LV) structural and functional abnormalities. Obesity is well known to imply some cardiac consequences with the inducement of several modifications in cardiac structure and function, which are associated with hemodynamic volume overload. Atrial and ventricular remodeling is common in obese patients, and this pathophysiological change plays a pivotal role in atrial and ventricular dysfunction. Hence, it is hypothesized that different grades of BMI may contribute to the cardiac remodeling progression in the HHD patient. This research investigates whether different grades of BMI status is correlated with echocardiographic findings in HHD patient.

**Materials and Method**

**Research Design:** This retrospective study consisted of subject ≥ 18 years old with hypertensive heart disease evaluated at the Echocardiography Laboratory of the Department of Cardiology and Vascular Medicine Dr. Soetomo General Hospital, Surabaya, Indonesia between January 2018 and January 2019. Eligible patients required to have LV Ejection Fraction (EF) ≥ 50%. Normal weight, overweight, and obesity were defined according to body mass index (BMI) established criteria. Diabetes mellitus and hypertension were defined according to current recommendations. Patients were excluded if they had a history of acute coronary syndromes, angina, or revascularization procedures or evidence of segmental wall motion abnormalities at echocardiography, or a history of heart failure. Other exclusion criteria were significant aortic or mitral valve disease, severe mitral annular calcification, hypertrophic cardiomyopathy, secondary forms of cardiomyopathy, stroke, peripheral artery disease, and chronic kidney disease.

**Doppler Echocardiography:** Transthoracic two-dimensional and Doppler echocardiographic examination was carried out by Vivid S6, Logic E9, and Vivid S60 Ultrasound instrument (General Electric) with 2nd-harmonic imaging and a 3.5-MHz transducer. Patients were examined in the left lateral decubitus position, and data were acquired in the parasternal (long-and short-axis views) and apical views (two chambers (A2C) and four chambers (A4C) and apical long-axis views). In every echocardiographic evaluation, all parameters were derived according to current indications and considered in relation to their established reference ranges. Left ventricular volumes and EF were calculated from apical A2C and A4C views using the TEICH and Modified Simpson’s Biplane rule. LV mass was calculated and indexed according to body surface area and height. Left atrial (LA) and Right atrial (RA) size were also measured by major and minor dimension. Relative wall thickness (RWT) was derived as the ratio between 2 multiplied posterior wall diastolic thickness and end-diastolic diameter. Pulsed wave Doppler mitral velocity curves were obtained from the A4C view by positioning sample volume between the tips of the mitral valve leaflets in diastole. From mitral velocity tracings, peak early (E) and late (A) transmitral flow velocities, their ratio E/A, and E-wave deceleration time (EDT) were measured accordingly. From A4C view, tissue Doppler longitudinal velocities were recorded with the sample volume placed at the junction between LV wall (medial and lateral) and the mitral annulus. The ratio of mitral E peak velocity and averaged ratio of mitral to myocardial early velocities (E/e′) was calculated. The peak tricuspid regurgitation (TR) velocity was measured from the maximal velocity of tricuspid Doppler regurgitant jet. To derive stroke volume and cardiac output using Doppler method, continuity equation at LV outflow tract and velocity time integral were used.

**Statistical Analyses:** Statistical analyses were performed using IBM SPSS Statistics 25.0. Data are considered significantly different if p<0.05. Continuous variables, presented as mean±SD, were evaluated for normal distribution and compared using the ANOVA test, as appropriate. The correlation was evaluated with Spearman Rho analysis followed by multiple stepwise linear regression test to determine Beta Coefficient and R-square.

**Findings**

**Demography of HHD patients:** The echocardiographic finding was obtained from 50 HHD patients with demography as follow:
Table 1. Characteristic of the HHD patients

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>n (%) or mean ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Age (years)</td>
<td>60.3±9.83</td>
</tr>
<tr>
<td>2.</td>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a. Male</td>
<td>13 (26%)</td>
</tr>
<tr>
<td></td>
<td>b. Female</td>
<td>37 (74%)</td>
</tr>
<tr>
<td>3.</td>
<td>Body Height (cm)</td>
<td>155 ± 6.24</td>
</tr>
<tr>
<td>4.</td>
<td>Body Weight (kg)</td>
<td>62.6±11.88</td>
</tr>
<tr>
<td>5.</td>
<td>Weigh Classification</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a. Normoweight</td>
<td>24 (48%)</td>
</tr>
<tr>
<td></td>
<td>b. Overweight</td>
<td>18 (36%)</td>
</tr>
<tr>
<td></td>
<td>c. Obese</td>
<td>8 (16%)</td>
</tr>
<tr>
<td>6.</td>
<td>Systolic Blood Pressure</td>
<td>137.5±24.35</td>
</tr>
<tr>
<td>7.</td>
<td>Diastolic Blood Pressure</td>
<td>80.0±7.56</td>
</tr>
</tbody>
</table>

Echocardiographic Findings from HHD Patients

Table 2. Significant Difference in Echocardiographic Findings of HHD patients

<table>
<thead>
<tr>
<th>No</th>
<th>Description</th>
<th>BMI &lt; 25</th>
<th>25 ≤ BMI &lt; 30</th>
<th>BMI &gt;30</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>LA Major</td>
<td>4.55±0.71&lt;sup&gt;b&lt;/sup&gt;</td>
<td>5.10±0.69&lt;sup&gt;a&lt;/sup&gt;</td>
<td>4.93±0.29</td>
</tr>
<tr>
<td>2.</td>
<td>RA Major</td>
<td>3.92±0.69&lt;sup&gt;b,c&lt;/sup&gt;</td>
<td>4.35±0.59&lt;sup&gt;a&lt;/sup&gt;</td>
<td>4.52±0.25&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>3.</td>
<td>Ejection Fraction</td>
<td>64.3±3.67</td>
<td>66.51±4.01&lt;sup&gt;c&lt;/sup&gt;</td>
<td>62.12±0.98&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>4.</td>
<td>LVD Mass</td>
<td>140.2±36.58&lt;sup&gt;c&lt;/sup&gt;</td>
<td>161.59±39.61</td>
<td>194.93±58.05&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>5.</td>
<td>LVS Mass</td>
<td>126.02±29.39&lt;sup&gt;c&lt;/sup&gt;</td>
<td>140.77±41.91</td>
<td>173.68±46.29&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>6.</td>
<td>LVSI Dopp</td>
<td>50.36±6.76&lt;sup&gt;b&lt;/sup&gt;</td>
<td>44.15±10.32&lt;sup&gt;a&lt;/sup&gt;</td>
<td>44.30±7.54</td>
</tr>
<tr>
<td>7.</td>
<td>LVPWD</td>
<td>1.00±0.14&lt;sup&gt;c&lt;/sup&gt;</td>
<td>1.11±0.21</td>
<td>1.29±0.35&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>8.</td>
<td>LVPWS</td>
<td>1.39±0.15&lt;sup&gt;c&lt;/sup&gt;</td>
<td>1.49±0.22&lt;sup&gt;c&lt;/sup&gt;</td>
<td>1.71±0.36&lt;sup&gt;a,b&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

Comparison of the echocardiographic finding of normoweight (BMI<25), overweight (25 ≤ BMI<30), and obese (BMI >30) patient with HHD. Different annotation showed a significant difference (p<0.05) if compared with normoweight (a), overweight (b), obese (c).

As shown in Table 2 above, Significant difference was observed between normoweight and overweight patient in LA Major, RA Major, and LVSI Dopp (p<0.05). Comparison between normoweight and the obese patient showed a significant difference in RA Major, LVD mass, LVS mass, LVPWD, and LWPWS (p<0.05). Comparison between overweight and obesity only showed significant difference in Ejection Fraction and LVPWS (p<0.05).

Table 3. Correlation Between BMI with Echocardiographic Findings of HHD patients

<table>
<thead>
<tr>
<th>No</th>
<th>Description</th>
<th>Correlation</th>
<th>Beta Coefficient</th>
<th>R-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>LA Major</td>
<td>0.335&lt;sup&gt;*&lt;/sup&gt;</td>
<td>0.310&lt;sup&gt;*&lt;/sup&gt;</td>
<td>0.055</td>
</tr>
<tr>
<td>2.</td>
<td>RA Major</td>
<td>0.371&lt;sup&gt;*&lt;/sup&gt;</td>
<td>0.359&lt;sup&gt;*&lt;/sup&gt;</td>
<td>0.111</td>
</tr>
<tr>
<td>3.</td>
<td>Ejection Fraction</td>
<td>-</td>
<td>0.393&lt;sup&gt;**&lt;/sup&gt;</td>
<td>-</td>
</tr>
<tr>
<td>4.</td>
<td>LVD Mass</td>
<td>0.341&lt;sup&gt;*&lt;/sup&gt;</td>
<td>0.362&lt;sup&gt;*&lt;/sup&gt;</td>
<td>0.137</td>
</tr>
<tr>
<td>5.</td>
<td>LVS Mass</td>
<td>0.303&lt;sup&gt;*&lt;/sup&gt;</td>
<td>-0.313&lt;sup&gt;*&lt;/sup&gt;</td>
<td>0.113</td>
</tr>
<tr>
<td>6.</td>
<td>LVSI Dopp</td>
<td>-0.376&lt;sup&gt;*&lt;/sup&gt;</td>
<td>0.403&lt;sup&gt;**&lt;/sup&gt;</td>
<td>0.079</td>
</tr>
<tr>
<td>7.</td>
<td>LVPWD</td>
<td>0.369&lt;sup&gt;**&lt;/sup&gt;</td>
<td>0.401&lt;sup&gt;**&lt;/sup&gt;</td>
<td>0.145</td>
</tr>
<tr>
<td>8.</td>
<td>LVPWS</td>
<td>0.391&lt;sup&gt;**&lt;/sup&gt;</td>
<td></td>
<td>0.143</td>
</tr>
</tbody>
</table>

Annotation * showed significance at p<0.05 and ** showed significance at p<0.01
As shown in table 3 above, Positive correlation was shown between different grades of BMI with LA Major, RA Major, LVD Mass, LVS Mass, LVPWD, and LVPWS. Inverse correlations can be observed only on LVSI.

**Discussion**

Obesity induces several modifications in cardiac structure and function, which are associated with hemodynamic volume overload. Atrial and ventricular remodeling is common in obese patients, and this pathophysiological change plays a pivotal role in atrial and ventricular dysfunction.\(^6\) In this research, we found that comparison between obese patient has significantly higher RA Major, LVD mass, LVS mass, LVPWD, and LWPWS. Previous longitudinal research has demonstrated that increasing BMI for 5 units from normoweight patient in the 4 years, can significantly increase the LA and LV compared to patient without increased BMI. Other cross-sectional studies also demonstrated that obesity and greater BMI are correlates with the larger LA dimensions.\(^11\) Previous research also showed that patient with lower BMI (BMI <18.5) will also followed by significantly lower LVMI and smaller LV mass.\(^12\) This suggested that atrial and ventricular dimension are increased in the HHD patient as BMI grades increased.

Correlation test also showed that different grades of BMI are positively correlated with LA Major, RA Major, LVD Mass, LVS Mass, LVPWD and LVPWS, suggesting that higher BMI grades will affect the volume of the left atrium, right atrium and left ventricle. Additonally it will also affect the systolic and diastolic function of left ventricle. Previous research also showed similar finding, which found a linear correlation between increased LV mass (g/m\(^2\)) with BMI.\(^13\) It was also shown that increased BMI is related to both LV systolic and diastolic dysfunction.\(^6\) However, another study showed that obesity might not follow by increasing the LV Mass if the obesity is followed by confounding disease, which can alter the hypertrophic progression such as myocardial infarction.\(^14\) This suggested that in the patient with HHD, increasing BMI is associated with atrial and ventricular enlargement and HHD may not alter the hypertrophic progression of the heart muscle.

There are several limitations to our findings. Firstly, obesity was only measured through BMI rather than the direct measurement of central obesity, such as abdominal circumference or waist and hip circumference. While many studies have shown that central obesity measurement is more robust predictors of cardiovascular outcomes, this suggested that more detailed metrics of central adiposity will be important to be considered in future studies.

Secondly, our sample size was limited and not equally distributed between underweight, normoweight, overweight, and obese which might affect lack of significance in cardiac dimension measured through echocardiography. More samples with better distribution among the BMI grades would be beneficial for future research. Thirdly, as the data only derived from single cardiology center in urban area, the data may not be representative or generalizable to other populations.

**Conclusion**

BMI grades is associated with the functional and structural changes such as LA Major, RA Major, LVD Mass, LVS Mass, LVPWD and LVPWS in the heart of HHD patients.

**Conflict of Interest:** The authors declare no conflict of interest.

**Source of Funding:** This research received no external funding.

**Ethical Clearance:** The research was conducted in accordance with the Helsinki declaration of 1975 as revised in 2000. All participating patient has signed written informed consent. The study protocol has been approved by the local ethics committee. Data which shows patient personal information was omitted.

**References**


Relationship Analysis of Factors with Implementation Measures Collaboration Effective Nurse in the HA Thalib Hospital Kerinci Indonesia 2018

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Abstract

Background: Collaboration in health is very important because each health worker has knowledge, skills, keahlian, and different experiences that can improve performance in various aspects related to health care system. This study aims to determine the relationship of factors related to the effective implementation of nurse and doctor collaboration.

Method: This research is a quantitative study with cross sectional design. The sample in this research is Team Leader at Inpatient Installation of Major General HA Thalib Kerinci General Hospital which amounts to 39 people with total sampling technique. Data collection using Nurse-Physician Collaboration Scale Questionnaire (NPCS) and Tang 2013. Bivariate data analysis with chi square and multivariate with logistic regression.

Results: The results showed that p-value = 0.042 and communication (p-value = 0.007) had relationship significant with the effective collaboration of nurses and doctors at Major General HA Thalib Kerinci General Hospital. Factors most related to the effective implementation of nurse and physician collaboration are the factors of communication.

Conclusion: It is advisable to the Hospital need to improve the more effective communication between nurses and doctors.

Keywords: Collaborative factors, Effective collaborative, implementation, nursing, hospital.

Introduction

The current health care system, focusing on patient-centered and family-centered services to provide quality care, patient satisfaction, and avoid unexpected events. Effective collaboration among health team members facilitates the delivery of quality services¹. Improving the quality of service is determined by the quality of medical care services and nursing care. Qualified medical care can be provided by professional medical personnel in their fields and quality nursing care can be provided by nursing staff who are equipped with adequate knowledge and clinical skills and have the ability to maintain professional relationships with patients, collaborate with other health team members, carry out activities. The collaboration of nurses and doctors is seen as an important factor in the provision of quality nursing care².

Collaboration works well if each team member understands each other’s roles and responsibilities, has the same goals, recognizes the expertise of each profession, exchanges information openly, has the ability to manage and perform tasks both individually and in groups in the team. Collaboration in interprofession improves the effectiveness of patient health and safety services³ states that. The collaboration of nurses and physicians improves clinical outcomes as well as patient satisfaction, can reduce hospital costs³, ⁴ and increase satisfaction for families of patients, nurses and doctors⁴, ⁵. More importantly, collaborative relationships between nurses and physicians can reduce patient mortality⁵, ⁶.
The collaboration of doctors and nurses improves the quality of care to patients, shorter treatment periods, cheaper maintenance costs, and reduces the burden and stress of work on health professional teams\(^6\) while interprofession is associated with reduced mortality, increased job satisfaction, and reduced maintenance costs\(^7\). Based on the preliminary survey, nurses and doctors find it difficult or rare to meet, the lack of mutual understanding between nurses and doctors in collaboration, the interaction between nurses and doctors is more dominated by team leaders and doctors alone, doctors assume that nurses have not been competently invited to collaborate, considered and has no benefit, doctors have dominant authority in all health problems and nurse duty to do doctor’s instructions, not free to discuss and give feedback, still not heard and appreciated. Based on the above description, the authors are interested in conducting research on “Analysis of factors related to the effective implementation of nurse and physician collaboration in Inpatient General Hospital HA Thalib Kerinci which aims to find out factors related to the implementation of effective nurse-doctor collaboration actions.

**Method**

This research is a quantitative research with approach *cross sectional*. Population and sample in this research are all team leader in Installation of Major General Hospital HA Thalib Kerinci which amounts to 39 people, with sampling technique of *total sampling*. The data was collected using *Nurse Physician Collaboration Scale* and Tang 2013 questionnaire which consist of respondent characteristic, related factors and effective implementation of nurse-physician collaboration, with score from 1 to 4. In this research the researcher uses ethical consideration that is *informed consent, Anonymity and Confidentiality*. The data collected were analyzed using SPSS program with bivariate statistical test using *chi-square* and multivariate logistic regression.

**Result**

**Characteristics of Respondents:** In the table below shows that the characteristics of the age of almost all respondents 25-35 years, Respondents are almost entirely female (87.2%) with the education level of some vocational respondents 59%, and the working period is mostly ≥ 5 year (74.4%).

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age: 25-35 years old</td>
<td>33</td>
<td>84.6</td>
</tr>
<tr>
<td>36-47 years old</td>
<td>6</td>
<td>15.4</td>
</tr>
<tr>
<td>Gender: Male</td>
<td>5</td>
<td>12.8</td>
</tr>
<tr>
<td>Female</td>
<td>34</td>
<td>87.2</td>
</tr>
<tr>
<td>Education: Professional</td>
<td>16</td>
<td>41</td>
</tr>
<tr>
<td>Vocasional</td>
<td>23</td>
<td>59</td>
</tr>
<tr>
<td>Work Period: New (&lt; 5 years)</td>
<td>10</td>
<td>25.6</td>
</tr>
<tr>
<td>Old (≥ 5 years)</td>
<td>29</td>
<td>74.4</td>
</tr>
</tbody>
</table>

**Factors relating to Collaborative Implementation Effective nurse-physician in the HA Thalib Hospital Kerinci:** Based on table 2, factors related to the effective implementation of nurse-physician collaboration include communication, mutual respect, unequal strength, professional roles, and task priorities. The nurse’s assessment of communication is mostly good (64.1%), almost all respondents have a high degree of mutual respect (97.4%), partial unequal power (59%), professional role (51.3%), and high priority tasks (51.3%) in the effective implementation of nurse and physician collaboration.

<table>
<thead>
<tr>
<th>No</th>
<th>Factor- factor</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Communication</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a. Less good</td>
<td>14</td>
<td>35.9</td>
</tr>
<tr>
<td></td>
<td>b. Good</td>
<td>25</td>
<td>64.1</td>
</tr>
<tr>
<td>2</td>
<td>Mutual Respect</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a. Low</td>
<td>1</td>
<td>2.6</td>
</tr>
<tr>
<td></td>
<td>b. High</td>
<td>38</td>
<td>97.4</td>
</tr>
<tr>
<td>3</td>
<td>Power of unequal</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a. Low</td>
<td>16</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td>b. High</td>
<td>23</td>
<td>59</td>
</tr>
<tr>
<td>4</td>
<td>Professional role</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a. Less good</td>
<td>20</td>
<td>51.3</td>
</tr>
<tr>
<td></td>
<td>b. good</td>
<td>19</td>
<td>48.7</td>
</tr>
<tr>
<td>5</td>
<td>Priority Task</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a. Low</td>
<td>19</td>
<td>48.7</td>
</tr>
<tr>
<td></td>
<td>b. High</td>
<td>20</td>
<td>51.3</td>
</tr>
</tbody>
</table>

**Implementation Effective Collaboration of Nurse-Doctor:** Table 3 below shows that the effective collaboration of nurse-physicians is categorized good (53.8%).
Table 3: Effective Collaboration Implementation of Nurse-Doctor at Inpatient Installation in the HA Thalib Kerinci Hospital

<table>
<thead>
<tr>
<th>Effective collaboration implementation</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less Good</td>
<td>18</td>
<td>46.2</td>
</tr>
<tr>
<td>Good</td>
<td>21</td>
<td>53.8</td>
</tr>
</tbody>
</table>

Relationship Analysis Factors with the Effective Collaboration of Nurse-Doctors in the HA Thalib Kerinci Hospital: Based on the table below, the relationship analysis using chi square test found that related factors are communication (p-value 0.007) and unequal strength (p-value 0.042)

Table 4: Relationship Analysis of Factors with Implementation Effective Collaboration of Nurse-Doctor in the HA Thalib Kerinci Hospital

<table>
<thead>
<tr>
<th>No</th>
<th>Factor-factor</th>
<th>Effective collaboration implementation nurse-physician</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Communication</td>
<td>f</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td>a. Less good</td>
<td>11</td>
<td>78.6</td>
</tr>
<tr>
<td></td>
<td>b. Good</td>
<td>7</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>Mutual Respect</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>a. Low</td>
<td>17</td>
<td>44.7</td>
</tr>
<tr>
<td></td>
<td>b. High</td>
<td>7</td>
<td>30.4</td>
</tr>
<tr>
<td>2</td>
<td>Power of unequal</td>
<td>f</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td>a. Low</td>
<td>11</td>
<td>68.8</td>
</tr>
<tr>
<td></td>
<td>b. High</td>
<td>7</td>
<td>30.4</td>
</tr>
<tr>
<td>3</td>
<td>Professional role</td>
<td>f</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td>a. Less good</td>
<td>12</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>b. good</td>
<td>6</td>
<td>31.6</td>
</tr>
<tr>
<td>4</td>
<td>Priority Task</td>
<td>10</td>
<td>52.6</td>
</tr>
<tr>
<td></td>
<td>a. Low</td>
<td>8</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>b. High</td>
<td>8</td>
<td>40</td>
</tr>
</tbody>
</table>

Factors most related to Implementation Effective collaboration of nurse-physician: Table 5 below, indicating that the factor most closely related to the effective implementation of nurse-physician collaboration is communication p = 0.026 (p < 0.05). The result of analysis shows that the highest OR is communication (OR = 6.503) so it can be concluded that communication is the factor most related to the effective implementation of nurse-doctor’s effective collaboration. Value B = 1.872, because the value of B is positive, then communication has a positive relationship with the effective implementation of nurse-doctor’s effective collaboration.

Table 5 Logistic Regression Analysis on factors related to the implementation of effective nurse- in the HA. Talib Kerinci Hospital

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>P</th>
<th>OR</th>
<th>95%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication</td>
<td>1872</td>
<td>0.0026*</td>
<td>6.503</td>
<td>33.689-1.255</td>
</tr>
<tr>
<td>Power of unequal</td>
<td>0.0969</td>
<td>0.0225</td>
<td>2.634</td>
<td>12.594-0.551</td>
</tr>
<tr>
<td>Constan</td>
<td>-0.4471</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Discussion
The results of analysis chi square showed that there was a significant relationship between communication with the effective implementation of nurse-physician collaboration with p-value 0.007 (p <0.05). This result is in accordance with Anggreny’s study that there is a relationship between communication with nurse and physician collaboration(6). Research Weller, on the perception of 720 nurses and 173 doctors from 84 hospitals in Northern California that nurses often fail to gather all relevant patient information before contacting a doctor. This unclear communication causes the doctors to speak roughly, which will affect the nurse’s attitude toward patient care and hamper teamwork. In addition, observes that doctors and nurses often communicate through written patient care records, wherein information is not always delivered accurately or on time(4, 9).

According to the researchers, respondent age characteristics can also be related to communication in
the effective collaboration of nurse-physicians where almost all (84.6%) of respondents have age 25-35 years. Age factor has a direct relationship with the logic of thinking and knowledge of a person. The more mature a person’s age usually tends to increase his knowledge and maturity level. The ability to control his psychic emotions can reduce the occurrence of accidents so that performance increases\(^{(10, 11)}\), which means between mutual respect and the effective implementation of nurse-physician collaboration with \(p\)-value 0.938 (\(p > 0.05\)).

Based on the research results, the attitude of mutual respect between nurses and doctors in collaboration is good, it is supported that the education level of respondents mostly D3 nursing and 41% professional education level (S1 nursing). According to main research the attitude of doctors and nurses in collaboration is influenced by education, knowledge collaboration and understanding the role of each health profession owned by doctors and nurses. The higher the education the more professionally will be and the better the implementation of the collaboration. Therefore it is necessary to improve education to a higher level so that the implementation of effective collaboration will be better.

The results of Rahamita’s implementation of mutual respect and trust to gain trust from others, nurses want their contributions to the care of patients appreciated and recognized by doctors, as nurses appreciate and acknowledge the ability of doctors, but that is not always the case\(^{(11)}\). In fact, mutual respect and trust is expected to facilitate a dynamic process between people characterized by a forward desire to achieve the goal and satisfaction of each member to realize effective collaborative relationships\(^{(9, 12)}\).

The result of c test analysis shows that there is a significant relationship between unequal strength with the effective implementation of nurse-physician collaboration with \(p\)-value 0.042 (\(p <0.05\)). The results of this study in accordance with Anggreny that there is a relationship of power domination with peawat-doctor collaboration. Petri Research proves that doctors and nurses have decision-making, responsibility and power capacities\(^{(12)}\). However, a descriptive comparative study reported that nurses do not feel confident or assertive to communicate and discuss patient care equally with doctors. The nurse senses a power imbalance between the two professions. Hansson et.al explains that this unequal strength can be attributed to different levels of education, status and ability for each profession\(^{(9, 10)}\).

According to Evan et.al Organizational environmental factors (systemic determinants) are elements outside the organization, such as social systems, culture, education and autonomy (professional). Social systems that can hamper collaborative practice are 1) inequality between each profession, 2) gender differences in which men are more powerful than women 3) differences in economic status. Some cultural systems may impede a collaboration such as professional autonomy\(^{(13, 14)}\).

The result of test analysis \(chi square\) showed that there was no significant relationship between the professional role and the effective implementation of nurse-physician collaboration with \(p\)-value 0.145 (\(p > 0.05\)). The role of professionals is not good in implementing effective collaboration of nurses and doctors because there are still respondents who clarify the scope of professional expertise when requested by the doctor, not to inform the doctor about the scope of the field of nursing practice.

The lack of understanding of each other’s professional roles, and task priorities influence the nurse and physician collaboration factors suggests that a lack of understanding of the unique role of nurse professionals, will lead to ineffective collaboration between doctors and nurses. Nurse autonomy in the collaboration of doctors and nurses includes reading nurse records, participating in hospital programs and exchanging opinions in the treatment and nursing care of patients\(^{(15-17)}\).

The result of test \(chi square\) shows that there is no significant relationship between task priority and the effective implementation of nurse-physician collaboration with \(p\)-value 0.639 (\(p > 0.05\)).

Based on the results of the research the task priority is largely unfavorable (48.7%) in the effective implementation of nurse-physician collaboration, where nurses still exist who do not read the nurses’ records and the nurse’s integrated development note format, and judge that the primary duty of the nurse is to follow the physician’s instructions. Based on reported research, that collaboration is influenced by various doctors and nurses authority with respect to patient care. The results of this study indicate that the implementation of effective collaboration is good more on pimer nurse with a working duration \(\geq 5\) years. Mistuti’ long study with nurses’ ability to collaborate with doctors is closely related to the experiences gained during the task. The longer a person works, their knowledge will be better because it has adjusted to his job\(^{(9)}\).
Conclusion

It is advisable to the Hospital need to improve the more effective communication between nurses and doctors.

Conflict of Interest: No conflict of interest arose in this study.

Source of Finding: This study was conducted using a source of funds derived from the researcher himself

Ethical Clearance: This research has graduated from the Research Ethics Committee of Medical Faculty of Andalas University Padang Indonesia.

References


Seroprevalence Rates of Typhoid Fever among Children in Endemic Areas, South Sulawesi, Indonesia

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Abstract

Typhoid fever is still a major health problem in endemic countries. However, the real magnitude of the incidence rate is unclear and difficult to determine. This study is to evaluate the validity of extrapolation of the seroprevalence in children as a proxy indicator for the level of endemicity.

Two rural areas of South Sulawesi (Paitana subdistrict as the high-endemic area and Bantimurung subdistrict as low-endemic), Indonesia with approximately 1,000 inhabitants each were selected for this study. Diagnosis of typhoid fever was based on the clinical signs and Widal test confirmed by blood culture. Sera were taken from subjects for determination of IgM by ELISA.

The incidence rate of typhoid fever among community both in Paitana and Bantimurung subdistrict was 20.60/1,000 and 8.5/1,000 population, respectively; while the incidence rate of typhoid fever among children both in Paitana and Bantimurung subdistrict was 35.83/1,000 and 9.30/1,000 children, respectively. The seropositivity rates of community in Paitana were significant higher than in Bantimurung subdistrict (11.42% vs 4.67%) (p <0.05). Also, the seropositivity rates of children in Paitana were significantly higher than in Bantimurung subdistrict (45.60% vs. 11.63%) (p<0.05). The high-endemic area in Paitana had similar high-incidence and seroprevalence rates both in community and children. In contrast, Bantimurung subdistrict had much lower incidence and seroprevalence rates both in community and children. The correlation coefficient between incidence and seroprevalence rates was 0.98.

The results revealed that seroprevalence rates among children may use as an indicator and extrapolation of typhoid fever endemicity.

Keywords: Typhoid fever; seroprevalence; community; children; Indonesia.

Introduction

Typhoid fever is still a major health problem in many developing countries. Worldwide, an estimated 17 million persons develop this disease annually. Most of this burden occurs among citizens of low-income countries, particular those in Southeast Asia, Africa, and Latin America. In South Sulawesi, Indonesia, typhoid fever is one of the most important infectious diseases¹. The disease is endemic in South Sulawesi throughout the region and is the fourth most frequently infectious disease in 24 districts. In many districts of South-Sulawesi, typhoid is the most important cause of community-acquired septicemia, with a reported incidence rate exceeding 250/100,000². The prevalence in South Sulawesi is one of the highest in the Indonesian
The case detection rate in 1991 was 257/100,000 population which had risen to 386/100,000 population by 2007. Published figures for Indonesia as a whole estimated a prevalence of 358-810/100,000 in 2007, with 64% of enteric fever in 3 to 19 year olds. However, the real magnitude of the problem is difficult to determine. In rural areas where access to diagnostic facilities is limited, there are probably many cases that remain undiagnosed.

Salmonella Typhi (S.Typhi) is the causative agent of typhoid fever. The Gram-negative rod-shaped bacterium is pathogenic only in humans. Infection occurs when water or food contaminated with the pathogen is consumed.

Also, only small proportions of Salmonella enterica serovar Typhi (S. Typhi) exposing individuals to develop typhoid fever symptoms and polymorphisms NOD2, VDR and NRAMP1 genes is novel strategies for the prevention of infection. Previous study revealed that polymorphisms of exon 8 in NOD2 gene; heterozygotes or homozygotes for G/C in codon 2722 were related to susceptibility to typhoid fever in clinical severity.

Facilities to perform this diagnostic test are costly and time-consuming procedures are usually not available in endemic areas. In these problematic situations the serological test can be used to aid the clinical diagnosis. Unfortunately, serological test not too useful in endemic areas since many cases should be positive in healthy persons.

Previous study has suggested that the risk factors for transmission of typhoid fever was not reported among children under five. But, in a community based study performed in the Mekong Delta in Vietnam reported a highest attack rate in children age 5-9 years and lowest for >30 year-old. Therefore the age dependent attack rate of typhoid is controversial. Furthermore, our previous study revealed that severity of typhoid fever have associated with polymorphisms of host susceptibility gene in endemic areas of Indonesia. The aim of this study is to evaluate the validity of extrapolation of the seroprevalence in children may use as a proxy indicator for the level of typhoid fever endemicity.

**Materials and Method**

**Community survey:** Two remote rural areas of South Sulawesi (Paitana subdistrict as the high-endemic area and Bantimurung subdistrict as low-endemic area of typhoid fever) were selected for this study. Both are isolated locations with similar characteristics in terms of geographic, socioeconomic, and cultural conditions.

The typhoid fever incidence rate at the time of study was found to be 20.60/1,000 and 8.57/1,000 population in the Paitana and Bantimurung subdistrict, respectively.

The total registered population in Paitana was 1785 and in Bantimurung subdistrict was 1119. The total numbers examined on serology in Paitana and Bantimurung subdistrict were 1699 and 1050, respectively. Tables. 1 show the number and distribution of the population in the two areas according to age and sex. There were no differences in sex distribution among the samples from the two areas (chi-square test with Yate’s correction, p > 0.05). Clinical examination was carried out by experienced medical doctor and confirmed by provincial the internal medicine specialist.

Clinical symptoms and signs are examine for fever, malaise, coated tongue, headache, lost of appetite, relative bradicardia, nausea, muscle aches, apathy, stupor, coma, constipation, abdominal distention, melena, septicemia, intestinal perforation, hepatomegaly, splenomegaly, and jaundice. Children were included in this study from 7 to 12 years old and serology was done by widal test in the field. Diagnosis of typhoid fever was based on the clinical signs and symptoms and Widal test confirmed by blood culture in Molecular Biology and Immunology Laboratory, Faculty of Medicine, Hasanuddin University, Makassar, Indonesia. Blood were taken from subjects for determination of IgM antibodies titers by Enzyme linked Immunosorbance Assay (ELISA).

**Serological assay on blood collection:** The ELISA assay to determine the seroprevalence according to standard protocol as described previously. Briefly, In-house indirect sandwich ELISAs were established to detect anti-LPS S.typhi IgM. All reagents used were purchased from Sigma unless stated otherwise. Immunosorb Nunc 96 well flat bottomed plates (Thermo Scientific, USA) were coated overnight at 4°C with 100 ml of either 1 mg of antigen/ml in coating buffer (0.1 M carbonate buffer [pH 9.4], antigen positive) or coating buffer alone (antigen negative). Sera were either assayed at a single dilution of 1/250 for anti-LPS IgM S.typhi or serially diluted (starting at a dilution of 1/50).The latter were diluted anti-IgM, 1/2,500) in Tris-buffered saline containing 0.1% BSA and 0.05% Tween 20. One hundred microliters was added to each
well, and the plates were incubated overnight at 4°C. The absorbance at 405 nm (reference filter, 450 nm) was determined using an automated ELISA reader (Reader 270, Biomerieux, France).

For the titration assays, sera were assayed in triplicate (two wells antigen positive and one well antigen negative), and the titer was taken as the highest dilution giving a net OD (mean OD of antigen-positive wells minus OD of antigen-negative well) of more than 0.2 of anti-LPS S.typhi IgM. Six standards were included on each plate, and the OD or titer of the samples was adjusted accordingly. Blank wells with no sera were included to monitor background.

**Statistical analysis:** All data were recorded on special forms and immediately was performed using a software package Epi-Info, version 6 and SPSS. All tests described used an alpha of 5% and were 2-tailed. The chi-squared test or Fisher’s test statistic is used to compare the results percentage.

**Results**

**Incidence of typhoid fever:** At the beginning of the survey 1,785 and 1,119 people were registered in Paitana and Bantimurung subdistrict, respectively. In table 1 shown a total of 1699 and 1050 inhabitants above 12 years (95.18 and 94.01% of the registered population) were clinically examined for signs and symptoms of typhoid fever. During the survey, 35 and 9 typhoid fever were detected among community in Paitana and Bantimurung subdistrict, respectively based on blood culture; 11 and 2 typhoid fever were detected among children in Paitana and Bantimurung subdistrict, respectively. The incidence rate of typhoid fever among community both in Paitana and Bantimurung subdistrict was 20.60/1,000 and 8.57/1,000 population, respectively; while the incidence rate of typhoid fever among children both in Paitana and Bantimurung subdistrict was 35.83/1,000 and 9.30/1,000 children, respectively.

Furthermore, the incidence rate both among community or children between male and female in Paitana and Bantimurung subdistrict was not significantly difference (p>.0.05).

**Seroprevalence in community and children:** Table 1 shows the results of serological examinations. The seropositivity rates for typhoid fever in community in Paitana subdistrict as the high-endemic area were slightly higher than in Bantimurung as the low-endemic area (11.42% vs 4.67%). They were notably higher than the 6.75% found in the low-endemic areas. No significantly difference in seroprevalence was found between male and female subjects both in the high-endemic and the low-endemic areas. Furthermore, the seropositivity rates for typhoid fever in children in Paitana subdistrict as the high-endemic area were slightly higher than in Bantimurung as the low-endemic area (45.60% vs 11.63%). They were notably higher than the 33.97% found in the low-endemic areas. No significantly difference in seroprevalence was found between male and female subjects both in the high-endemic and the low-endemic areas (Table 1) (p>0.05).

**Correlation between incidence and seroprevalence rates:** Comparison in Paitana subdistrict as the high-endemic area and Bantimurung subdistrict as the low-endemic area on incidence and seroprevalence rates indicate that remained constant correlation (20.60/1,000 vs 8.57/1,000 for incidence rate of community and 11.42% vs 4.67% for seroprevalence rates of community). Also, the incidence and seroprevalence rates in children indicate that remained constant correlation (35.83/1,000 vs 9.30/1,000 for incidence of children and 45.60% vs 11.63% for seroprevalence rates of children).

We have determined the seroprevalence rate in community children both in Paitana subdistrict as the high-endemic area and Bantimurung subdistrict as the low-endemic area in Sulawesi, Indonesia. The high-endemic area in Paitana subdistrict had similar high-incidence and seroprevalence rates both in community and children. The other Bantimurung subdistrict had much lower incidence and seroprevalence rates both in community and children. The correlation coefficient between incidence and seroprevalence rates was 0.98 (Table 1).

Overall, the percentage of percentage of IgM titer in male and female subjects of community both in community and children in Paitana subdistrict as the high-endemic area was found significantly higher compared in Bantimurung as low-endemic area (p<0.05) (data not shown).
### Table 1. Incidence and seropositivity rates of typhoid fever in community and children

<table>
<thead>
<tr>
<th>Subdistrict</th>
<th>Paitana</th>
<th>Bantimurung</th>
<th>Significant Difference(a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number examine/registered of community (%)</td>
<td>Male</td>
<td>774/802 (96.50)</td>
<td>481/521 (92.32)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>925/983 (94.10)</td>
<td>569/598 (95.15)</td>
</tr>
<tr>
<td>Number examine/registered of children less than 12 years (%)</td>
<td>Male</td>
<td>307/319 (96.23)</td>
<td>215/231 (93.07)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>133/139 (95.68)</td>
<td>97/103 (94.17)</td>
</tr>
<tr>
<td>Incidence typhoid fever in community (%) (patients/1000/year)</td>
<td>Male</td>
<td>35 (20.60)</td>
<td>9(8.57)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>11 (35.83)</td>
<td>2(9.30)</td>
</tr>
<tr>
<td>Incidence typhoid fever in children (%) (patients/1000/year)</td>
<td>Male</td>
<td>194 (11.42)</td>
<td>49(11.63)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>14 (45.60)</td>
<td>25(11.63)</td>
</tr>
</tbody>
</table>

a. Probability of difference between Paitana and Bantimurung subdistrict is significant (Fischer exact test, p <0.05)

### Discussion

To detect the present and past infection of S.Typhi both in community and children in which typhoid fever is hyperendemic, we applied the ELISA from sera collected both in a community survey in two subdistrict in an area population an area in South Sulawesi, Indonesia. The children survey to determine the incidence of typhoid fever in each subdistrict and compared with their seroprevalence. Also, we examine the community to determine incidence and seroprevalence.

The community of Paitana subdistrict as the high-endemic area constituted on ideal group for assessing the value of serological examination for typhoid fever such as IgM anti-Lipopolysaccharide (LPS) S.typhi antibody by ELISA at the community level, in view of the remarkably high incidence of typhoid fever among the community and children (20.60/1,000 and 35.83/1,000). In contrast, Bantimurung subdistrict as the low-endemic area of typhoid fever was found significantly lower in incidence and seroprevalence rates among community and children compared with Paitana subdistrict as the high-endemic area.

Studies conducted in South Sulawesi, Indonesia suggest that age is related to the appearance of symptoms of typhoid fever, both in primary and secondary infections of variant of S. Typhi and that the occurrence of asymptomatic typhoid fever in a community in a given year leads to the emergence of serious cases in the following years. Therefore, the characterization of typhoid fever and its agents are a very important topic, emphasizing the importance of establishing new diagnostic criteria for this group, since laboratory tests are not always available for diagnosis. Previous study found seroincidence rate 710/100 000 in children 1-15 years old in Pakistan.

In this study found seropositivity rates for typhoid fever in children in Paitana subdistrict as the high-endemic area were slightly higher than in Bantimurung as low-endemic area (45.60% vs 11.63%). This study shows the more seroprevalence of typhoid fever in the remote high endemic areas of Indonesia and suggests the difficulty of diagnosing typhoid fever in children. Further studies on the relationship between the typhoid fever and the children are needed to assess for the true proportion of asymptomatic infections and cases that present diagnostic difficulties in settings with poor diagnostic resources such as the remote areas of Indonesia. However, differences in transmission levels and the characteristics of each region make it difficult to compare these data with our study. Furthermore, environmental condition and sanitation has been determine as risk factor to typhoid fever in endemic areas, Indonesia.

This study discovers the seroprevalence rates of typhoid fever among children in endemic areas, South Sulawesi, Indonesia. This study will help researchers to understand in more detail information on the magnitude and extrapolation of the typhoid problem in endemic areas and it is important for the health services for their planning to prevent typhoid fever.

### Conclusion

These results indicate that seropositivity rates among children may reflect the typhoid fever incidence. They
illustrate the potential applicability of seroprevalence as an indicator of the magnitude of the typhoid fever problem in high endemic areas among children.

**Ethical Clearance:** Obtained from the Committee of Institutional Research Board of Medical Faculty of Hasanuddin University, Makassar, Indonesia (Register Approval Number UH16080708-1046/H4.8.4.5.31/PP36-KOMETIK/2016, Date 20 September 2016).

**Conflict of Interest:** The authors declare that they have no conflicts of interest.

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**References**


Clinical Profile and Outcome of Juvenile Autoimmune Hepatitis in Iraqi Children

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Abstract

Purpose: The aim of this study was to assess the clinical, laboratory and histopathological characteristics and treatment outcomes in children and adolescents with autoimmune hepatitis (AIH).

Method: The present research is a descriptive study consisting of 19 children and adolescents with autoimmune hepatitis who receive care at the Gastroenterology and Hepatology Department of Children Welfare Teaching Hospital, Baghdad / Iraq from January 2014 to December 2017.

Results: Nineteen children and adolescent were diagnosed with juvenile autoimmune hepatitis during the study period. The presentation was acute in 10 patients (52.6%) and 9 (47.4%) had a chronic type. 15 (78.9%) of them with Type I and 4 (21.1%) with Type II. The commonest presenting features were jaundice, abdominal distension, edema, fatigue, and hepatosplenomegaly. The way of diagnosis depends on an original scoring system of the International Autoimmune Hepatitis Group (IAIHG) compared to simplified scoring system definite AIH was (37.0% versus 79.0% respectively), and probable diagnosis of AIH was (63.0% versus 31.0% respectively). More than two third of patients were treated with prednisone and azathioprine 13 (68.5%), the outcome revealed complete response in 9 (47.4%) and partial response in 5 (26.3%).

Conclusions: The typical characteristics of AIH were: Female sex, type I, a wide range of clinical presentations, treatment using prednisolone and azathioprine turned out to be effective with complete remission in about half of patients.

Keywords: Autoimmune hepatitis, clinical presentation, and outcome, Iraqi children.

Introduction

Autoimmune hepatitis (AIH) is a rare progressive inflammatory hepatopathy, of uncertain etiology mainly affecting females. The most common features of AIH are increased immunoglobulin G (IgG), the presence of circulating auto-antibodies (two main forms have been manifested in children: type I associated with antinuclear and/or anti-smooth muscle (ANA/SMA) antibodies, and type II is associated with antiliver–kidney microsomal antibody type 1 (LKM-1). The proposed target for anti-smooth muscle antibodies in AIH is the actin microfilament, while antimuscle antibodies directed to non-actin microfilaments can be found in other situations, like viral hepatitis. The anti-liver–kidney microsomal antibody type 1 is usually directed against cytochrome P45011D6), and a picture of interface hepatitis on histology, in the absence of a known etiology, which, if untreated, evolves to end-stage liver disease (1-4).

Before the age of two years, AIH is rare, but it obviously increases after that, reaching its maximum between ten and thirty years (5).
Autoimmune hepatitis unless it presents as acute liver failure is responding well to immunosuppression, primarily on the use of prednisolone or prednisolone with azathioprine and is aimed at normalization of immunoglobulin G (IgG), reduction of inflammatory infiltrate within the liver and clinical remission maintenance of aminotransferases at normal levels or not twice higher than the reference value (6-8).

The achievement of therapeutic response occurs in more than two-thirds of the patients, and those who do not respond to treatment and might require urgent liver transplantation (9).

Materials and Method

The present article is a prospective study of 19 patients (15 female, 4 male), their age ranged between (3-16 years), presented with AIH and treated between January 2014 and December 2017 in Gastroenterology and Hepatology department at the Children Welfare Teaching Hospital, Baghdad /Iraq. The diagnosis was established according to the revised International Autoimmune Hepatitis Group, published in 1999 (8) and a simplified IAIHG scoring system published more recently which is better suited to clinical application (10).

All patients were investigated for hepatitis B surface antigen and Hepatitis C virus antibody and it was seronegative. Other possible causes of hepatitis were excluded by using appropriate investigations.

Autoimmune markers ANA, SMA, AMA (titers > 1/20 were positive) and anti-LKM1 (titer > 1/10 were positive), were done by indirect immunofluorescence assay.

AIH was classified into: type I, in case of positive ANA and/ or ASMA; and type II, when anti-LKM1 was positive.

Liver biopsy is essential to confirm the diagnosis and to evaluate the severity of liver damage and to guide the treatment decision. It was performed in the pathology department/Gastroenterology hospital/medical city complex. According to liver histopathology, the presence of piecemeal necrosis, lymphoplasmacell infiltrate with a great number of plasmocytes and formation of rosettes are suggestive of AIH (1,11).

Other Laboratory tests: 1- Liver function tests [aspartate aminotransferase (AST), alanine aminotransferase (ALT)] reference values were: ALT and AST - 15 to 35 U/L, Alkaline phosphatase, total bilirubin, serum protein, serum albumin, prothrombin time (PT).

2- Serum immunoglobulin concentration (IgG) by radial immunodiffusion technique.

All patients were initially treated with prednisolone (1-2 mg/kg/day; maximum 60 mg/day). It was gradually tapered by 5-10 mg every 2 weeks depending upon the clinical symptoms and AST and ALT level.

A maintenance dose of 10 mg prednisolone continued for two years after improvement, keeping the patient in clinical and laboratory remission. Azathioprine (1-2 mg/kg/day; maximum 100 mg/day) was administered with prednisolone if significant side effects of steroid appeared or an increase in AST or ALT level was observed on tapering the dose of steroid.

All patients were followed up after the end of treatment throughout the period of the study.

And after achievement of remission for a minimum of 2 years, as defined by absence of necroinflammatory activity on a liver biopsy, the absence of clinical symptoms, and normal transaminases, the treatment was discontinued.

Complete remission is considered when transaminase and IgG levels are normal, ANA and SMA are negative or low-titer (<1:20), and anti-LKM1 and anti-LC-1 are <1:10 or negative.

Partial response is considered in subjects whose ALT and AST levels did not normalize up to two years, but decreased compared to the baseline level.

Poor response or unresponsiveness is considered in subjects whose ALT and AST levels did not decrease in the 2-year follow-up period.

Six patients we lost follow their condition and were excluded from the study.

Exclusion criteria: Viral hepatitis, Wilson’s disease, drug induced hepatitis, α1-antitrypsin deficiency, Fatty liver disease and metabolic disorders.

Data were analyzed using Fisher’s exact test on IBM SPSS Statistics version 22.0 (IBM Co., Armonk, NY, USA). The p-value for statistical significance was defined as p<0.05.
The study was approved by the Ethical Scientific Committee of Children Welfare Teaching Hospital, Medical City Complex, Baghdad, and was carried out according to the guidelines of the Helsinki Declaration\(^{(13)}\).

**Results**

Among 19 patients, 15 were females (78.9%), aged between 3 and 16 years (mean: 8.12 years in type I and 9.13 years in type II) at the time of admission.

According to the clinical findings at presentation, 10 patients (52.6%) had acute type and 9 (47.4%) had chronic type.

Among the 19 patients, 15 (78.9%) were classified as having type I AIH, four patients (21.1%) presented type II AIH.

Table 1: Patients’ Characteristics

<table>
<thead>
<tr>
<th>Variables</th>
<th>Type I</th>
<th>Type II</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median age (year)</td>
<td>8.12</td>
<td>9.13</td>
<td>0.73</td>
</tr>
<tr>
<td>Gender, female/male</td>
<td>12/3</td>
<td>3/1</td>
<td>1.0</td>
</tr>
<tr>
<td>Clinical presentation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acute</td>
<td>8/15</td>
<td>2/4</td>
<td>1.0</td>
</tr>
<tr>
<td>Chronic</td>
<td>7/15</td>
<td>2/4</td>
<td>1.0</td>
</tr>
<tr>
<td>Associated autoimmune disorders</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insulin-dependent diabetes</td>
<td>2/15</td>
<td>1/4</td>
<td>0.53</td>
</tr>
<tr>
<td>Celiac disease</td>
<td>2/15</td>
<td>0/4</td>
<td>1.0</td>
</tr>
<tr>
<td>Systemic lupus erythematosus</td>
<td>1/15</td>
<td>1/4</td>
<td>0.38</td>
</tr>
<tr>
<td>Inflammatory bowel disease</td>
<td>2/15</td>
<td>0/4</td>
<td>1.0</td>
</tr>
<tr>
<td>Thyroiditis</td>
<td>0/15</td>
<td>1/4</td>
<td>0.21</td>
</tr>
<tr>
<td>Idiopathic thrombocytopenic purpura</td>
<td>1/15</td>
<td>0/4</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Table 2: Clinical and histopathological findings at presentation

<table>
<thead>
<tr>
<th>Clinical presentation</th>
<th>Type I</th>
<th>Type II</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jaundice</td>
<td>14(93.3)%</td>
<td>2 (84.2)</td>
<td>0.09</td>
</tr>
<tr>
<td>Abdominal distension</td>
<td>12(80%)</td>
<td>2(50%)</td>
<td>0.27</td>
</tr>
<tr>
<td>Oedema</td>
<td>9(60%)</td>
<td>3(75%)</td>
<td>1.00</td>
</tr>
<tr>
<td>Fatigue</td>
<td>10(66.6%)</td>
<td>2(50%)</td>
<td>0.60</td>
</tr>
<tr>
<td>Pruritus</td>
<td>7(46.6%)</td>
<td>3(75%)</td>
<td>0.58</td>
</tr>
<tr>
<td>Bleeding</td>
<td>6(40%)</td>
<td>1(25%)</td>
<td>1.00</td>
</tr>
<tr>
<td>Arthralgia</td>
<td>3(20%)</td>
<td>1(25%)</td>
<td>1.00</td>
</tr>
<tr>
<td>Hepatomegaly</td>
<td>13(86.6%)</td>
<td>2(50%)</td>
<td>0.17</td>
</tr>
<tr>
<td>Splenomegaly</td>
<td>7(46.6%)</td>
<td>2(50%)</td>
<td>1.00</td>
</tr>
<tr>
<td>Ascites</td>
<td>5(33.3%)</td>
<td>2(50%)</td>
<td>0.60</td>
</tr>
<tr>
<td>Lower limbs oedema</td>
<td>2(13.3%)</td>
<td>1(25%)</td>
<td>0.53</td>
</tr>
</tbody>
</table>

Azathioprine at a dose of 1-2 mg/kg/day was required in 10 patients after a mean time of 3 months (range 1–19 months) following development of steroid toxicity, complications and failure with good outcome and no significant side effects (especially bone marrow suppression).

By the end of 2 years, 9 patients (47.4%) were considered to have complete response (including the patient who submitted to liver transplant), 5 patients (26.3%) were considered to have partial response, 3 patients (15.8%) were missed because of poor compliance and poor response to treatment and 2 patients (10.5%) were died during the course of treatment as a result of hepatic failure. (Table -4).
Table -3:- Histopathological findings

<table>
<thead>
<tr>
<th>Disease</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cirrhosis</td>
<td>12(63.1%)</td>
</tr>
<tr>
<td>Fibrosis</td>
<td>7(36.8%)</td>
</tr>
<tr>
<td>Piecemeal necrosis</td>
<td>18(94.7%)</td>
</tr>
</tbody>
</table>

**Portal inflammation**

<table>
<thead>
<tr>
<th></th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild</td>
<td>4(21%)</td>
</tr>
<tr>
<td>Moderate</td>
<td>10(52.6%)</td>
</tr>
<tr>
<td>Severe</td>
<td>3(15.8%)</td>
</tr>
<tr>
<td>Absence of lesion to bile ducts</td>
<td>18(94.7%)</td>
</tr>
<tr>
<td>Cholestasis</td>
<td>5(26.3%)</td>
</tr>
</tbody>
</table>

Table 4: Diagnosis of studied cases.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Revised original scoringsystem of AIH</strong></td>
<td></td>
</tr>
<tr>
<td>Probable diagnosis</td>
<td>12(63)</td>
</tr>
<tr>
<td>Definite diagnosis</td>
<td>7(37)</td>
</tr>
<tr>
<td><strong>Simplified scoringsystem of AIH</strong></td>
<td></td>
</tr>
<tr>
<td>Probable diagnosis</td>
<td>5(21)</td>
</tr>
<tr>
<td>Definite diagnosis</td>
<td>14(79)</td>
</tr>
</tbody>
</table>

Table -5:- Characteristics of patients who were treated and their prognosis

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Treatment regimen</strong></td>
<td></td>
</tr>
<tr>
<td>Prednisone alone</td>
<td>6(31.5%)</td>
</tr>
<tr>
<td>Prednisone and azathioprine</td>
<td>13(68.5%)</td>
</tr>
<tr>
<td>Liver transplantation following failure of medical treatment</td>
<td>1(5.2%)</td>
</tr>
<tr>
<td><strong>Outcome</strong></td>
<td></td>
</tr>
<tr>
<td>Complete</td>
<td>9(47.4%)</td>
</tr>
<tr>
<td>Partial</td>
<td>5(26.3%)</td>
</tr>
<tr>
<td>Missed</td>
<td>3(15.8%)</td>
</tr>
<tr>
<td>Death</td>
<td>2(10.5%)</td>
</tr>
</tbody>
</table>

Discussion

This is the first study from Iraq describing the clinical characteristics of autoimmune hepatitis in children. AIH is an uncommon childhood disease, although the etiology and the pathogenesis of AIH remain largely obscure but the loss of tolerance against autologous hepatic tissue in a genetically predisposed host exposed to environmental factors is involved in development of autoantibodies against hepatocytes(13).

Mean age of onset of symptoms in our study was 8.12 years in type I and 9.13 years in type II (with age range from 3 -16 years), with female preponderance (78.9%).

These results were in agreement with other studies in the world(14-17). However, Miyake et al(18) reported that male and female had the same frequency of symptomatic concurrent autoimmune diseases and this may be elucidated by the differences in genetic backgrounds.

About half of our patients (52.6%) were presenting with acute hepatitis like illness in the present study. And these findings correlate with the results of the study by Sani M N et al.(19) Gregorio et al.(20),

Type II AIH consisting 21.1% of the study population which was compatible with the series of literature data were reported type 2 constitute 8-38% in studies performedin other countries(20-23).

The wide range of variation in the percentage may be explained by the different genetic backgrounds.

The most presenting symptom (in both types) was jaundice 84.2% and the most common clinical findings were hepatomegaly 78.9%, Splenomegaly 47.3% and as cites 36.8%. These findings are in agreement with what were present in other studies(19,20,24,25,27).

Regarding diagnosis of AIH by revised original scoring system of the IAIHG compared to simplified scoring system, the performance of the revised original scoring system and the simplified scoring system that performed by Yeoman et al.(27) found a compatibility between the original revised and the simplified scores for probable or definite diagnosis of AIH (90% and 61%, respectively). Czaja(29) found a little bit smaller sensitivity for the diagnosis of AIH in the simplified scoring system (100% in the original versus 95% in the simplified). El-koofy N et al (24) found the sensitivity of revised original scoring system was (100% versus 88.5%) for the simplified scoring system and the concordance for definite or probable diagnosis of AIH was (38.5% and 19.2% respectively).

In this study an original scoring system of the IAIHG compared to simplified scoring system definite AIH was (37.0% versus 79.0% respectively), and probable diagnosis of AIH was (63.0% versus 31.0% respectively).

The main target of treatment is to induce remission, to reduce or eliminate liver inflammatory process, improve symptoms, and prolong life expectancy, although cirrhosis is present in at least one third of children at the time at diagnosis(1).
Prednisolone alone or in combination with azathioprine is the cornerstone of treatment. In the present study treatment with prednisolone alone was 6 (31.5%) and azathioprine was added to prednisolone in 13 (68.5%) to reduce the steroid dose because of significant side effects or due to failure in decline of transaminase levels after 2 months of treatment. Both regimens are effective in alleviating the inflammatory process in 9 (47.4%), while 5 (26.3%) had partial response with recurrent relapses, 3 (15.8%) missed and we lost communications with them, and 2 (10.5%) were died during the course of treatment because of hepatic failure and unavailability of urgent measures for liver transplantation.

In comparison with other studies it was better than the results of El-koofy N et al (24) remission of the inflammatory process in 33%, but much lower than those reported in the literature, with a complete response of 65 to 80% (17, 28, 29) and this may be explained by delay in seeking medical advice and poor compliance in many patients because of prolonged course of the disease, side effects of the drugs, financial difficulties in keeping in touch for follow up especially in families from other governorates.

The mortality in this series of two (10.5%) is similar to the two (8%) reported by Saada et al (23), six (11%) reported by Gregorio et al (20) and two (6%) reported by Maggiore et al (29) of patients.

Disclosure Statement: We declare that there are no conflicts of interests.

Source of Funding: Self funding (On the researcher expense).

References


Nutritional Study on Promising Plants for Nephropathy Treatment of Male Albino Rats

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Abstract

The present work aimed to evaluate the effect of Almond nut, Sambucus herbs, Juniperus seeds, Grapefruit albedo & the combination of all (as 5%) on nephropathic rats. For this purpose the study included about 35 rats about 150/200 (g) weight. Biological & chemical analysis of serum investigation of internal organs were carried out. The experiment lasted for 4 weeks and eventually urine samples were collected for each rat for 24 hours and size measured and estimated (create). The present work aimed to evaluate the effect of Almond nut, Sambucusines- urea-uric acid- protein- sodium- potassium. The weight of the rats and collect blood samples after collected fasting 12 hours and then serum separated to estimation of (creatinine- urea-uric acid- sodium- potassium). Finally a statistical analysis of all the data was done.

Keywords: Almond nut, sambucus herbs, Juniperus seeds, Grapefruit albedo, nephropathy rats.

Introduction

Previous study claimed that almond provides with a nutrient- dense source of vitamin E, manganese, magnesium, copper, phosphorus, fiber, riboflavin, monounsaturated fatty acids and protein. Although almost 50% of almond weight is fat, incremental intakes of 7 g/ day of this tree nut reduced low- density lipoprotein (LDL) cholesterol concentration by 1%, especially within the context of diets recommended by the national cholesterol education program. Habitual almond consumption does not lead to weight gain, and their inclusion in low- calorie diets appears to promote more weight loss than a comparable carbohydrate-based low- calorie diet.(1) Also, almonds have a low glycemic index and do not adversely impact insulin sensitivity. Almonds are an excellent source of bioavailable á–tocopherol announced that Sambucus nigra (elder) has been documented as a traditional treatment of diabetes. The results, demonstrated the presence of insulin- releasing and insulin- like activity in the traditional antidiabetic plant, Sambucus nigra. (2) Juniperus excelsa Bieb. Is used in folk medicine for lowering blood pressure (BP). Its BP- lowering effect, endothelium-dependent and endothelium-independent vasodilator effects, and cardio- modulatory effect was studied. The crude extract of J. excelsa (Je. Cr) induced a dose- dependent (10- 300 mg/ kg) fall in the the arterial BP of anesthetized rats. In isolated rabbit aorta, Je. Cr (0.01- 5.0 mg/ Ml) inhibited high K (+) (80 mM)- and phenylephrine (1 M)- induced contractions, like that caused by verapamil and papaverine. In guinea pig atria, Je. Cr initially caused mild cardiac stimulation, followed by inhibition, like that exhibited by papaverine. These results reveal that cardiovascular effects of J. excelsa are mediated possibly through a combination of Ca (++) antagonism nitric oxide- modulating mechanism, and phosphodiesterase inhibitory mechanism, which explain its medicinal use in hypertension.(3)

Another study reported that Grapefruit is an excellent source of many nutrients and phytochemicals that contribute to a healthy diet. Grapefruit is a good source of vitamin C, contains the fiber pectin, and the pink and red hues contain the beneficial antioxidant lycopene. Studies have shown grapefruit helps lower cholesterol, and there is evidence that the seeds have antioxidant properties. Grapefruit forms a core part of the “grapefruit diet”, which was with low glycemic
index being able to help the body’s metabolism burn fat. The grapefruit albedo needs to be investigated for amelioration of nephropathy. The same could be suggested for almond nut, elder and Juniperus excels.(4)

Materials and Method

In this study, The plants and their preparations used were: Almond nut (Prunus dulcis) Juniperus seeds (SP. L.) Grapefruit albedo (Citrus paradise)

The plants, nuts & grapefruit obtained from supermarket and the special shop and then dried, milled and added to diet.

“Biological experiment”

1-Basal diet composition of tested rats: The basal diet consisted of casein (12%), corn oil (10%), choline chloride (0.25%), vitamin mixture (1%), cellulose (5%), corn starch (up to 100%) and salt mixture (4%), according to (Campbell, 1963), and the composition of salt and vitamin mixture were according to previous studies.(5,6)

2-Preparation of Rats with impaired kidney: Impaired kidney could induced in normal healthy male albino rats by intra- peritoneal injection of gentamicin (amino glycosides antibiotics) obtained by Memphis Co. form pharm. Chem. Ltd. Cairo. A.R.E. at 10 mg/ kg/ day for 6 days in which the nephrotoxicity, one of the adverse reaction of gentamicin takes place.

3-Experimental design and animal groups: Thirty five (35) adult male albino rats, Sprague- Dawley strain, weighting (150 ± 10 g) were used. All rats were fed on basal standard diet for seven consecutive days as adaptation period. Then, rats were distributed into 7 groups each of 5 rats in which means of rats weight for all groups were nearly equal. All the groups of rats were housed in wire cages and fed on the experimental diet for 4 weeks according to the following groups:

Group (1): This group was fed on basal diet only as a negative control (Healthy rats) c-ve) (n= 5).

Group (2): This group was fed on basal diet only as a positive control (rats with impaired kidney by gentamicin) (c+ ve) (n= 5).

Group (3): this nephritis group was fed on basal diet containing 5% almond nut.

Group (4): This nephritis group was fed on basal diet containing 5% sambucus herbs.

Group (5): This nephritis group was fed on basal diet containing 5% junipers seeds.

Group (6): This nephritis group was fed on basal diet containing 5% Grapefruit albedo.

Group (7): This nephropathy group was fed on basal diet containing 5% mixture of plants powder

4-Biological evaluation: During the experimental period (28 days), the diet consumed recorded every day, and body weigh recorded every week. The body weight gain (BWG g), feed efficiency ratio (GER), and also organs weights determinate.(7)

5-Urine and serum: At the end of experiment period, the urine of each rats was collected for 24 hours and it was analyzed for determination the following parameter: Total protein, sodium and potassium.

Also, blood samples were gather when twelve hours abstinence at the end of experiment in which the rats were scarified under ether anesthesia. Blood samples were received into clean dry centrifuge tubes and left to clot at room temperature, then centrifuged for 10 minutes at 3000 rpm to separate the serum. Serum was carefully aspirated and transferred into clean cuvette tubes and stored frozen at - 20°C for analysis. All serum samples were analyzed for determination of following parameters: urea, uric acid, creatinine, sodium & potassium and glucose.

6-laboratory Analytical Method:

Determination of urea: Urea was determination according to the enzymatic method.(8)

Determination of uric acid: Uric acid was determination according to the enzymatic colorimetric test. (9)

Creatinin, Sodium and Potassium was measured according to the colorimetric method of Henry.(10)

7-Statistical analysis: The obtained data were statistically analyzed using computerized SSPS (Statistic program Sigma stat, Statistical Soft-Ware, SAS Institute, Cry, NC). Effects of different treatments were analyzed by one way ANOVA (Analysis of variance) test using Duncan’s multiple range tests.(11)
Results and Discussion

Effect of Almond nut, Sambucus herbs, Juniperus seeds, Grapefruit albedo & the combination of all on kidney function of nephropathy rats.

1-Serum creatinine (mg/ dl): Data of table (1) indicated the average value of serum creatinine (mg/ dl) of nephropathy rats devoured varied diets. It could be observed that the mean value of creatinine of management (+) cluster was more than management (-) cluster, being 1.20 0.03 & 0.50 ± 0.03 respectively, showing significant difference. All nephropathy rats devoured totally different diets discovered important decreases in mean values as compared to control (+) group. Groups 3 & 7 indicated non significant differences when compared to control (-) group and revealed the best treatment.

2- Serum urea (mg/ dl): Data of table (1) illustrate the average value of serum urea (mg/ dl) of nephropathy rats devoured varied diets. It can be detected that the mean value of urea of management (+) cluster was more than management (-) cluster, being 110.00 ± 4.58 & 20.00 ± 1.76 mg/ dl respectively, indicating significant difference. All nephropathy rats devoured totally different diets discovered important decreases in mean values as compared to control (+) group. The best treatment was recorded for group 7 (mixture of all plants) when compared to control (+) group.

3- Serum uric acid (U. A.) (mg/ dl): Table (1) results show the mean value of serum (U. A) (mg/ dl) of nephropathy rats fed on various diets. It could be observed that the mean value of uric acid of control (+) group was higher than control (-) group, being 7.70 ± 0.03 & 1.70 ± 0.03 mg/ dl respectively, indicating significant difference. All nephropathy rats fed on various diets revealed significant decreases in mean value as compared to control (+) group. The best treatment was recorded for group 7 (mixture of all plants) when compared to control (+) group.

It seems possible that the used plants could correct the changes in kidneys function due to injection of rats with gentamicin.

4- Electrolytes (m. eq/1): In this part of measurement, the samples have been taken from blood and urine.

A-Serum sodium (Na) & potassium (k) (m.eq/ l): Table (2) results show the mean value of serum (Na) &
(k) (m. eq/l) of nephropathy rats devoured varied diets. It could be observed that the mean values of Na & K of management (+) cluster were less than management (-) cluster, being (36.20 ± 2.45, 199.00 ± 7.94) & (2.80 ± 0.26 & 12.40 ± 0.35) m.eq/ l respectively, indicating significant differences. Rats fed on various diets revealed significant increases in mean values as compared to control (+) group. The best treatment was recorded for group 7 (mixture of all plants) when compared to control (-) group. It seems possible that the used plants could correct the changes in serum electrolytes Na & K due to injection of rats with gentamicin.

B-urine sodium (Na) & potassium (k) (m.eq/l): Table (2) results indicate the mean value of urin (Na) & (k) (m.eq/l) of nephropathy rats devoured varied diets. It could be observed that the mean values of Na & k of management (+) cluster were higher than management (-) cluster, being (245.00 ± 15.09 & 95.00 ± 3.46) & (96.30 ± 5.48 & 44.10 ± 2.7) m.eq/l) respectively, indicating significant differences. Rats fed on various diets showed significant decreases in mean values as compared to control (+) group. The best treatment was recorded for group 7 (mixture of all plants) for both Na & K when compared to control (-) group. It seems possible that the used plants could correct the changes in urine electrolytes Na & K due to injection of rats with gentamicin.

Such results are in agreement with that recorded by previous studies reported that creatinine, urea & uric acid level was decreased by treatment with herbal combination of some plants. Almond oil had diuretic effect in human body. The decoction of the inner bark of Sambucus is used freely as a diuretic in the treatment of acute nephritis. Also Sambucus used for nephritis- edema with 12- 25 g drug material from entire plant in decoction.

The main biologically active substances are falconoid (1.61%) in Juniperus oxycedrus and possess the diuretic effect. Junipers sp. Is mainly used as diuretic in Turkish folk. Also grapefruit juice ingestion was associated with an increase in mean oxalate excretion and citrate excretion. Grapefruit juice increased urinary excretion of citrate and calcium, magnesium in healthy subjects. Both grapefruit and apple juices reduced the risk of calcium oxalate stone formation.

### Table (2): Effect of Almond nut, Sambucus herbs, juniperus seeds, Grapefruit albedo & the combination of all (as%) on serum and urine sodium Na and K (m. eq/l) of nephropathy rats

<table>
<thead>
<tr>
<th>Groups</th>
<th>Serum Na</th>
<th>Percent of change of control (+) group</th>
<th>K</th>
<th>Percent of change of control (+) group</th>
<th>Urine Na</th>
<th>Percent of change of control (+) group</th>
<th>K</th>
<th>Percent of change of control (+) group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1 control-ve</td>
<td>199.00±7.94a</td>
<td>+342.85</td>
<td>12.40±0.53b</td>
<td>0342.86</td>
<td>95.00±3.46c</td>
<td>-62.59</td>
<td>44.10±2.71d</td>
<td>-54.20</td>
</tr>
<tr>
<td>Group 2 control+ve</td>
<td>36.00±2.45F</td>
<td>00.00</td>
<td>2.80±0.26f</td>
<td>00.00</td>
<td>254.00±3.46c</td>
<td>00.00</td>
<td>96.30±5.48a</td>
<td>00.00</td>
</tr>
<tr>
<td>Group 3 5% Almond nut</td>
<td>176.00±5.29c</td>
<td>+185.71</td>
<td>8.00±0.37c</td>
<td>+185.71</td>
<td>95.00±3.46c</td>
<td>-62.59</td>
<td>54.00±4.36c</td>
<td>-43.92</td>
</tr>
<tr>
<td>Group 4 5% Sambucus herbs</td>
<td>157.00±6.08d</td>
<td>+46.42</td>
<td>4.10±0.62e</td>
<td>+46.43</td>
<td>97.00±3.61c</td>
<td>-61.81</td>
<td>54.60±4.51c</td>
<td>-43.30</td>
</tr>
<tr>
<td>Group 5 5% Juniperus seeds</td>
<td>145.30±5.02e</td>
<td>+85.71</td>
<td>5.20±0.75d</td>
<td>+85.71</td>
<td>106.00±4.36b</td>
<td>-58.26</td>
<td>63.70±3.25b</td>
<td>-33.85</td>
</tr>
<tr>
<td>Group 6 5% Grapefruit albedo</td>
<td>154.30±5.14b</td>
<td>+60.71</td>
<td>4.50±0.75e</td>
<td>60.71</td>
<td>94.00±5.29c</td>
<td>-62.99</td>
<td>54.00±3.61c</td>
<td>-43.92</td>
</tr>
<tr>
<td>Group 7 5% mixture</td>
<td>181.00±3.41b</td>
<td>+571.42</td>
<td>18.80±0.15a</td>
<td>+571.42</td>
<td>94.00±3.49c</td>
<td>-62.99</td>
<td>42.60±2.51d</td>
<td>-55.76</td>
</tr>
<tr>
<td>LSD</td>
<td>4.454</td>
<td>0.689</td>
<td>8.367</td>
<td>3.198</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


Values denote arithmetic means ± standard deviation of the mean. Means with different letters (a, b, c and d) in the same column different significantly at p ≤ 0.05 using one way ANOVA test, while those with similar letters are no significant different.

**Conclusion**

The best treatment of nephropathy rats according to the present study is by mixture of all plants (almond nut, Sambucus herbs, Juniperus seeds and Grapefruit albedo) as compared to each plant alone due to the synergistic effect of each one according to previous studies.

**Conflict of Interest:** Nil

**Source of Funding:** Self

**Ethical Clearance:** Nil

**References**

The Role of 3D CISS MRI in the Evaluation of Primary Trigeminal Neuralgia

Mohammed abd Kadhim, Rasha Muzahim Rasheed, Bashar Talib Huweidy

Abstract

Background: Trigeminal neuralgia (TN) is the most common form of facial neuropathic pain characterized by recurrent episodes of unilateral brief electric shock-like pains localized to the sensory supply areas of trigeminal nerve.

Aim of study: to study the role of axial and coronal 3D CISS MRI in the diagnosis of primary TN.

Method: This study is a cross sectional analytic study conducted in the MRI department at AL_Imamain AL_kadimian medical city during October 2017 and August 2018. The study included 30 patients with the clinical diagnosis of unilateral primary TN. Exclusion criteria were secondary cause of TN as brain tumor, MS, and other contraindication of MRI. MRI examination was done using 3 TESLA super conducting system. The patient were examined in the supine position by the following sequences: T1WI sagittal, T2WI axial, T2W FLAIR coronal, DWI, MRA /MIP MRA and 3D CISS (FFE/M) in axial and coronal orientation.

Results: Right and left sided complains represented 63.3% and 36.7%, respectively. Mean complain duration was 2.5±2.4 years. The compression was absent in 1 patient, arterial compression in 18 (60%) and venous compression in 11 (36.7%) patients. Arterial compression was related to superior cerebral artery in 83.3% and anterior inferior cerebral artery in 16.7%. Asignificant lower mean distance between compression vessels and root entry zone between symptomatic and control sides (p<0.001). The appropriate cut off level for distance between compression vessels and REZ in prediction of primary TN was 3.1mm with 96.7% sensitivity and 96.6% specificity.

Conclusions: The 3D CISS MRI is an accurate imaging technique in diagnosis and evaluation of primary TN. The distance between compression vessels and REZ at symptomatic side is lower than opposite asymptomatic side.

Keywords: 3D CISS MRI, primary trigeminal neuralgia.

Introduction

Trigeminal neuralgia (TN) is the most common form of facial neuropathic pain with an annual incidence of 4 to 5 new patients per 100,000 . It is characterized by recurrent episodes of unilateral brief electric shock-like pains localized to the sensory supply areas of trigeminal nerve and has been considered as one of the most serious pains that can experience . It is usually unilateral, affects older aged group. Occasional reports of bilateral primary TN reflect successive episodes of unilateral pain that move to the opposite side of the face rather than pain episodes that occur simultaneously on both sides . Attacks usually last only seconds but may recur repeatedly within short period of time. The attacks are often precipitated by mild sensory stimulation (trigger zones), which may be located anywhere within
the territory of the affected trigeminal nerve. Typical antecedent stimuli include light touching, draughts of wind, eating, drinking, washing, shaving and applying make-up. The neuralgia tends to occur in bouts over a period of weeks or months, with subsequent spontaneous remission that may last months or years. In time, however, attacks usually become more frequent and the pain more sustained \(^4\).

Idiopathic or classical TN is mainly caused by neurovascular compression of trigeminal nerve at its root entry zone \(^5\). In the early 20th century, Harvey Cushing studied the etiology of TN and proposed the hypothesis of mechanical compression, which was further improved by W.E. Dandy by proposing the vascular compression theory in 1932 \(^6\), hypothesizing the presence of arterial compression of the root entry zone (REZ) at the root of the trigeminal nerve. However, TN is not confined to arterial compression at the root of the trigeminal nerve. The causes of pain are complex and diverse. Various types of compression from the offending vessels, including arterial compression, venous compression, or even no neurovascular compression (NVC) have been found in clinical practice \(^7\).

Three D CISS (stands for Constructive Interference in Steady State), is part of fast gradient echo sequences and considered to be superior to the conventional MRI \(^8\), CISS is used in the assessment of the anatomical variations and for different pathologies involving the cranial nerves and CNS \(^9\). The CISS has been shown to be useful in spinal imaging too mainly in the cases of AVM. The main roots of trigeminal nerve especially at root entry zone and the gasserian ganglion can be depicted by CISS in the pre-pontine cistern and in Meckel’s cave, respectively. In cases of TN it plays an important role in searching for vascular compressions \(^10\).

**Aim of study:** To study the role of axial and coronal 3D CISS MRI in the diagnosis of primary TN.

**Patients and Method**

This is a cross sectional analytic study conducted in the MRI department at AL_Immamain AL_kadimian medical city /Baghdad /Iraq from October 2017 to August 2018. The study included 30 patients (22 female and 8 male, mean age 54.2 ± 16.5 years) with the clinical diagnosis of unilateral primary TN.

**Exclusion criteria:** secondary cause of TN as brain tumor, MS, … etc., other contraindication of MRI

All patients were subjected to full history and clinical examination. MRI examination was done using 3 TESLA super conducting system (Achieva 3, Philips medical system, Netherland). The patient were examined in the supine position using maximum gradient capability and circularly polarized head coil, all the patient were examined by the following sequences: T1WI (parameter: TE 4.76ms, TR 232ms, slice thickness 4mm, sagittal orientation, FOV 214mm, matrix 256 X256). T2WI (parameter: TE 80ms, TR 2.8ms, slice thickness 4/1.9mm, axial orientation, FOV 230 mm, flip angle 90\(^\circ\)). T2W FLAIR (parameter: TE 120ms, TR 11ms, flip angle 90\(^\circ\) degree, coronal orientation, FOV 230mm). DWI (parameter: TE98ms, TR 4.0ms, flip angle 90\(^\circ\), axial orientation, slice thickness 4.0/1.0mm, FOV 230mm). MRA /MIP MRA (parameter: TE 3ms, TR 23ms, flip angle 18\(^\circ\), slice thickness 1.4/-0.7mm, axial orientation, FOV200mm, matrix 256X512). 3D CISS (FFE/M) (parameter: TE 3ms, TR 6ms, slice thickness 1.0/-0.5mm, axial and coronal orientation, flip angle 45\(^\circ\), FOV180mm, matrix 512 X512).

**Image** evaluation was done by two independent radiologists to decrease inter-observer error, NVC considered being present if the CSF fluid amount was severely decreased or not visible between the trigeminal nerve and the aberrant vessels in axial and coronal CISS images, MRA is used to confirm whether the compressed vessels artery or vein, then we measure the shortest distance between the trigeminal nerve on the symptomatic side (at REZ region) and the blood vessels at site of neuro-vascular compression (NVC) (whether the contact is laterally or medially), measured distance for each patient was compared with the contralateral side as a control.

**Statistical Analysis:** The data were analyzed by Microsoft program and statistical package for social sciences version 23. Outcome of analysis were arrange in scale variables (mean and standard deviation) and in categorical variable. Fisher’s exact test and Independent sample t-test were used for comparison between the categorical data. The level of significant (P value) was set as≤ 0.05.

**Results**

Thirty patients with primary TN were included with mean age of 54.2±16.5 years; Female to male ratio as 2.7:1. Right side complains represented 63.3% while left sided complain represented 36.7%. Mean complain
duration was 2.5±2.4 years; 23.3% of them had duration of less than 1 year, 70% of them had duration of 1-5 years and 6.7% of them had duration of more than 5 years. The compression was absent in 1 patient, arterial compression was observed in 18 (60%) patients and venous compression was observed in 11 (36.7%) patients. Arterial compression was related to superior cerebral artery (SCA) in 83.3% and anterior inferior cerebral artery (AICA) in 16.7%. Mean distance between compression vessels and REZ at symptomatic side was 2.4±0.5 mm and mean distance between vessels and REZ at control side was 5.4±1.2 mm. All these findings were shown in table 1.

Table 1: MRI findings of neurovascular compression in patients with primary TN.

<table>
<thead>
<tr>
<th>Variables</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compression</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arterial</td>
<td>18</td>
<td>60</td>
</tr>
<tr>
<td>Venous</td>
<td>11</td>
<td>36.7</td>
</tr>
<tr>
<td>No compression</td>
<td>1</td>
<td>3.3</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>100</td>
</tr>
<tr>
<td>Arterial compression</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCA</td>
<td>15</td>
<td>83.3</td>
</tr>
<tr>
<td>AICA</td>
<td>3</td>
<td>16.7</td>
</tr>
<tr>
<td>Total</td>
<td>18</td>
<td>100</td>
</tr>
</tbody>
</table>

Distance between compression vessels and REZ at affected side: mean±SD (2.4±0.5mm)
Distance between blood vessels and REZ at control side: Mean±SD (5.4±1.2mm)

There was a highly significant difference in distance between compression vessels and REZ between symptomatic side and control side detected by MRI (p<0.001), the mean distance was significantly lower among symptomatic side. These findings were shown in table 2.

Table 2: Distribution of distance between compression vessels and REZ according to symptomatic and control sides.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Symptomatic side</th>
<th>Control side</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance between compression vessels and REZ:</td>
<td>2.4±0.5</td>
<td>5.4±1.2</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>(Mean±SD in mm)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Independent sample t-test.

The appropriate cut off level for distance between compression vessels and REZ in prediction of primary TN were shown to be 3.1mm with 96.7% sensitivity and 96.6% specificity. Figure 1 and 2 show MR images of some 2 patients with TN.

Figure 1: 65 years female with Rt. TN for 12 years with history of Gamma knife radio surgery, (A) axial view and (B) coronal view which show NVC.

Figure 2: 67 years female with Lt. TN for 9 years. (A) axial view and (B) coronal view which show NVC (SCA).
Discussion

Primary TN is a compression syndrome in which one and more division of 5th cranial nerve is affected leading to characteristic paroxysmal facial pain. Three D CISS-MRI is the appropriate choice in the evaluation and assessment.

Present study showed mean age of the patients with primary trigeminal neuralgia was 54.2 years with predominance of old age group (≥60 years). This finding is close to the results of Yaseen study in Iraq which referred to increased age of patients with primary TN. Females with primary TN were more than males. This was similar to the results of Bee et al. study in Malaysia which reported high predominance of female gender. Inconsistently, Rai et al. study in India found that males were more common than females with mean age of 58.9 years. This difference might be attributed to the difference in risk factors for primary TN and difference in methodological inclusion and exclusions criteria. The Current study showed that right sided complain was most prevalent (63.3%). This finding coincides with results of Bangash et al study in Pakistan which revealed that 64% of patients had right sided complain. Mean complain duration of primary TN in our study was 2.5 years. This finding is close to results of Cruccu et al study in UK which reported mean complain duration of 2.8 years.

In this study, previous history of central nervous surgery was seen in 2 patients with primary TN, Machet et al. study in France documented that there is an effect of previous history of CNS surgery on development of primary TN.

Zerris et al. study in USA 3D CISS-MRI could identify accurately 24 (96%) patients. Many authors examined the role of MRI in detection of primary NT and reported a sensitivity of 94–97% However, cases with asymptomatic vascular contact were also found to be high, for that, both MRI imaging and clinical evaluation must be used together. Besta et al. stated that common advantages of 3D CSSI-MRI were long relaxation times that lead to additional signal, while the main disadvantage was the high cost as compared to conventional MRI.

In this study 3D CISS-MRI reported no vessels compression in 1 patient, 60% artery compression and 36.7% vein compression. Pecker et al. study in Turkey found that 86% had arterial compression (mainly SCA) while 14% had venous compression. It is believed that compression of the nerve fibers causes hyperexcitability.

The most interesting finding of the present study was the significant difference in distance between compression vessels and REZ between symptomatic side and contralateral normal side (p<0.001), the mean distance was significantly lower among symptomatic side. This finding is in agreement with the results of Lang et al. study in Germany. Elaini et al. study in Egypt stated similar findings. In Denmark study conducted by Maarbjerger et al. similar findings were observed.

The Present study showed that appropriate cut off value for distance between compression vessels and REZ at symptomatic sided was 3.1 mm with sensitivity of 96.7% and specificity of 96.6%. These findings were similar to the results of many studies like Suzuki et al. study in Japan and Guclu et al. study in France.

Conclusions

The 3D CISS MRI is an accurate imaging technique in diagnosis and evaluation of primary TN. The distance between compression vessels and REZ at symptomatic side of primary TN is lower than distance at opposite asymptomatic side. Cutoff value in detecting primary TN was 3.1 mm. The compression vessels were arterial more than venous.

Ethical Clearance: All ethical issues were approved by the scientific committee of the College. Signed informed consents were obtained from all participant patients and data were collected according to the declaration of Helsinki, 64th World Medical Association General Assembly of ethical principles for medical research involving human subjects.

Funding: None, self-funded

Conflict of Interest: Nil

References


Serum Levels of Oxidative Stress Biomarkers in Patients Obsessive Compulsive Disorder in Tikrit City, Iraq

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Abstract

Background: Obsessive–compulsive disorder (OCD) is one of the major disabling disorder affecting about 2% of the population, and it causes significant mental health costs. Aim: The purpose of this study is to determine the changes in serum levels of oxidative stress and the role of oxidative stress biomarkers in obsessive compulsive disorder (OCD).

Materials and Method: A cross-sectional controlled study was carried out in Salah Al-din City from 1st of February 2019, to 1st of June, 2019. The number of obsessive compulsive disorder 60 patients whose ages between 18-68 years old. These patients admitted to psychiatric unit at Salah Al-din Teaching Hospital. The control group who were match to the patients studied include 30 healthy control.

Results: The study showed that there is the significant difference between serum level of patients and the control groups. In this study showed that is high level of malondialdehyde (MDA), in patients in compare with control group and lower levels of antioxidant enzymes (GSH-PX, SOD1, CAT) of patients in compare with control group.

Conclusion: We can use serum level of some biochemical markers in compare between patients, and control with OCD. The relationship inverse between MDA and GSH-PX, SOD1, CAT, in patients and control groups.

Keywords: Obsessive compulsive disorder, Oxidative stress, Superoxide dismutase 1, Glutathione peroxidase, Catalase, Malondialdehyde.

Introduction

Obsessive–compulsive disorder (OCD) is one of the major disabling disorder affecting about 2% of the population, and it causes significant mental health costs. Several hypotheses exist regarding the physiological basis of OCD with dysfunction of brain circuits involving the limbic cortex and basal ganglia being at the core of the disorder(1). Indeed, several imaging studies found hyper activity of the orbito–frontal cortex and anterior cingulate cortex(2). Some authors proposed hypotheses involving dysfunction of microcircuits within these limbic loops(3). They provide energy that is released upon reactions with adjacent molecules such as lipids, proteins, carbohydrates, nucleic acids, that develop many diseases(4-5). Free radicals are molecules or ionic atoms with unpaired electrons in their outer shells which have a high reactive ability (5). Oxidative stress is a process that reactive oxygen species (ROS) generation prevails over the antioxidant capacity of cells, which may provoke oxidative damage to major groups of cellular macromolecules (lipids, proteins, and DNA). Malondialdehyde (MDA) is currently considered to the most widely used representative of oxidative lipid damage. Glutathione peroxidase (GPX), superoxide dismutase (SOD1), and catalase (CAT) are also well-established marker of antioxidant enzymes(6) that can reduce the ROS burden and act as antioxidant defense.
Objective of this study, this study was conducted to evaluate serum levels of oxidative stress biomarkers and antioxidant parameter in patients undergoing obsessive compulsive disorder. To measure the change in serum levels of Malondialdehyde (MDA) as a marker of oxidative stress and antioxidant parameters (GPX, SOD1, CAT) in adults patients undergoing OCD and compare these results with that obtained from healthy individuals (control).

**Aim of the study:** The purpose of this study is to determine the changes in serum levels of oxidative stress and the role of oxidative stress biomarkers in obsessive compulsive disorder (OCD).

**Materials and Method**

The study is a cross-sectional controlled study that was conducted on 90 individuals, comprised of 60 patients and 30 controls. Patients were subjected to obsessive compulsive disorder in General Salah Addin Hospital, Salah Addin - Iraq between 1st of February, 2019 to 1st of June, 2019. Patients data were collected and compared with 30 apparently healthy subjects who participated as control group. The levels of SOD1, GSH-PX, CAT and MDA were measured by ELISA technique. A volume of 5ml of blood sample was taken by vein puncture from each subject enrolled in this study. Blood samples were placed into sterile test tubes, after blood clotting, the samples were centrifuged at 3000 rpm for 15 min and the obtained serum were aspirated using mechanical micropipette and transferred into clean plain tubes with screw which labeled and stored in deep freeze at -20 °C for the biochemical measurement of MDA, GSH-PX, SOD1, CAT, by ELISA. The principle of ELISA, various antigen-antibody combinations are used, always including an enzyme labeled antigen or antibody, and enzyme activity is measured colorimetrically.

**Normal Value:** MDA: 7.813-500ng/ml, GSH-PX: 2-600U/ml, SOD1: 0.78-50ng/ml, CAT: 15.625-1000pg/ml.

**Statistical Analysis:** The Statistical Analysis System- SAS (2012) program was used to effect of difference factors in study parameters. Least significant difference –LSD or T-Test was used to significant compare between means. Estimate of correlation coefficient between variables in this study.

**Results**

For statistical analysis, the data were collected from the cases group in two different stages: Patients newly diagnosis, and patients previously diagnosis. P-value Means having with the different letters in same column differed significantly.

**1-Comparison between patients and control in MDA, GSH-PX, SOD1 and CAT:** Comparison between study groups regarding serum MDA and GSH-PX and SOD1 and CAT levels was performed using Student’s Least Significant Difference (LSD) or t-test. Cases were compared in all different states: patients newly diagnosis, patients previously diagnosis (and on treatment). There was a statistically highly significant difference in the serum MDA level for cases in patients group (121.03 ± 9.49) and control group (83.16 ± 4.77) conditions; p <0.01. As for the GSH-PX there was a statistically significant difference in the serum GSH-PX level for cases in patients group (71.11 ± 6.55) and control group (97.96 ± 12.22) conditions; p<0.05. And there was a statistically non-significant difference in the serum SOD1 level for cases in patients group (58.57 ± 5.71) and control group (74.05 ± 11.05) conditions; p-value Non-Significant p <0.171. And there was a statistically non-significant difference in the serum CAT level for cases in patients group (38.96 ± 5.52) and control group (49.24 ± 8.09) conditions; p-value Non-Significant p <0.832. These statistics were summarized in table (1).

<table>
<thead>
<tr>
<th>Group</th>
<th>MDA (ng/ml)</th>
<th>GSH-PX (U/ml)</th>
<th>SOD1 (ng/ml)</th>
<th>CAT (pg/ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients</td>
<td>121.03 ± 9.49</td>
<td>71.11 ± 6.55 b</td>
<td>58.57 ± 5.71</td>
<td>38.96 ± 5.52</td>
</tr>
<tr>
<td>Control</td>
<td>83.16 ± 4.77</td>
<td>97.96 ± 12.22 a</td>
<td>74.05 ± 11.05</td>
<td>49.24 ± 8.09</td>
</tr>
<tr>
<td>P-value</td>
<td>0.0001</td>
<td>0.036</td>
<td>0.171</td>
<td>0.832</td>
</tr>
</tbody>
</table>

* (P<0.05), ** (P<0.01), NS: Non-Significant, Means having with the different letters in same column differed significantly.
2. Effect of difference groups in MDA, GSH-PX, SOD1 and CAT: In this table show the effect difference groups in MDA was the results for patients newly diagnosis (122.24 ± 12.92) and control group (73.08 ± 8.98), and patients previously diagnosis (94.81 ± 6.42) and control groups (73.08 ± 8.98), P<0.05 highly significant. While for GSH-PX was the results for patients newly diagnosis (59.57 ± 8.12) and control groups (93.69 ± 13.84), and patients previously diagnosis (82.76 ± 9.61), and control groups (93.69 ± 13.84), P-value<0.01 significant. SOD1 was the results for patients newly diagnosis (53.97 ± 7.86), and control groups (82.87 ± 15.22), and patients previously diagnosis (81.68 ± 9.37), and control groups (82.87 ± 15.22), P<0.01 highly significant. While for CAT was the results for patients newly diagnosis (20.03 ± 3.38), and control groups (36.69 ± 5.54), and patients previously diagnosis (32.43 ± 4.03), and control groups (36.69 ± 5.54), P<0.01 highly significant. These statistics were summarized in table (2).

Table 2: Effect of difference groups in MDA, GSH-PX, SOD1 and CAT

<table>
<thead>
<tr>
<th>Group</th>
<th>MDA (ng/ml) Mean ± SE</th>
<th>GSH-PX (U/ml) Mean ± SE</th>
<th>SOD1 (ng/ml) Mean ± SE</th>
<th>CAT (pg/ml) Mean ± SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients: Newly diagnosis</td>
<td>122.24 ± 12.92 b</td>
<td>59.57 ± 8.12 b</td>
<td>53.97 ± 7.86 ab</td>
<td>20.03 ± 3.38 b</td>
</tr>
<tr>
<td>Patients: Previously diagnosis</td>
<td>94.81 ± 6.42 ab</td>
<td>82.76 ± 9.61 ab</td>
<td>81.68 ± 9.37 a</td>
<td>32.43 ± 4.03 b</td>
</tr>
<tr>
<td>Control:</td>
<td>73.08 ± 8.98 a</td>
<td>93.69 ± 13.84 ab</td>
<td>82.87 ± 15.22 a</td>
<td>36.69 ± 5.54 b</td>
</tr>
<tr>
<td>P-value</td>
<td>0.0015</td>
<td>0.0461</td>
<td>0.0028</td>
<td>0.0003</td>
</tr>
</tbody>
</table>

*(P<0.05), ** (P<0.01), Means having with the different letters in same column differed significantly

3. Effect of gender in MDA, GSH-PX, SOD1 and CAT / in Patients: Table (3) compares the gender of the study participants, showing that (52%) of study participants were males while the remaining (48%) were females. In this table showed negative correlation.

Table (3) Effect of gender in MDA, GSH-PX, SOD1 and CAT / in Patients:

<table>
<thead>
<tr>
<th>Gender</th>
<th>MDA (ng/ml) Mean ± SE</th>
<th>GSH-PX (U/ml) Mean ± SE</th>
<th>SOD1 (ng/ml) Mean ± SE</th>
<th>CAT (pg/ml) Mean ± SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>95.42 ± 8.69</td>
<td>73.15 ± 10.66</td>
<td>79.42 ± 10.87</td>
<td>28.24 ± 4.48</td>
</tr>
<tr>
<td>Female</td>
<td>93.54 ± 8.69</td>
<td>103.18 ± 18.70</td>
<td>86.48 ± 19.01</td>
<td>41.32 ± 7.76</td>
</tr>
</tbody>
</table>

NS: Non-Significant.

Discussion

Oxidative stress may be an important systemic component of the pathophysiology of psychiatric disorders. In our data-analysis we found a statistically significant global increase in oxidant markers in patients with OCD, similarly to what has been described for other psychiatric disorders(7). Patients with OCD do precipitate with symptoms during acute attack of anxiety and stress. Anxiety may cause secretion of catecholamines which in turn may lead to free radical production through NADPH oxidase(8).

Furthermore, Moreira and his co-authors reviewed that the oxidative stress increased in elderly as a result of a nutritional status which contribute to the decline in the antioxidant ability of the body leading to many consequences such as aging, cardiac diseases and neurological problems(9). Parameters that were used in this study for the assessment of oxidative stress include malondialdehyde (MDA) as oxidative stress marker and three antioxidant indicators including glutathione peroxidase (GPx), Catalase (CAT), and superoxide dismutase1 (SOD1). Many previous studies reported an inversely correlation between defense antioxidant enzymes SOD1, GPx, and CAT with MDA as a result of their ability to neutralize ROS (10). In the our study we are measurement of MDA level in patients in tow groups showed a significant higher level than that of controls that may indicate a higher oxidative stress. This finding is in agreement with Abhijeet Shrivastava et al. who
found a significant difference in MDA levels between of obsessive compulsive disorder (OCD) patients and control\textsuperscript{(11)}.

Malondialdehyde is a product of peroxidation of lipid, and it reflects the extent of tissue damage mediated by free radicals. Oxidative stress thus developed causes peroxidation of membrane lipids, hence further increasing the symptoms of OCD. Lipid peroxidation releases excess malondialdehyde into blood. MDA play a role in OCD and can be a good marker. So, in the our study an attempt was made to find out the efficacy of malondialdehyde as a marker in patients of obsessive compulsive disorder. In patients previously diagnosis(and on treatment), we found decline gradient levels and why it back to take the treatment. Previous studies also had high levels of MDA in patients and lowest levels in healthy controls, these study agree with our studies\textsuperscript{(12)}. The current study revealed that the level of GPx and SOD1 enzymes was significantly lower in all patients’ subgroups “ newly diagnosis, previously diagnosis(and on treatment) patients” when compared with controls, which might indicate a reduction in antioxidant ability of GPx and SOD1 to neutralize reactive oxygen species (ROS) in patients compared to controls. In a similar manner, Abhijeet Shrivastava et al. Have found a significant decrease in GPx in patients with obsessive compulsive disorder (OCD),these results agree with our results.

In recent study, have also found significantly lower levels of glutathione in posterior cingulate cortex in OCD patients in comparison to healthy controls\textsuperscript{(13)}. Both these studies, further strengthen the case for a role of glutathione peroxidase in OCD. The antioxidant enzymes have complementary activities in the antioxidative defense system. In oxidative stress, SOD1, which has central role in defense. We observed lower levels in patients newly diagnosis, and start to increase levels in patients previously diagnosis this response to treatment and become a nearby levels of health(control), which could be attributed to the improvement in the overall health status of the patient in addition to the use of medications and supplements. In the previous study has higher level of SOD1\textsuperscript{(14)}, this studies disagree with our study. CAT this enzyme is considered as one of the antioxidant defense mechanisms against ROS. In the current study, catalase activity showed to significantly lower in patients compared to controls. The level of catalase enzyme activity in patients groups that showed a significant lower level than that of control may indicate an activation of this enzyme as a result of increase in the oxidative stress. This is consistent with the findings by Abhijeet Shrivastava et al. Also agree with E.Ozdemir et al. who described a significant decrease in catalase activity.

**Conclusion**

We can use serum level of some biochemical markers in compare between patients, and control with OCD. The relationship inverse between MDA and GSH-PX, SOD1, CAT, in patients and control groups.

**Acknowledgment:** First of all my deep thanks and gratitude are presented to almighty ALLAH (Glorified and exalted He be) for my success and inspiration in gaining this great opportunity to develop my professional life. The greatest thanks for Ministry of Higher Education and Scientific Research for giving me the chance to get the Master degree from Tikrit University. I share the accomplishment of this thesis with those who gave their valuable time and effort to help me complete this study. This study could not have taken place without the support of my supervisors Dr. Nihad Nijris and Dr. Ahmed Hashim for their invaluable advice, assistance, cooperation, and support throughout the preparing of my thesis. Faithful thanks to Dr. Ibrahim A. Al Sabawy, Specialist of Psych. For helping me in collection of the specimens.

**Ethical Clearance:** Taken from Tikrit University College of Medicine committee

**Source of Funding:** Self

**Conflict of Interest:** Nil.

**References**


Comparative Study of Lipid Profile in Sedentary and Active Hypertension Population of Maharashtra

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Abstract

Background: 93 active hypertensives were compared with 93 sedentary persons of the same age group, and their lipid profile and BP were recorded to study the prediction cardiovascular disease.

Method: BP was recorded by Diamonds mercury. The serum of the blood analyzed for lipid profile. i.e. total cholesterol, HDL, triglyceride, VLDL, LDL in both groups

Results: Comparative study lipid profile parameter and BP study in both sedentary and active HTN groups were statistically highly significant (p<0.01)

Conclusion: This study highlights the diagnostic and prognostic values for cardiovascular diseases which have a high rate of mortality and morbidity.

Keywords: HTN=Hypertension, CVD – cardiovascular disease, lipid profile, BP Blood pressure

Introduction

Dyslipidemia is often observed in a sedentary population associated with Hypertension. Hence, these two major risk factors contribute to an increase in cardiovascular disease globally.¹ The reasons seem to be many and some are associated with an unhealthy diet, stressful and sedentary lifestyle. Stress is also a major contributing factor to cardiovascular disease. The major cause of HTN is dyslipidemia, which leads to risk of cardiovascular disease² like coronary heart disease, CCF, ischemic and hemorrhagic stroke, renal failure and peripheral arterial disease³. Excessive intake of saturated fats, cholesterol and other sources of calories and subsequent disturbance of lipid profile leading to hypertriglyceridemia and hypercholesterolemia,⁴ are associated with obesity and consequent hypertension. Impaired insulin function, increase in peripheral resistance, cardiac output, sympathetic tone and salt ingestion are some responsible mechanisms that lead to morbidity and mortality. Hence lipid profile of active and sedentary was compared and BP of both groups were recorded.

Material and Method

93 active Hypertensive and 93 sedentary group of patients regularly attending OPD of medicine department Government Medical College Hospital Aurangabad (Maharashtra) were selected for study.

Inclusive criteria: Active patients and sedentary patients having variations in blood pressure and lipid profile were included in the study.

Method: Blood pressure of each patient was recorded by Diamond’s mercury sphygmomanometer. Blood samples were collected after an overnight fast of 10-12 hours. About 5 ml of blood was drawn in a dry autoclaved disposable syringe and poured in sterilized plain vial after removing the needle, and allowed to clot, and then centrifuged to separate the serum. The serum was stored at 2-6 °C for a period of 2-3 days in a refrigerator until they were analyzed, lipid profile

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(total cholesterol, HDL, Triglyceride) both groups and recorded separately.

**Exclusion criteria:** Addiction to alcohol and tobacco. Patients on a diet, or having personal or family history of diabetic mellitus, asthma, and tuberculosis were excluded from the study.

**Statistically:** Lipid profile parameters, blood pressure readings were compared in both groups statistically in 2007 Microsoft word computer. The ratio of males to females was 2:1. The duration of study was about 2 years.

### Observation and Results

**Table 1: Comparison of lipid profile in both active and sedentary group**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Sedentary</th>
<th>Active</th>
<th>Test statistic</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean ±SD</td>
<td>Mean ± SD</td>
<td>T value</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total cholesterol</td>
<td>280.60±0.80</td>
<td>266.04±0.68</td>
<td>133.52</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>HDL</td>
<td>33.95±0.46</td>
<td>36.65±0.29</td>
<td>-47.79</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Triglyceride</td>
<td>202.93±0.52</td>
<td>171.87±0.58</td>
<td>383.12</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>VLDL</td>
<td>42.69±0.36</td>
<td>36.61±0.42</td>
<td>104.62</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>LDL</td>
<td>207.69±0.54</td>
<td>199.45±0.41</td>
<td>115.84</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>

Statistically Total cholesterol, Triglyceride, VLDL and LDL values are significantly higher in Sedentary life style peoples than Active life style peoples (P<0.01) while HDL values is significantly less in Sedentary life style peoples than Active hypertensive (p<0.01)

**Table 2: Comparison of Blood pressure in both groups**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Sedentary</th>
<th>Active</th>
<th>Test statistic</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean ±SD</td>
<td>Mean ± SD</td>
<td>T value</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Systolic BP</td>
<td>179.42±0.34</td>
<td>167.16±0.03</td>
<td>385.14</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Diastolic BP</td>
<td>103.04±0.34</td>
<td>98.35±0.36</td>
<td>90.49</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>

Statistically systolic and Diastolic blood pressure values are significantly higher in sedentary life style peoples than Active Hypertensive (p<0.01)


Discussion

In the comparative study of lipid profile, in sedentary and active HTN population of Maharashtra, in the study of parameters of lipid profile mean value of (a) total cholesterol sedentary group was 280.6 (SD±0.80), 266.40 (SD±0.68) t test value was 133.3 and p value was significant (p<0.01) (b) mean value of HDL in sedentary group was 33.9 (SD±0.46), 36.6 (SD±0.29) t test value was -47.7 and p value was highly significant (p<0.01). (c) Mean value of triglyceride in sedentary group was 202.9 (SD±0.52) 171.8 (SD±0.58) t test value was 383.1 and p value. (d) Mean value of VLDL in sedentary group was 42.6 (SD±0.36) 36.6 (SD±0.42) t test value was 104.6, p value was highly significant (p<0.01). (e) Mean value of LDL in sedentary group was 207.6 (SD±0.54), 199.4 (SD±0.41) t test value was 115.4 and p value was highly significant (p<0.01). (Table-1)

Comparison of systolic and diastolic BP in both groups. (a) Mean of systolic BP in sedentary group was, 179.4(SD±0.30), 167.1 (SD±0.03) in active HTN group t test was 385.1 and p value was highly significant (p<0.01). (b) Mean of Diastolic BP in sedentary group was 103.0 (SD±0.34), 98.3 (SD±0.36) in active group t test value was 90.4 and p value was highly significant (Table-2) These values were more or less in agreement with previous studies. (5)(6)(7)

The HDL cholesterol profile the individual from HTN and its consequences the independent protective effect of HDL cholesterol or in risk of coronary heart disease, especially the total cholesterol. (8) The physical activity and physical fitness have been related to normalcy in lipid profile. Hence physical activity has been described as a lipid lowering antihypertensive, positive inotropic, negative chronostreopic, vasodilating, diuretic, anorexigenic, weight reducing, cathartic, hypoglycemic tranquilizing, hypnotic and antidepressive agents. (9)

Atherosclerotic heart disease is the leading cause of mortality among patients with chronic kidney disease associated with dyslipidemia (10) which is mainly due to sedentary lifestyle contributed by intake of unsaturated fatty excessive food. (11) Thich leads to endothelial damage and triggers an increase in blood pressure which may partially account for its strong predictive power for coronary heart disease (12) followed by vascular constriction and stiffness.

Summary and Conclusion

The present study of comparison of lipid profiles in sedentary and active hypertensive population will be quite useful to physicians, cardiologists, and bio-chemists and enable them to treat such patients efficiently. Routine monitoring of BP and lipid profiles must be encouraged among such patients. But this study demands further genetic, nutritional, angiological and patho-physiological correlation & study because exact pathogenesis of CHD is still unclear.

This research paper was approved by Ethical committee of Govt. Medical College Aurangabad (Maharashtra).

Conflict of Interest: No

Source of Funding: No

References

5. Feldstein CA- status of hypertension are they a new class of antihypertensive agents Am J there 2010 – 17(3)
Study of Role of Serum Proteins in Viral Hepatitis in Maharashtra Population

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¹Assistant Professor, Department of Pathology, College of Medicine, Jouf University, Kingdom of Saudi Arabia,
²Head and Associate Professor, Department of Physiology, College of Medicine, Jouf University, Kingdom of Saudi Arabia

Abstract

Background: 94 Hepatitis A & B groups’ serum proteins were compared with levels of S. Albumin, Globulin and total proteins of control groups to know the prognostic value of jaundice.

Method: LFT, S. Bilirubin, Prothombin time, HbsAg, HBC antibody and IgM, HAV antibody, S. Proteins, S. Albumin and Globulin were studied in the groups of ABCD and controls.

Results: S. Albumin (gm/dl) – Mean value of control group was 4.35 (SD±0.13) 3.75(SD±0.01), t test was 44.08 in group A, 3.29 (SD±0.01), t test was 77.1 in group B, 3.64(SD±0.01), t test was 51.5 in group C, 3.23(SD±0.03), t test was 79.5 in group D and statistically highly significant (p<0.01). Globulin (gm/dl) study of controls had mean value control of 2.12(SD±0.08) 3.22(SD±0.01), t test – 124.8 in group A, 3.60 (SD±0.01), t test – 167.8 in group B, 3.37 (SD±0.01), t test – 141.3 in group C, 3.75(SD±0.01), t test – 185.1 in group D. Total protein mean value in controls was 7.29 (SD±0.05), 6.94(SD±0.01), t test 67.3 in group A, 6.86(SD±0.01), t test 82.4 in group B, 6.99(SD±0.01), t test 75.4 in group C, 6.94(SD±0.0), t test 67.8 in group D and statistically significant p value (p<0.01).

Conclusion: This study highlights the diagnostic and prognostic roles of Albumin, Globulin and total protein levels in patients with Hepatitis A and B.

Keywords: Albumin Globulin proteins, Hepatitis.

Introduction

Viruses which infect the liver and often lead to inflammation of liver parenchyma are labeled as hepatitis viruses and can be grouped as hepatitis ABCD and E.

Among these quite common are hepatitis A and B. Hepatitis A virus is a single stranded, non-enveloped virus belonging to the picornaviridae family. It usually spreads via the fecal-oral route and is closely related to bad hygienic and sanitary conditions. It is considered to be endemic in India.²(3) If untreated it may lead to mortality due to liver failure or underlying chronic liver diseases.

Hepatitis B virus is a double stranded DNA virus belonging to the family Hepadnaviridae. It is transmitted through per mucosal or percutaneous exposure to infected body fluids or blood products and has an incubation period averaging around four months. The spectrum of hepatitis B infection varies from acute to chronic depending on the persistence of virus surface antigen (HBSAg) in serum. Majority of patients with acute infection would remain asymptomatic. Hence attempt was made to study the serum proteins in patients of Hepatitis A and B and compared with normal (control) groups.
Material and Method

Group A - 94 patients of viral hepatitis A having their serum Bilirubin level up to 10mg. Group B - 94 patients of viral hepatitis A with serum Bilirubin level above 10 mg. Group C- 94 patients of hepatitis B having serum Bilirubin level up to 10 mg.

Group-D - 94 patients of hepatitis B having serum Bilirubin above 10mg. Control (Normal) - 94 healthy persons’ serum protein levels were also studied to compare with these groups (ABCD) (total 94*4=376+94 control).

Inclusive criteria – Adults aged between 18-30 years having signs and symptoms of viral hepatitis like abdominal pain, nausea, vomiting, anorexia, fever, icterus and hepatomegaly were selected for study.

Method- LFT, serum Bilirubin, Prothombin time, serological marker HbsAg, IgM, Hbc antibody and IgM HAV antibody serum proteins and serum Albumin and Globulin of controls and group ABCD was carried out by Burette method. Percentages of Albumin and Globulin were found out by the Elution method. The amount of Albumin and Globulin was calculated in gram percentage.

Exclusive criteria- Patients having malignancy of liver and HIV positive patients were excluded from the study.

Statistical analysis- Was done in all 4 groups. Obtained results were compared with control group values. The ratio of male to female was 2:1. The duration of study was two years.

Observation and Results

Table-1 – study of S. Albumin (gm/dl) - 4.35 (SD±0.13) was mean value of control compared with 3.75 (SD±0.01) and test value 44.08 in group A, 3.29 (SD±0.01) t test value was 77.1 in group B, 3.64 (SD±0.01) t test value was 51.5 in group C 3.23 (SD±0.03) t test value was 79.5 in group D, and statistically p value was highly significant (P<0.01) as the control average value was higher

Table-2 study of Globulin (gm/dl) 2.12 (SD±0.08) was the mean value of controls compared with 3.22 (SD±0.01) t test value was – 124.8 in group A 3.60 (SD±0.01) t test value was – 167.8 in group B, 3.37 (SD±0.01) t test value was – 141.3 in group C, 3.75 (SD±0.01) t test value was – 185 in group D, the mean value of control group was higher than other group hence value was highly significant (P<0.01)

Table-3 study of total protein (gm/dl) 7.29 (SD±0.05) was the mean value of control compared with 6.94 (SD±0.01) t test value was 67.3 in group A 6.86 (SD±0.01) t test value was 82.1 in group B, 6.99 (SD±0.01) t test value was 57.8 in group C, 6.94 (SD±0.01) t test value was 67.8 the statistically p value was highly significant (P<0.01)

Table 1: Study of serum Albumin (gm/dl)

<table>
<thead>
<tr>
<th></th>
<th>Control</th>
<th>Group A</th>
<th>Group B</th>
<th>Group C</th>
<th>Group D</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>92</td>
<td>92</td>
<td>92</td>
<td>92</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>4.35</td>
<td>3.75</td>
<td>3.29</td>
<td>3.64</td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td>0.13</td>
<td>0.01</td>
<td>0.01</td>
<td>0.01</td>
<td></td>
</tr>
<tr>
<td>t test</td>
<td>44.08</td>
<td>77.17</td>
<td>51.54</td>
<td>79.55</td>
<td></td>
</tr>
<tr>
<td>P value</td>
<td>P&lt;0.01</td>
<td>P&lt;0.01</td>
<td>P&lt;0.01</td>
<td>P&lt;0.01</td>
<td></td>
</tr>
</tbody>
</table>

Statistically average value of control is significantly higher than average values of Group A, Group B, Group C and Group D (P<0.01).

Table 2: Study of Globulin (gm/dl)

<table>
<thead>
<tr>
<th></th>
<th>Control</th>
<th>Group A</th>
<th>Group B</th>
<th>Group C</th>
<th>Group D</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>94</td>
<td>94</td>
<td>94</td>
<td>94</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>2.12</td>
<td>3.22</td>
<td>3.60</td>
<td>3.37</td>
<td>3.75</td>
</tr>
<tr>
<td>SD</td>
<td>0.08</td>
<td>0.01</td>
<td>0.01</td>
<td>0.01</td>
<td></td>
</tr>
<tr>
<td>t test</td>
<td>-124.84</td>
<td>-167.81</td>
<td>-141.39</td>
<td>-185.14</td>
<td></td>
</tr>
<tr>
<td>P value</td>
<td>P&lt;0.01</td>
<td>P&lt;0.01</td>
<td>P&lt;0.01</td>
<td>P&lt;0.01</td>
<td></td>
</tr>
</tbody>
</table>

Statistically average value of control is significantly lower than average values of Group A, Group B, Group C and Group D (P<0.01).

Table 3: Study of total protein (gm/dl)

<table>
<thead>
<tr>
<th></th>
<th>Control</th>
<th>Group A</th>
<th>Group B</th>
<th>Group C</th>
<th>Group D</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>95</td>
<td>95</td>
<td>95</td>
<td>95</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>7.29</td>
<td>6.94</td>
<td>6.86</td>
<td>6.99</td>
<td>6.94</td>
</tr>
<tr>
<td>SD</td>
<td>0.05</td>
<td>0.01</td>
<td>0.01</td>
<td>0.01</td>
<td></td>
</tr>
<tr>
<td>t test</td>
<td>67.31</td>
<td>82.14</td>
<td>57.84</td>
<td>67.82</td>
<td></td>
</tr>
<tr>
<td>P value</td>
<td>P&lt;0.01</td>
<td>P&lt;0.01</td>
<td>P&lt;0.01</td>
<td>P&lt;0.01</td>
<td></td>
</tr>
</tbody>
</table>

Statistically average value of control is significantly higher than average values of Group A, Group B, Group C and Group D (P<0.01).
Discussion

In the present study of role of serum proteins in viral hepatitis in Maharashtra population, four groups of viral hepatitis were compared with control groups-the Albumin (gm/dl) study had mean value of control was 4.35 (SD±0.13) 3.75(SD±0.01) t test value 44.08 in group A, 3.29 (SD±0.01) t test value was 77.1 in group B, 3.64 (SD±0.01) t test value 51.5 in group C, 3.23 (SD±0.03) t test value 79.5 in group D statistically p value was highly significant (p<0.01) in the study of Globulin (gm/dl), the mean value of control was 2.12 (SD±0.08), 3.22 (SD±0.01) t test value was - 124.8 in group A. 3.60 (SD±0.01) t test value - 167.8 in group B, 3.37 (SD±0.01) t test value - 141.3 in group C, 3.37 (SD±0.01) t test- 185.1 in group D. All the values were statistically highly significant (p<0.01). In the study of total proteins mean value of control group was 7.29(SD±0.05) 6.94 (SD±0.01) t test value was 67.3, in group A, 6.86(SD±0.01) t test value was 82.1 in group B, 6.99(SD±0.01) t test value was 67.8 in group D. All the values were statistically highly significant (Table-1,2,3) These values were more or less in agreement with previous studies.(5)(6)(7)

Role of liver in the metabolism of body proteins is illustrated in phases serum Albumin is believed to be synthesized solely in liver, hence hepatic diseases are directly related to variations in levels of S. Albumin, despite inadequate dietary intake. (8) Similarly, alpha Globulin including alpha-1 antitrypsin, glucoproteins, alpha-2 lipoproteins are also synthesized in the liver and Globulin levels are increased in chronic hepatic disease.

Variations in the values of S Albumin, Globulin, total proteins associated with portal cirrhosis with jaundice, edema or ascites are more pronounced.(9) (10) The question has been raised that, whether these alterations of serum proteins are the manifestations of hepatic dysfunction or of infection process, because somewhat similar abnormalities have been observed in infectious disease like STD (sexually transmitted Diseases) TB malaria, lympho granuloma venerium.(11) Hence precise interactions of serum proteins remains to be clarified

Summary and Conclusion

Serum protein changes occurring in liver diseases associated with parenchymal damage characteristically decrease in S Albumin and increased in gamma Globulin levels. As viral hepatitis poses a major health care burden. Hence, strategies to be effective controlling the problem to be needed and vaccination has to be mandatory. Virus transmitted through fecal, oral route can be effectively controlled, by hygienic awareness. Infections through blood and blood products require awareness among people. But this study demands further patho-physiological, nutritional, genetic study because the exact pathogenesis of hepatitis is still un-clear.

This research paper was approved by ethical committee of government medical college Aurangabad-Maharashtra).

Conflict of Interest: No

Source of Funding: No

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Vitamin D Receptor Polymorphisms and Correlated with Some Chronic Diseases among Iraqi Women

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Abstract

The VDR (vitamin D receptor) is one of the key genes that may be associated with the reduced effectiveness of vitamin D. This study was performed to describe the potential role of the VDR genetic variation in with the development of cardiac, arthritis, and urinary tract diseases in patients with vitamin-D deficiency in the Middle Euphrates region of Iraq using PCR-sequencing strategy. Genomic DNA was extracted from eighty female blood specimens. Then, polymerase chain reaction (PCR) followed by direct dideoxy sequencing reactions were performed. Eight single nucleotide polymorphisms (SNPs) were observed in the VDR amplified fragment, which were distributed amongst the analyzed specimens. Within the observed SNPs, five previously known SNPs were detected, two of them had intronic variations, including rs11574113 and rs11574114, while other three SNPs had synonymous variations, including rs731236, rs765762631, and rs550308645. Whilst, three novel SNPs were identified in the present study, one of them was an intronic variant, g.64366C>T, while the other two variants had synonymous variations, g.64932G>A and g.65214C>T. The most frequent mutation in in intronic part was in urinary tract disease (G>C) (40%) p< 0.01 and cardiac disease (G>C) (25%) p< 0.05. additionally the most frequent mutation in exonic part was in cardiac disease (C>G) and (C>T) both (29%) p< 0.05 and urinary tract disease (C>G) and (C>T) both (23%) p< 0.05. another mutation was obtained in all the control and patients of all diseases (C>T) but it was not significant. Finally out of eight mutations three were novel and five were registered in NCBI website. In conclusion, the present pilot study has provided a practical guide to potentially associate VDR fragment with the progression of desired diseases in the Middle Euphrates region of Iraq.

Keywords: Vitamin D, Polymorphisms, Chronic Diseases.

Introduction

Vitamin D is a steroid hormone with important physiological roles in several organs and tissues. It obtained from foods or by synthesis in the skin after sunlight exposure (Ultraviolet rays) and converted to the active form in the liver and kidneys. 1,25-Vitamin D$_3$ (1,25-D$_3$) is the functional form of vitamin D (Figure 1.1), and known for its role in calcium and phosphate homeostasis. Further, Vitamin D insufficiency has been related with several health consequences, including bone infection, tumor, autoimmune diseases, infectious disorder, type 1 and type 2 diabetes, hypertension, and cardiac disease.

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Figure-1: Vitamin D structure.

It plays an active role in the multiplying and discrimination of different cell type. Vitamin D cause suppression of specific inflammatory pathways.
and reduces inflammatory cytokine production by human periodontal ligament cells. Suggestions are progressively presenting that vitamin D insufficiency is an unrecognized and communal healthiness problem in several age groups. In addition, in different situations like mature medicinals inpatients, postmenopausal women showing with hip rupture, and homebound elderly individuals. However, there is no information accessible regarding the prevalence of Vitamin D insufficiency amongst healthy females in Middle East. Vitamin D shows a main role in renal pathophysiology. Patient with glomerular disorder has a damaged renal filtering barrier, causing proteinuria and decrease the renal function. Therefore, additionally to presence a significance of renal deficiency, it has been theorize that 1,25-D3 insufficiency itself may also cause renal damage. Newly, vit-D3 has been presented to probably assist as a therapeutic cause in RA (Rheumatoid arthritis) patients. Infections and autoimmune responses show a central character in RA progress and development, in addition to genetics and environmental reasons. Vit-D can also prevent the production of B-cells and stimulate apoptosis, leads to reduced autoantibody construction due to reduced plasma cell manufacture and antibodies class substituting. Furthermore, vit-D declines auto-reactivity by controlling the pro-inflammatory and antinflammatory cytokines produced by APCs (antigen-presenting cells). Polymorphism of the vit-D receptor (VDR) and 1-a-hydroxylase genes may also conform the susceptibility.

Vitamin D receptor polymorphisms: The VDR gene is positioned in the homo sapiens 12q12-q22 section and comprises more than 470SNPs (single nucleotide polymorphisms), some of which control 1,25 dihydvyitamin D3 approval. The greatest communal variations of the VDR contain rs228570 variation in exon 2 and rs1544410 variation positioned in the intron13 between exons 8 and 9 (Figure 1.2). Variation of the targets genes transcript was described to have a relationship with vit-D stimulation, through Vitamin-D Receptor (VDR), therefore vitamin D might have an effect at the cell function levels. Valuation of the vit-D receptor gene polymorphism exposed inconstant arrangement including ApaI (VDR 7975232 C>T), FokI (VDR 2228570 C>T), TaqI (VDR 731236 T>C), and BsmI (VDR 1544410 A>G). Among these, particular polymorphisms were described to be linked with diabetes mellitus, arthritis, obesity, cardiac, and urinary tract diseases. A small number of researches have considered VDR gene variations for relations with the possibility of some disorders. Consequently, several researches have considered the genetic factors of this vitamin. Currently investigations in the procedures of important genetic suggestion, assisted to categorize the genetic causes of vit-D ratio and investigate its associations to many disorders. For that reason, recognizing the relationship between vit-D serum ratio and the variations in VDR gene with the happening of some diseases would have significant satisfying suggestions in standard medication.

Materials and Method

DNA extraction: DNA samples were extracted according to the instruction manual that was described by manufacturers (Bioneer, Korea). The concentration and purity of DNA were measured by a nanodrop (BioDrop μLITE, BioDrop co., UK), while the DNA integrity was checked by a standard 0.8% (w/v) agarose gel electrophoresis that is pre-stained with a higher concentration of ethidium bromide (0.7 μg/ml) in TAE (40 mM Tris-acetate; 2 mM EDTA, pH 8.3) buffer, using a 1 kb ladder as a molecular weight marker.
The lyophilized primers were purchased from Bioneer (Bioneer, Daejeon, South Korea). The PCR reaction was performed using AccuPower PCR premix (Cat # K-2012, Bioneer, Daejeon, South Korea). The following program was applied in PCR thermocycler (My Genie TM 96/384 Thermal Block, Bioneer, Daejeon, South Korea). The amplification was begun by initial denaturation at 94°C for 5 min, followed by 30 cycles of denaturation at 94°C, annealing at 65°C, and elongation at 72°C, and was finalized with a final extension at 72°C for 10 min. Amplification was verified by electrophoresis on an ethidium bromide pre-stained 1.5% (w/v) agarose gel in 1× TBE buffer using a 100-bp ladder (Cat # D-1010, Bioneer, Daejeon, South Korea) as a molecular weight marker. It was made sure that all PCR resolved bands are specific and consisted of only one clean and sharp band in order to be submitted into sequencing successfully.

DNA Sequencing: The PCR amplicons of Eighty of female patients were commercially sequenced from their forward termini according to instruction manuals of the sequencing company (Macrogen Inc. Geumchen, Seoul, South Korea). Only clear chromatographs obtained from ABI sequence files were further analyzed, ensuring that the annotation and variations are not because of PCR or sequencing artifacts. By comparing the observed DNA sequences of local specimens with the retrieved DNA sequences of VDR DNA sequences (GenBank acc. no. NG_008731.1), the exact positions and other details of the retrieved PCR fragments were identified. The sequencing files of the PCR products of different samples were edited, aligned, and analyzed as long as with the respective sequences in the reference database using BioEdit Sequence Alignment Editor Software Version 7.1 (DNASTAR, Madison, WI, USA). The observed variation in each sequenced sample was numbered in PCR amplicons as well as in its corresponding position within the referring genome. The novelty of the observed SNPs were checked by dbSNP server (https://www.ncbi.nlm.nih.gov/projects/SNP/).

Results

The alignment results of the sequenced samples with the reference sequences had revealed the presence of eight SNPs that were distributed variably in the studied VDR amplicons. The sequencing chromatogram of the observed substitution mutation is shown in (Fig. 4).

The observed SNPs were variably distributed in the analyzed samples. However, the identified SNPs of the present study were divided into two main categories according to their position; intronic variants...
and synonymous counterparts. Regarding the intronic variants, four SNPs were identified in the current study, two of them were novel, including g.64366C>T and g.64932, g.64915, while the other two had previously been identified, including g.64915G>C (rs11574113) and g.64978 (rs11574114).

Figure 4. The pattern of DNA chromatogram of the 2175 bp amplicons of the VDR locus. The observed substitution mutations are highlighted according to its position in the PCR product.

Regarding the synonymous variants, four SNPs were detected too. Three of the observed synonymous SNPs were found to be known previously, including g.65058T>C (rs731236), g.65166C>G (rs765762631), and g.65259 (rs550308645), while the only observed novel synonymous SNP was g.65214C>T. However, no missense SNP was observed in the present study. Thus, the resulting vitamin D3 receptor had no substitution in its amino acid sequences. To summarize all the results obtained from the sequenced 2175 bp fragment, the exact description of the observed variations is listed according to its corresponding position within the NCBI referring sequences as it’s shown in Table 2.

Table-2. The pattern of the observed single nucleotide polymorphisms (SNPs) in comparison with the NCBI referring sequences of 2175 bp amplicons of the VDR locus (GenBank acc. no. NG_008731.1).

<table>
<thead>
<tr>
<th>No.</th>
<th>Wild-type</th>
<th>Allele</th>
<th>Position in the amplicon</th>
<th>Position in NCBI web server</th>
<th>Position in the protein</th>
<th>Type of SNP</th>
<th>SNP Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>C</td>
<td>T</td>
<td>1032</td>
<td>64366</td>
<td>NA</td>
<td>Intronic variant</td>
<td>Novel</td>
</tr>
<tr>
<td>2</td>
<td>G</td>
<td>C</td>
<td>1581</td>
<td>64915</td>
<td>NA</td>
<td>Intronic variant</td>
<td>rs11574113</td>
</tr>
<tr>
<td>3</td>
<td>G</td>
<td>A</td>
<td>1598</td>
<td>64932</td>
<td>NA</td>
<td>Intronic variant</td>
<td>Novel</td>
</tr>
<tr>
<td>4</td>
<td>G</td>
<td>T</td>
<td>1644</td>
<td>64978</td>
<td>NA</td>
<td>Intronic variant</td>
<td>rs11574114</td>
</tr>
<tr>
<td>5</td>
<td>T</td>
<td>C</td>
<td>1724</td>
<td>65058</td>
<td>Ile352</td>
<td>Synonymous variant</td>
<td>rs731236</td>
</tr>
<tr>
<td>6</td>
<td>C</td>
<td>G</td>
<td>1832</td>
<td>65166</td>
<td>Ala388</td>
<td>Synonymous variant</td>
<td>rs765762631</td>
</tr>
<tr>
<td>7</td>
<td>C</td>
<td>T</td>
<td>1880</td>
<td>65214</td>
<td>Leu404</td>
<td>Synonymous variant</td>
<td>Novel</td>
</tr>
<tr>
<td>8</td>
<td>C</td>
<td>T</td>
<td>1925</td>
<td>65259</td>
<td>Leu419</td>
<td>Synonymous variant</td>
<td>rs550308645</td>
</tr>
</tbody>
</table>

The correlations between the observed mutations in VDR gene with cardiac, urinary tract infection, and arthritis diseases have been summarized in table 3.3.
Table-3: Correlation between the observed mutations in VDR gene with the desired diseases.

<table>
<thead>
<tr>
<th>Mutation</th>
<th>Type</th>
<th>Cardiac</th>
<th>Urinary Tract Infection</th>
<th>Arthritis</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>C&gt;T</td>
<td>Intronic</td>
<td>All</td>
<td>All</td>
<td>All</td>
<td>N.S</td>
</tr>
<tr>
<td>G&gt;A</td>
<td>Intronic</td>
<td>-</td>
<td>20%</td>
<td>-</td>
<td>P=a</td>
</tr>
<tr>
<td>G&gt;C</td>
<td>Intronic</td>
<td>25%</td>
<td>40%</td>
<td>-</td>
<td>P=a, P=b</td>
</tr>
<tr>
<td>G&gt;T</td>
<td>Intronic</td>
<td>28%</td>
<td>19.4%</td>
<td>-</td>
<td>P=a both</td>
</tr>
<tr>
<td>T&gt;C</td>
<td>Silent</td>
<td>25%</td>
<td>-</td>
<td>-</td>
<td>P=a</td>
</tr>
<tr>
<td>C&gt;G</td>
<td>Silent</td>
<td>29%</td>
<td>23%</td>
<td>-</td>
<td>P=a</td>
</tr>
<tr>
<td>C&gt;T</td>
<td>Silent</td>
<td>29%</td>
<td>23%</td>
<td>-</td>
<td>P=a both</td>
</tr>
<tr>
<td>C&gt;T</td>
<td>Silent</td>
<td>-</td>
<td>20%</td>
<td>-</td>
<td>P=a</td>
</tr>
</tbody>
</table>

N.S = non-significant, P=a (< 0.05), P=b (< 0.01)

**Discussion**

This is the first genetic research associated to vitamin D receptor polymorphisms and linked with some kinds of diseases among females in Iraq. There are rising suggestions of the impact of vit-D in human health; also there are studies through the world to determine its rate and several health influences because of its insufficiency. As the rise of acknowledgment of people in Iraq with the vitamin D3 especially female gender encourage us to study the genetic background about VDR gene and check if there is any defect or mutation that leads to reduce the vitamin D3 level in female body.

Vitamin D insufficiency is becoming an international growing issue. It must not be disregarded, not only because of the totally known significances vit-D insufficiency has on bone health, but mostly as modern researches have presented how the naturally active type of vit-D – 1,25(OH)2D – is implicated in several biological method, comprising immune-system modification. Patients affected through many autoimmune issues presented less rate of vit-D. Though, it is not constantly clear whether vit-D insufficiency is the reason or rather reduced because of the disease17. A Meta-analysis presented that Vit-D may be used for the cure of a large number of disorders. It has a biological advantage in skeletal mineralization and increase in phosphorus and calcium serum rates18.

The observed mutations were variably distributed in the analyzed samples. However, the identified mutations of the present study were divided into two main categories according to their position: intronic variants and synonymous counterparts. Regarding the intronic variants, four mutations were identified in the current study, two of them were novel, including g.64366C>T (Non-significant for all disorders) and g.64932 G>A (P<0.5) presented only in urinary tract infections (UTI), while the other two had previously been identified g.64915 G>C (rs11574113) (P<0.5 for cardiac disorder and P<0.01 for urinary tract infection) and g.64978 G>T (rs11574114) (P<0.5 in both cardiac and urinary tract disorders). Regarding the synonymous variants, four mutations were detected too. Three of the observed synonymous SNPs were found to be known previously, including g.65058T>C (rs731236) (P<0.5 for cardiac disorders only), g.65166C>G (rs765762631) (P<0.5 for both cardiac and UTI again), and g.65259 C>T (rs550308645) (P<0.5 for both cardiac and UTI also), while the only observed novel synonymous SNP was g.65214C>T (P<0.5 only in UTI). However, no missense mutation was observed in the present study. Thus, the resulting vitamin D3 receptor had no substitution in its amino acid sequences. In addition there was no mutation correlated with arthritis disorder not from the register mutation or from the novel one.

**Conclusion**

As a result the polymorphism in VDR gene has no correlation between urinary tract, cardiac, and arthritis diseases with any mutation presented in VDR gene. In conclusions VDR gene has no effect on vitamin D deficiency, decreasing in vitamin D level might be due to less exposure to sun light, also the decreasing in vitamin D level might be due abnormal diet system and In addition also decreasing in vitamin D level might be as a result of effect of some drugs or GMO food.

**Conflict of Interest:** None

**Funding:** Self

**Ethical Clearance:** Not required.
References


Estimation of Serum Level of Micro RNA 224 in Different Stages of Hepatocellular Carcinoma

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¹Tropical Medicine Department, Faculty of Medicine, Minia University

Abstract

Background: Hepatocellular carcinoma (HCC) is the fifth common cause of cancer iaround the world, and the third common cause of death related to cancer. miR-224 done an important role in cell proliferation, migration, invasion, and antiapoptosis in HCC by binding to its gene targets. So, miR-224 can be used an important biomarker for predicting the aggressiveness of HCC.

Aim of study: to evaluate its role in predicting aggressiveness of HCC through detecting its level across different stages of hepatocellular carcinoma.

Method: An observational study, in Tropical Medicine Department, El-Minia University Hospital, El-Minia, Egypt. Patients with hepatocellular carcinoma on top of HCV induced Liver cirrhosis collected among the patients of tropical medicine department from January 2017 to January 2018. Patients were divided into 3 groups according to Barcelona classification of liver cancer (BCLC) into, group 1 with BCLC A, group 2 with BCLC B, group C with BCLC C, and control group of LC without HCC, for all groups: history, examination and routine investigations, abdominal ultrasound, Multislice CT scan and miR-224 assay were done.

Results: There was a significant difference between the level of miR 224 in different stages of hepatocellular carcinoma with the lowest level in BCLC A and the highest level in BCLC C with P value 0.001 indicating its role in predicting aggressiveness of hepatocellular carcinoma.

Conclusion: miR-224 could serve as a good prognostic biomarker for HCC, and can be used as a marker predicting aggressiveness of HCC.

Keywords: LC. Hepatocellular carcinoma. miR–224.

Introduction

Hepatocellular carcinoma (HCC) is the fifth common cancer in men and ninth common in women, however the second common cause of death from cancer worldwide¹. The occurrence of HCC is highest in those with hepatitis C and hepatitis B related cirrhosis, however even those patients with noncirrhotic hepatitis C virus (HCV) or hepatitis B virus (HBV) are risk for HCC. Patients with cirrhosis, whatever the etiology, are at high risk for the occurrence of HCC². American Association for the Study of Liver Diseases (AASLD) guidelines recommend screening at risk patients for HCC every 6 months with an ultrasound, however other societies recommend a-fetoprotein in addition to ultrasound for increased sensitivity of screening³. Those patients who are not found to have hepatocellular carcinoma until symptoms develop have a 0% to 10% 5-year survival, whereas those patients whose HCCs are detected at an early stage have a 5-year survival that exceeds 50% with specific treatment⁴. HCV causes HCC mainly by encouraging continuous inflammation and hepatocyte regeneration as it causes chronic hepatitis and subsequent development of cirrhosis, which can
lead to chromosomal damage and subsequent hepatic carcinogenesis\(^{(5)}\).

MicroRNAs (miRNAs), single-stranded nocloding RNAs consisted of 19–25 nucleotides, doing approximately 1% of the human genome, however can regulate more than 50% of all protein-coding genes\(^{(6)}\).

miRNAs are important factors in cancer development and progression, miRNAs can work as both tumor suppressors (by binding to oncogenes and inhibiting them) and oncogenes (by binding to tumor suppressor genes and inhibiting them)\(^{(7)}\).

Zhang et al. reported that miR-224 possess an important role in cell proliferation, migration, invasion, and antiapoptosis in hepatocellular carcinoma through direct combining to its gene targets\(^{(8)}\). Thus, miR-224 thought be a promising biomarker for predicting the aggressiveness of HCC.

**Patients and Method**

**Subjects:** This study included thirty five patients with hepatocellular carcinoma (HCC) on top of hepatitis C virus (HCV) related liver cirrhosis and twenty patients with liver cirrhosis without hepatocellular carcinoma, matched for age and sex to studied group, as control group, all the patients were selected from the visitor to Tropical Medicine Department El- Minia university hospital. All HCC patients were classified according Barcelona classification for liver cancer (BCLC) into

- **Group A:** fifteen patients with Barcelona classification stage A (BCLC stage A): single nodule or not more than 3 nodules, their size not more than 5 cm, diagnosed as HCC by 4-phase MDCT,
- **Group B:** ten patients with BCLC stage B: multiple nodules with size more than 5 cm with no vascular invasion,
- **Group C:** Ten Patients with BCLC stage C: multiple foci with vascular invasion (portal vein thrombosis).

**Blood sampling**

Peripheral blood samples were withdrawn from all subjects under complete aseptic conditions. A total of about 8 ml of blood were collected. 2 ml of blood was withdrawn into an EDTA tube for complete blood picture (CBC) which was analyzed with automated cell counter Sysmex KX-21N (TAO Medical incorporation, Japan). 1.8 ml of blood was collected in a citrated tube (3.2% trisodium citrate) for prothrombin time and concentration (PT and PC) which was evaluated by STAGO COMPACT CT Coagulation Analyzer (Diamond Diagnostics, USA). The last 4 ml of blood was evacuated in a plain tube, left to clot and centrifuged at 3000 revolutions per minute (rpm) for 5 minutes. The serum was then separated and liver function tests (AST, ALT, Alkaline phosphatase, bilirubin, total protein and albumin) were detected immediately using fully automated clinical chemistry auto-analyzer system Konelab 20i (Thermo Electron Incorporation, Finland). The remaining serum was aliquoted and stored at -70°C till used for further assessment of serum AFP, and miR-224.

**Laboratory method:** Serum AFP was determined by EIA kit according to the manufacturer’s instructions using anti-AFP antibodies for quantitative detection of human AFP (EIAab-China).

**Assay of miR-224:** Small RNAs were extracted from 500 L of serum using a miR-PARIS kit (AM1556) according to the manufacturer’s instructions.

**RNA Isolation:** To allow for normalization of sample-to-sample variation in RNA isolation, synthetic Caenorhabditis elegans miRNAcel-miR-54 (purchased as a custom RNA oligo nucleotide from Qiagen) was added (50 pmol/L in a 5 L total volume) to each denatured sample.

**Quantitative Real-Time Reverse-Transcription-(RT-) PCR Assays:** We used TaqMan miRNA probes (Applied Biosystems) to perform qRT-PCR assays according to the manufacturerc’s instructions.

- Briefly, 2 L aliquot of enriched smallRNAs from serum samples was reverse transcribed using the Taq-Man MicroRNA Reverse Transcription Kit (Applied Biosystems, San Diego, CA).
- Then 2 L of the cDNA solution was used as template for the PCR stage.
- No-template controls for both RT step and PCR step were included to ensure target specific amplification.
- All reactions were run in duplicate.
- The CT(cycle threshold) (number of cycles required for the fluorescent signal to exceed back ground level) values of the different samples were compared using the ΔΔCT method (the difference between CT of MIR224 and CT of cel-miR -54). The relative expression levels of target miRNAs were normalized by cel-miR-54.
Statistical analysis: All collected data were analyzed statistically using statistical package for social sciences (SPSS) program version 20.0 (SPSS Inc., Chicago, IL, USA). The quantitative data were presented as mean ± standard deviation (SD) while the qualitative variables were described as number and percentage. Results were expressed as tables and Figures. Graphics were done by Excel Microsoft Office 2010. Student t-test was used to compare results between groups as regards quantitative data. P-values equal to or less than 0.05 are statistically significant.

Results

Table 1: shows the demographic data of studied groups of patients with HCC and control group of patients with LC:

<table>
<thead>
<tr>
<th></th>
<th>HCC (n=35)</th>
<th>LC (n=20)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in years (mean ± SD)</td>
<td>52±4</td>
<td>48±10</td>
<td>0.544</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>17(48.6%)</td>
<td>8(35%)</td>
<td>0.889</td>
</tr>
<tr>
<td>Female</td>
<td>18(51.4%)</td>
<td>12(65%)</td>
<td>0.887</td>
</tr>
</tbody>
</table>

It was found that the mean age for HCC patients was 52±4, the mean age for control group was 48±10 with no statistically significant difference. (48.6%) were males and (51.4%) were females in HCC group while (35%) were males and (65%) were females in LC group with no statistically significant difference.

Table 2: shows the demographic data of the different three groups of patients with HCC and the group of patients with LC:

<table>
<thead>
<tr>
<th>Patients groups</th>
<th>Patients with HCC (n=35)</th>
<th>Patients with LC (n=20)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in years (mean ± SD)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group A (n=15)</td>
<td>45±11</td>
<td>48±10</td>
<td>0.776</td>
</tr>
<tr>
<td>Group B (n=10)</td>
<td>55±8</td>
<td>63±8</td>
<td>0.776</td>
</tr>
<tr>
<td>Group C (n=10)</td>
<td>57±9</td>
<td>114.6±1.4</td>
<td>0.001</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>8(55%)</td>
<td>8(35%)</td>
<td>0.545</td>
</tr>
<tr>
<td>Female</td>
<td>7(45%)</td>
<td>12(65%)</td>
<td>0.667</td>
</tr>
</tbody>
</table>

Shows the demographic data of the different three groups of patients with HCC and the group of patients with LC. As regard HCC patients, the mean age for group A was 45±11 years, the mean age for group B was 55±8 years, the mean age for group C was 57±9 years with no statistically significant difference. (55%) were males and (45%) were females in group A, (40%) were males and (60%) were females in group B and (50%) were males and (50%) were females in group C with no statistically significant difference.

Table 3: The mean levels of laboratory data in different HCC groups:

<table>
<thead>
<tr>
<th>Lab parameters mean±SD</th>
<th>HCC patients (n=35)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>HB (gm%) Mean±SD</td>
<td>Group A</td>
<td>Group B</td>
</tr>
<tr>
<td></td>
<td>11.3±1.3</td>
<td>10.3±1.4</td>
</tr>
<tr>
<td>Platelets Mean±SD</td>
<td>165.801±6515</td>
<td>110.803±8159</td>
</tr>
<tr>
<td>ALT (IU/ml) Mean±SD</td>
<td>28.8±7.8</td>
<td>63.8±6.3</td>
</tr>
<tr>
<td>Bilirubin (mg/dl) Mean±SD</td>
<td>1.1±0.29</td>
<td>2.9±0.003</td>
</tr>
</tbody>
</table>

P1:group A versus group B  P2:group A versus group C  P3:group B versus group C
It was found that there were statistically significant differences between the mean levels of HB, with the highest level in group A 11.3±1.3 and lowest level in group C 9.7±0.9 (p value 0.001,0.001, 0.001 respectively), the highest mean ALT level was in group C 114±1.4 and lowest level in group A 28±7.8 (p value 0.001,0.001, 0.001 respectively), also the highest bilirubin level was in group C 5.6 ±0.1 and lowest level in group A 1.1±0.29 (p value 0.001,0.001, 0.001 respectively). In addition there was statistically significant difference between the mean level of platelet count among different HCC groups (p value 0.001,0.001, 0.001 respectively).

### Table 4: The mean of level of miR 224 in studied patients of HCC and control groups:

<table>
<thead>
<tr>
<th>Variant</th>
<th>HCC patients</th>
<th>Control Group</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>miR 224 (CT value)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Group A</td>
<td>Group B</td>
<td>Group C</td>
</tr>
<tr>
<td></td>
<td>8.9±0.4</td>
<td>11.7 ± 0.5</td>
<td>14.4±0.6</td>
</tr>
<tr>
<td></td>
<td>6.1±1.3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


This table shows the mean of serum level of MiR 224 in the different groups of patients of HCC and control group of patients with LC, there were statistically significant differences between the mean level of MiR 224 in the different HCC groups and also between different HCC groups and control group of LC (p value 0.001).

### Table 5: The mean of serum level of miR 224 in HCC patients versus control group of LC:

<table>
<thead>
<tr>
<th>Variants</th>
<th>HCC (n=35)</th>
<th>Control Group (n=20)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>miR 224 (CT value) (Mean ± SD)</td>
<td>11.6±0.5</td>
<td>6.1±1.3</td>
<td>0.001</td>
</tr>
</tbody>
</table>

This table shows the mean serum level of miR 224 among the groups of HCC patients and control group of LC, there was statistically significant difference between the mean serum level of miR 224 in HCC patients (11.6±0.5) versus control group of LC (6.1±1.3) (p value 0.001).

### Table 6: Correlation between level of miR 224 and laboratory parameters in studied groups of patients with HCC

<table>
<thead>
<tr>
<th>Variants</th>
<th>miR 224 (CT value)</th>
<th>R</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>AFP</td>
<td>0.667</td>
<td>&lt; 0.001*</td>
<td></td>
</tr>
<tr>
<td>HB%</td>
<td>-0.532</td>
<td>&lt; 0.01*</td>
<td></td>
</tr>
<tr>
<td>Bilirubin</td>
<td>0.737</td>
<td>&lt; 0.001*</td>
<td></td>
</tr>
<tr>
<td>ALT</td>
<td>0.544</td>
<td>0.001</td>
<td></td>
</tr>
<tr>
<td>Platelets count</td>
<td>0.07</td>
<td>0.7</td>
<td></td>
</tr>
</tbody>
</table>

This table shows the Correlations between level of miR 224 and the laboratory parameters in studied groups of patients with HCC and those with LC, There were statistically significant correlations between level of miR 224 and the mean level of AFP, HB, total bilirubin and ALT level (p value 0.001, 0.01,0.001,0.001 respectively), however there was no statistically significant correlation between level of miR 224 and platelet count (p value 0.7).

### Discussion

Hepatocellular carcinoma (HCC) constitute the fifth common cancer and the second most frequent cause of cancer-related death around the world, with 854,000 new cases and 810,000 deaths per year, constituting for 7% of all cancers. Hepatocellular carcinoma (HCC) make about 90% of primary liver cancers and constitutes a major health problem all around (8), miR-224 is one of the commonly over expressed miRNAs in hepatocellular carcinoma (HCC) (9). The upregulation of miR-224 starts form the precancerous stage and completed throughout HCC development (10).

When evaluating the ability of MiR- 224 in predicting progression and prognosis of HCC, we found that the serum level of miRNA 224 was increased as the tumor grade increase with its lowest level in BCLC A and its highest level in BCLC C, and these results was significant (P value 0.001), denoting the ability of MiR-224 to predict the disease progression of HCC.

These results were consistent with results of (11), who found the same results in their study of 50 HCC patients.
and 20 healthy volunteers, and they found statistically significant difference between levels of MiR-224 in different grades of HCC (P value 0.02) (11).

This also was consistent with the results of (12) who studied One hundred and eighty-two patients. The majority of patients were men and long-term hepatitis B virus (HBV) related cirrhosis. Of the 182 patients with HCC, the serum MiR-224 levels were significantly higher in the stage C patients compared with the stage A and B patients (P= 0.005) (12).

In addition we found that the serum level of miR-224 was significantly correlated with Child grading and parameters of liver damage as serum bilirubin, serum ALT and AST. The results showed that serum levels miR-224 showed significant correlation with parameters of severity of liver damage, such as ALT, AST, and bilirubin level (P values were 0.001).

This was consistent with study of (12), who found a significant correlation between level of miR-224 and liver related parameters (ALT, bilirubin level) in their studied patients (P value 0.001), also this was consistent with results of (11), who studied 50 hepatocellular carcinoma patients, and found strong correlation between miR-224 level and liver related parameters such as ALT, and bilirubin level (P value 0.001).

The possible mechanisms might be that liver damage induced inflammation activated inflammatory pathways, such as p65/NFkB. And p65/NFkB is identified as a direct transcriptional regulator of miR-224 expression.

This study was approved by the Institutional Ethics Committee of School of Medicine, Minia University, Egypt, and all patients gave informed consent before participation in this study. The study conducted in accordance with the ethical guidelines of the 1975 Declaration of Helsinki and International Conference on Harmonization Guidelines for Good Clinical Practice.

Source of Funding: None

Conflict of Interest: The authors declare that there are no conflict of interests.

References
Histopathological Changes of Mice Immunized by Serratia Marcescens Whole Cell Sonicated Antigens

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Abstract

The research was designed to prepare sonicated antigen of *Serratiamarcescens* and evaluate its histopathological effect of mice organs which include (liver, spleen, lung and kidney). For this purpose, 24 mice randomly divided into four groups. The first group was immunized with killed whole cell sonicated *Serratiamarcescens* (KWCSA-SM) (1000 µg/ml) subcutaneously. Second group was immunized with killed whole cell sonicated *S.marcescens*(KWCSA-SM) (500 µg/ml) subcutaneously. Third group was immunized with whole cell *S.marcescens* (1000cfu/ml) subcutaneously, 4th group was injected by P.B.S.(pH7.2) as negative control group. Histopathological changes many showed differences between the first group which characterized by sever lesion and other immunized groups, compared with the control group which showed mild lesion in their organs which include severe mononuclear cells infiltration in the interstitial tissue with acute cellular degeneration of epithelial cells.

**Keyword:** *Serratiamarcescens, Antigens, Histopathological changes, Mice.

Introduction

*S. marcescens* is a species of rod-shaped gram-negative bacteria in the family Enterobacteriaceae. A human pathogen, it is involved in hospital-acquired infections (HAIs), particularly catheter-associated bacteremia, urinary tract infections and wound infections[1]. *S. marcescens* can cause infection in several sites, including the urinary tract, respiratory tract, wounds[2] and the eye, causing conjunctivitis, keratitis, endophthalmitis, and tear duct infections[3]. It is also a rare cause of endocarditis and osteomyelitis (particularly in people who use intravenous drugs recreationally), pneumonia, and meningitis[4]. *S. marcescens* characteristics; unique membrane (LPS) as a Gram-negative bacterium, the ability to survive in aerobic and anaerobic conditions, and its motility[5]. Most strains are resistant to several antibiotics because of the presence of R-factors (genes coding for antibiotic resistance) on plasmids[6]. There are many diseases that are associated with *S. marcescens*: sepsis, bacteremia, meningitis and cerebral abscesses, urinary tract infections, osteomyelitis, ocular infections, and endocarditis[7]. Also, as mentioned in the cell structure, the LPS layer is attached to the outer membrane of the Gram negative bacteria. The LPS acts as an endotoxin (a cell component that is harmless as long as the pathogen remains intact). The release of LPS would over-stimulate the host defenses and cause them to undergo lethal endotoxic shock[8].

The innate immune system initiates host defense against invasive microbial pathogens using specific recognition mechanisms. Here we review the current concepts and the molecular basis of innate immune responses to bacterial infections, focusing our attention on the actors involved in the response to Gram-negative bacteria. Lipopolysaccharide (LPS) is the major virulence factor of Gram-negative bacteria. During the past decade, enormous progress has been obtained in the elucidation of LPS recognition and signaling in mammalian phagocytes. According to the current model, recognition of LPS is initialized by the cooperative interplay between the LPS-binding protein (LBP), the membrane-bound or soluble forms of CD14 and the recently identified Toll-like receptor 4 (TLR4)-MD-2 complex. Recognition of LPS leads to the rapid activation of an intracellular signaling pathway, highly homologous to the signaling pathway of interleukin-1, which results in the release of pro-inflammatory mediators. In vivo models in which animals are challenged with LPS or Gram-negative bacteria have highlighted opposite roles for LBP, CD14 and TLRs. Regarding LPS challenge, there is a large body of evidence in favor of a detrimental role played by LBP, CD14 and TLRs. These molecules sensitize the host to a LPS-induced uncontrolled acute
inflammatory response that results in animal death. However, when the host is in the presence of virulent Gram-negative bacteria, the invading pathogens must be held in check by the innate immune system until a specific immune response is mounted. Under these conditions, LBP, CD14 and TLRs are required to trigger a pro-inflammatory response which is crucial for keeping infection under control. Therefore, caution should be the rule about the development of therapeutic approaches aimed at blocking the pro-inflammatory response during Gram-negative infections. Prodigiosin can trigger a body’s immune system (antibodies and T cells), so it is possible that _S. marcescens_ living in a human body will limit prodigiosin synthesis and hence escape detection by the host’s immune system. Many strains appear to have lost the ability to produce it at all.

Prodigiosin characterized by apoptotic action and the morphological analysis to those cells demonstrated that Prodigiosin induced shrinkage chromatin condensation.

Many other aspects of pathogenicity and virulence of _S. marcescens_ have been studied including adherence and hydrophobicity LPS and extracellular products. This bacterium appears to modes of adherence to host epithelial surface. In keeping with its role as an agent of opportunistic infection, _S. marcescens_ was traditionally associated with low intrinsic pathogenicity. Whilst almost all isolates produce extracellular products such as DNase, chitinase, lecithinase, lipase, gelatinase and siderophores, it appears that in _S. marcescens_, these products do not act as potent virulence factors. Nevertheless, ongoing studies indicate that _S. marcescens_ may produce other invasive factors. Almost all isolates of _S. marcescens_ secrete a pore-forming hemolysis, The aim of study the histopathological effect of these antigens on body organs.

**Materials and Method**

1-Bacterial isolation: _Serratiamarcescens_ which was obtained from pathology Unit / College of Veterinary Medicine / Baghdad University and the diagnosis in central pulpic health labrotory was confirmed again according to API-20E system: (to Atlas, 1995)

2-Laboratory animals: A total number 24 mice of both genders which obtained commercially, were adapted for 1 week before started experiment by reared in separated clean and disinfected cages; they were fed on commercial assorted pellets and clean tap water.

**3-Antigen preparation: Serratiamarcescens_ Killed whole cell sonicated antigen was prepared according to Motive (1992) procedure:

1. Bacterial culture on nutrient agar was incubated at 37 °C for 48 hours to harvest a dense culture of bacteria; the bacteria were examined microscopically after staining with Gram stain to confirm a complete morphology of bacteria.

2. The bacteria was harvested by using PBS (pH 7.2), washed three times by PBS (pH 7.2) and then precipitated by centrifugation at 3000 rpm / 20 minutes.

3. The precipitate was re suspended with formalinized 0.3% PBS solution (pH 7.2); then incubated at 37 °C for 1-2 hours, after that kept in a refrigerator (4 °C) over night.

4. The bacterial suspension was washed three times with PBS (pH7.2) and then precipitated by centrifuge 3000 rpm / 20 minutes and then re suspended with PBS pH 7.2 according to McFarland tube (No. 3) (3x10⁸ CFU/ml) to be used for immunization.

5. The suspension was sonicated by ultra sonicator at 15 KHZ/sec. rate for 30 minutes’ intervals in a cold environment.

6. The sonicated suspension of bacteria was centrifuged at 3000 rpm / 20 minutes; the supernatant was filtered by Millipore filter (0.45µ), subsequent culture on Nutrient agar and blood agar and was microscopically examined to confirm a complete sonication and detected contamination. The suspension was kept frozen (-20C°) till estimating the protein concentration.

4-The protein concentration of _S. marcescens_ was measured by using Biuret method according to Henry (1974).

5-Laboratory animal (mice) immunization: Twenty-four mice of both sexes were used which were randomly divided into five equal groups (6 animals for each group), as follows:

1. The first group was immunized with 1 ml (1000µg/ml) of KWCSA-SM subcutaneously.

2. The second group was immunized with 1ml (500µg/ml) of KWCSA-SM subcutaneously.

3. The forth group (positive control group) was injected with 1 ml of (1000µg/ml) of KWCSA-SM subcutaneously.
4. The fifth group (negative control group) was immunized with 1 ml PBS (PH 7.2) subcutaneously.

5. At day 10 of immunization blood samples were collected from the direct puncture of the heart by sterile syringes for blood picture.

6. At day 20, 40, 60, blood samples (3ml) were collected from all animal groups for blood picture.

7. At day 60, challenge test was done by *S.marcescens* at dose cfu/ml for each animal orally.

**6-Histopathological examination:** After one week of challenge dose, the samples were collected from vital organs (liver, spleen, lymph nodes, kidneys and lung) of experimental animals: fixed in 10% buffer formaldehyde solution immediately after removal. After 72 hrs of the fixation the specimens were washed with tab water and then processing was routinely done with asset of upgrading alcoholic concentration from 70% to absolute 100% in each concentration; to remove water from the tissues, then clearance was done by xylol, then the specimens were infiltrated with semiliquid paraffin wax at 58°C on two stages, then blocks of the specimens were made with paraffin and sectioned by rotary microtome at 5 mm for all tissue.

All tissues were stained with hematoxylin and eosin stain and the histopathological changes were observed under microscope. (Luna and Lee, 1968).

**Results and Discussion**

**Histopathological changes:** The results showed significant differences in the histopathological changes between immunized rabbits groups and control group that suffer from sever histopathological lesions. As in control group.

In the group that immunized with sonicated *S. marcescens* 1000 µg/ml; The main lesions characterized by marked proliferation of lymphocytes on periarteriolar sheath in the spleen with hyperplasia of bronchial associated lymphoid tissue, in addition to lymphocytes aggregation in portal area and around bile ducts and mononuclear cells aggregation in portal area (Fig1-A)\[13\].

The immunized group with sonicated *S. marcescens* 500 µg/ml; Histopathological section showed proliferation of lymphocytes in bronchial associated lymphoid tissue, The liver expressed aggregation of inflammatory cells particularly mononuclear cells in liver parenchyma, marked proliferation of inflammatory cells particularly mononuclear cells in portal area and around bile duct,,also the spleen revealed proliferation of lymphocytes in periarteriolar sheath, the kidney shows no clear lesions (Fig-2A)\[14\].

The group that immunized with whole cell *S. marcescens* 1000 µg/ml only; Histopathological section in the liver shows congested of dilated sinusoids and mononuclear cells aggregation in portal area around blood vessels and hyperplasia of bile ducts with large area of hepatocytes degeneration characterized by foamy enlargement of hepatocytes and coagulative necrosis of hepatocytes with hemorrhage, the kidney shows acute cellular degeneration, the spleen shows depletion of white pulp, while Histopathological section in the lung shows no clear lesions.

The group which was immunized with P.B.S(pH7.2) (control group); Histopathological lesions showed mild lesion in their organs which include severe mononuclear cells infiltration in the interstitial tissue with acute cellular degeneration of epithelial cells.

The immune response influenced by many factors, such as type of the strain and injected antigen. As well as the efficacy of the vaccine to protect the animals against the virulent challenge dose \[15\].

*S.marcescens* like other enterobacteriaceae infiltration in several sites, including urinary tract, respiratory tract and showed acute cellular infiltration in urinary tract and proliferation of lymphocytes in bronchial associated lymphoid tissues.

In the liver, there is proliferation of kuffer cells and mononuclear cells aggregation around central veins. As well as, congestion of the blood vessels and infiltration of inflammatory cells in lumen \[16\].

*S. marcescens* replicate directly in the mucosa associated lymphoid tissue then disseminated via the mesenteric lymph nodes to liver and spleen, this induce broad immune response inducing cell – mediated, humoral and secretory immunoglobin A (IgA) antibody response \[17\].

IFN have increased numbers of IL – 4, IL – 5, IL – 6 secreting cells in peyers patches, and the continued persistence of *S. marcescens* in the infected macrophages results in activation of *S. marcescens*specific Th2 cells and activation of humorl immunity \[18\].
Ericson and Waldschmidt, 1998 have shown that antibody secretion IgM and IgG and B cells proliferation is enhanced by Th2 clones S. LPs – TLR4 in the kuffer cells signaling plays important role in the generation of both innate and adaptive immunity [19]. The common route of intestinal entry involves M cells, then access to B cells rich peyers patches, B cells phagocyte S. marcescens upon recognition by the specific Ig receptors (BCR) [17].

Spleenomegaly commonly results from systemic S. marcescens infection. Although this increase in splenic cellularity is often due to the recruitment of leukocytes [18].

CD 4 T cells are represent as the specific cells for S. marcescens. Such cells localize to the peyers patches of the small intestine [19].

Fig(1-A): Section in the kidney of animal treatment with 1000 shows severe mononuclear cells infiltration in the interstitial tissue with hyaline cast in the lumen of renal tubules and atrophy of glomerular tufts (H and E stain 400X).

Fig(1-B): Section in the kidney of animal treatment with 1000 shows severe mononuclear cells infiltration in the interstitial tissue with acute cellular degeneration of epithelial cells of renal tubules (H and E stain 400X).

Fig(1-C): Section in the kidney of animal treatment with 1000 shows mononuclear cells infiltration in the interstitial tissue with pinkish protinous material in dilated renal tubules and acute cellular degeneration of epithelial cells of renal tubules (H and E stain 400X).

Fig(2-A): Section in the kidney of animal treatment with 500 shows severe mononuclear cells infiltration in the interstitial tissue with acute cellular degeneration of epithelial cells of renal tubules (H and E stain 400X).

Fig(2-B): Section in the kidney of animal treatment with 500 shows severe mononuclear cells infiltration in the interstitial tissue and around atrophy glomerular tufts of glomerula (H and E stain 400X).
Fig(2-C): Section in the kidney of an animal treated with 500 shows pinkish material in dilated renal tubules (H and E stain 400X).

Conflict of Interest: None

Funding: Self

Ethical Clearance: Not required.

References
Effect of Healthy Special Exercises of Interval Lactic Technique in the Development of Bearing the Performance, LDH Enzyme, and Schematic Action for Young Football Players Health

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Abstract

The process of modern sports training depends on the concentration of objectives for the development of energy production systems and associated functional changes. Since football is also dependent on the anaerobic system because of the high and variety speed, strength in physical performance and planning, so the need to use the trainers and focus on the special exercises and appropriate to the nature of this game, including the system Interval Lactic the importance of research through putting the special exercises in the method of Interval Lactic to improve the level of physical and biochemical players and the schematic action, which contributes to the development of levels of players and enable them to achieve better results in matches. The aim of the study was to: Prepare special exercises in the Interval Lactic method. And to recognize the effect of interval lactic exercises for young footballers. The researchers used the experimental approach and they identified the research population from the Karbala’s players clubs, they chose the randomly specimen which The Karbala Sports Club numbered 20 players, divided to two experimental groups (10) and a Control group of 10 players.

The exercises used by interval lactic method and by (80-90%). The exercises were performed three units a week and were on Saturday, Monday and Wednesday. It lasted eight weeks. The most important conclusions included: The presence of a positive effect of the exercises in the interval lactic method in the development of bearing the performance, LDH enzyme and the schematic action of young football players. The recommendations confirmed of the need for trainers to use exercises for the dynamic lactic method and their interest in biochemical measurements as indications for the adaptation of organs functional in the body and its impact in the detection of the training situation.

Keywords: Interval Lactic, bearing the performance and LDH enzyme.

Introduction

1-Introduction and Importance of research: the modern sport training depends on concentration of objectives for the development of energy production systems and associated functional changes. Whenever the aerobic or anaerobic of player possibility getting better that’s directly reflect on the physical level, skill and planning performance. This will be achieved by the development of training programs and special exercises based on the development of energy systems related to the game. The football game from the events which a separate activity that requires special physical preparation. It is known that the anaerobic system of energy production is the prevailing system in the football game because of the high speed and strength in physical and skill performance. Therefore, the importance of this research is the need to use special exercises in the interval lactic method to develop bearing the performance of rate of LDH enzyme activity and the schematic action of young football players.

2- The research problem: Through the work of the researchers in the field of football noted that there
is insufficient attention in the physiological side, which reflected negatively on the performance of some players through the low level of performance and the emergence of fatigue, which is due to several reasons, the most important lactic acid, which is disabled for the players in most times, This is due to the lack of good behavior of some trainers in the components of the training load with the times when concentrated lactic acid significantly and not control the active comfort, which plays an important role in the best deal with the lactic and turn it into energy in the absence of oxygen. So the researchers worked on the preparation of special exercises in the interval lactic method to develop the variables investigated may contribute to a relative solution to the problem of research.

3-The Objectives of Research:

1. Preparation of special exercises of interval lactic method to develop bearing the performance, LDH enzyme and schematic action method of young football players.

2. Knowing the effect of exercises of interval lactic method to develop bearing the performance, LDH enzyme and schematic action method of young football players.

3. The special exercises have an effect on developing bearing the performance, LDH enzyme and schematic action method of young football players.

Research methodology and field procedures

Research Methodology: The researchers depend on the experimental design and the design of random equal groups of choice with tribal and remote tests.

The Research population and itself same: The research population included of the clubs of the holy Karbala governorate for the youth football team numbered (12) club and then the selfsame was chosen by the random way they are the club Ghadrianumbered (20) players represented the selfsame and were divided into two experimental and control groups In a random way too.

Means, equipments and tools used in research:

The researchers used the following tools and tools:

The Observation
The resolution

The personal interview
Test and Measurement
Computer brand (Samsung)
Camera brand(Sony) Japanese-made
Lumbar measuring tape
Medical scale (buerer) made in china
Plastic collars of various heights numbered (10)
Plastic figures, various heights numbered (10)
(2) hand watch brand (kisio610) made in china
Handheld Electronic Calculator Numbered (1) brand (Casio)
(2)Whistle
blood transfusion tubes without material(edta) made in Jordan
(80) Blood extraction syringe
Medical cotton and sterile materials
Medical cooling bag to save blood tubes

3-4 Field research procedures:

3-4-1 Determining the variables and tests used in the research: The researchers depends on the survey of many available scientific sources, as well as in the modest experience of the researchers as they are former players and currently trainers. The variables that will be studied in the search for the football game have been determined. Agencies: (bearing the performance, LDH enzyme, and schematic action).

First: the circular performance test (1):

The Purpose of the test: Measure bearing The circular performance of the players

Testing Requirements: football stadium, 10 foot balls, 6, whistle, stopwatch, timer, recorder.

Test Description: This test is in a round shape where the player stands at the middle line on the right and Bounce the ball 30 times then runs along the line of the ball until the player reaches the corner area of the side and plays the high cross ball into the penalty area. Then the player run to the penalty area line which opposite of the goal to get (5) balls on the goal and then go to the tangent line from the left side to do throw to the colleague team and then take the ball from the colleague
team to run by the ball and do Zigzag by the ball between the plastic barrier (cones) and then run the distance of 30 meters.

**Recording:** Calculates the total performance time.

**Show the circular performance test**

**Second: Measure the rate of the effectiveness of the (LDH) enzyme after the effort:** Through the circular performance test above, the researchers measured rate of the effectiveness of the (LDH) enzyme in the blood after the effort through a specialized medical staff assistant by blood draw for all the main sample and after the effort, blood samples were drawn from the players by medical injection by (5CC) of each player of the research sample to measure the (LDH), and the blood was drawn by a specialist medical team of laboratory analysis and vein in the humerus by using the stretcher (Torinke) in the sitting position on the chair, then emptied blood from syringes of keeping blood tube (TUBES), Bottle-free of (Edta) material anti blood clotting numbered from (1) to (20) each number matched by the player’s name on the registration form. After completing the blood draw and putting it in the tubes, the tubes were kept in a Cod -Box and transferred to the laboratory near of the stadium for measuring the variable Above.

**Third: The schematic action test:** The researchers do two games, one in the tribal test and the other in the dimensional test, the two matches were filmed and presented to the experts * for the purpose of evaluating the players in the test of schematic conduct.

**Sample equivalence**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Experimental</th>
<th>Control</th>
<th>Calculated value</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 circular Performance test</td>
<td>89,6</td>
<td>0,76</td>
<td>89,2</td>
<td>0,92</td>
</tr>
<tr>
<td>2 LDH Enzyme after effort / UL</td>
<td>-0,59</td>
<td>4,66</td>
<td>387</td>
<td>8,95</td>
</tr>
<tr>
<td>3 Schematic action/ degree</td>
<td>0,95</td>
<td>2,55</td>
<td>14,17</td>
<td>2,15</td>
</tr>
</tbody>
</table>

T tabular value is 2,262 at grade 9 and significance leve l0,05

**3-4-2 Exploration Experiment:** The researchers do the exploration experiment on a sample of 10 players from the youth of Al Ghadria Club. They are part of the research population

**3 - 4 - 3 The scientific basis for the tests:**

**Validation of the tests:** In order to verify the validity of the tests, they used validly of content as the tests were presented to a group of experts and specialists, thus gaining the objective of the content.

**Stability tests:** In order to calculate the stability factor, the researchers used the method of (test and retest) where the same test was returned after one week and then treated the test scores statistically by using the simple correlation coefficient.

**Objectivity of the test:** The researchers presented a performance test to two arbitrators for evaluate the degree of performance and then used the coefficient of correlation between the grades of the arbitrators were subjectivity coefficients are very appropriate and enjoy a Have a high correlation.

**3-4-4 Tribal measurements and tests:** The two researchers conducted the tribal tests on the research sample on 15-16 / 12/2016 (two days) on the youth playground in the holy governorate of Karbala, where on the first day a match was held for knowing the schematic behavior and in The next day, the circular performance was tested and measure the effectiveness of the enzyme.

**3 - 4 - 5 The main experiment:** The researchers used the interval lactic method in varying proportions ranging from 60% to 90% applied to the experimental group and the number of training units in one week and three units of Saturday, Monday and Wednesday and eight weeks, which included the curriculum on 24 training unit at the end of the preparation period in addition to each stage of the special preparation and there was a variety in giving the stress between the rise and fall, as for rest periods were (1 - 1).

**3 - 4 - 6 Remote Measurements and Tests:** The two researchers conducted with the assistant working team after the end of the last training unit the remote
tests on the research sample. The researchers were as far as possible to get the dimensional tests under the same conditions as the tribal tests.

**Statistical means:** The researchers used the following statistical means:

1. Arithmetical mean
2. Standard deviation
3. Simple correlation coefficient
4. T test for independent and interrelated samples

**Part three**

4. Presentation and discussion of the results

4.1 Presentation and discussion of the results of the tribal and dimensional tests of the experimental and control groups

**Chart (2): Shows The Arithmetical means, standard deviations, calculated t value and statistical significance between the tribal and dimensional of tests results, experimental and control groups**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Total</th>
<th>Tribal</th>
<th>Dimensional</th>
<th>F</th>
<th>Fd</th>
<th>Calculated t value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>s</td>
<td>a</td>
<td>s</td>
<td>a</td>
<td></td>
<td>a</td>
<td></td>
</tr>
<tr>
<td>circular Performance test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4.2</td>
<td>0.9</td>
<td>14.75</td>
</tr>
<tr>
<td></td>
<td>89.6</td>
<td>0.76</td>
<td>85.4</td>
<td>0.62</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>d</td>
<td>89.2</td>
<td>0.92</td>
<td>88</td>
<td>0.707</td>
<td>1.211</td>
<td>0.657</td>
</tr>
<tr>
<td>LDH Enzyme after effort/UL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>65</td>
<td>10.403</td>
<td>19.759 Moral</td>
</tr>
<tr>
<td></td>
<td>t</td>
<td>385</td>
<td>8,957</td>
<td>450</td>
<td>7,703</td>
<td>14</td>
<td>3.528</td>
</tr>
<tr>
<td></td>
<td>d</td>
<td>387</td>
<td>4,667</td>
<td>401</td>
<td>4,163</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Schematic action/degree</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4.149</td>
<td>0.88</td>
<td>14.909 Moral</td>
</tr>
<tr>
<td></td>
<td>t</td>
<td>16,08</td>
<td>0.104</td>
<td>20,23</td>
<td>0.129</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>d</td>
<td>16,11</td>
<td>0.131</td>
<td>17,02</td>
<td>0.155</td>
<td>0.36</td>
<td>7.985 Moral</td>
</tr>
</tbody>
</table>

The tabular t value is 2.262 at the freedom level 18 and the significance level is 0.05

The results of Table (2) and the experimental and control groups showed that the results were significant for all tests and for both groups.

**Chart (3): Shows the Arithmetical mean and standard deviations, calculated t value and statistical significance between the results of the remote tests and the experimental and control groups**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Experimental</th>
<th>Control</th>
<th>Calculated value</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>s</td>
<td>a</td>
<td>s</td>
<td>a</td>
</tr>
<tr>
<td>1 circular Performance test</td>
<td>85,4</td>
<td>0,627</td>
<td>88</td>
<td>0,707</td>
</tr>
<tr>
<td>2 LDH Enzyme after effort/UL</td>
<td>450</td>
<td>7,703</td>
<td>401</td>
<td>4,163</td>
</tr>
<tr>
<td>3 Schematic action/degree</td>
<td>20,232</td>
<td>1,129</td>
<td>17,023</td>
<td>1,155</td>
</tr>
</tbody>
</table>

The Value T tabular 2,262

Chart (3) shows the preference of the experimental group on the control group in all the tests. Regarding to the circular test that measures bearing the performance, the researchers believe that the main reason for this preference is the practice of the interval lactic method based on modern training method and various training. And oscillating between uprights and land, the nature of these exercises used in the preparation of these exercises and the similarity to large extent, Real playing circumstances with these physical, skilled and schematically training works on ability of develop bearing the performance that is what said (Salman Ali Hassan) : The training process is a construction process works on develop the physical abilities and develop them to achieve the best performance \(^{[1-2]}\). Mentioned (Mufti Ibrahim) whenever its closer the exercise circumstances from the competition circumstances (the match) the exercise was more useful for the player and achieve the goals of reaching to the level of match performance \(^{[3]}\).

With respect to the test of the LDH enzyme after the effort, the experimental group achieved a preference on the control group in the dimension tests, where the researchers observed that there are significant differences between the two groups and this means that the concentration of the enzyme increased after the Lactik physical effort This increase is due to the anaerobic sugar analysis process, It is known that any
Oxidation process in the body must be have a set of factors that help in the process of accelerating the chemical reactions of the this process and enzymes are one of the most important protein structures that contribute to accelerate the chemical reactions, ensuring the speed of the necessary energy. (Mohamed Selim and Abdel Rahim) show that enzymes are protein substances of an auxiliary nature that increase of the chemical reactions speed without involved in it, which in all living cells in addition to secretion by cells in the bloodstream [4].

With respect to the third variable, which is the schematic behavior, the researchers attribute this development in the schematically actions of the exercises given to the experimental group, which contributed to the development of the schematic behavior, “the preparation of football players from a schematic side is very necessary and must have the same importance from the coach as well as his share enough” [5]. It is also noticeable that the reason of this moral development of the experimental group to the kind of the used exercises, which included many rated exercises by implement the rapid schematic skills, which aims to achieve rapid progress and the direct link between the skills in the implementation and speed of performance. No exercise of schematic skills of the performance and under the similar atmosphere of the real state of playing, the researchers prepared these exercises similar to the state of play and repeat these exercises in the units or training doses used have all developed the time of exercises implementation in the players because the continuation of the application requires them to implement at the minimum time during the game in order to achieve the required goal to put the ball in the competitor goal “Repeating of the schematic exercises are similar to playing in particular can shorten the player’s perception of situations and increase his ability to schematic act quickly” [5].

**Conflict of Interest:** Nil

**Source of Funding:** Self

**Ethical Clearance:** Not required

**References**

2. Salman AH. Introduction to Sports Training, 1, Press of Mosul University, 1983, page 1
5. Mufti IH. Defense to build the attack in football, Cairo, Dar al-Fikr al-Arabi, 1994, page. 25
The Effect of Perceived Quality and Perceived Sacrifice to Perceived Value at Inpatient Installation of Dr. Soetomo Hospital Surabaya, Indonesia

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Abstract

Introduction: The main orientation of hospital as a health services is upholding good governance and improve customer satisfaction by provide the perceived value.

Aims: To analyze the effect of perceived quality and perceived sacrifice to perceived value at Inpatient Installation of Dr. Soetomo Hospital Surabaya, Indonesia.

Method: A cross-sectional observational analytical research with random sampling method. This study was conducted at the Inpatient Instalation Dr. Soetomo Hospital. The sample size of this study was 353 patients determined using Sample Size Determination in Health Studies application. The eligible patients were explained about the study objectives. Approval from patient regarding the participation in the study was obtained by written informed consents. The research instrument used consisted of a valid and reliable closed questionnaire. This questionnaire is used to measure perceived quality, perceived sacrifice, perceived value, and customer satisfaction variables through questionnaire-guided interview. T-test, Multiple Correlation Test (R test), Regression Coefficient with Simulant (F test) was performed to analyze the significant effect from perceived quality and perceived sacrifice to perceived value with p<0.01 were considered significant.

Results: The perceived quality has a positive significant effect while the perceived sacrifice has a negative significant effect to perceived value. Perceived quality and perceived sacrifice variables has moderate relationship with perceived value.

Conclusion: Perceived quality and perceived sacrifice simultaneously have a significant effect on perceived value of the customer at Inpatient Installation of Dr. Soetomo Hospital Surabaya, Indonesia.

Keywords: Perceived Quality, Perceived Value, Perceived Sacrifice, Service Quality, Health Service.

Introduction

Health care industry is one of the important industries with high potential development. Health services industry are currently in a strict and tight competition situation due to globalization with high demands of health service. High and strict competitiveness must be a top priority to win the competition. The number of hospitals that have sprung up and offered superior health services also increase competitiveness between hospitals. The hospital as one of the health services,
should implement competent management values by upholding good governance and improve customer satisfaction as a main orientation in providing health services.1

Customer satisfaction is a satisfaction or dissatisfaction feeling that felt by the customer after comparing the performance of the product / service received with the customer expectation.2 Customers will be satisfied if the health service provider performance can meet their expectations. Customer satisfaction and customer loyalty are influenced by perceived value.3 Perceived value is the difference between the value enjoyed by a customer after using a product, service and cost or sacrifice to obtain the product or service.4 The component of perceived value comes from product quality, service quality, price and image or reputation that can shape customer’s perceived value.5

The previous study showed that perceived value is influenced by perceived quality and perceived sacrifice.6,7,8 Perceived quality is defined as the customer’s perception of the overall quality and excellence of a product or service that is related to the customer’s expectations.9 Further development of perceived quality in the health service is technical quality, interpersonal quality and convenience. Perceived sacrifice is a sacrifice made by a customer in obtaining goods or services.10

Technical quality showed professional competence, skills and experience of laboratory technicians and physician.11 Interpersonal communication is a face-to-face communication between people in informal social situations to engage in focused interaction by using verbal and nonverbal communication. The process of sending and receiving messages between two people or between a small group of people with multiple effects and some instant feedback.12 Facilities relate to physical appearance of health facilities, physical appearance of officers, and medical and non-medical equipment.13 Facilities include time, place and procedure, physical environment conditions, place of service (comfort, safety, safety, or admission procedures). This facility also includes the internal environment of the hospital. Perceived sacrifice can be monetary (non-monetary) and negative factors (negative experience, waiting time, mental and emotional stress)14

The aim of this study was to analyze the effect of perceived value and perceived sacrifice to perceived quality at Inpatient Installation of Dr. Soetomo Hospital Surabaya, Indonesia.

Material and Method

A cross-sectional observational analytical research was carried between October 2017 – December 2017 at the Inpatient Installation Dr. Soetomo Hospital, Surabaya. The study protocol was approved by Ethics Committee of Dr. Soetomo Hospital (313/PANKE/IV/2017). Population of this study was all patients in Inpatient Installation Dr. Soetomo Hospital, Surabaya. Determination sample size in accordance with the strata of Inpatient Installation using software or the Sample Size Determination in Health Studies application (Sample Size 2.0). Based on the calculation results obtained 353 patients for sample size. Prior to the study, the eligible patients were explained about the study objectives. Approval from patient regarding the participation in the study was obtained by written informed consents. The research instrument used consisted of a valid and reliable closed questionnaire. This questionnaire is used to measure the effect perceived quality and perceived sacrifice to perceived value variables through questionnaire-guided interview. All data was analyzed using Statistical Package of Social Sciences (SPSS) 17.0 for windows was used and p values <0.01 were considered significant. T-test, Multiple Correlation Test (R-test), Simulant Regression Coefficient (F-test) were performed to analyze the significant effect from perceived quality and perceived sacrifice to perceived value.

Results

The perceived value has a positive significant effect while the perceived sacrifice has a negative significant effect to perceived quality (Table 1). The multiple correlation test showed perceived quality and perceived sacrifice variables has moderate relationship with perceived value (Table 2). Perceived quality and perceived sacrifice simultaneously have a significant influence on perceived value (Table 3)

Table 1. T-test result of perceived quality and perceived sacrifice to perceived value at Inpatient Installation in Dr. Soetomo General Hospital 2017.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Regression Coefficient</th>
<th>Beta</th>
<th>Sig. t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>5.562</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived Quality</td>
<td>0.066</td>
<td>0.417</td>
<td>0.000*</td>
</tr>
<tr>
<td>Perceived Sacrifice</td>
<td>-0.074</td>
<td>-0.162</td>
<td>0.001*</td>
</tr>
</tbody>
</table>

Information: dependent variable: perceived value. *significant at p<0.01.
Table 2. Multiple Correlation test result of perceived quality and perceived sacrifice to perceived value at Inpatient Installation in Dr. Soetomo General Hospital 2017.

<table>
<thead>
<tr>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.438</td>
<td>0.192</td>
<td>0.187</td>
<td>2.17700</td>
</tr>
</tbody>
</table>

Table 3. Simultaneous Regression Coefficient test (F-test) result of perceived quality and perceived sacrifice to perceived value at Inpatient Installation in Dr. Soetomo General Hospital 2017.

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>394.272</td>
<td>2</td>
<td>197.136</td>
<td>41.596</td>
<td>0.000</td>
</tr>
<tr>
<td>Residual</td>
<td>1658.770</td>
<td>350</td>
<td>4.739</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2053.042</td>
<td>352</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Information: *significant at p<0.0. Dependent Variable: Perceived Value, Predictors: (Constant), Perceived Sacrifice, Perceived Quality

Discussion

Perceived value can be achieved in the health service industry depends on the health provider’s commitment to provide a good service. Good health provider service will be able to achieve customer value. The quality service must cover various aspects such as administrative services, doctor services, nurse services, pharmaceutical services and nutrition services. Perceived quality was an evaluative assessment given by the customer for good superiority of service performance. Perceived quality was not the actual brand or product quality, but the customer’s assessment of service as a whole.

The relationship between perceived quality and perceived value showed a positive and significant effect. The perceived quality provided by the Inpatient Installation of RSUD Dr. Soetomo can affect and influence the perceived value of customers. The higher the perceived quality, the higher the perceived value of the hospital’s customers. Perceived quality of a service or product will affect the perceived value of the customer. The perceived value showed that overall assessment is based on the benefits and sacrifices of the health service customer.

The customer sacrifice can be described as perceived sacrifice. The perceived sacrifice in this study consisted monetary and non-monetary aspects. Perceived sacrifice felt by customers at the Inpatient Installation of Dr. Soetomo was difficult to accept in both monetary and non-monetary terms. These results lead to a significant negative influence between perceived sacrifice and perceived value that means the higher perceived sacrifice will decrease perceived value of the hospital customer. The higher customer sacrifice then the customer feels the perceived benefits decreased. Perceived quality and perceived sacrifice simultaneously have a significant influence on perceived value. This is consistent with the previous studies that showed perceived value was influenced by perceived quality and perceived sacrifice.

Conclusion

Perceived quality and perceived sacrifice simultaneously have a significant effect on perceived value. The perceived sacrifice has a negative influence or opposite direction toward perceived value, so that the higher the perceived sacrifice will decrease the perceived value or perceived value of the customer at Inpatient Installation of Dr. Soetomo Hospital Surabaya, Indonesia. Further study is needed and can be done to provide empirical evidence about other factors that affect perceived value.

Conflict of Interest: The authors declare no conflict of interest.

Source of Funding: This study was funded by author independent fund.

References


Reduction and Fixation of Orbital Floor Fracture Using Trans-Antral Balloon Technique: A Case Report

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¹Assistant Lecturer of Oral and Maxillofacial Surgery Department, ²Professor and Head of Oral and Maxillofacial Surgery Department, Faculty of Dentistry, Minia University

Abstract

Orbital floor fracture is considered as a major function and aesthetic challenge for maxillofacial surgeons. The emergence of endoscopic controlled techniques in reducing this type of fractures has gained popularity in the last few years. Here we present a case of orbital floor fracture, accompanied with zygomatico-maxillary complex (ZMC) fracture that was treated through intraoral incision using trans-antral balloon. The fractured orbital floor was accessed and reduced through the underneath antrum under endoscopic control and was temporarily supported using Foley catheter balloon. This technique seems safe easy and feasible technique for reducing orbital floor fracture.

Keywords: Orbital floor fracture, endoscopic reduction, Foley catheter, sinus fracture, maxillofacial fracture, fracture stabilization.

Introduction

Orbital wall fracture commonly occurs in patients with facial trauma, and its incidence ranges from 18% to 50% of all cases of maxillofacial trauma (1, 2). Fractures occur mainly in the orbital floor, with the medial wall as the second most frequent location of orbital fractures (3). Orbital wall fractures are explained by a hydraulic mechanism of injury and present themselves when a blunt object, which is of equal or greater diameter than the orbital aperture, strikes the eye. The globe usually does not rupture, but the resultant force is transmitted throughout the orbit causing a fracture of the orbital floor, being the weakest part of the orbital framework (4). These blowout fractures result in changes in the bony orbital dimensions which can affect the function of intraorbital contents (2, 5). Signs and symptoms of orbital floor fracture can vary greatly, ranging from being asymptomatic with minimal bruising and swelling, to severe affection, with diplopia, enophthalmos, hypophthalmia, and hypoesthesia of the cheek on the affected side (4).

The objective of surgical treatment of an orbital fracture is to anatomically restore the orbital soft tissue content and orbital walls to their positions and in that way, restoring the shape and volume of the orbital cavity (6, 7). The classic treatment method consists of approaching the floor through transcutaneous or transorbital incision, accurate repositioning of the bony fragments and herniated orbital contents, spanning defects with autogenous or synthetic graft that can restore the orbital volume, and rigid fixation to restore the orbital framework. The key to successful surgical repair using such technique is the adequate exposure and proper visualization of the posterior bone shelf (4, 8, 9). However, this technique does not exempt from complications and limitations. Beside being technically sensitive, transcutaneous incisions through lower eye lid carry major esthetic and function risks. Ectropion, scleral show, canthal malposition, and prolonged swelling are among those risks (10, 11). In addition, reassembling of the bone fragments and performing internal fixation using metal plates and screws is not always feasible due to the thin orbital wall, the narrow surgical field, and the possibility of orbital tissue damage (6).

In order to overcome some of these limitations and complications, a new simple technique was introduced for restoring orbital floor fragments and fix them temporarily using a balloon introduced through the
underneath antrum under endoscopic control\(^{(12, 13)}\). The technique involves trans-antral access to the orbital floor through anterior maxillary osteotomy or through the concurrent anterior maxillary wall fracture which provides a route for releasing herniated tissue and reducing the floor under endoscopic visualization\(^{(14)}\). Afterwards, a Foley catheter is introduced through the antrum and inflated to temporarily support the reduced fragments. This technique omits the need for permanent hardware support and allows for reducing the orbital floor through the same intraoral incision used to manage the concurrent zygomatico-maxillary complex (ZMC) fractures\(^{(12, 13)}\).

Herein, we present a case of orbital floor fracture in combination with concurrent ZMC fracture that was treated through intraoral route using trans-antral-balloon technique.

**Materials and Method**

A 28-year-old male patient was referred to oral and maxillofacial surgery department, Minia University, with chief complaint of right eye swelling and inability to open mouth widely after motorcycle accident. Clinical examination revealed, right periorbital ecchymosis, subconjunctival haemorrhage, right enophthalmos, and limited range of vertical mandibular movement. CT examination showed right orbital floor fracture with herniated periorbital tissues, right zygomatico-frontal (ZF) suture fracture, and maxillary sinus wall fracture (Fig.1). Fundus examination was done by ophthalmologist and revealed healthy internal ocular tissues. Patient was treated under general anaesthesia using nasotracheal intubation. The anterior maxilla was approached through right hemi-maxillary vestibular incision. The ZF suture fracture was approached through right upper blepharoplasty incision. The ZF suture fracture was first reduced and temporarily fixed followed by zygoma reduction. Through the anterior maxillary fracture, a 30degree endoscope (4.5mm, 18cm) was introduced in the right antrum to visualize the fractured orbital floor. Using periosteal elevator, the herniated periorbital tissues was released and pushed back into the orbital cavity. Plating of the ZF suture took place thereafter. Then, under endoscopic control, a 12 F Foley catheter was inflated with saline to support the reduced bony fragments of the floor (Fig.2). Afterwards, the anterior maxillary sinus wall was reduced and plated. The outlet of the catheter then, was tied and cut just beneath the vestibular incision. The incisions were closed and patient was extubated.

**Results**

Visual acuity and ocular motility were checked postoperatively. Patient was on oral antibiotic regimen for 1 week, while the Foley catheter was left in place for 2 weeks. No post-operative complications related to the catheter were noted during this period. CT scan were taken while the catheter in place to check for floor reduction stability (Fig.3). Afterward, the Foley catheter was deflated and removed uneventfully on office-based settings without the need for local anaesthesia and again, the visual acuity and ocular motility were re-checked.

![Figure 1: Preoperative CT. (A): Coronal view of right orbital floor fracture, right ZF suture fracture, and right maxillary sinus fracture. (B): Axial view of right maxillary sinus fracture.](image_url)
Figure 2: Intraoperative image of the Foley catheter balloon after inflated with saline to support the reduced orbital floor before plating of the anterior maxillary sinus wall fracture.

Figure 3: Postoperative CT. (A): Axial view of the reduction and fixation of right maxillary sinus fracture. (B) and (C): Coronal and sagittal views of reduced and temporarily fixed orbital right orbital floor. Note the tube of the Foley catheter “arrow”.

Discussion

Orbital floor fracture is a frequently encountered fracture in maxillofacial trauma field which presents major aesthetic and function challenges. This type of fracture was classically treated through extraoral incisions\(^{(15)}\). However, with the evolution of endoscopic-assisted techniques in the field of maxillofacial trauma surgery, techniques of reducing orbital floor fracture, among other maxillofacial fractures, were subjected to continuous developing in order to enhance the safety and aesthetic outcomes\(^{(1, 6, 12)}\). Here, we presented a case for reducing orbital floor fracture through the same intraoral incision used to reduce the concomitant ZMC fracture. The major advantage of this technique is the elimination of the need for transcutaneous incision, which minimizes complications, preserves the integrity of lower eye lid, and reduces operative time. Reducing the herniated periorbital tissues under endoscopic magnification through the antrum provides more safe technique to the optic nerve in contrary to intra-orbital dissection conducted during classic transcutaneous incisions\(^{(8)}\).

The utilization of Foley catheter balloon as a temporary fixation for the reduced orbital floor provides many advantages. Beside being cost effective, easy, and simple fixation technique, the balloon can be easily adjusted by inflating or deflating the saline to support bony fragments\(^{(12)}\). In addition, the balloon also supports the bony fragments of anterior maxilla from inward migration toward the sinus. The patient was on antibiotic regimen till the end of fixation and no foreign body reaction was noticed in our case till deflating the balloon. However, the elasticity of the balloon has its limitations as it can be perforated by screws, needle, or sharp bony fragments. Hence, caution should be considered during applying bone screws and during closing the wound.

In conclusion, the result of this case report is encouraging, and it seems that this technique provides a simple, safe, and cost effective method for reducing and fixing the orbital floor fractures accompanied with ZMC fracture through the antrum utilizing the same intraoral incision under endoscopic control.
Funding: Self-funding.

Ethical Clearance: Approved by the ethical committee of Faculty of Dentistry, Minia University (protocol #151)

Conflict of Interest: None.

References
Determination of Some Human Enzymes Activities in Presence of Titanium Oxide Nanoparticles

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Abstract
Titanium oxide nanoparticles (TiO₂NPs) are the most common particles that have industrial, commercial, medial and antibacterial applications. On the other hand, they have toxic properties within some concentrations that show the ability to inhibit some human enzymes. In this study a diluted solutions of TiO₂NPs were prepared by weighting (0.08 gm) with deionized water as $10^{-1}, 10^{-2}, 10^{-3}, 10^{-4}, 10^{-5}$ with low conductivity to avoid interaction with other ions. Our study aimed to estimate the effect of different concentration of TiO₂NPs on liver enzymes aspartate transaminase (GOT), alanine transaminase (GPT), alkaline phosphatase (ALP) and Amylase in human serum by using a healthy human serum with a mixture of enzyme solution in absence and presence of diluted solution of TiO₂NPs. The results showed that different TiO₂NPs concentrations used had inhibitory effect on all the enzymes.

With TiO₂NPs high concentration solutions the activity of enzyme decreased, inversely and the efficiency inhibition ratio increase. The kinetic properties of enzymes in presence of TiO₂NPs solutions had been studied as well. Different concentrations of substrate used to study type of inhibition. The study illustrated that there is a competitive inhibition in GOT and ALP enzymes, while there was uncompetitive inhibition in case of GPT and Amylase enzymes. Transmission electron microscope (TEM) technique was used to describe the two dimensional picture for the structural changes of the molecule, evaluate the nature of the studied NPs and particle size.

Keywords: Inhibition, TiO₂ nanoparticles, Enzyme, Kinetic.

Introduction
Nanotechnology is a set of techniques to manipulate the material that aims to obtain materials with new functions and improved properties. Among the different materials, nanoparticles have specific role in various applications. Several studies showed the toxic effect of TiO₂NPs and they showed that the toxicity mechanism occurs mainly through oxidative stress which damages carbohydrates, lipids, protein and DNA. Moreover, the pathological changes occurs in liver tissue could be caused by deposition and accumulation of nanoparticles in this tissue (¹).

Many researches stated that exposure to metal oxide nanoparticles induced reactive oxygen species (ROS) generation and subsequently caused oxidative stress (²-⁴).

While another study tested titanium nanoparticles acute toxicity in vivo in mature rats and their effects at different times on hepatic parameters, liver, kidney, and lung tissues. They stated nanoparticle accumulation of the in the liver, kidney, and lung tissues and elevated levels of liver markers GOT, GPT and ALP. Correspondingly, they observed apoptosis, hepatic fibrosis, hepatic necrosis, pneumonia, renal glomerular inflammation and pulmonary thrombosis (⁵).

Also M. Doudiand M. Setorkiin their experimental study on Wistar rats hepatic enzymes, concluded that if nanometer spherical-shaped TiO₂NPs used for medical purposes even in small amounts they will cause cell toxicity (⁶).

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Although, extensive researches achieved on TiO$_2$NPs applications in tumor therapy, drug and gene delivery to the cells and tissues and labeling cells and macromolecules (7), but there is a lack in studies reporting their toxicity or side effects on cells and animals in vivo.

There are a lot of disadvantages for TiO$_2$ nanotechnology. Titanium dioxide nanoparticles as a toxic, carcinogenic, and light-sensitive substance were described by the Scientific Organization for Consumer Protection (SCCS) (8). The nanoparticles of titanium dioxide have two crystal shape (anatomical and rutile) (9). They are effective and light toxic in their interaction with the reactive oxygen species (ROS) in the presence of ultraviolet light (10). Different experiments have been performed on rats by giving different intake amounts of TiO$_2$ nanoparticles. The negative effects of these doses have been diagnosed and they had showed that it caused apoptosis and/or oxidative damage, accompanied by reactive oxygen species excessive production and lipids, proteins and DNA peroxidational with antioxidant capacities significant reduction (11-13). To identify TiO$_2$NPs hazard in a laboratory test of terrestrial invertebrates, Drobne et al. (14) evaluated each of weight change, feeding parameters, mortality and catalase and glutathione-S-transferase activities after dietary exposure and concluded that the response to soluble chemicals is different from that to nanoparticles therefore results should be processed differently. In other word, the response to TiO$_2$NPs exposure can be defined as the threshold of the minimum amount of feeding.

In our study we choose four enzymes to evaluate mainly; Glutamate oxaloacetate transaminase (GOT) enzyme EC(2:6:1:1) which is hydrolase enzyme called transferase that act as a catalyst to transfer amino group from aspartic acid to α-ketoglutarate, GOT enzyme mainly diagnose heart and liver diseases (15,16).

Glutamate pyruvate transaminase (GPT) enzyme EC(2:6:1:2) is an enzyme that transfer amino group from alanine amino acid to α-ketoglutarate, this enzyme diagnose liver diseases (15).

α-Amylase (1,4-α-glucanglucanohydrolase) enzyme EC(3:2:1:1)is the primary digestive enzyme, acting on starch, glycogen and present in plants and animals. α-Amylase found in pancreas, parotid serum and urine, it is elevated in variety of surgical, traumatic and neoplastic diseases (17).

Alkaline phosphatase (ALP) enzyme EC(3:1:3:1) found in several tissues throughout the body, elevated levels of ALP are most commonly caused by liver diseases and bone disorders (15,16).

Materials and Method

TiO$_2$NPs Solution Preparation:
Titaniumtetraisoperoxide (TTIP) was dissolved in absolute ethanol and in terms of molar ratio deionized water was added to the solution TTIP:H$_2$O (1:4); while to adjust the pH nitric acid (5%) was used. The solution was vigorously stirred for 60 min at room temperature in order to form solutions. The solution was left for 24 hour to transform to a gel to obtain nanoparticles. The gel was dried under 80°C for 2 hours to evaporate water and subsequently calcined at 450 °C for 2 hours to obtain desired TiO$_2$NPs (12,18-20).

Atomic force microscopy (AFM) was used to determine the physical properties of TiO$_2$NPs such as shape and size.

Determination of Enzymes Activity:

A- A colorimetric determination of GOT, GPT (16,21,22), α- Amylase (17) and ALP (15,22) activities were carried out according to the following equations:

$$\text{L- Aspartate} + \alpha-\text{Ketoglutarate} \xrightarrow{\text{GOT}} \text{Oxalic acid} + \text{Glutamate}$$

$$\text{Alanine} + \alpha-\text{Ketoglutarate} \xrightarrow{\text{GPT}} \text{Pyruvate} + \text{Glutamate}$$

$$\text{Starch} \xrightarrow{\text{Amylase}} \text{Maltose} \xrightarrow{\text{Glucosidase}} \text{Glucose} \xrightarrow{\text{Glucoxidase}} \text{Glucose} + \text{O}_2$$

Phenyl phosphate $\xrightarrow{\text{ALP}}$ Phenol + Phosphate ion

Concentrations of (1×10$^{-1}$, 1×10$^{-2}$, 1×10$^{-3}$, 1×10$^{-4}$, 1×10$^{-5}$) M were prepared from a stock solution of (0.1M)-TiO$_2$NPs by diluting with deionized water, the conductivity of the solution was (0.25°C/m).

The activity of all the enzymes in presence of TiO$_2$NPs was measured in human serum by using (Bio system kit) method of these enzymes with replacement of (100µL) buffer solution with (100 µL) of TiO$_2$NPs solution.

The inhibition percentage was evaluated by comparing the activity in presence and absence of TiO$_2$NPs under the same conditions according to the equation:

$$\%\text{Inhibition} = \frac{100 - \text{Activity in the presence of TiO}_2\text{NPs}}{\text{Activity in the absence of TiO}_2\text{NPs}}$$
B-A constant concentration of TiO$_2$NPs (10$^{-1}$ M) were used with different substrate concentrations of (10, 20, 30, 40, 50) m mole/L for GOT, GPT Amylase and ALP enzymes to study the inhibition type. Different substrates concentrations of these enzymes were prepared by using buffers. Using Lineweaver-Burk equation, the enzymes activities were determined in presence and absence of TiO$_2$NPs by plotting 1/V against 1/[S], and the values of $K_m$, $V_m$ and type of inhibition were estimated$^{(20)}$.

### Results and Discussion

**TiO$_2$NPs characteristics:** Atomic Force Microscopy (AFM) of TiO$_2$ nanoparticles, demonstrated that they having spherical shape with diameter (90.36) nm. AFM images of material nanoparticles in which is irregular and randomly distributed TiO$_2$ NPs, can be seen with max value of 10.000-90.000 nm respectively exhibit morphology with (RMS) root mean square roughness off (1.70) and for (2.410) in nitric acid at 450$^\circ$C as in (Figure 1)$^{(23)}$.

![Figure 1: Atomic force microscopy (AFM) for TiO$_2$NPs](image)

The AFM charts for TiO$_2$ NPs agreement with those reported in literatures$^{(2,7)}$.

**Enzyme activity:** The study illustrates effect of TiO$_2$NPs on some liver enzymes (GOT and GPT) and hydrolysis enzymes ($\alpha$-Amylase and ALP) activities.

Table (2) show the relation between $\alpha$-Amylase and ALP activities and TiO$_2$ nanoparticles concentrations, when nanoparticles concentration decrease from (10$^{-1}$) M to (10$^{-5}$)M enzyme activity decreases from (3.77) to (1.1) for $\alpha$-Amylase enzyme, (3.84) to (2.67) for ALP enzyme.
The study shows that even diluted TiO$_2$NPs solutions still had inhibitory effect on enzyme with less percentage in vitro.

The inhibition average value was decreased (50.57% to 36.41%) for GOT, (38.78% to 29.37%) for GPT, while Amylase and ALP enzymes inhibition was (34.27% to 26.27%) and (14.40% to 11.18%) respectively.

Tables (3) illustrate the kinetic variables of ($K_m$ and $V_m$) and type of inhibition, where shown its (competitive) inhibition to GOT and ALP enzymes, and (uncompetitive) inhibition to GOT and α-Amylase enzymes as shown in figure (2) by using Lineweaver–Burk equation.

Where $K_m$ 33.3, 25, 66.7, 113 and $V_m$ 20, 9.1, 6.7, 10 for GOT, GPT, ALP, α-Amylase enzymes respectively.

TiO$_2$ NPs inhibited enzymes activities by caused by enzyme protein denaturation, when NPs interact with the functional group in the active side of enzyme that cause denaturation, or caused by the acidic solution of TiO$_2$ NPs, where the negative charge of the enzyme proteins with NPs that have positive charge that cause denaturation and inhibition in enzyme activity.

**Table (1): Effect of different TiO$_2$NPs concentration on GOT and GPT enzymes activity**

<table>
<thead>
<tr>
<th>Conc. of NPs (M)</th>
<th>GOT enzyme activity (U/L)</th>
<th>% Inhibition</th>
<th>GPT enzyme activity (U/L)</th>
<th>% Inhibition</th>
</tr>
</thead>
<tbody>
<tr>
<td>$10^{-1}$</td>
<td>4.54</td>
<td>50.57</td>
<td>6.22</td>
<td>38.78</td>
</tr>
<tr>
<td>$10^{-2}$</td>
<td>4.32</td>
<td>47.78</td>
<td>5.85</td>
<td>36.04</td>
</tr>
<tr>
<td>$10^{-3}$</td>
<td>4.06</td>
<td>43.31</td>
<td>5.31</td>
<td>34.38</td>
</tr>
<tr>
<td>$10^{-4}$</td>
<td>3.46</td>
<td>40.34</td>
<td>5.18</td>
<td>31.86</td>
</tr>
<tr>
<td>$10^{-5}$</td>
<td>3.66</td>
<td>36.41</td>
<td>4.71</td>
<td>29.37</td>
</tr>
<tr>
<td>Control</td>
<td>1.451</td>
<td>------</td>
<td>1.827</td>
<td>------</td>
</tr>
</tbody>
</table>

**Table (2): Effect of different TiO$_2$NPs concentration on Amylase and ALP enzymes activity**

<table>
<thead>
<tr>
<th>Conc. of NPs (M)</th>
<th>Amylase enzyme activity (U/L)</th>
<th>% Inhibition</th>
<th>ALP enzyme activity (U/L)</th>
<th>% Inhibition</th>
</tr>
</thead>
<tbody>
<tr>
<td>$10^{-1}$</td>
<td>3.77</td>
<td>34.27</td>
<td>3.84</td>
<td>14.40</td>
</tr>
<tr>
<td>$10^{-2}$</td>
<td>3.48</td>
<td>31.63</td>
<td>3.63</td>
<td>13.62</td>
</tr>
<tr>
<td>$10^{-3}$</td>
<td>3.27</td>
<td>29.72</td>
<td>3.46</td>
<td>12.95</td>
</tr>
<tr>
<td>$10^{-4}$</td>
<td>3.04</td>
<td>27.63</td>
<td>3.21</td>
<td>12.02</td>
</tr>
<tr>
<td>$10^{-5}$</td>
<td>2.89</td>
<td>26.27</td>
<td>2.98</td>
<td>11.18</td>
</tr>
<tr>
<td>Control</td>
<td>1.1</td>
<td>------</td>
<td>2.67</td>
<td>------</td>
</tr>
</tbody>
</table>

**Table (3): Kinetic variables ($K_m$ and $V_m$) and inhibition type**

<table>
<thead>
<tr>
<th>Inhibition type</th>
<th>$V_m$</th>
<th>$K_m$</th>
<th>Enzyme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competitive</td>
<td>20.0</td>
<td>33.3</td>
<td>GOT</td>
</tr>
<tr>
<td>Un-competitive</td>
<td>9.1</td>
<td>25.0</td>
<td>GPT</td>
</tr>
<tr>
<td>Competitive</td>
<td>6.7</td>
<td>66.7</td>
<td>ALP</td>
</tr>
<tr>
<td>Un-competitive</td>
<td>10.0</td>
<td>113.0</td>
<td>Amylase</td>
</tr>
</tbody>
</table>
Conflict of Interest: No conflict of interest exists

Source of Funding: Self-Funding

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Creating Value by Service Experience to Increase Health Service in hospitalized South Sulawesi Hospital, Indonesia: A Literature Review

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Abstract

Background: Service experience are personal psychological environment and feeling experienced to service. Service experience will influence value of the service especially in health service. Understanding the value of service experience can increase health service in hospital.

Objective: The aim of this study were to understand about the role of customer experience in the main marketing phenomenon.

Method: Phenomenology.

Result: Consumer service experience influence their valued for health service. Service experience were driven by factors of service environment, employee service, comfort of service, and hedonic service.

Conclusion: Some dimensions of service experience were very important for improving services in hospitals.

Keyword: Service experience, Health service, Hospital.

Introduction

Facing the increasing pressure on the health sector like the introduction of new technologies and the development of economy globally has also affected the hospital sector. This requires hospitals to adopt modern management. Modern hospital management systems must provide services that focused to customer. Hospital must be able to understand the needs, desires and expectations of customers and create value in providing services to achieve satisfaction of customersand be able to survive competition.1

Over the past few decades, experience has become a central phenomenon that appeals to researchers and service managers. Since the idea emerged that consumer behavior has an experiential dimension.2 Academics and practitioners recognize that need for more deep understanding about the role of customer experience in the main marketing phenomenon.3 Quality improvement is not a miraculous thing, but is a command and control in organizational evolution from the previous traditional conditions to better forms of management. It is conducted with high performance approaches to improve the design and management of organizational.4 As one example of maximizing health care, a model of predicting drug adherence. systemic therapy can help to identify a high risk of noncompliance among patients.5

Objective: The aim of this study is to understand about the role of customer experience in the main marketing phenomenon.

Types of studies: Phenomenology

Outcomes: This study outcome created valuebyservice experienceto increase health service inHospitalized.

Result

Climate service a companies have been defined as sharing perceptions about policies, practices, and
procedures that are related to customer service. The empirical model was developed to examine the direct and indirect role of equity service experience, relationship equity, brand equity, and customer satisfaction. The results show that service experience is driven by four factors. Factors of service experience are environment service, employee service, comfort of service, and hedonic service.

Customer experience dimension are sensorial, emotional, cognitive, pragmatic, lifestyle, relational. While according to Kim et al, (2011) that the Customer Experience are environment, benefits, convenience, accessibility, utility, incentive, trust. Other study result show that the hotel brand image and customer dissatisfaction to staff performance are related to guest experience and it will influence on marketing decision making for managers.

### Discussion

**Service experience:** The service experience are a psychological environment of personal reactions and feelings experienced by customers when consuming services. Service experience also defined as consider the experience and subjective responses of customers direct or indirect contact with companies.

Voorhees et al (2017) define that service experience is as the period of all service encounters or service meetings that relevant to core service offerings that affect the customer.

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**Pre core Service Meeting**
- Communication
- Information search
- Access to competing site
- Access to third party site
- Recommendation
- Initial contact
- Face to face
- Telephone
- Internet
- Onboarding activities

**Core Service Meeting**
- Core interactions
- Employee
- Other customers
- Technology
- Environment

**Post Core Service Meeting**
- Service Recovery Efforts
- Customer feedback
- Review
- For development new service
- Recommendation
Customer experience dimension is experience that consists of involving and entertaining dimensions based on active or passive participation from customers throughout the enjoyment process has been found to be a source of motivation, customers get a strong feeling of pleasure, such as shopping pleasure.\textsuperscript{11}

**Mood:** Retail environments that affect the mood of customers in creating customer happiness and unforgettable experiences was observed.

**Free time:** Relaxing activities, the results of shopping become pleasure, pleasure and freedom that is felt.

**Special:** In a study of fashion shops found that the design and environment of the store gave a unique personality to the store and created a perception of authenticity, solidity, enthusiasm and inconvenience.

**Customer experience Dimension by Kelly et al (2010)** include climate service a companies, creativity, empathy, Anticipation, Structural empowerment,Adaptive service offering have been defined as sharing perceptions about policies, practices, and procedures that are related to customer service.\textsuperscript{12}

The empirical model was developed to examine direct and indirect role of equity service experience, relationship equity, brand equity, and customer satisfaction. Study results shown that service experience is driven by four factors its are service environment, employee service, comfort of service, and hedonic service.\textsuperscript{13}

**Customer Experience Dimension by Gentile et al:** Customer experience dimension are sensorial, emotional, cognitive, pragmatic, lifestyle, relational. While according to Kim et al, (2011)\textsuperscript{14} in the Customer Experience are environment, benefits, convenience, accessibility, utility, incentive, trust.\textsuperscript{15} Dimensions of service quality that are important by Parasuraman et al., (1985) such as access, communication, competence, courtesy, credibility, reliability, responsiveness, security, tangibles, understanding/knowing customers.\textsuperscript{16}

Exploring several dimensions from several researchers is recommended to develop dimensions or instruments to measure service experience in hospitals. Review clues of management are functional clue, mechanic clue and humanic clue.\textsuperscript{10} Increase organization understanding can develop and grow the ability of workers to adjust customer satisfaction. The perceived service climate has a greater impact on the recognition of customer needs, while empowerment has stronger strength the effect on the creation of alternatives.\textsuperscript{19}

Helkkula A et al (2012) reported that four theoretical propositions that describe the value in experiences, The First is the value in the experience is intra specific and socially inter subjective. The second is value in experience can be loved and imagined. The third values in experience are built based on past, present, and imaginary future experiences in nature used the fourth is the value in experience arises from one by one to determine the social context.\textsuperscript{20} other study shown that managerial relationships of service experience, combining dimensions of experience to more functional services.\textsuperscript{5}

Organizational culture has become important links to improve performance in both of the manufacturing and service sectors. There is significant relationship between the patient safety culture and several dimensions of hospital performance.\textsuperscript{21} This study does not provide insight into specific ways that culture can be strengthened as well in this study focuses on US hospitals and it can’t be generalized to health systems in other countries.

Stimpfel AW, Sloane DM, Mchugh MD, Aiken LH found that there was significant relationship between the introduction of magnet and a better treatment experience for patients.\textsuperscript{22} The characterization concepts of service experience a). Phenomenological service experience related to values discussion at dominant logic of service and interpretive consumer research. b) Service experience based on process (it related with understanding service as a sequential process). c). Results-based service experience (which is related to understanding service experience as one element in the service model that connects variables or attributes to various results.\textsuperscript{24}

Frame of exchange service is better to understand how values and experiences are evaluated. The method is a conceptual approach integrating two research streams. The research stream are consumer culture theory and dominant service logic. The author expands the context of experience by implementing a service ecosystem perspective and identified social and cultural factors that influence experience from system context: An expanded context system, Multiplicity of structures and institutions, value-in-cultural context, and co-construction context.\textsuperscript{17}
Study in the Western of Delhi report that most restaurant get a positive score, especially in terms of having fun and enjoying a restaurant. Restaurant able to meet customer expectations that make customers more willing to share experiences with others and return to the restaurant once again. But at the same time customers are not satisfied because they think that they are not learning something new they want to learn.25

Other study result shown that service experience must be managed appropriately by small and medium enterprises (SMEs) operators by collecting and evaluate relevant data regarding customer experience. Service design must be done holistically. The ways that are embedded in the service provider’s organizational culture by using tools such as “Blueprinting” Synergic collaboration and learning areas among traditionally fragmented tours. Service providers are important for achieving long-term competitiveness.26

Conceptualization of the behavior role in customer engagement shared value creation in multi-party service systems. Customer behavior: First, the formulation of behavior envisions customers using their resources to extend and add to company offers. Second, Co-developing behavior sees customers donating resources such as knowledge, skills and time to facilitate the development of focal company offerings. Third, Affecting behavior is associated with customers who use their resources and skills to influence other. Mobilizing behavior is referred to customers who use resources and time to mobilize other.3

Service research has traditionally concentrated on understanding, measure and optimize delivery of core services. service experience as the period in which all service meetings relevant to core service offerings may occur. The concept consists of pre and post-core meetings. The meeting was built into core service provision as “moments of truth” which affects customer results. We see service experience by highlighting the future,core and post-meeting services. The period also provides an approach to regulating existence and the future research on service experience. This widespread view makes it easy research not only at individual service meetings in single language period, but also on the dynamics of customer experience throughout this period.9

This study in meeting casino services found that the conceptualizes customer equity replace equity value by postulating service experience equity. An empirical model was developed for ensuring the direct and indirect roles of service experience equity, relationship equity, brand equity, and customer satisfaction with loyalty results. The results show that the service experience is driven by four factors in first-order dimensions environment service, employee service, convenience service, and hedonic service.13

The factors of improving service experience in hotels are service quality, service delivery; component, hotel atmosphere, quality of staff and facilities, experience quality, and aesthetic quality. The study results show that the hotel brand image and customer dissatisfaction with staff performance are related to guest experience and it will influence on marketing decision making for managers.8

Study was conducted by Aiken, L. H (2012) reported that from the study of hospital work and patient safety, satisfaction, and service quality in European hospitals as reported by both nurses and patients all countries faced hospital quality, safety, and nurse fatigue and dissatisfaction problems. In all of countries, staff of nurse and quality of hospital working atmosphere is significant related with patient’s satisfaction, quality, and safety of nursing. Quality of hospital working including managerial support for harboring good relationship between doctor and nurse, nurse participation in making decision, and organization priority in nursing quality.18

The group of patients tested in the geriatric ward did not show anxiety levels. Generally: patients are satisfied, very happy with the provisions of the hospital and behavior of staff. Factors are related patient’s satisfaction: Friendly medical staff, Friendly non-medical staff, Procedure for receiving smoothly, Information about daily routines, the choice of menu varies, Ordinary cooking, Privacy, Comfortable furniture, Recreational facilities, Attractive decoration, A smooth acceptance procedure, and adequate provisions for visitors/visits.27

Conclusion

Some dimensions of service experience were very important for improving services in hospitals. Consumer want development of health service in hospital are accordance with the service experience dimensions of consumer. Service experience dimension are accordance with almost all of the Bugis ideology which is the majority of customer in South Sulawesi. So that in the future this research will develop models that are suitable for Bugis culture.
Limitations: This article has several dimensions of experience but does not cover all dimensions in Bugis culture in health services.

Recommendation: So that in the future exploration creating value is in accordance with local wisdom, especially government hospitals in southern Sulawesi. In South Sulawesi, majority of customer is Bugisness. So, Bugis tribe in the future are expected to have a model of creating value based on the Bugis philosophy to improve the equity of health services.

Ethical Clearance: Not applicable

Conflict of Interest: Nil

Source of Funding: None

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Investigation of Infectious Stages of Intestinal Parasites and Fungal Spores which Contaminated Nails of Some Students in Tikrit University, Iraq

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Abstract

The study included collection of nail swabs in 119 subjects; three slides from each person selected randomly to determine the infectious stages of intestinal parasites and fungal spores that polluted it. The samples were stained with loughidine and collected samples from some students of Tikrit University / Salah ad Din governorate from October 2018 until the end of January 2019. The results showed; the number of positive cases was 44with 36.974%. Three intestinal parasitic stages were recorded, Entamoeba histolytica, Giardia lambelia, Toxocara canis and two fungus, Microsporum canis and Microsporum nanum. Where the infection rate of E. histolytica where proportion of 59.09%, and the least cysts of parasite G. lambelia 11.36%. The fungal spores recorded a higher ratio with M. canis with 15.90% percentage and the lowest of M. nanum with 9.09%. Interference overlaps with single, double and triple contamination was recorded in parasitic and fungal contaminated nails. The results showed that the highest percentage of nail pollution of students nails of College of Education for Women, where it reached 40.74%, followed by percentage of pollution of students of Faculty of Management and Economics college and college of Agriculture and the College of Law will continue 38.09%, 35.29%, 33.33% respectively and the lowest was 27.77% of students of Education for pure sciences. The percentage of a pollutant in female fingernails is higher than that of male fingernails where it reaches 39.72%, 32.60% respectively.

Keywords: Infectious stages of intestinal parasites, fungal spores, nail pollution.

Introduction

Intestinal parasitic infections have spread and caused a decline in level of health in different age groups, especially in underdeveloped societies. Diseases caused by pollution of infectious pathogens of human pathogens¹. There are four main species that infect humans and cause them “common and dangerous diseases, eg, infection with infectious stages of Cryptsporidium spp.; GG. lambelia; Cyclospora; oyetonensis². Intestinal parasites cause global health problems, especially intropical and subtropical regions that play an important role in transmitting these pathogens and thus constitute an important epidemiological factor for disease transmission³. These pathogens can contaminate vegetables and fruits in a number of ways. They can be found in soil where these plants are grown or in animal faces used for fertilization or in water used for watering, they can be found by the workers in these plants or in the water. Used in washing or also possible pollution occurs during transport or storage of these plants⁴. Skin fungus is an intrusive organism and is almost mandatory for human intrusion Alone or on man and animal together⁵ and has the ability to produce Enzymes decomposition of the horns and its exploitation as a source of nutrition. And classified these fungi are based on the properties of their compositions resulting from the non-sexual reproduction to three Genus Epidermophyton, Microsporum, Tichophyton, but it later emerged that some of the fungus genotypes Microsporum. Tichophyton possessed the ability to be sexual reproductive⁶. Nail fungus is a common fungal infection and is often transmitted among people in wet areas, swimming pools and other wet areas. It is common

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in people who put their hands and feet in the water such as housewives and cooks. People who suffer from nail fungus are often patients with immune system problems and nail fungus that usually begins with the nail and the skin and finger fungus causes itching, cracks, peeling and foul odor. The nail fungus often develops at the base of the nail and is accompanied by irritated red and inflamed skin. As the fungus evolves, the nail turns darker, yellow and thicker than usual, and the nail area becomes more sensitive and painful and loses its transparency. The study aimed to identify the infective stages of intestinal parasites and contaminated fungi of some. Tikrit University students, and to study the percentage of the spread of these pollutants for students and both sexes.

Materials and Method

Places and duration of sample collection: Samples were collected from some students of Tikrit University / Salah ad Din Governorate for the period from October 2018 until the end of January 2019.

Type of samples and method of collection: 119 students were randomly collected from University of Tikrit by conducting direct swabs from the nails and by three replicates per student, as follows:

1 ml of the normal saline solution was applied to the nail to remove the ova, larvae, cyst, oocyst and parasitic parasites. Then a drop of the sediment was taken by loop and placed on the glass slide and pigment dye. And then the glass slide was loaded and then the slides were scanned with a light microscope under the magnification force of 100x and 40x and the parasitic and fungal phases were identified.

Statistical analysis: The results obtained were statistically analyzed using a chi square test. Below the level of 0.05 ≥p to determine the presence or absence of moral differences.

Results and Discussion

The total number of samples taken from nail swabs was 119 swabs and three replicates were randomly selected to identify parasitic and fungal infections. The results showed that the number of positive samples was 44 with 36.974%. Three infectious parasitic stages were recorded: Entamoebahistolytica, Giardia lamblia, Toxocaracanis and two fungal buds are Microsporumcanis and Microsporumnanum (Table 1) (Fig. 1, 2, 3, 4). The highest infection rate for parasitic infections was in the gastrointestinal stage of E.histolytica, where it reached 59.09%, the lowest of which was G.lamblia parasite. The infection rate was 11.36%, whereas the fungal spores had the highest infection rate of M.canis (15.90%). The smallest was M.nanum And 9.09%. Overlap cases were recorded with single-infection parasitic and fungal infections under study in fingernails and double and triple (Table 1). The infection of intestinal parasites transmitted by soil is one of the most common infections in the world, and it is generally a serious health problem, which is transmitted through eggs and parasitic cysts in human faces that pollutes the soil in areas suffering from the deterioration of health services and hygiene and impact. Over 1.5 billion people, or 24% of the world's population, are infected with parasitic infections transmitted by soil and distributed to the tropical and subtropical regions. Toxocara eggs were the second in terms of contamination of infectious parasitic pathways, and perhaps because female worms put 10,000 eggs a day and are resistant to environmental conditions and this result matches what the researchers recorded. In recent years, there have been cases of infection due to food contamination of intestinal parasitic pathways. The pollution of hands, vegetables and fruits plays a role in the transmission of these pathogens and therefore constitutes an important epidemiological factor for the transmission of diseases, such as: Giardia lamblia, Entamoebaspp., Enterobiusvermicularis, Hymenolepis nana, Ascarislumbricoides, Taniidaespp., Toxocarasp., Trichostorongelus spp. recorded 14 cases of dermatofungus in Portugal during 10-year period, with Taeniarastrum being the most common, with a prevalence of 50%, followed by infection by Microsporumcanis 11%.

The results showed that the highest percentage of infection of nails of some students of Tikrit University under study was for students of College of Education for women with percentage of 40.74%, followed by percentage of pollution to nails of the students of Management and Economics college, college of Agriculture and Law College, with 38.09%, 35.29%, 33.33% respectively. And the lowest was 27.77% for students of college of Education for pure Sciences. (Table 2). The percentage of infection in female fingernails was higher than that of male fingernails, which reached 39.72% and 32.60%, respectively. (Table 2). This may be due to the extension of some girls to their nails, leading to the accumulation of pollutants from pathogens and other causes of contact with polluted soil, water or contaminated food.
Table (1): Percentage of overlap between parasitic and fungal contaminants diagnosed in nail swabs for students of Tikrit University during study period

<table>
<thead>
<tr>
<th>Type Pollution</th>
<th>Name of Parasite</th>
<th>+ Samples</th>
<th>%</th>
<th>Isolated Stages Number 1 (%)</th>
<th>Isolated Stages Number 2 (%)</th>
<th>Isolated Stages Number 3 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parasites</td>
<td><em>E. histolytica</em> cyst of</td>
<td>26</td>
<td>59.09</td>
<td>15</td>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td><em>G. lamblia</em> cyst of</td>
<td>5</td>
<td>11.36</td>
<td>3</td>
<td>2</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>Ova of <em>T. canis</em></td>
<td>17</td>
<td>38.63</td>
<td>10</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Funges</td>
<td>Spores of <em>M. canis</em></td>
<td>7</td>
<td>15.90</td>
<td>4</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Spores of <em>M. nanum</em></td>
<td>4</td>
<td>9.09</td>
<td>2</td>
<td>1</td>
<td>–</td>
</tr>
</tbody>
</table>

\[ \chi^2 \text{value} = 1.33^* \]

*Indicates significant differences at probability level of $p < 0.05$

Table (2): Percentage of Pollutants Diagnosed in Nail Wipes for Male and Female Students

<table>
<thead>
<tr>
<th>College</th>
<th>Male</th>
<th>Female</th>
<th>Number of Total samples</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of Total samples</td>
<td>Number of + samples</td>
<td>%</td>
</tr>
<tr>
<td>Education for women</td>
<td>17</td>
<td>3</td>
<td>17.64</td>
</tr>
<tr>
<td>Agriculture</td>
<td>6</td>
<td>2</td>
<td>33.33</td>
</tr>
<tr>
<td>Management and Economics</td>
<td>11</td>
<td>2</td>
<td>18.18</td>
</tr>
<tr>
<td>Law</td>
<td>4</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Education for pure Sciences</td>
<td>8</td>
<td>1</td>
<td>12.5</td>
</tr>
<tr>
<td>Total</td>
<td>46</td>
<td>15</td>
<td>32.60</td>
</tr>
</tbody>
</table>

Figure 1: Egg of *Toxocara canis* (lugoliodin stain 1000x)

Figure 2: Trophozoite of *Entamoeba histolytica* (lugoliodin stain 1000x)

Figure 3: Spores of *Microsporum nanum* (lugoliodin stain 1000x)

Figure 4: Spores of *Microsporum canis* (lugoliodin stain 1000x)
Conflict of Interest: None

Funding: Self

Ethical Clearance: Not required.

References


The Significance of Vimentin and Matrix Metalloproteinase-9 in Oral Squamous Cell Carcinoma in Relation with Tumor Depth and Prediction of Lymph Node Metastasis in South of Iraq

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Assistant Professor, Head of Pathology Department, College of Medicine, University of Al-Qadisiyah

Abstract

Objective: To evaluate the early diagnostic value of Vimentin and Matrix metalloproteinase-9 biomarkers immunohistochemistry depending on tumor depth in oral squamous cell carcinoma.

Materials and Method: Forty-five paraffin wax blocks of malignant squamous cell in oral cavity were funded retroactively. An immunohistochemical staining was proceeded using anti-Vimentin and anti-Matrix metalloproteinase-9 monoclonal antibodies.

Results: The mean age of patients was 55.67±15.45, male affected more than the female with male to female ratio 1.5:1, 50% of tumors were located in tongue, (53.33%) presented as mass. more than half of the cases were well differentiated squamous cell carcinoma (51.11%), (26.66%) had lymph node metastasis, and (33.33%) of the patients were in disease stage II. Tumor depth revealed statically significant relation with lymph node involvement (P=0.036), and (57.78%) showed tumor depth more than 7mm. Both Vimentin and Matrix metalloproteinase-9 revealed significant positive correlation with depth of invasion, lymph node metastasis and stage of disease. There was a patent positive interconnection between Vimentin and MMP-9 (P=0.034).

Conclusion: Both proteins expression offers exalted rate of lymph node hitting, deeper tissue invasion and worse speculation.

Keywords: OSCC, Vimentin, MMP-9, Tumor depth, Immunohistochemistry.

Introduction

Occurrence rate of oral squamous cell carcinoma (OSCC) is evaluated to be more than 300,000 cases annually all over the world[1]. Management of OSCC be based on the clinical tumor-node-metastasis (TNM) tabulation[2]. Eminent clinical value in patient with OSCC is the early diagnosis of the disease prior hosting vague lymph node, so these patients would profit from salubrious neck dissection [3]. Various tumor countenance has been offered to assist in foretelling which patients have inscrutable lymph node involvement at diagnosis, such as gene exhibition subscriptions[4], tumor bottom[5] and “worst pattern of invasion”[6].

With regard to tumor depth (TD), there is no uniform method for researchers to measure the TD until now. TD is considered to be a more reliable feature, as many studies have shown that the risk of metastasis and spread to cervical LN increases with increase in TD, it is agreeable to suppose that the extreme offensive tumors are those with the substantial capability to expand downwards to the deepest area[10]. Epithelium into mesenchymal transformation (EMT) has been obviously perform a crucial function in neoplasmin festation and metastasis Matrix-metalloproteinase-9 (MMP-9), a 92 kDa gelatinase, has a clear function in cancer infestation and angiogenesis [15]. And it expected to be involved in the aggressiveness of many tumors. It is believed to give rise to type four collagen declination [16]. MMP manifestation raise a probability for local recrudescence, and lymph node and far metastasis. High MMP-9 manifestation was linked with the series of lymph-node dispersal which is related with undesirable prognosis[17]. The survival proportion in OSCC is affected by the matter of fact that diagnoses happen mostly in delayed grades of the disease. Thus, the intent of this project was to
estimate the early diagnostic value of VIM and MMP-9 biomarkers immunohistochemistry depending on tumor depth.

**Materials and Method**

A whole of 45 retrospectivelwax embedded tissue blocks of fully excised OSCC were obtained pro- and retrospectively from the dossiers of maxillofacial and pathology labs, Al-Diwaniyah Teaching Hospital, Basra Teaching Hospital; Al-Samawa Teaching hospital, Al-Nasiriya Teaching and several private pathology labs in southern Iraq from (2014 – 2018). Four μm thick segments were deduct and hematoxylin and eosin slides were suitable for histopathological reevaluationby two experienced pathologists, Figure (1). The clinical data consisted of age, sex, site, clinical presentation; tumor grade, stage and LN status were identified from surgical and pathological reports of the patients. Tumor Stages were carried out according to WHO classification schema, while tumor grades were established as follows: Grade I (well differentiated), Grade II (moderately differentiated), and Grade III (poorly differentiated).[1]

Statistical Analysis: Numeric variables were showed as mean+SD (standard deviation) whereas nominal variables which include: sex, sites, clinical presentation, grade, LN and stage were expressed as number and percentage. Spearman Rank coefficient of correlation (r) was used to find the relation between any two variables. Statistical analysis was done with SPSS (statistical package for social sciences) V20. The level of (≤0.05) was considered significant, while the level of (≤0.001) was considered highly significant for interpretation of P values.

**Tumor depth measurement:** An ocular micrometer was used to account the distance (to the closer mm) from stratum granulosum to the inmost point of neoplasminfestation, in ulcerated lesions the thickness deliberated from the ground of the ulcer instead of granular cell layer, neglecting any superficial keratin or inflammatory insinuate that may subsist in all cases. For each section, the power field (4X) were used.

The patients were distributed into 3 groups as stated by their TD measurment: 1: ≤3mm, 2: 4–7 mm, 3: >7 mm. Figure 2.

Results

Clinicopathologic Characteristics: The age ranges from 22 to 82 years (mean ± SD = 55.67±15.45).
Twenty-seven patients (60%) were male, the rest 18 (40%) were female, with male to female ratio was 1.5:1. Primary sites were mainly identified in the tongue (22 cases= 48.89%), followed by the lip (8 cases= 17.78%), buccal mucosa (6 cases=13.33%) and only one case was recorded in the floor of the mouth (1 case= 2.22%). Twenty-four cases (53.33%) presented as mass, the remaining 21 cases (46.67%) were presented as ulcer.

Table 1: Clinical characteristic

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>N (%)</th>
<th>Mean±SD (range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td></td>
<td>(55.67±15.45)</td>
</tr>
<tr>
<td>Sex</td>
<td>Male</td>
<td>27 (60%)</td>
</tr>
<tr>
<td>Site</td>
<td>Tongue</td>
<td>18 (40%)</td>
</tr>
<tr>
<td></td>
<td>Lip</td>
<td>22 (48.89%)</td>
</tr>
<tr>
<td></td>
<td>Buccal mucosa</td>
<td>8 (17.78%)</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>6 (13.33%)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>18 (40%)</td>
</tr>
<tr>
<td>Clinical presentation</td>
<td>Mass</td>
<td>24 (53.33%)</td>
</tr>
<tr>
<td></td>
<td>Ulcer</td>
<td>21 (46.67%)</td>
</tr>
</tbody>
</table>

Table 2: Stage, grade and LN involvem

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade</td>
<td></td>
</tr>
<tr>
<td>Well</td>
<td>23 (51.11%)</td>
</tr>
<tr>
<td>Moderate</td>
<td>18 (40%)</td>
</tr>
<tr>
<td>LN</td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td></td>
</tr>
<tr>
<td>N1</td>
<td>11 (8.89%)</td>
</tr>
<tr>
<td>N2</td>
<td>6 (13.33%)</td>
</tr>
<tr>
<td>Stage</td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>9 (20%)</td>
</tr>
<tr>
<td>II</td>
<td>15 (33.33%)</td>
</tr>
<tr>
<td>III</td>
<td>12 (26.67%)</td>
</tr>
<tr>
<td>IV</td>
<td>9 (20%)</td>
</tr>
</tbody>
</table>

Tumor depth: Concerning the tumor depth, 26 cases (57.78%) revealed tumor depth more than 7mm, 13 cases (28.89%) showed 4-7mm depth, and 6 cases (13.33%) were less than 3mm in depth. The mean depth of tumor invasion was 6.98 mm (SD ± 2.67), with a maximum registered depth of 18mm. Moreover, the TD revealed statically significant relation with lymph node involvement (P=0.036). Table 3.

Table 3: Tumor depth in 45 OSCC

<table>
<thead>
<tr>
<th>Tumor depth</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤3mm</td>
<td>6 (13.33%)</td>
</tr>
<tr>
<td>4-7mm</td>
<td>13 (28.89%)</td>
</tr>
<tr>
<td>&gt;7mm</td>
<td>26 (57.78%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lymph node</th>
<th>Tumor depth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>≤3mm</td>
</tr>
<tr>
<td>N1</td>
<td>0</td>
</tr>
<tr>
<td>N2</td>
<td>0</td>
</tr>
<tr>
<td>P=0.036</td>
<td></td>
</tr>
</tbody>
</table>

Immunohistochemistry evaluation: Regarding VIM most of the cases expressed score 4 (21 cases=46.66%), followed by score 3 (13 cases=28.88%), then score 2 (8 cases= 17.77%), while score 1 recorded in 3 cases (6.66%), with a mean score range of 1.73±0.70. The IHC expression of MMP-9 was distributed as follows: The majority of the cases expressed score 2 (20 cases = 56.67%), followed by score 3 (16 cases = 36.67%) whereas 9 cases (6.67%) had score 3, with a mean score range of 2.6±0.20. Table: 3 and Figure: 3, 4.

Table 3: Immunohistochemical expression scores of VIM and MMP-9

<table>
<thead>
<tr>
<th>Score</th>
<th>VIM N (%)</th>
<th>MMP-9 N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3 (6.66)</td>
<td>9 (20)</td>
</tr>
<tr>
<td>2</td>
<td>8 (17.77)</td>
<td>20 (44.44)</td>
</tr>
<tr>
<td>3</td>
<td>13 (28.88)</td>
<td>16 (35.55)</td>
</tr>
<tr>
<td>4</td>
<td>21 (46.66)</td>
<td></td>
</tr>
<tr>
<td>Mean score (range)</td>
<td>1.73±0.70</td>
<td>2.6±0.20</td>
</tr>
</tbody>
</table>
According to Chi-Square test, the IHC expression of VIM announced a respectable positive interconnection with tumor stage (r=0.238, P=0.024), TD (r=0.137, P=0.045), and LN metastasis (r=0.554, P=0.039). Whereas, MMP-9 revealed meaningful positive relation with both TD (r=0.013, P=0.015) and LN metastasis (r=0.421, P=0.034). Moreover, there was a respectable positive linkage between VIM and MMP-9 (r=0.666, P=0.034). Table: 4.

Table 4: Correlation between pathologic parameters and immunohistochemical expression of VIM and MMP2

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Correlation</th>
<th>Grade</th>
<th>Stage</th>
<th>Clinically</th>
<th>TD</th>
<th>LN</th>
<th>MMP-9</th>
</tr>
</thead>
<tbody>
<tr>
<td>VIM</td>
<td>r</td>
<td>0.296</td>
<td>0.238</td>
<td>-0.005</td>
<td>0.137</td>
<td>0.554</td>
<td>0.666</td>
</tr>
<tr>
<td></td>
<td>P</td>
<td>0.431</td>
<td>0.024</td>
<td>0.69</td>
<td>0.045</td>
<td>0.039</td>
<td>0.034</td>
</tr>
<tr>
<td>MMP-9</td>
<td>r</td>
<td>0.053</td>
<td>0.672</td>
<td>0.569</td>
<td>0.013</td>
<td>0.421</td>
<td></td>
</tr>
<tr>
<td></td>
<td>P</td>
<td>0.725</td>
<td>0.011</td>
<td>0.489</td>
<td>0.015</td>
<td>0.034</td>
<td></td>
</tr>
</tbody>
</table>

**Discussion**

The present study showed significant positive correlation between IHC expression of both VIM and MMP-9 and the following: depth of point of tumor front, involvement of lymph node by malignant cells and stage of disease. These findings disclose the predictive role of both VIM and MMP-9 in determining the prognosis of OSCC.

In this regards a study showed Enhanced expression of VIM in association with a direction across a greater metastatic risk (33% versus 77%) and the author concluded that attain of VIM may be associated with
reinforcement of immigration of tumor cells, resulting in elevated rate of metastasis in head and neck squamous cell carcinoma. In one study, multivariate analysis showed that VIM IHC was independent prognostic factors for OSCC of patients. Vimentin is a primed designation of EMT, and novel proof has conveyed it to be an substantial organizer of cellular motion. There are various proceedings that realize the metastatic cascade, many of which regulates directly or indirectly by VIM: EMT, violation of the basement membrane, separation of cells from the premalignant tissue, inroad into another tissue, and promotion at secondary site.

On the other hand, a study showed significant association between IHC manifestation of MMP-9 and involvement of nodes in patients with OSCC, a finding that is similar to the result of the present study. In support of the results, Lotfi et al. found a significant role for MMP-9 in predicting lymph node metastasis in OSCC; however, the marker was measured in serum of patients rather than in tissue. Furthermore, in study conducted by lawal et al. 2015, found poor prognosis for OSCC in association with high IHC expression of MMP-9.

In cancer, upset in proteolysis leads to tumor cells growth disturbance, tissue rehashing, inflammation, obstruction of tissue, and spreading of malignant cells. The matrix metalloproteinases (MMPs) typify the most eminent family of proteinases connected with tumorigenesis. Modern technological evolution has distinctly developed our perception of MMPs as efficacious of the tumor microenvironment. Moreover, to their function in extracellular matrix turnover and malignant cell peregrination, MMPs coordinate passage that orient cell growth, and might act in a nonproteolytic situation. These aspects of MMP task are redirects our access treatment of oral malignancies. Once activated, MMP-9 may initiate a negative feedback hint, for example, by insulting plasminogen and thus intervention with plasminogen transformation to active plasmin. This knotted organization of MMP-9 efficiency is requisite, given that unhampered proteinase efficacymitted from inflammatory cells may cause tissue injury and the pertinacity of the tumor progression in cancer.

Vimentin score was proved to be positively correlated with MMP-9. This is an indication of the combined ability of a malignant cell to express both markers when they undergo down differentiation. These results suggest that Vim and MMP-9 may contribute in epithelial acquires mesenchymal properties and making the cell more powerful in invasion and metastasis. This is in agreement with the findings of Ding et al., found that Vim and MMP-9 expression showed a positive correlation (r = 0.789, P<0.01), and concluded that they can be used as a reference indicator of early diagnosis and prognosis.

In conclusion, the higher IHC expression of VIM and MMP-9 in OSCC are run in parallel with upmost proportion of lymph node metastasis, deeper tissue invasion and hence with worse prognosis.

References


Comparative Study of Two Different Telescopic Crown Materials Retaining Lower Partial Overdenture

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Abstract

Background and Objective: This study was conducted to measure the difference between Chrome Cobalt telescopic crowns and Poly ether ether ketone (PEEK) telescopic crowns retaining implant retained partial overdenture.

Materials and Method: This is a comparative study that included fourteen lower kennedy class I partially edentulous patients. All patients received posterior implant in the second molar area in each side. The patients were divided into 2 groups, the first group received chrome cobalt telescopic crown and the second group received poly ether ketone telescopic crowns over the implants. Partial overdenture was constructed for all the patients in the two groups. Patients were followed up clinically to measure crestal bone height changes using cone beam CT, implant stability test using osstell and periodontal pocket depths.

Results: Both groups showed increase in implant stability, periodontal pocket depths and decrease in crestal bone height, however the difference between the two groups were non-significant except in the periodontal pocket depth, the chrome cobalt group showed increased pocket depths than the PEEK group.

Conclusions: From the results of this study the following conclusions could be obtained. There was almost no difference in crestal bone height resorption between the CrCo and the PEEK telescopic crowns, the difference between implant stability in both groups were non-significant, at the end of the follow up period, the PEEK telescopic crown group showed lesser periodontal pocket depths than the CrCo group which suggests that the PEEK is more biocompatible than the metallic crowns.

Keywords: Telescopic, crown materials, partial overdenture.

Introduction

Posterior free end saddle edentulous patients are the most prevalent among the population. The absence of posterior abutments may affect the support, retention and stability of the prosthesis. Loss of posterior teeth results in loss of neuromuscular stability of the mandible and loss of vertical dimension of occlusion. [1,2]

The great difference in the resiliency between the soft tissues and the teeth will have a damaging effect on the remaining abutment teeth with unfavorable movements with subsequent patient dissatisfaction.[3,4]

The rehabilitation of partially edentulous patients with missing mandibular premolars and molars with implant supported overdentures showed successful results.[5]

Implant supported telescopic prosthesis is a reliable method of treatment of atrophied arches that ensures better masticatory function, esthetics, oral hygiene.[6]

The placement of implants in partially edentulous patients to retain tooth-implant telescopic prosthesis proved to be a successful line of treatment.[7]
Metal-free restorations are becoming increasingly important in dentistry due to the increased aesthetic demands of the patient and possible material incompatibility.[8]

In dentistry, Peek can be utilized in the construction of CAD/CAM removable and fixed prosthesis.[9,15] PEEK can be used as fixed crowns to create a more wettable surface and to facilitate its bonding with hydrophobic resin composites. Many studies suggested the use of PEEK with more advantageous than alloy and ceramic restorations because of its mechanical properties.[14,16-19]

**Materials and Method**

This study included fourteen patients having Kennedy class I in the lower arch with first premolar being the last standing abutment were selected.

Patients were carefully informed about the treatment procedure and agreed to participate in the study. A cone beam computed tomography was taken to evaluate the bone height, width and density in the area of interest.

All the patients received the same kind of implants (Neobiotech IS II Active Fixture, Korea). Two implants were placed in each patient in the posterior mandible area (estimate in the lower 7 region). Flap was raised and implants were placed using free hand technique. Fig. (1). After placement of implants, they were covered by the cover screw and the flap was sutured.

After four months, all the implants were exposed, and healing collars were placed for each patient for one week. After one week the healing collars were removed and the abutments were placed in position to start the prosthetic phase.

Patients were divided randomly into two equal groups. The first group received partial overdenture covering chrome cobalt telescopic crowns and the second group one received partial overdenture covering polyetherether ketone telescopic crowns.

Primary impressions were taken to prepare for a special tray. Then secondary impressions were taken for the fabrication of the telescopic crowns. Telescopic crowns were fabricated and cemented over the implant abutments. Fig. (2)

Custom made perforated acrylic resin tray was constructed and preliminary surveying of the lower study cast was carried out. Inside the patient’s mouth, mesial occlusal rest seat and distal guiding plane were prepared on the first premolar bilaterally. Final impression was taken and poured into improved dental stone to obtain master cast. Secondary surveying was done for master casts before duplication. The partial denture framework was casted in cobalt-chromium alloy. Metal framework try in was done to ensure proper seating of the partial denture. Bite registration were done.

Waxed partial dentures were then tried inside patient’s mouth and processed using heat cured acrylic resin (Acrostone Dental Factory, Cairo, Egypt), finished and polished. Fig. (3)
Clinical follow up: CPCT was used to detect changes in crestal bone height at denture insertion. On each follow up visit, mesial and distal crestal bone levels were calculated from the reconstructed corrected sagittal views. Similarly, buccal and lingual bone levels were calculated by using cross-sectional views. Average readings of the four sides at each interval were calculated and tabulated for statistical analysis. Implant stability was measured using resonance frequency analysis (Osstell® Integration Diagnostics AB, Gothenburg, Sweden). A periodontal pocket depth was measured using graduated periodontal probe.

Results

A. Crestal Bone Height: At overdenture insertion, the mean crestal bone height was significantly higher in PEEK group than in CrCo group (P=0.000). After 6 months, PEEK group yielded significantly higher mean values than CrCo group (P=0.003). At 12 months, the crestal bone height was also significantly higher in PEEK group than CrCo group (P=0.018).

Table (1): Comparison of mean values crestal bone height (mm) between CrCo and PEEK telescopic crowns

<table>
<thead>
<tr>
<th></th>
<th>CrCo</th>
<th>PEEK</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>At insertion</td>
<td>8.63 ± 0.68</td>
<td>9.58 ± 0.52</td>
<td>0.000*</td>
</tr>
<tr>
<td>6 months</td>
<td>8.22 ± 0.71</td>
<td>9.03 ± 0.57</td>
<td>0.003*</td>
</tr>
<tr>
<td>12 months</td>
<td>7.6 ± 0.62</td>
<td>8.43 ± 0.54</td>
<td>0.018*</td>
</tr>
</tbody>
</table>

*: Significant at P ≤ 0.05

B. Implant Stability: At each follow-up period, there were no statistically significant differences in Osstell readings between CrCo and PEEK groups (P=0.256, P=0.588 and P=0.504; at insertion, 6 months and 12 months respectively).

Table (2): Comparison of mean values of implant stability quotient values (ISQ) between CrCo and PEEK telescopic crowns

<table>
<thead>
<tr>
<th></th>
<th>CrCo</th>
<th>PEEK</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>At insertion</td>
<td>70.4 ± 1.03</td>
<td>71.01 ± 1.66</td>
<td>0.256NS</td>
</tr>
<tr>
<td>6 months</td>
<td>72.37 ± 0.87</td>
<td>72.64 ± 1.62</td>
<td>0.588NS</td>
</tr>
<tr>
<td>12 months</td>
<td>72.46 ± 0.85</td>
<td>72.78 ± 1.55</td>
<td>0.504NS</td>
</tr>
</tbody>
</table>

NS: not significant

C. Periodontal Pocket Depth: There were no statistically significant differences between pocket depth mean values between CrCo and PEEK groups at overdenture insertion (P=0.902) and 6 months (P=0.168). While CrCo group displayed significantly higher mean pocket depth than PEEK group (P=0.001).

Table (3): Comparison of mean values of pocket depth (mm) between CrCo and PEEK telescopic crowns

<table>
<thead>
<tr>
<th></th>
<th>CrCo</th>
<th>PEEK</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>At insertion</td>
<td>1.47 ± 0.25</td>
<td>1.48 ± 0.20</td>
<td>0.902 NS</td>
</tr>
<tr>
<td>6 months</td>
<td>1.71 ± 0.22</td>
<td>1.59 ± 0.19</td>
<td>0.168 NS</td>
</tr>
<tr>
<td>12 months</td>
<td>2.01 ± 0.21</td>
<td>1.72 ± 0.19</td>
<td>0.001*</td>
</tr>
</tbody>
</table>

*: Significant at P ≤ 0.05, NS: not significant

Discussion

In this study fourteen partially edentulous patients were selected with mandibular kennedy class I with the first premolar as the last standing abutment.

Two stage surgical protocol was followed to identify the effect of early loading on implants. Prospective clinical studies showed that two-stage system was preferred because it showed higher bone contact percentage than one-stage system.\[20\]

Telescopic crowns were used in this study as they are characterized by lesser number of implants, comparatively higher retention and flexible prosthetic design.\[21-24\]

Two types of telescopic crowns were fabricated over the implants, chrome cobalt and PEEK to increase the retention of the prosthesis. Implant supported telescopic partial overdenture was chosen as a treatment option as it is a reliable method of treatment of atrophied arches.\[6\]

Cone beam computed tomography (CBCT) was used effectively to detect bone height.\[25\]

Resonance Frequency Analysis (RFA) technique using Ostell was used for measuring dental implant stability.\[26\] Pocket depth was measured to assess the condition of the implants.\[27\]

All the implants investigated during the follow-up period showed satisfactory results within the parameters studied. By the end of follow up period, there was significant decrease in the bone height in the two groups with the decrease in chrome cobalt telescopic crown group was 1mm while in the PEEK telescopic crown group was 1.1 mm. This amount of reduction was within the acceptable range of implant success and it agrees with the findings of Merheb J. et al.\[28,29\]
There was a significant difference between the chrome cobalt telescopic crowns and the PEEK telescopic crowns with the PEEK telescopic crowns showed higher bone levels at the three follow up periods. This is usually due to the bone reaction of some patients in the chrome cobalt telescopic crowns group.

Concerning the implant stability, within the two groups, the Osstell readings were significantly lowest at overdenture insertion. The great changes in implant stability followed by the slow change are due to the formation of woven bone and the deposition of lamellar bone between zero and 4.5 months. [30]

At each follow-up period, there were no statistically significant differences in Osstell readings between CrCo and PEEK groups; this suggests that the two types of telescopic crowns had the same effect on the stability of dental implants.

The periodontal pocket depths within CrCo group was significantly highest after 12 months, followed by that measured at 6 months. Within PEEK group, the mean pocket depth after 12 months was significantly higher than at overdenture insertion. While the mean value recorded after 6 months had no significant difference with those measured at insertion and 12 months. This increase is attributed to the gingival inflammation caused by overdenture therapy and the decrease in crestal bone height. These findings agree with Renner et al, Toolson et al and Telleman et al.[31-34]

There were no statistically significant differences between pocket depth mean values between CrCo and PEEK groups at overdenture insertion and 6 months but after 12 months CrCo group displayed significantly higher mean pocket depth than PEEK group.

This could be explained by that the PEEK has better biocompatible nature, less plaque accumulation and almost no gingival inflammation around the implants. [35,36]

Conclusions
From the results of this study it can be concluded that:
1. There were no difference in crestal bone height resorption between the CrCo and the PEEK telescopic crowns.
2. The difference between implant stability in both groups were non-significant

At the end of the follow up period, the PEEK telescopic crown group showed lesser periodontal pocket depths than the CrCo group which suggests that the PEEK is more biocompatible than the metallic crowns.

Conflict of Interest: Nil
Source of Funding: Self funding
Ethical Clearance: Ethical committee of faculty of dentistry, Minia University

References


Renal Protective Effect of Quercetin on Cisplatin-Induced on Some Blood Parameters and Nephrotoxicity in Male Rats

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Abstract

This work was carried out to investigate the possible protective effect of quercetin on some blood parameters and nephrotoxicity in male rats treated with cisplatin. Cisplatin is an important chemotherapeutic agent useful in the treatment of several cancers such as tumors of the testis (including extragonadal germ cell tumors), ovarian cancer, small cell and non-small cell lung cancer, squamous cell carcinomas of the head and neck, and despite the availability of some newer and less toxic quercetin drugs. Eighteen blood samples were obtained from male rats which divided into three groups for each group (n = 6), the first group (control), the second group (Cisplatin) and third group (Cisplatin + Quercetin). There is a significant decrease (P < 0.05) in Creatinine, urea and TNF-α concentrations in the second group compared with the control and third groups. Also, the result showed a significant increase in Creatinine, urea and TNF-α concentrations in the second group compared with the control group. The results showed a significant increase (P ≤ 0.05) in red blood cell count (RBC), packed cell volume (HCT), hemoglobin (Hb) and Platelet in the second group compared with the control and third groups, also it showed a significant decrease in the third group compared with the control group. Therefore, the present study is undertaken to investigate the possible some blood parameters and renal protective effect of quercetin in rats treated with cisplatin.

Keywords: Cisplatin, Quercetin, acute kidney injury, blood parameters and nephrotoxicity.

Introduction

The human kidneys together account for less than 1% of body weight, yet receive about 25% of the cardiac output. Acute kidney injury (AKI) is defined as a clinical syndrome characterized by a rapid decrease in renal function together with the accumulation of waste products such as urea. Cisplatin (cis-diammine dichloro platinum, CDDP) is an alkylating inorganic compound that is widely used as a potent anticancer agent against variety of tumors including testes, ovaries, breasts, lung, and bladder cancer. Cisplatin and other platinum derivatives are the most widely used chemotherapeutic agents to treat tumors including ovarian, head, neck and testicular germ cell tumors. A known complication of cisplatin administration is acute kidney injury (AKI). The mechanism for this renal cell injury has been the focus of intense investigation for many years, and recent studies suggest that inflammation, oxidative stress injury, and apoptosis probably explain part of this injury. However, a large fraction of human malignancies rapidly become insensitive to the cytotoxic effects of cisplatin. Therefore, it is important to improve the sensitivity of chemotherapeutic agents in order to reduce drug dosage and improve the efficacy of treatment. Combination medication was recommended to improve the effectiveness of cancer therapy and reduce the side effect of cisplatin. Quercetin is a type of flavonoid antioxidant that’s found in plant foods. Quercetin has been reported to exert numerous pharmacological activities such as free radical scavenging, TNF-alpha inhibition and anticarcinogenic effects. Nephrotoxicity can be defined as renal disease or dysfunction that arises as a direct or indirect result of exposure to medicines and industrial or environmental chemicals. It is a serious condition that often requires intensive care. After appropriate diagnosis and treatment, the kidneys can restore function such that acute kidney injury can be reversed. The exact mechanisms of nephrotoxicity induced by cisplatin are still not fully elucidated. A variety of cell types have suggested that cancer chemotherapy drugs induce cell apoptosis by induction of formation of reactive oxygen species (ROS) and that the generation of ROS and lipid peroxidation is responsible for the cisplatin induced renal tubular injury. Studies in rats and mice indicate that cisplatin undergoes metabolic activation in the kidney.
to more potent toxins. This process begins with the formation of glutathione conjugates in the circulation, perhaps mediated by glutathione-S-transferase. As the glutathione conjugates pass through the kidney, several apoptotic pathways have been implicated in cisplatin-induced renal epithelial cell death, including the extrinsic pathway activated through death receptors such as Tumor necrosis factor (TNF) receptors, the intrinsic mitochondrial pathway and the endoplasmic reticulum stress pathway. Dosage of cisplatin depends on the clinical condition, renal response, hematological and otic response of the patient, also the carcinoma being treated and the combination with other cancer chemotherapy agents. Erythropoietin (EPO) has recently been shown to exert important cytoprotective and antiapoptotic effects in experimental cisplatin-induced nephrotoxicity and ischaemic acute renal injury. The results suggest that, in addition to its well-known erythropoietic effects, EPO inhibits apoptotic cell death, enhances tubular epithelial regeneration and promotes renal functional recovery in hypoxic or ischaemic acute renal injury. The aim of the study is to determine the toxicity of cisplatin on blood parameters and its effect on kidney function, Also, effect quercetin on cisplatin induced on some blood parameters and nephrotoxicity.

Materials and Method

Eighteen male rats aged 20 - 25 weeks with a weight of (250 to 300 g), were obtained from the animal house Biology Department, Science College, Thi-Qar University, Iraq. They are housed in a room at constant temperature of (20-22˚C) with 12 h light/dark cycles and fed a standard laboratory rat diet and water ad lbitum. The male rats divided into three groups each consisting of 6 animals (n = 6) and were as follows:

1. **The first group (control)**, treated I.P. with a signal dose of (5 ml/animal /day) of normal saline (0.9% Nacl).

2. **The second group**, treated I.P. with a signal dose (10 mg/kg) of Cisplatin.

3. **The third group**, treated I.P. with a signal dose of (100 mg/kg) Quercetinorally by gastric savage 10 hr before and 24 hr. after cisplatin injection of Creatinine, urea and TNF-α determination.

At the end of the experiment period 30 day the animals were killed. The blood and biochemical parameters were measured in the laboratory of Hussain Hospital in Thi-Qar, Iraq. 4 ml of blood samples were collected and divided in to two parts the first part was 2 ml by EDTA tubes, and analyzed to determine of hematological parameters such as a red blood cell count (RBC), the packed cell volume (PCV), hemoglobin (Hb) and platelets (PLT) by using an automatic hematological assay analyzer and the second part was 2ml blood was collected from each animal into plain centrifuge tubes, at room temperature for clotting. Serum was separated by centrifugation at 3000g for 30 min and analyzed, for the concentration

**Statistical Analysis:** All data were expressed as mean ± SD, then subjected to statistical analysis using SPSS software version (16), to know the Least significant differences (L.S.D). P-value < 0.05 was considered to be statistically significant.

**Results**

The effect of quercetin on renal injury markers in cisplatin-induced nephrotoxicity of male rats in table (1), the results showed a significant increase (P≤0.05) in Creatinine, urea and TNF-α concentrations in second group compared with the control and third groups. Also, the result showed a significant increase Creatinine, urea and TNF-α concentrations in second group compared with the control groups.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Parameters</th>
<th>Creatinine (mmol/L)</th>
<th>Urea (mmol/L)</th>
<th>TNF-α (mg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td></td>
<td>0.89 ± 0.05</td>
<td>32.45 ± 1.03</td>
<td>0.02 ± 0.00</td>
</tr>
<tr>
<td>Cisplatin 10mg/kg</td>
<td></td>
<td>2.12 ± 0.29</td>
<td>67.45 ± 2.50</td>
<td>5.13 ± 0.33</td>
</tr>
<tr>
<td>Cisplatin + Quercetin 100mg/kg</td>
<td>1.32 ± 0.01</td>
<td>42.21 ± 0.29</td>
<td>3.05 ± 0.12</td>
<td></td>
</tr>
<tr>
<td>L.S.D</td>
<td></td>
<td>0.34</td>
<td>2.29</td>
<td>0.41</td>
</tr>
</tbody>
</table>

The effect of quercetin in cisplatin-induced on some hematological parameters of male rats in table (2), the results showed a significant decrease (P≤0.05) in red blood cell count(RBC), packed cell volume (HCT), hemoglobin (Hb) and Platelet in second groups compared with the control and third groups, also it showed a significant decrease in third group compared with control group.
Discussion

Anemia in cancer patients is multifactorial, resulting from nutritional deficiencies, decreased production of red blood cells, and/or increased loss/destruction of blood and may occur as either a direct effect of the cancer or due to chemical factors produced by the cancer. In our study we observed a significant fall in total red blood cell count, packed cell volume and hematocrit in all the cancer patients in comparison to baseline (before starting the chemotherapy). In the same study it was tumor cells that were attributed to the development of anemia. Cisplatin is known to cause anemia by interfering in the iron metabolism. Cisplatin is a very effective chemotherapeutic agent, used in the treatment of a wide range of malignant diseases. Cis administration might cause many unwelcome adverse effects, such as genotoxicity, nephrotoxicity and hepatotoxicity that any of them may limit its clinical use. The anticancer drug cisplatin is a very effective compound in the treatment of several cancers. Its clinical use, however, is associated with severe side effects. Main side effect which limits its use in treatment of cancers is nephrotoxicity. Cisplatin in the kidneys penetrates the tubular cells and reaches high concentration in the proximal tubules. Glomerular injury is less frequent. Tubular damage manifests through impaired reabsorption which is characterized by reduced glomerular filtration rate, increased serum Creatinine and blood urea concentrations. The cisplatin-induced tubular damage is complex and involves a number of interconnected factors such as accumulation of cisplatin mediated by membrane transportation, conversion into nephrotoxins, mitochondrial dysfunction oxidative stress, inflammatory response. The administration of quercetin resulted in significantly lower serum Creatinine and urea concentration that may be attributed to the action of flavonoid in the prevention of renal toxicity that the antioxidant properties of quercetin is likely to be shared by other flavonoids. The present results suggest that quercetin is a potentially effective chemoprotective agent by acting in the kidneys as a potent scavenger of free radicals. We studied the effect of quercetin on several mediators and players of the renal inflammation and leucocyte infiltration observed after treatment with cisplatin. Particularly, we measured the renal levels of the TNF-α. Therefore, our study was designed to deeply examine the protective effect of quercetin on the underlying mechanisms of cisplatin induced nephrotoxicity and, the effect on the anti-tumour activity in tumour-bearing rats. Quercetin has been reported as a renoprotective agent in cisplatin-induced nephrotoxicity. Oxidative stress is also involved in the inflammatory response, ROS can induce inflammatory processes via activation of transcription factors such as NF-κB, which in turn induce the production of pro-inflammatory cytokines, such as TNF-α. As such, the beneficial effect of quercetin might also be related to amelioration of inflammation. The present study showed that quercetin significantly decreased plasma TNF-α in quercetin protection group. This study showed the protective effects of quercetin on cisplatin induced nephrotoxicity by inhibiting pro-inflammatory cytokines production as TNF-α. Quercetin has protective effects on acute kidney injury who indicated that, in rat, acted via inhibition of TNF-α (an important cytokine involved in systemic inflammation and the acute phase response), and that this inhibition may act to stabilize a cell survival factor. Besides tubular protection, direct haemodynamic effects may also be invoked to explain the effect of quercetin in the maintenance of GFR through the preservation of blood supply to the kidney. Quercetin administered in daily oral doses before and after cisplatin treatment either prevented or significantly reduced the development of cisplatin-induced acute renal failure as evidenced by functional findings. showed that Cis causes significant effects on hematological parameters only during chronic treatment in humans and rats. Showed fall in hemoglobin level. Our previous results showed that high, acute doses of Cis did not affect the RBC maturation in rats. The results of our study are

<table>
<thead>
<tr>
<th>Groups</th>
<th>Parameters</th>
<th>RBC 10⁶ / mm³</th>
<th>HCT%</th>
<th>Hb%</th>
<th>PLT(10⁹/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td></td>
<td>6.79 ± 1.23</td>
<td>37.14 ± 0.81</td>
<td>10.37 ± 0.81</td>
<td>150.02 ± 5.18</td>
</tr>
<tr>
<td>Cisplatin 10mg/kg</td>
<td></td>
<td>4.22 ± 0.39</td>
<td>34.12 ± 0.52</td>
<td>7.59 ± 0.26</td>
<td>110.58 ± 1.39</td>
</tr>
<tr>
<td>Cisplatin + Quercetin 100mg/kg</td>
<td></td>
<td>4.78 ± 0.98</td>
<td>35.89 ± 0.92</td>
<td>8.31 ± 0.32</td>
<td>135.12 ± 3.09</td>
</tr>
<tr>
<td>L.S.D</td>
<td></td>
<td>0.43</td>
<td>1.28</td>
<td>0.58</td>
<td>6.36</td>
</tr>
</tbody>
</table>
in accordance with literature data and show that chronic application of Cis induced depletion in RBC number and maturation. 25 showed that incubation of human venous blood in the presence of Se is followed by hemolysis. This could explain the occurrence of reticulocytosis, an indicator of stimulated erythropoiesis. was reported that cisplatin treatment causes anemia as a result of fall in the levels of Hb, PCV and TRBC. In the same study it was reported that the reduction of glutathione level in the blood and tumor cells was attributed to the development of anemia. In other studies, on mice it was found that cisplatin was more toxic to earlier haemopoietic progenitor cells then the mature ones26. 22have shown that cis causes oxidative stress in human platelets and lymphocytes, which might reflect on their life expectancy, the induction of apoptosis, and thereby ultimately reduce the number of these cells in the blood. The nephrotoxic effects of Cis23 could be related to renal failure, leading to the loss of body fluids and hemoconcentration and therefore an increased hematocrit in cis treated animals Se in the co-treatment with Cis recovered the number of these blood cells to the control level, indicating that it has preventive and protective effects. Indeed, co-administration of quercetin clearly improves the pharmacotoxicological profile of this family of drugs by reducing their most important side effect.

**Conclusion**

It can be concluded that quercetin is a promising compound for reducing the risk of cisplatin induced nephrotoxicity. So, supplementation with this dietary antioxidant could maintain the integrity of lipid in kidney and blood parameters under oxidative stress during chemotherapy.

**Conflict of Interest:** None

**Funding:** Self

**Ethical Clearance:** Not required.

**Reference**


Factors Influencing Professionalism of Nurses in Community Based Non-life Insurance Company in South Korea

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Abstract

The purpose of this study was attempted to increase the nursing professionalism of nurses in community based non-life insurance companies (CBNLIC) by understanding effects of Ethical dilemmas and decision-making type on their professionalism. This study utilized a structured questionnaire survey of nurses in CBNLIC (103 nurses) in the whole country. Data were collected from 1 August to 31 August, 2015. Data were analyzed with descriptive statistics, t-test, one way ANOVA, and multiple regressions using the SPSS 20.0 program. This study showed that major variables which had statistically meaningful differences on nursing professionalism were job satisfaction (β=.364, p<.001), reasonable decision-making type (β=.258, p=.003), dependent decision-making type (β=-.289, p=.002). And those variables explained 38.2% of nursing professionalism (F=11.501, p<.001). Developing a program which can improve quality of nurse in non-life insurance company, is required to enhance their performance.

Keywords: Insurance, nurses, professionalism, ethics, decision-making.

Introduction

The ‘best economic system’ created by mankind is the insurance against the risks that may arise at anytime, anywhere in the uncertain future¹. Insurance contracts involve risks such as illegal, gambling, and unfair conduct, and the risk of insurance fraud or insurance crime is relatively high². According to the statistics of the Financial Supervisory Service in Korea in 2016, the number of auto insurance fraud detectors in 2016 was 83,012, amounting to 7,185 billion won, and this number is increasing every year and insurance fraud is becoming a social problem³.

The Korean government opened the ‘Insurance Fraud Prevention Center’ to investigate and analyze information on suspicion of insurance fraud obtained from the general public, and to investigate cases in which fraud is suspected⁴. Several non-life insurers in Korea are also working to prevent insurance fraud by operating a special investigation unit that specializes in insurance fraud. In particular, the role of nurses who have been employed for the purpose of medical examination and the efficiency of compensation work has been expanded. On the other hand, in the United States and the United Kingdom, independent adjusters or loss adjusters carry out work commissioned by community based insurance companies¹⁻². In addition to investigation, confirmation, and evaluation, consultation and adjustment are also carried out between the insurance company and the insured¹⁻².⁴.

These roles are performed by nurses who are examiners of community based non-life insurance companies (CBNLIC), and their role is to serve as a judge, manager, coordinator, educator, and researcher in conducting medical education for compensating staff⁵. This role places high importance on professionalism. In addition, the nurse face the ethical dilemma of managing and counseling the victims and assessing the appropriateness of the medical expenses, while at the same time performing financial evaluation and

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Tel.:+82-55-772-8248
Non-life insurance nurses experience negative feelings of frustration, anger, helplessness, exhaustion, and experience leads to a decrease in job satisfaction. The lowered job satisfaction detrimentally affects work performance and efficiency, and this hinders the development of nurses and the nursing profession. In addition, when a nurse is in an ethical dilemma, proper decision-making ability is required. In decision-making individuals perceive and respond to decision-making tasks. In particular, nurses for non-life insurance companies need to make rational decisions to calculate objective and fair damage for victims of traffic accidents. In this light, it is necessary to conduct basic research on nurses self-awareness and ethical attitudes toward nurses expand the scope of nurses activities to various fields including insurance institutions.

Previous studies have shown that the factors affecting professionalism include self-efficacy, job satisfaction, job commitment, and job performance. The role of nurses at non-life insurers is a new area based on medical knowledge and clinical experience. More specifically, nurses are professionals who carry out non-life insurance inspections based on expert knowledge, such as understanding of automobile insurance and the medical insurance system and policy, and compensatory and legal knowledge of car injuries and disabilities. It is important to examine the professionalism and ethical attitude of nurses to expand the scope of their activities to various fields such as non-life insurers. Thus, this study investigates the ethical dilemmas nurses experience in the work of accident insurance review and how decision-making affects their professional work.

Method

Sample and Data Collection: This study utilized a cross-sectional research design that investigated the linking nurse who belongs to the Korean CBNLIC. The CBNLIC is located in Seoul, Gangnam, Kyongwon, Chungcheong, Honam, and Daegu Compensation Center in South Korea. The study period ranged from August 1, 2015 to August 31, 2015. A total of 129 questionnaires were distributed to all of the respondents, and 103 (79.8%) were collected. 26 expressed their lack of interest in the study as a reason for refusal.

Measurements: The ethical dilemma was modified and supplemented to measure the ethical dilemma experienced by Park nurses during the course of their work, and the total score was 13 points. This tool consists of examination of medical expenses, injury and disability management, victim management, statistics, and others. The possible score range is from 13 to 65, and the higher the score is, the greater the ethical dilemma is. In Park, Cronbach’s α was .75 and similarly in the current study our Cronbach’s α was 0.94. The type of decision making is based on Harring’s Assessment of Career Decision Making (ACDM), which was modified and supplemented by Koh. The tool consists of a rational decision type, an intuitive decision type, and a dependent decision type. The score range for each type is 10-50 points. In Koh, Cronbach’s α was 0.84 and in this study it was 0.77. Professionalism used a tool that standardized Hall’s Professional Inventory in Korean by Baek, Kim and Soo. This tool is composed of professional organization, the belief in public service, autonomy, belief in self-regulation, and a sense of calling for work. The possible score range is 25 ~ 125 points. Previous studies have indicated reliability with Cronbach’s α 0.82, in the current study had a reliability of 0.75.

Data Analyses: Statistical analysis was performed using SPSS / win 20.0. The general characteristics of the subjects, the ethical dilemmas associated with variables were calculated with real numbers, percentages, means, and standard deviations. The differences in the professionalism according to the general characteristics of the subjects were analyzed using a t-test and ANOVA. The factors affecting the professionalism of the subjects were analyzed by multiple-regression.

Results

Differences in Professionalism of Participants according to General Characteristics: As seen in Table 1, the participants’ mean age 41.6 year. There was a statistically significant difference according to general characteristics according to job satisfaction (F = 13.24, p<.001). Table 1 showed that there was no significant difference in the professionalism according to education level, NIS experience, current position, and job stress.
Table 1: Differences in Professionalism of Participants according to General Characteristics (N=103)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Categories</th>
<th>n</th>
<th>M±SD</th>
<th>t/F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (year)</td>
<td></td>
<td>103</td>
<td>41.6±6.3</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Education level</td>
<td>Junior College</td>
<td>27</td>
<td>3.28±.35</td>
<td>.18</td>
<td>.835</td>
</tr>
<tr>
<td></td>
<td>University</td>
<td>69</td>
<td>3.30±.29</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>≥Master’s degree</td>
<td>7</td>
<td>3.23±.23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NIS* experience (yr)</td>
<td>&lt; 5</td>
<td>18</td>
<td>3.24±.07</td>
<td>1.06</td>
<td>.349</td>
</tr>
<tr>
<td></td>
<td>5-9</td>
<td>35</td>
<td>3.25±.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>≥10</td>
<td>50</td>
<td>3.33±.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work part</td>
<td>CST+</td>
<td>13</td>
<td>3.41±.19</td>
<td>3.16</td>
<td>.046</td>
</tr>
<tr>
<td></td>
<td>CC derogati</td>
<td>77</td>
<td>3.30±.31</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>13</td>
<td>3.12±.26</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current position</td>
<td>Staff</td>
<td>12</td>
<td>3.15±.35</td>
<td>2.01</td>
<td>.139</td>
</tr>
<tr>
<td></td>
<td>Assistant</td>
<td>50</td>
<td>3.28±.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Manager</td>
<td>41</td>
<td>3.34±.05</td>
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<td></td>
</tr>
<tr>
<td>Job satisfaction</td>
<td>Satisfaction</td>
<td>54</td>
<td>3.42±.25</td>
<td>13.24</td>
<td>&lt;.001</td>
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<tr>
<td></td>
<td>Normal</td>
<td>49</td>
<td>3.15±.27</td>
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</tr>
</tbody>
</table>

NIS*Non-lifeinsurance; CST+Compensation Support Team; CC derogatiCompensation center team

Descriptive Statistics: Table 2 shows degrees of ethical dilemma, decision making type, and professionalism. Ethical dilemma was scored as 2.47±.70. The nurses of non-life insurers showed the highest ethical dilemma among victim management. This is because most auto-insured patients are patients with minor injuries, but unnecessary hospitalization and long term treatment increased the demand for the victim. In principle, this appears to be due to the work of managing and adjusting the conflicts arising from management of an appropriate loss ratio by applying the insurance premium calculation standard. On the other hand, there was a low level of counseling and medical knowledge provision on statistics and health problems of medical expenses and disability related items. Decision making type was scored as 2.92±.26. The nurses consider the patient’s health and interests to be the top priority because it is an important issue or difficulty about the ethical dilemma. Therefore, it is necessary to discuss the dilemma experienced in the field in order to facilitate logical and systematic decision-making and to develop the ability to make decisions through continuing nursing ethics and value education. The degree of professionalism was scored as 3.29±.30. As a result, the establishment of professionalism of nurses improved the performance of non-life insurer nurses, control turnover, and promote quality insurance.

Table 2: Mean Scores for Main Variables (N=103)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Items</th>
<th>Instrument range</th>
<th>M ± SD</th>
<th>Point M ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethnical Dilemmas</td>
<td>13</td>
<td>13-65</td>
<td>39.99±12.08</td>
<td>2.47±.70</td>
</tr>
<tr>
<td>Decision-making Type</td>
<td>30</td>
<td>30-150</td>
<td>86.61±7.92</td>
<td>2.92±.26</td>
</tr>
<tr>
<td>Professionalism</td>
<td>25</td>
<td>25-125</td>
<td>75.76±6.99</td>
<td>3.29±.30</td>
</tr>
</tbody>
</table>

The Influencing Factors on Professionalism: Table 3 shows the correlations of professionalism with ethical dilemma and decision making type. In order to identify factors affecting the professionalism of the subjects, the departments that showed a significant relationship in general characteristics of the subjects, job satisfaction and ethical dilemma, rational decision type, and intuitive decision type were measured correlations and then subjected to a multiple regression analysis. The main factors affecting the professionalism of the
subjects are the departments (β = .290, \( p = .001 \)), job satisfaction (β = .364, \( p < .001 \)), rational decision type (β = .258, \( p = .003 \)), and dependent decision type (β = -.289, \( p = .002 \)) were statistically significant, and they had an F score of 11.501 (\( p < .001 \)) and an explanatory power of 38.2\%(Table 4).

### Table 3: Correlations of Ethnical Dilemmas, Decision-making Type, Professionalism

<table>
<thead>
<tr>
<th>Variables</th>
<th>Professionalism</th>
<th>Ethnical Dilemmas</th>
<th>Decision-making Type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( r (p) )</td>
<td>( r (p) )</td>
<td>( r (p) )</td>
</tr>
<tr>
<td>Professionalism</td>
<td>1</td>
<td>-237(-.016)</td>
<td></td>
</tr>
<tr>
<td>Ethnical Dilemmas</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>RT*</td>
<td>.325(-.001)</td>
<td>-286(-.003)</td>
<td>1</td>
</tr>
<tr>
<td>IT+</td>
<td>-.099(-.321)</td>
<td>.060(-.549)</td>
<td>-.189(-.056)</td>
</tr>
<tr>
<td>DT(\dagger)</td>
<td>-.334(-.001)</td>
<td>.059(-.556)</td>
<td>-.177(-.073)</td>
</tr>
</tbody>
</table>

RT\* = Reasonable type; IT\+=Intuitive type; DT\(\dagger\)=Dependent type

### Table 4: The Influence Factors on Professionalism

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>SE</th>
<th>( \beta )</th>
<th>t</th>
<th>( p )</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>64.04</td>
<td>7.7</td>
<td>8.315</td>
<td>&lt;.001</td>
<td></td>
</tr>
<tr>
<td>Work part</td>
<td>4.02</td>
<td>1.12</td>
<td>.290</td>
<td>3.585</td>
<td>.001</td>
</tr>
<tr>
<td>Job satisfaction*</td>
<td>4.56</td>
<td>1</td>
<td>.364</td>
<td>4.529</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Ethnical dilemmas</td>
<td>-.95</td>
<td>.81</td>
<td>-.097</td>
<td>-1.173</td>
<td>.244</td>
</tr>
<tr>
<td>Reasonable type</td>
<td>3.94</td>
<td>1.3</td>
<td>.258</td>
<td>3.035</td>
<td>.003</td>
</tr>
<tr>
<td>Intuitive type</td>
<td>2.81</td>
<td>1.57</td>
<td>.163</td>
<td>1.78</td>
<td>.078</td>
</tr>
<tr>
<td>Dependent type</td>
<td>-4.38</td>
<td>1.37</td>
<td>-.289</td>
<td>-3.192</td>
<td>.002</td>
</tr>
</tbody>
</table>

Adj \( R^2 = .382, F = 11.501, p = <.001 \)

*Dummy variable; Reference group=Satisfaction

### Discussion & Conclusion

This study was conducted to determine the degree of professionalism of CBNLIC in South Korea and discuss the effects of ethical dilemmas and decision-making styles on professionalism.

First, the degree of professionalism of the subjects was 3.29 points, similar to the value (3.33) of Han, Sohn, Park, and Kang\(^{12}\), who did not use the same tools but studied hospital nurses. In addition, in the results of Lee and Kim\(^{18}\), who studied nurses according to the size of the hospital, the occupational specialty score was 3.30, similar to the results of this study. However, in Kim and Park\(^{9}\) the score was lower than 4.05. The results of this study were similar to those of previous studies on general nurses, but they were lower than those of professional nurses because of the specialization of medical services and the increasing role of nurses and the increasing specialization of nursing staff. It appears that nurses did not positively perceive their professionalism and identity. Also, in this study, we used a tool to measure the professionalism of nurses.

Second, the factors influencing the participants’ professionalism were the statistically significant effects of job satisfaction, rational decision types, and dependent decision types, with explanatory power of 38.2\%. The nurse requires a high level of professional competence to calculate damage compensation for persons injured in an auto accident. In addition, some value problems need to be judged by nurses of CBNLIC, and hence it is necessary to collect enough information and make realistic, careful, and logical decisions. Therefore, it is thought that the decision-making affects the professionalism, consistent with the result of this study.

In the study, the ethical dilemma experienced during job performance was not a significant variable to explain job professionalism. This can be attributed to the fact that the ethical perspective, which is the criterion for the ethical dilemma that arises while performing nursing...
work, is not clearly established. Therefore, it is necessary to discuss the dilemma experienced in the field in order to facilitate logical and systematic decision-making and to develop the ability to make decisions through continuing nursing ethics and value education.

Although there is no comparative study because there is no precedent study in which the same concept is researched, the nurses experience diverse situations in the field due to system of non-life insurers, and when making decisions about attitudes and behaviors in the field, it is important to choose types of decisions making. In the case of non-life insurers, the nurse should collect the opinions of experts and various alternatives for problem solving, and then choose the most reasonable method and perceive the responsibility for the choice as important. Therefore, it is important that the social status within the insurance review agency and the scope of the role of the nurse in the decision-making process be clearly identified and the position as a decision maker recognized. In order to ensure that insurance nursing practitioners do not have a conflict of values in problem situations and make reasonable decisions, it is necessary to prepare a strategy to strengthen intensive care education through the CBNLIC association or the compensation medical association.

Job satisfaction has the greatest effect on the participants’ professionalism. The results of this study are similar to those of Lee and Kim, who studied the effects of job satisfaction on professionalism in dental hygienists. The results of this study are similar to those of Cho and Han, in which job satisfaction was found to be an influential variable for home nurses. Satisfaction with occupation is important in achieving more qualitative and efficient work and self-realization by maximizing the ability in performing tasks. This support can improve status of non-life insurers’ nurses, which would lead to an increase in job satisfaction, which is a positive factor for the management of the company.

There are limitations in this study. First, given the nature of cross-sectional data, causality cannot be inferred. Second, the two instruments measuring ethical dilemma and decision-making have not been validated with non-life insurers’ nurses; however, both measures were validated among medical insurance review nurses in Korea with good internal consistency reliability. Finally, our data focused on Korean nurse population, and thus nurse population in the world was not included in our data. Future studies are necessary that use larger samples, including a multitude of different specialty areas nurse.

**Ethical Clearance:** Taken from the researchers’ organization of the Institutional Review Board in Korea (IRB No. 079-01).

**Source of Funding:** Self

**Conflict of Interest:** NA

**References**

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Studying TMJ Changes After Using Twin Block Appliance for the Treatment of Class II Cases

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Abstract

Twin block appliance was selected for treating 10 children displaying skeletal class II malocclusion, mandibular deficiency. MRI was then used to study the changes that occurs in the TMJ in response to the treatment. All included subjects were free of any TMJ problems. MRI was performed before starting treatment and after 8 months of using twin block appliance, for each patient. Sagittal concentricity, sagittal disc position and eminence angle were calculated for each patient from the MRIs. Insignificant differences were found for the sagittal concentricity, sagittal disc position and the eminence angle before and after treatment. When comparing sagittal concentricity, sagittal disc position and eminence angle for the right and left TMJs of each patient, significant difference was recorded either before or after treatment for the disc position while the results were insignificant for the rest.

Keywords: Twin block, TMJ, MRI.

Introduction

One of the most common malocclusions in children is skeletal class II cases mandibular retrusion. Many appliances can be used for such cases as Activator, Frankel, Twin block or Herbst appliance.

One of the most popularly used functional appliances for treating skeletal class II cases, is the twin block appliance originally developed by William J Clark [1].

Functional appliances work by moving the mandible into a more forward position thus displacing the condyles in the glenoid fossa and promoting remodeling on the articular surfaces of the TMJ. Chavan SJ., et al 2014[2].

MRI is believed to be radiation free, non-invasive and gives accurate images of soft and bony tissues of the TMJ, so considered to be best choice for imaging temporomandibular disorders. Wadhawan N., et al. 2008 [3].

TMJ adaptation and remodeling in response to using twin block appliances was the concern of many authors and to study the changes between the right and left TMJs before and after treatment Livieratos FA, 1995[4].

This study aimed to examine the TMJ changes that occur after using twin block appliance in treating skeletal class II cases.

Materials and Method

Ten female patients were selected, all of which were skeletal class II with overjet more than 5 mm. all of them were growing patients in their pre-pubertal growth period with a mean age of 11.5 years.

None of the patients had previous orthopedic, orthodontic or surgical treatment, and all of them had retruded mandible with normal maxillary growth.

One of the main inclusion criteria that none of these patients suffered or had any temporomandibular disorders or problems.

Treatment procedures were explained to each patient and their parents and a written assent was signed by them.

TMJ imaging was conducted using MRI machine of 1.5 tesla with bilateral TMJ coils and both sides were imaged.

Patients were instructed to bite in maximal intercuspation during pre-treatment images, while in post-treatment unstrained retruded mandibular position were used in the images cause of the posterior open bite that develop in patients treated using twin block Chavans J.et al 2014 [2].
Condylar position, sagittal disk position and the eminence angle were measured from the recorded MRIs.

**Condylar position:** The sagittal position of the condyle was assessed using the method described by Nezar, et al.[5] by drawing the longitudinal axis of the condyle, it was determined by defining the anterior and posterior poles of the condyle and connecting them with a line. From the middle of this line a perpendicular line was drawn directed cranially passing through the cranial pole of the condyle.

From the middle of the first line, another vertical line was drawn passing through the center of the glenoid fossa (maximum concavity in the fossa).

Condyle was considered in a centric position if both vertical lines overlapped each other, posteriorly positioned if negative angle was formed between the lines and anteriorly positioned if positive value was recorded.

**Sagittal disc position:** Chintakanon., et al.[6] described the method to define the disc position depending on drawing the 12 o’clock line through the center of the condyle and the roof of the fossa. The posterior part of the disc was then measured as an angle to the 12 o’clock position.

The disc can be either anteriorly or posteriorly displaced or normally positioned.

The normal position of the disc lies between 25.7° to -18.7° as given by bySilverstein., et al.[7]

**Eminence angle:** The slope of the eminence was calculated by the angle formed between the tangent to the posterior part of the eminence and the posterior border of the ramus.

**Statistical analysis:** The collected data were analyzed using SPSS software and paired t test was used to describe the difference between the changes of the different variables.

**Results**

The following table shows the comparison of the mean of the right and left TMJ records and their P-value before and after treatment:

| Table (1): comparison of the mean of the right and left TMJ records and their P-value before and after treatment |
|---|---|---|---|---|---|
| Side | Pre | P-Value | Post | P-value |
| Condylar position | Right | -0.14 | 0.5 | 3.21 | 0.3 |
| | Left | -0.98 | 1.3 | 1.3 |
| Disc position | Right | 14.1 | 0.01 | 12.1 | 0.03 |
| | Left | 12.2 | 10.4 | 10.4 |
| Eminence angle | Right | 36.9 | 0.44 | 38.1 | 0.64 |
| | Left | 36.2 | 37.7 | 37.7 |

The following table shows the comparison of the mean of the right TMJ records and their P-value before and after treatment:

| Table (2): comparison of the mean of the right TMJ records and their P-value before and after treatment |
|---|---|---|
| Side | Pre | P-Value |
| Condylar position | Right (pre) | -0.14 | 0.3 |
| | Right (post) | 3.21 | 0.3 |
| Disc position | Right (pre) | 14.1 | 0.37 |
| | Right (post) | 12.1 | 0.37 |
| Eminence angle | Right (pre) | 36.9 | 0.06 |
| | Right (post) | 38.1 | 0.06 |

The following table shows the comparison of the mean of the left TMJ records and their P-value before and after treatment:

| Table (3): comparison of the mean of the left TMJ records and their P-value before and after treatment |
|---|---|---|
| Side | Pre | P-Value |
| Condylar position | left (pre) | -0.98 | 0.44 |
| | left (post) | 1.3 | 0.44 |
| Disc position | left (pre) | 12.2 | 0.39 |
| | left (post) | 10.4 | 0.39 |
| Eminence angle | left (pre) | 36.2 | 0.05 |
| | left (post) | 37.7 | 0.05 |

**Discussion**

Many authors studied the effect of using twin block appliance in the treatment of skeletal class II mandibular deficiency cases, and some studies used MRI to evaluate the changes that could occur in the TMJ during treatment as Chavan., et al.[4], Ruf and Pancherz[8], Kinzinger., et al.[9], Chintakanon., et al. [6]
According to Foucart et al.\textsuperscript{[10]}, and Sanchez et al.\textsuperscript{[11]} bilateral disc displacement in both joints are more common up to 3 times than unilateral disc displacement, so both joints should be studied for TMJ changes after using twin block appliance.

**Condylar position:** It shows the position of the condyle in sagittal direction within the TMJ in relation to the glenoid fossa.

It was evaluated using the method described by Nezar, et al.\textsuperscript{[5]} in which he stated that the condyle is anteriorly positioned when results are positive, posteriorly positioned when negative and concentric when results are zero.

In this study, pre-operative MRIs showed that the condyles were in a non-concentric position that follows the findings of Nezaret al.\textsuperscript{[5]} and Chintakanon Sampson., et al.\textsuperscript{[6]} and when comparing each side of the TMJ separately, pre-operative results were found to be insignificant. These findings come in agreement with Vitral, et al.\textsuperscript{[12]}, Rodrigues, et al.\textsuperscript{[13]}, Whyte, et al.\textsuperscript{[14]}. The post-operative MRIs showed that the condyle moved to a more anterior position, but when comparing these results of the TMJs either separately or together changes were found to be insignificant.

**Sagittal disc position:** Significant difference was found after 8 months of treatment using the twin block appliance regarding the relation between the pre and post-treatment records of the disc and the condyle in sagittal direction.

Both sides of the disc moved in the same direction and remained within the physiologic range determined by Silverstein, et al, 1994\textsuperscript{[7]}

**Conclusions**

It could be concluded from these results that condyles moved in an insignificant way to a more anterior position after using twin block appliance, while the disc moved to a more posterior position.

When comparing each side of the TMJ separately, significant difference was recorded concerning the disc position either in the right or the left side.

**Conflict of Interest:** None

**Source of Funding:** Self-funding

**Ethical Clearance:** Each patient or their parents within the study signed an informed consent for participating in the study, and the study was approved by the Ethics Committee of Minia University.

**References**


Abuse of Appetite Stimulant Medications in AL-Anbar, Iraq

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Abstract
Medication abuse is characterized as utilizing of medications for a non-restorative or non-medicinal reason. In Iraq medicate abuse is a noteworthy issue on the grounds that practically any medication can be effectively acquired from drug stores. Appetite stimulant medications are case of medications that are broadly utilized without a medicine. The examination incorporates 250 persons who utilize these medications in AL-Anbar governorate. A poll incorporate the accompanying inquiries: age, sex, conjugal express, the explanation behind utilize the medication, whether the medication is recommended by doctor or not, sort of medication utilized, the recurrence of day by day portion and finally the degree of reactions of the medications utilized.

Keywords: Abuse of medication, Appetite stimulant, dexamethasone, cyproheptadine.

Introduction
Medication abuse can be essentially characterized as utilizing of medications for a non-helpful or non-therapeutic reason. Medication abuse is a term utilized usually for professionally prescribed drugs with clinical viability. In Iraq medicate abuse is a broadly spread issue in light of the fact that practically any medication can be effectively gotten from drug stores and medication stores. Appetite stimulant medications are generally utilized without a solution or medicinal supervision to put on body weight and improve viewpoint. Appetite stimulant medication is any medication which builds the craving. A few investigations have demonstrated that there is a solid relationship between self-saw weight status and Weight control conduct. Incomprehensibly, in many creating networks like Iraq,completion is socially connected with magnificence, success, wellbeing and notoriety, while thinning is seen to be an indication of sick wellbeing or destitution, so using these medications to expand body load so as to improve the state of subject

Cyproheptadine hydrochloride in antihistaminic/anticholinergic/ Antiserotonergic operator. In Iraq cyproheptadine is accessible in two pharmaceutical measurements frames; tablets and syrup and broadly utilized as a Appetite stimulant.

Dexamethasone is a mitigating and immunosuppressant. One of its symptoms is expanded hunger prompting noteworthy weight gain and thusly abused for this reason. In Iraq dexamethasone is accessible in various pharmaceutical measurement shapes like tablet, syrup and infusion. Betamethasone is another glucocorticoid steroid with mitigating and immunosuppressive properties. In Iraq betamethasone is accessible in various pharmaceutical measurement shapes as tablet and infusion. Tonics incorporate chiefly nutrients and minerals, are accessible in various pharmaceutical measurements shapes like tablet, syrup and injection.

Subjects and Strategy: The illustrative cross segment contemplate was directed from January 2018 to May 2019 on a continuous example of 250 subjects, in AL-Anbar, The subjects were gathered from patients going to six private drug stores in various areas to Purchase diverse kinds of Appetite stimulant medications. A poll was developed and incorporated the accompanying inquiries: age, sex, conjugal state, explanation behind utilizing the medication, whether it is recommended by doctor or utilized without medicine, sort of medication utilized, every now and again day by day portion utilized, and degree of symptoms in the subjects of study.
Results and Discussion

Variety of age: The outcomes demonstrated that 18 subjects (7%) utilizing appetite stimulant medications were under 12 years of age, 70 subjects (28%) were between 12-16 years of age, 85 subjects (34%) were between 17-21 years of age, 62 subjects (25%) were between 22-40 years of age and 15 subjects (6%) were over 40 years of age (Figure 1). These numbers showed that appetite stimulant medications are utilized generally by adolescents and youthful grown-ups.

Variety of sex: The outcomes demonstrated that 75 of the subjects (30%) utilized appetite stimulant medications were guys and 175 (70%) were females at a proportion 1:2.3 as females constantly will in general improve their look as finished up from the appropriate responses of members amid talking.

Conjugal state: The investigation uncovered that 156 (62%) of subjects who utilized appetite stimulant medications were single (unmarried), while 94 (38%) of them were hitched. These outcomes demonstrated that the unmarried subjects, maybe the vast majority of them, are attempting to build their body load to improve their shape and to look progressively alluring and solid by other individuals.

The explanation behind utilizing hunger stimulant medications: At the point when the subjects of study were approached about the explanation behind utilizing hunger stimulant medications, 120 (48%) of them credited the reason to low body weight, while 92 subjects (37%) utilized it to improve shape and standpoint, and 38 subjects (15%) said that they utilized it only for general wellbeing (Figure 2). These outcomes showed that the vast majority of the subjects utilizing these medications were either to build body weight or for better outlook. The attractive quality of a specific body estimate aren’t just a self-sufficient, singular decision, yet is intervened by social components. In a few nations there is a craving to get more fit however in different nations there is a longing for completion. 

Medication recommended by doctor or not: The outcomes demonstrated that just 80 subjects (32%) utilized hunger stimulant medications recommended by doctor or under therapeutic supervision while 170 subjects (68%) utilized these medications without doctor remedy, these outcomes demonstrated that there is an extraordinary abuse of such medications and a large portion of them are utilized without solution or supervision by medicinal specialists.

Sort of appetite stimulant medications utilized: Eighty three of the subjects utilized steroids (33%), while 67 subjects utilized cyproheptadine (27%), 30 of them utilized tonics (vitamins and minerals) (12%), and 50 subjects utilized mixes of these operators (28%) (Figure 3), and these outcomes demonstrated that steroids and cyproheptadine are the most sorts utilized locally in light of the fact that they trust that steroids are the best and quick medications to expand body weight (in view of the network involvement).

Recurrence of day by day portion of craving stimulant medications: One hundred subjects (40%) utilized these medications once every day, 110 subjects (44%) utilized it two times per day, 35 subjects (14%) utilized it three times each day while just 5 subjects (2%) utilized it multiple times each day (Figure 4). These outcomes demonstrated that the majority of subjects like to utilize the medications 1-2 times each day as opposed to a few times each day as it is progressively helpful.

Symptoms: As per our discoveries, just 10% of the subjects utilized general tonics experienced reactions, for the most part gastric issues (like queasiness), half of the subjects utilized cyproheptadine experienced drowsiness and migraine while 80% of subjects who utilized steroids experienced separate symptoms (like edema, skin inflammation, dry layered skin and expanded perspiring) (Figure 5). Cyproheptadine causes sluggishness as is basic with original antihistamines. Sickness and regurgitating are noted ordinarily in individuals with neuromuscular disarranges. Cyproheptadine can likewise cause over-resting (10 hours) in kids and adolescents. 

![Figure 1: Variety of age](image)
Conclusions

The outcomes acquired from this investigation, demonstrated that there is a misuse of appetite stimulant medications in the subjects took an interest in this examination in AL-Anbar which are not utilized on medicinal bases and without doctor supervision. The abuse of appetite stimulant medications is high among youthful age females and utilized by unmarried more than wedded subjects.

The vast majority of the subjects utilized these medications to build body weight and improve outlook (not because of illnesses) and a large portion of them want to take craving stimulant medications two times per day. Dexamethasone was generally utilized appetite stimulant medication and most of subjects utilized steroids had experienced severe side reactions.

Conflict of Interest: Nil

Source of Funding: Self

Ethical Clearance: Nil

References

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Organized Activities in Peer Groups Improve Mental and Social Well-Being in Adolescents: A Qualitative Study

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Abstract

Introduction: Mental and social well-being in adolescents can be improved by organized activities in peer groups. This qualitative study aimed to explore organized activities in peer groups related to mental and social well-being in adolescents.

Method: Five focus groups were carried out with 30 adolescents aged 12–24 in Surabaya, Indonesia. Participants were purposively selected and had all experienced organized activities. A thematic approach was used for analysis and data collection was completed at the point of data saturation.

Results: Four interconnected themes emerged from the data; (a) self-esteem and self-regulation, (b) resilience, hardiness and mental toughness, (c) social adjustment and (d) social support in organized activities. Adolescents who involve in sports, arts, and clubs have high confidence, easiness to control their emotion, stronger in facing various problems. They also felt more adapt, respect, tolerant of others and get social support.

Conclusions: This study demonstrates that organized activities in peer groups improve mental and social well-being. Adolescents can have good self-esteem, self-regulation, resilience, hardiness and mental toughness. Adolescents also can have good social adjustment and social support. One of the efforts to prevent a mental and social problem is early recognition or detection in adolescents.

Keywords: Organized activities, peer groups, mental and social well-being, adolescents, qualitative research, focus groups.

Introduction

Mental and social health is one of the health problems in the world, including in Indonesia. One population that has a risk for mental and social health disorders is adolescents. Mental disorders in adolescents include anxiety and depression, while social disorders that occur are social isolation and loneliness. 1

Adolescence is a transitional period of development between childhood and adulthood. The development of adolescent social life is characterized by the influence of peers in adolescent life.2 Peer groups are a place for adolescents to socialize with peers and they gain social support.3,4,5 Activities undertaken by adolescents with peers include activities such as sports, arts and clubs and impact on social and mental well-being.6

World Health Organization states that health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.7 Mental health is a state of well-being in which every individual realizes his or her own potential, can work productively and able to make a contribution to the community. A social well-being manifests if one is able to relate to another person or group well.
Criteria of mental well-being as follows mental
efficiency, control and integration of motives, control of
conflicts and frustrations, positive and healthy feelings
and emotions, the tranquility of peace of mind, healthy
attitudes, healthy self-concepts, adequate ego identity
and adequate relation to reality. Mental well-being
enhances our cognitive process, and to deal with simple
as well as complex task. It also helps us in developing
intrinsic motivation.

Social well-being concerned with social support
and interpersonal relationship. Social support was
simultaneously related with health and personal control
beliefs in relation to well-being. Close support figure
can be sufficient to promote well-being. The high social
well-being is a positive significance in coping with
the stresses of life and developed high productivity to
make an effective community. One factor that related to
well-being among adolescents was organized activities
involvement.

The purpose of this study is to explore organized
activities in peer groups related to mental and social
well-being in adolescents.

Materials and Method

Study design: This study used qualitative
description as a design and focus group for
information gathering to explore organized activities
in peer groups related to mental and social well-being
in adolescents. This study chose focus groups because
this method possible to acquire valuable data. Ethical
approval was granted by The Faculty of Public Health
Airlangga University Health Research Ethics Committee
(No: 69-KEPK).

Recruitment process: Participants were male and
female students who attend organizations in schools
with peer groups. We used a purposive sampling
technique, aiming to be inclusive of experiences of boys
and girls from diverse backgrounds. Recruitment ended
once theoretical saturation was achieved. In total, 30
adolescents ranging in age from 12 and 21 years, 12
participants were girls (40%) and 18 (60%) were boys.

Conduct of focus groups: Data collection was
carried out by the main researcher from January-
December 2017. Focus groups were conducted with
pupils in same year group to get naturalistic discussions.
We designed a questioning route informed by existing
mental and social well-being literature and guidance on
focus groups. Focus groups lasted 50-60 minutes
and were digitally audio recorded. The researcher
assistant took field notes including verbal and non-verbal
communication. Audio recordings were transcribed
verbatim.

Data analysis: All data emerging from interviews
and field notes helped inform the data-analysis process,
were reviewed and coded by the researcher. This study
using a thematic analysis approach. Pupils were given
the opportunity to feedback on results to encourage
participation validation.

Results

Five focus groups were conducted in this study with
30 participants. Four interconnected themes emerged
from the data; (a) self-esteem and self-regulation, (b)
resilience, hardiness and mental toughness, (c) social
adjustment and (d) social support in organized activities.

Self-esteem and self-regulation along join an
organized activities: Participants reported about self-
estemeand self-regulation along join an organized activityin peer groups. Self-esteem and self-regulation are part of mental well-being.

Pupil A.2: “I feel more confident after meeting peer
groups because they always support positive things I do
like sports and arts activities.”

Pupil B.3: “I feel valuable when with them because I
am more recognized in the group if I follow the activities
of peer groups.”

Pupil C.15: “Before I joined the peer groups, I had
difficulty controlling the behavior, but after joining the
peer groups, I found it easier to control my behavior for
the better.”

Participants felt more confident and valuable after
following organized activities in peer groups. They
can control behavior after joining organized activities.
It can be concluded that adolescents have higher self-
esteemand self-regulation than before following peer
groups activities.

Resilience, hardiness and mental toughness in
organized activities

Participants also reported about resilience, hardiness
and mental toughness in peer groups activities. Mental
well-being in adolescents can be identified by resilience,
hardiness, and mental toughness.
Pupil E.19: “I become easier to control feelings of anxiety and stress, after joining the peer groups because we always discuss the problem of group members and find the solution.”

Pupil A.2: “I feel stronger in facing various problems both at school and at home because there is a place to store and solve the problem that is peer groups activities.”

Pupil D.13: “After I attended peer groups activities, I was more able to control my emotions, especially control anger, because my friend reminded me of a patience.”

Participants reported that they felt easier to control their feelings of anxiety and stress than before joining organized activities. They also reported that they felt stronger in facing various problems and easy to control their emotions. It can be concluded that adolescents have better resilience, hardness, and mental toughness after following peer groups activities.

Social adjustment in organized activities: Interviews related to a social adjustment in peer groups activities, participants reported that they have a good social adjustment along following organized activities in peer groups.

Pupil D.27: “I am more able to adapt and respect others since I join this activity (study club, sports).”

Pupil C.8: “I am more tolerant of my friends in peer groups activity because they come from various backgrounds, such as different in tribe and religion.”

Participants said that they feel more adept, respect and tolerant with others since joining organized activities. This study can be concluded that adolescents have a good social adjustment with the following peer groups activities.

Social support from peers: Participants reported that they get social support from peers along following peer groups activities.

Pupil 3: “My friends give me attention and support if I have a problem, and she/he always help me to solve my problem.”

It can be concluded that adolescents get social support from peers in peer groups activities. This social support important for them to help solve a problem.

Discussion

This qualitative study used focus groups to provide a naturalistic setting in which to explore organized activities in peer groups related to mental and social well-being in adolescents. This study has shown that organized activities (sports, arts, clubs) has consistently been associated with well-being. Mental well-being in the adolescent can be identified by self-esteem and self-regulation. Self-esteem is an individual’s judgment of self-respect. Self-esteem contributes in healthy functioning. There is an association between organized peer groups activities and high self-esteem. High self-esteem has been linked to mental and social health outcomes. Lower externalizing and internalizing problems as well as increased self-regulation, social skills and academic performance. Someone who participated in organized activities demonstrated significantly higher self-regulation. Self-regulation contributes to social and mental well-being. Self-regulation promotes harmonious interactions with others and poor self-regulation can contribute to crime and health risk behavior.

This study has shown that adolescents have a good resilience, hardness, and mental toughness after following organized activities in peer groups. Resilience is the ability to adapt in life and related to health. School connectedness may provide a role in promoting resilience for mental health for adolescents. Resilience was positively associated with psychological well-being and negatively associated with psychological distress, depression, and anxiety. Hardiness is a personality style characterized by a commitment, control, and perception of problems as a challenge. High hardiness is associated with lower psychological distress, higher quality of life and a high level of mental health. Hardiness is a psychological style associated with resilience, mental and social well-being. Hardiness was negatively correlated with physiological responses of systolic blood pressure, diastolic blood pressure, and respiratory rate. Resilience and hardiness were positively associated with psychological well-being, and negatively associated with psychological distress. Mental toughness was a multi-dimensional construct and positively correlated with mental and social well-being.

This study also has shown that adolescents have a good social adjustment with following organized activities in peer groups. Self-adjustment is the harmony between individuals and the environment in which individuals
can interact, socialize and behave appropriately with the environment. There is a relationship between social adjustment and social well-being. Organized activities have consistently been associated with adjustment and well-being.

This study has shown that adolescents get a social support in peer groups activities. Peer interactions play an important role and related to social support. Organized activities involvement related to social support and adolescent well-being.

Conclusions

This study has shown that organized activities in peer groups improve mental and social well-being. Adolescents who involve in sports, arts, and clubs have high confidence, easiness to control their emotion, stronger in facing various problems. They also felt more adapt, respect, tolerant of others and get social support. Adolescents can have good self-esteem, self-regulation, resilience, hardiness and mental toughness. Adolescents also can have good social adjustment and social support. One of the efforts to prevent a mental and social problem is early recognition or detection in adolescents.

Conflict of Interest: The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Occupational Asthma Severity among Flour Mill Workers and Adherence to Preventive Guidelines

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Abstract

Aims: To assess the prevalence of occupational asthma among flour mill workers in Giza governorate and adherence to preventive guidelines.

Design: A cross-sectional study

Method: This study was conducted from August 2018 till November 2018 in Egypt. Data were collected through Occupational asthma questionnaire, Spirometry test record, and Workplace observational checklist.

Results: The findings represented that 100% of flour mill workers complained of occupational asthma, 31.1%, and 27.9% of them had moderate and intermittent degree respectively. Concerning occupational asthma symptoms, 68% of flour mill workers complained of persistent cough, 45.9% of them waked up at night due to shortness of breath, and all of them complained of chest wheezing. Moderate and severe airway obstruction represented 18% and 17.2% of them respectively. There were lack of most of preventive measures in the flour mill.

Keywords: Occupational asthma, Flour Mill Workers, and Preventive Guidelines.

Introduction

The flour dust is one of the most common hazards in the flour mills. It is the finely ground particles of cereal or pulses (including contaminants) which result from any grinding process and from any subsequent handling and use of that flour. Flour dust is a hazardous substance; it is a respiratory sensitizer and the cause of allergic rhinitis. It is also an irritant and may give rise to short term respiratory, nasal and eye symptoms. It may provoke an asthmatic attack in flour mill workers with or without pre-existing disease, lead to chronic bronchitis and is known to cause occupational asthma.1

Occupational asthma is an international problem affecting large number of workers. Few studies were done on occupational asthma in Egypt focusing mainly on asthma symptoms. A study done to investigate the presence of occupational asthma among workers at flour mills of south Cairo which indicated that 25% of mills workers had asthma related to work, the asthma symptoms appeared during work and improved after leaving workplace. Also, the asthmatic workers had lower level of spirometric parameters in relation to non-asthmatic.2

Therefore, the aim of this study was to assess the prevalence of occupational asthma among flour mill workers in Giza governorate and adherence to preventive guidelines.

Research Questions: To achieve the aim of the study the following research questions were formulated:

1. What is the prevalence of occupational asthma among flour mill workers?
2. What are the occupational asthma degrees and symptoms prevailing among flour mill workers?

3. What is the impact of occupational asthma on lung function of flour mill workers?

4. What are the preventive measures applied in the flour mill?

**Materials and Method**

**Research Design:** A cross-sectional design will be utilized to fulfill the aim of the study.

**Subjects:** A convenient sample of 122 flour mill workers from El-Haram flour mill constituted the subjects of the study. The sample size was calculated based on a G-power version 3.1.1 for power analysis. A Power of .95 (β = 1-.95 = .05) at alpha .05 (one-sided) was used as the significance level, and effect size= 0.3 was utilized. The inclusion criteria were working at least one year in the flour mill, full-time (8 hours a day for 6 days per week). The exclusion criteria were having a history of bronchial asthma before joining the work or family history and having present or past history of severe respiratory infections as extensive pulmonary tuberculosis. These criteria were according to British Occupational Health Research Foundation [BOHRF].

**Setting:** This study was conducted at South Cairo & Giza Mills & Bakeries Company. It is the largest company in Egypt for the manufacture of flour and has the largest number of workers. It includes 950 workers. El-Haram Mill Branch was selected to implement the study because it includes the largest number of workers. It includes 300 workers out of 950 workers in all mills of the company. In addition, El-Haram mill is the main branch of the company.

**Tools of data collection:** Data were collected using two tools: I: Occupational Asthma Questionnaire: It structured by the researcher based on extensive literature reviews. It included three parts: (a) Workers’ personal characteristics which was consisted of 9 questions (b) Occupational asthma symptoms: It included 22 questions related to reported asthma symptoms as wheezing and tightness in the chest, cough and whether these symptoms improved when the worker was away from work.......etc. (c) occupational asthma flare-ups symptoms: It consisted of 3 questions related to reported sudden symptoms as coughing, shortness of breath, and wheezing.

II: Spirometry Test Record: Spirometry is a standard test used to measure how well patient lungs are functioning. The test works by measuring airflow into and out of patient lungs using spirometer. To make a spirometry test, the patient sit and breathe into a small machine (spirometer). This medical device records the amount of air patient breathe in and out to measure the Forced Expiratory Volume in one second (FEV1) and the speed of patient breathe. The readings were recorded by the researcher. Spirometry tests used to diagnose asthmatic patients.

III: Workplace Observational Checklist: It was developed by the researcher based on Stobnika and Gorny. It included five preventive measures that should be available in the workplace to minimize the risks that may contribute to occupational asthma among workers. A) Flour dust control measures. B) Ventilation measures. C) Personal Protective Equipment. D) First aid facilities. E) Waste management measures.

**Ethical Consideration:** The research proposal and the tools were submitted to the Committee of Research Ethics at the Faculty of Nursing, Cairo-University. Approval to start the study was obtained on 28 May 2018. A written approval was obtained from the director of the medical sector at South Cairo & Giza Mills & Bakeries Company at 8, July 2018 to collect data from the workers who are working at El-Haram flour mill.

Also, written informed consents were obtained from the workers who were working at El-Haram flour mill after explaining the aim of the study, its benefits and risks if any, duration of the study, data collection tools and the procedure of the study. The researcher informed the workers that all data gathered during the study would be confidential and they had the right to withdraw from the study at any time without giving any reason and without any pressure from the head of the department. Besides, workers were informed that the obtained data would be used for the purpose of this study and it would not be reused in other studies except with their permission.

**Statistical Analysis:** The collected data were tabulated and analyzed using personal computer and statistical package for the social science (SPSS) program version 22. Descriptive statistics utilized were frequency, percentage, mean, and standard deviation.
Results

Findings is presented in three parts: 1) Description of flour mill workers’ personal characteristics. 2) Description of occupational asthma and lung function among flour mill workers. 3) Preventive measures applied in the flour mill.

Part I: Description of flour mill workers’ personal characteristics (Table 1): In relation to personal characteristics of flour mill workers, table (1) shows that, 51.6% and 23% of workers aged 45 to less than 55 and from 25 to < 45 years old respectively with a mean of 48.11 ± 8.61 years. Also, the table reveals that 40.1% of workers had work experience of 20 to less than 30 years while 18% had work experience of 1 - < 10 years with a mean of 17.86 ± 8.69 years. As for history of smoking, 17.2% were moderate smokers and 6.6% were heavy smokers.

Part II: Description of occupational asthma and asthma flare-up symptoms among flour mill workers (Tables 2 & figure 1). Regarding prevalence of occupational asthma, 100% of flour mill workers complained from occupational asthma. As indicated in figure (1), 31.1%, 27.9% of flour mill workers had moderate and intermittent degree of occupational asthma respectively. Concerning occupational asthma symptoms, table (2) shows that 68% of flour mill workers complained of persistent cough and 82% coughed up sputum on most days, 45.9% waked up at night from shortness of breath. Moreover, table (2) shows that 27.9% of workers exposed to asthma flare-ups in the form of sudden cough, wheezing, and shortness of breathing.

Part III: Description of degrees of airway obstruction based on scores of lung function (figure 2). As indicated in figure (2), 27.9% of flour mill workers had normal lung function while 36.9% of them had mild airway obstruction. Moderate and severe airway obstruction represented 18% and 17.2% respectively.

Part IV: Preventive measures applied in the flour mill (Tables 3 & 4). Regarding preventive measures applied by flour mill workers, table (3) shows that the available measures were only those that are undertaken by workers. Table (4) indicates that there were good working extraction units and all equipment were clean and in good repair, the rest of the preventive measures were not available.

Table (1) Percentage distribution of flour mill workers’ personal characteristics (n=122).

<table>
<thead>
<tr>
<th>Personal characteristics</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age / year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25 &lt; 35</td>
<td>13</td>
<td>10.7</td>
</tr>
<tr>
<td>35 &lt; 45</td>
<td>15</td>
<td>12.3</td>
</tr>
<tr>
<td>45 &lt; 55</td>
<td>63</td>
<td>51.6</td>
</tr>
<tr>
<td>55 – 60</td>
<td>31</td>
<td>25.4</td>
</tr>
<tr>
<td>X ± SD</td>
<td>48.11 ± 8.61 years</td>
<td></td>
</tr>
<tr>
<td>Duration of work:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 - &lt; 10</td>
<td>22</td>
<td>18</td>
</tr>
<tr>
<td>10 - &lt; 20</td>
<td>39</td>
<td>32</td>
</tr>
<tr>
<td>20 - &lt; 30</td>
<td>49</td>
<td>40.2</td>
</tr>
<tr>
<td>30- 38</td>
<td>12</td>
<td>9.8</td>
</tr>
<tr>
<td>X ± SD</td>
<td>17.86 ± 8.69 years</td>
<td></td>
</tr>
<tr>
<td>History of smoking:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>82</td>
<td>67.2</td>
</tr>
<tr>
<td>Yes:</td>
<td>40</td>
<td>32.8</td>
</tr>
<tr>
<td>&lt; 10 cigarettes/day (light smoker)</td>
<td>11</td>
<td>9</td>
</tr>
<tr>
<td>10-20 cigarettes/day (moderate smoker)</td>
<td>21</td>
<td>17.2</td>
</tr>
<tr>
<td>&gt; 20 cigarettes/day (heavy smoker)</td>
<td>8</td>
<td>6.6</td>
</tr>
</tbody>
</table>

Table (2) Percentage distribution of occupational asthma & flare-ups symptoms among flour mill workers (n=122).

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occupational asthma symptoms:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chest wheezing</td>
<td>122</td>
<td>100</td>
</tr>
<tr>
<td>Breathless when the wheezing was present</td>
<td>122</td>
<td>100</td>
</tr>
<tr>
<td>Presence of wheezing without having cold</td>
<td>122</td>
<td>100</td>
</tr>
<tr>
<td>Presence of wheezing during or after work</td>
<td>122</td>
<td>100</td>
</tr>
<tr>
<td>Wheezing improved during holidays or weekend</td>
<td>121</td>
<td>99.2</td>
</tr>
<tr>
<td>Wheeze or cough gets worse during the working time</td>
<td>114</td>
<td>93.4</td>
</tr>
<tr>
<td>Woken up with a feeling of tightness in the chest at any time</td>
<td>57</td>
<td>46.7</td>
</tr>
<tr>
<td>Persistent cough</td>
<td>83</td>
<td>68</td>
</tr>
<tr>
<td>Cough up sputum on most days</td>
<td>100</td>
<td>82</td>
</tr>
<tr>
<td>Wake up at night from persistent cough</td>
<td>46</td>
<td>37.7</td>
</tr>
<tr>
<td>Short of breath during sleeping flat on the back</td>
<td>77</td>
<td>63.1</td>
</tr>
<tr>
<td>Short of breath on walking up a slight incline</td>
<td>105</td>
<td>86.1</td>
</tr>
<tr>
<td>Wake up at night from shortness of breath</td>
<td>56</td>
<td>45.9</td>
</tr>
<tr>
<td>Asthma flare-ups symptoms</td>
<td>34</td>
<td>27.9</td>
</tr>
</tbody>
</table>

*Responses aren’t mutually exclusive.
Table (3) Availability of preventive measures toward flour dust control in the flour mill.

<table>
<thead>
<tr>
<th>Preventive measures</th>
<th>Available</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fast delivery of flour</td>
<td>Yes</td>
</tr>
<tr>
<td>Short storage time of flour</td>
<td>Yes</td>
</tr>
<tr>
<td>Automatically closing doors</td>
<td>No</td>
</tr>
<tr>
<td>Restriction of entrance to areas with high dust levels</td>
<td>No</td>
</tr>
<tr>
<td>Relevant warning signs clearly displayed</td>
<td>No</td>
</tr>
<tr>
<td>Washing hands facilities</td>
<td>Yes</td>
</tr>
<tr>
<td>Taking shower facilities</td>
<td>No</td>
</tr>
<tr>
<td>Storage places of working clothes</td>
<td>Yes</td>
</tr>
<tr>
<td>Avoidance of eating, drinking, or smoking at the mill</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Table (4) Availability of preventive measures toward ventilation and Personal Protective Equipment (PPE) in the flour mill.

<table>
<thead>
<tr>
<th>Preventive measures</th>
<th>Available</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ventilation:</td>
<td></td>
</tr>
<tr>
<td>All areas are ventilated sufficiently</td>
<td>No</td>
</tr>
<tr>
<td>There are extraction units</td>
<td>Yes</td>
</tr>
<tr>
<td>Extraction units are in good working condition</td>
<td>Yes</td>
</tr>
<tr>
<td>The filter screens are free from any buildup of dust</td>
<td>No</td>
</tr>
<tr>
<td>There are air conditioning units / fans</td>
<td>No</td>
</tr>
<tr>
<td>All equipment are clean &amp; in good repair</td>
<td>Yes</td>
</tr>
<tr>
<td>Personal Protective Equipment (PPE):</td>
<td></td>
</tr>
<tr>
<td>Adequate for the task in dusted areas</td>
<td>No</td>
</tr>
<tr>
<td>Adequate arrangements for the storage, cleaning or disposal of dusted P.P.E</td>
<td>No</td>
</tr>
<tr>
<td>a. Overalls</td>
<td>No</td>
</tr>
<tr>
<td>b. Gloves</td>
<td>No</td>
</tr>
<tr>
<td>c. Face/dust masks</td>
<td>No</td>
</tr>
<tr>
<td>d. Respiratory equipment</td>
<td>No</td>
</tr>
</tbody>
</table>

Figure (1) Percentage distribution of occupational asthma degree among flour mill workers (n=122).

Figure (2) Percentage distribution of airway obstruction based on scores of lung function among flour mill workers (n=122).
Discussion

Concerning the prevalence of occupational asthma among flour mill workers, the current study revealed that all flour mill workers included in the study complained of occupational asthma. This finding was in agreement to some extent with the results of El-Gewily et al.\(^2\) study done in two flour mills at South Cairo on 120 flour mill workers, they found that more than one quarter of them complained of occupational asthma. In addition, this finding was in agreement to some extent with Ajeel, & Al-yassen\(^6\). Study done in flour mills at Basrah on 185 flour mill workers and found around half of flour mill workers complained of occupational asthma.

In relation to degrees of occupational asthma, the current study indicated that around one third of flour mill workers had moderated degree of occupational asthma and more than one quarter had intermittent degree of occupational asthma. The results of this study might be related to the flour mill workers who participated in the study had work experience for more than 10 years in the flour mill, this is according to Groene et al.\(^7\), they represented that continuous and prolonged exposure to flour dust increased likelihood of reported higher degree of occupational asthma.

Regarding occupational asthma symptoms that were prevailing among flour mill workers, the current study indicated that, all of the flour mill workers had occupational asthma symptoms, around half of them woken up with tightness in chest at any time and most of them had improved chest wheezing during holidays or weekend. They attributed the cause of their chest wheezing to the flour dust. These findings were consistent with El-Gewily et al.\(^2\), they found that all of flour mill workers had occupational asthma symptoms, one third of them woken up with tightness in chest at any time and a majority of them had improved chest wheezing during holidays or weekend.

In relation to degrees of airway obstruction based on lung function scores of flour mill workers, the current study revealed that more than one quarter of flour mill workers had normal lung function and more than one third of them had mild degree of airway obstruction. However, less than one quarter of them had either moderate or severe airway obstruction. These findings agreed to some extent with El-Gewily et al\(^2\) they found that, more than two thirds of flour mill workers had normal lung function and the quarter of them had mild degree of airway obstruction, while the minority of them had severe airway obstruction.

Regarding preventive measures applied by flour mill workers, the current study shows that the available measures were only those that are undertaken by workers as fast delivery of flour and short storage time of flour. Moreover, there were good working extraction units and all equipment were clean and in good repair, the rest of the preventive measures were not available. These findings were in agreement with Hosseinabadiet al\(^8\) who studied the relationship between lungs function and flour dust in flour factory workers in Iran and found lack of preventive measures in environmental conditions as improper ventilation systems and deficiency in equipment used in the milling process that led to excessive workload on the studied workers.

Conclusion

The results of this study indicated that occupational asthma was prevalent among all flour mill workers and all of them had definite occupational asthma symptoms. In addition, more than one third of them had moderate and severe airway obstruction. More than half of them had moderate persistent and severe persistent occupational asthma degree. Moreover, there were lack of most of preventive measures.

Recommendations: Based on the findings of this research, the following are recommended:

1. Periodic medical examination for early detection and early management of occupational asthma.
2. Pre-employment and in-job training for workers on preventive measures of occupational asthma.
3. More researches to study the effect of more potential confounding factors on the level of exposure, and effective ways of managing occupational asthma.

Author Contributions: All authors have contributed significantly to conception, design and execution of the study. All authors have participated in drafting, reviewing, and/or revising the manuscript, and have approved its submission.

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Conflicts of Interest: The authors declare no conflict of interest
References


E. Coli Bacteria Deactivation by Plasma Jet with Replica Plate Technique

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Abstract

In this research, non-thermal plasma system (plasma jet) of argon gas is designed to work at normal atmospheric pressure and suitable for work as well as use in medical and biotechnological applications, also applied this technique in the treatment of The E. Coli bacteria and show the role of the applied voltage on the killing rate of bacteria, and we obtained a 100% killing rate during the time of 5 minutes.

Keywords: Plasma jet, applied voltage, E.Coli bacteria.

Introduction

Plasma, the fourth instance of the issue. Different instances of the substance are strong, fluid and gas, plasma, is ionized gas. The greater part of these substances known to mankind is plasma. For instance, enormous items, for example, stars are plasma. Be that as it may, there is likewise man-made plasma, utilized every day on our planet. Plasma is utilized in modern and in medicinal applications, in the plasma business are utilized in numerous advancements: plasma TV screens, lighting frameworks, and power frameworks. A moderately new zone is plasma use in biomedical applications and dentistry [¹].

There are a few different ways to create non-warm plasma. Vitality is expected to deliver and support plasma. This should be possible in a few different ways: through warm, electrical, or photovoltaic vitality. Generally, a gas release happens electrically. For this situation, just [²].

(Electrons and particles) can get vitality from the electric field. At the point when these particles are in the minority, the warming of unbiased particles will be constrained. In this way, diffuse plasma where the division of ionizing species is under 0.1%, for the most part, non-warm. This mode is effectively accomplished under low weight, inside 10 to 1000 P. The impact of low weight is twofold: in uncommon gas ionization occasions uncommon, which keeps up a low charge thickness. In addition, the recurrence of impacts is adaptable among electrons and low particles, so electrons don’t have an extraordinary shot of transmission[³,⁴].

The temperature of the electron is usually greater 10⁴ K°, while the temperature of both particles and neutral ions depends heavily on the type of plasma produced Temperature can vary from approximately room temperature to 10⁷ K°. It is usually for each class of plasma components of its own degree the temperature of the T_e electrons and the positive ions of T_i and T_n neutral molecules. So it can be said that plasma is the only substance that contains several temperatures at the same time[⁵].

In this type of plasma ions and the temperature of neutral particles surrounding the same, the electron temperature rises much higher that any T_i >> T_e >> T_n in the cold plasma, most of the processing energy in the electrons in the plasma, this produces effective electrons instead of gas heating as a whole, because Ions and neutral components remain relatively cool This feature will enable us to use (plasma) to process sensitive materials, including biological tissue [⁶].

Escherichia coli (E. coli) bacteria contribute to many infections in hospitals such as surgery and burns. At present, bacterial resistance has increased for many drugs[⁷, ⁸]. The colonies may appear in blood agar (3-4 cm), Mac Conkey agar, in the colonies appeared red and these bacteria appeared in the form of fermentation of lactose [⁷, ⁸, ⁹].
**Experimental Procedure:** To generate the discharge of the air gap between two poles covered with insulation, use a high frequency digital oscillator to measure current and voltage as well as high voltage power source. Applied voltage, discharge current measured and analyzed.

Plasma jet system is based on a conventional plasma discharge which is basically a system driven by alternating current. High voltage is applied between two conductors where one or both are covered with a dielectric to limit the current and to prevent transition to an arc.

Cold plasma is produced by alternating voltage applied (1-30 kV) between an insulated high-voltage electrode and the grounded base holding the sample.

A variable voltage and current power supply was used for treating samples. The power supply was connected to stainless steel tube.

The dielectric prevented current flow between electrodes, creating plasma with high reactive species concentrations but minimal gas heating, the discharge distance between the dielectric and the sample was (1-3 cm).

In (13 kHz), to limit the current and to prevent transition to an arc. Fig. 2, shows the schematic diagram of the experimental set-up used in study. System is equipped with a high voltage (1-30 kV) connected to a stainless steel wire, the other part connected to the mica to prevent the discharge of the catcher.

Between the upper surface of the model and the bottom surface of the tube, the discharge occurs. The distance between discharge (1-3 cm) and the diameter of the glass tube (2.5 cm)

All the treatments are at room temperature and atmospheric pressure and were carried out according to the same procedure.

**Method**

Midstream Urine samples (MSU) and burns swabs were obtained from patients with urinary tract infections (UTIs) and burns respectively, these samples were cultured on culture media to isolate bacterial colonies. After that, bacteria were identified by means of highly specific tests. *Escherichia coli* (*E. coli*).

**Results and Discussion:**

According to replica plating technique, the effects of the plasma jet treatment on *E. coli* bacteria were studied. The bacteria were killed in different percentages depending on the experiments conditions. Killing percentage as a function of the plasma treatment time for different conditions was presented in figures. The results, show that the killing percentage increases with the increasing of treatment time for all applied voltages and gap distances. Also, it was clear, killing rate for bacteria increases with increased voltages while it was decreases with the increasing of the gap distance. That is the general behavior of the killing percentage according to the results.

In figure (2), the applied voltage is 13 kV and when the gap distance is 3 mm, the killing percentage for *E. coli* is 20% in 180 sec, then killing rates for bacteria increase with increased plasma processing time (exposure time). It was increased up to 70% in 270 sec.

![Figure 1: shows killing rate of E. coli with treatment time and at different distances of the gap in the frequency and voltage (17 kHz, 13 kV)](image)

When the gap distance is 2.5 mm, the killing percentage for *E. coli* bacteria increases up to 84% at 270 sec, while when the distance between electrodes 2mm, the killing percentage up to 90% at same period. Finally, when the distance between electrodes becomes 1.5 mm, the killing percentage was 90% with increase for plasma treatment time, then increases to 94% at plasma treatment time 270 sec.

However, the best result of killing percentage resulted from gap distance shorter and plasma treatment time longer, when gap distance 1.5 mm, killing percentage arrives to 94% in 270 sec, as long time effects with little on bettering killing percentage in 270 sec because interaction between *E. coli* are almost completed through
this time. These curves indicated that killing percentage became high with an increasing treatment time within 270 sec. However, a longer time had little effect on improving the killing percentage after 270sec. This was because the interaction between bacteria and reaction species was almost complete within 270 sec.

In figure (3), when applied voltage 17 kV, killing percentage for *E.coli* bacteria differs with different gap distances between electrodes, when distance 3 mm, it increases with increasing plasma treatment time and rest in 120 and 180 sec respectively, where it 50%, may be because less period, beyond this period, it increases more to 80% and rest with increasing plasma treatment time, where no effect on killing percentage with increasing plasma treatment time.

When the distances 2 mm and 2.5 mm the killing percentage increases with increasing plasma treatment time. While distance 1.5 mm, the killing percentage increasing in 60 sec, and it rest on 50% to time 120 sec, then increases to 96%, this favorite expectant value when plasma treatment time 270 sec, at 17 kV, the electric field dense in little gap distance, cold plasma generated by (plasma jet) which is active consequently, the plasma (jet) produced is more abundant for reaction species and connected with bacteria and led to efficiency for large killing percentage for bacteria with converted high energy [10].

Figure 3: Shows killing rate of *E. coli* with treatment time and at different distances of the gap in the frequency and voltage (17 kHz, 22 kV)

Figure 4 : Typical sample for the killing percentage of *E.coli* bacteria 84% at 4.30 sec on MacConkey agar.

**Conclusion**

Non-thermal plasma (cold) was manufactured using air pressure and used as an application for sterilization of
E. coli. At different volts (13, 17 and 22 kV), the bacteria are disrupted in 5 minutes. The sterilization efficiency improves with increased voltage applied. Through active species such as oxygen OH, N\(_2\) which appeared in the plasma jet, which oxidation and bombardment of the bacterial cell and inhibition.

**Conflict of Interest:** Nil

**Source of Funding:** Self

**Ethical Clearance:** Not required

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Pulmonary Rehabilitation for People with Pulmonary Tuberculosis: A Concept Analysis Based on Walker and Avant Approach

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Abstract

Background: Pulmonary Tuberculosis is greatly contributing to global illness and death. Pulmonary rehabilitation needed to maintain and improve the quality of life and health status of pulmonary TB patient.

Material and Method: A Concept Analysis based on approach Walker and Avant with eight steps were conducted. Relevant studies published from 2000 to 2017, in English language, full article, and retrieved from Pubmed, CINAHL, Wiley online library, SAGE with the keyword “pulmonary rehabilitation”, “pulmonary rehabilitation and Tuberculosis” and “lung rehabilitation and Tuberculosis”.

Findings: The concept analysis revealed that pulmonary rehabilitation program is consists of several programs by the following attributes: physical exercises, breathing exercises, educational program, nutritional support and psychological interventions that can enhance the quality of life and health status of people with pulmonary TB.

Conclusion: This analysis provides nurses with a new perspective by helping them to gather all the components within the concept of pulmonary rehabilitation that nurse can do. It is expected that understanding the nature, as well as the key elements of the concept, would assist with analyzing the existing pulmonary rehabilitation program and help to increase health status and quality of life of people with TB.

Keyword: Tuberculosis, Pulmonary Tuberculosis, Pulmonary Rehabilitation, Concept analysis, Companionship.

Introduction

Tuberculosis (TB) is still becoming a global problem. World Health Organisation (WHO) reports there are 10.4 million TB patients in 2015 and TB deaths of 1.8 million. 95% of deaths in lagging and developing countries. The presence of TB resistant provides an additional burden to this disease (¹).

TB is an infectious disease caused by Mycobacterium tuberculosis but it is unlikely to the other infectious diseases, TB is a chronic disease that effects in multiple acute and sub-acute complications (²,³). The Occurrence of Mycobacterium tuberculosis infection due to decreased immune system. Immune system disorder in severe conditions will cause malnutrition due to lack of food intake that caused by anorexia, malabsorption and increase use of nutrients in the body (⁴). Mycobacterium Tuberculosis destroys the histopathology of the pulmonary parenchyma (⁵,⁶,⁷). Other study reported pulmonary impairment after TB treatment that impacted in a decrease in health status (⁸).

Pharmacologic interventions for people with TB have been widely applied in the form of anti-TB treatment for at least 6 months for TB disease with category 1 (⁷). In countries with the largest TB populations such as India and Indonesia, active TB provides a greater burden than expected estimates and leads to decrease in prolonged lung function and the quality of life (⁹,⁵,¹⁰).

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Companionship treatment needed to maintain and enhance the quality of life and health status of TB patient. One of program that can be resolve is pulmonary rehabilitation. Pulmonary rehabilitation has an important role in the management of chronic lung disease and gives considerable results (11).

Materials and Method

This study is a concept analysis that obtained from various sources such as Pubmed, CINAHL, Wiley online library, SAGE with the keyword “pulmonary rehabilitation”, “pulmonary rehabilitation and Tuberculosis” and “lung rehabilitation and Tuberculosis”. The inclusion criteria of articles included: articles published through the year from 2000 to 2017, full article and using English language. The method was based on Walker and Avant that consisting of eight step.

Findings

Identifying Uses of the Concept of Pulmonary Rehabilitation: The American College of Chest Physicians (ACCP) and the American Association of Cardiovascular and Pulmonary Rehabilitation (AACPR) define pulmonary rehabilitation as a comprehensive, evidence-based and multidisciplinary intervention of patients with chronic respiratory disorders and decreased daily activity which aims to enhance the quality of life by improve health status, effectiveness of treatment, reduce symptoms, reduce maintenance costs and increase lung function capacity (13).

The research on pulmonary rehabilitation has been mostly done for chronic obstructive pulmonary disease. However, research on pulmonary rehabilitation of TB to patients during anti-TB and home-based treatment is still very limited. One finding of lung rehabilitation studies conducted in tuberculosis patients for 6 weeks on a home basis showed an increase exercise tolerance and vital capacity in people with Pulmonary TB (n = 34) (14). Another study of home-based pulmonary rehabilitation performed on restrictive lung disease group for 8 weeks showed an increase respiratory muscle strength, exercise tolerance and quality of life (15).

Determining Defining Attributes: In principle, the pulmonary rehabilitation process includes physical training programs, breathing exercises, education, and nutritional support by involving multi-professional teams and families in accordance with the needs of patients (16). Pulmonary rehabilitation can conduct at home, polyclinic or hospital which can applied at home that do not require special equipment includes physical exercise, breathing exercises, education, nutritional support and psychological interventions.

Physical training: Physical exercise is important to make people with TB stay fit during the treatment. Physical exercise in patients with TB adapted to the conditions and the abilities. The recommended exercises include endurance training and upper and lower limb strength training (17). Regular physical exercise will increase the immune system, respiratory function, assist in the performance of daily activities, reduce systemic pressure, improve lipid profile, fight depression, reduce anxiety and make sleep easier (18). Physical training is emphasized on intensity, specificity and reversibility. Regular physical exercise every day gives better results. When physical exercise is stopped, it will cause a loss of exercise effect (19). Physical exercise is adjusted for disease severity, symptom limitation, comorbidity, and motivational level of the patient during pulmonary rehabilitation. Under the American Thoracic Society (ATS) guidelines, physical exercise in a pulmonary rehabilitation program is conducted at least 20 sessions (divided 2-3 times/week) to achieve physiological benefits (20).

Breathing exercises: Respiratory exercise is to improve regional ventilation, gas exchange, respiratory muscle function, dyspnea, exercise tolerance and the quality of life. Recommended breathing exercises include pursed-lip-breathing techniques, active expiratory, diaphragmatic breathing, breathable coordination and activity (20). Breathing exercises are combined with physical exercise with a minimum of 15 minutes of breathing exercises (19).

Education: Education focuses on improving self-efficacy in TB patients as well as in families in supporting the success of treatment, including adherence to improved health behaviors (21, 18). Education taught is breathing strategy, normal respiratory function, TB disease pathophysiology, correct use of drugs, exercise benefits, appropriate diet, avoidance of irritant, relaxation techniques and stress management (20).

Nutrition Support: Nutrition plays an important role in supporting the healing of TB disease (22, 23). Poor nutrition is seen in low body weight and abnormalities of body composition such as small arm circumference that contribute to morbidity associated with decreased
the respiratory muscle strength, exercise tolerance and health status. Good nutrition contributes positively the respiratory muscle strength\(^{(21)}\). One study of TB in Indonesia in active TB patients experiencing malnutrition revealed anemia, low concentrations of retinol and zinc plasma\(^{(24)}\). Micronutrients such as Vitamin A and zinc increase the effectiveness of anti-TB drugs\(^{(25)}\).

**Psychological Intervention:** The need for psychological interventions during illness is important because people with chronic illness exhibit altered mental status resulting in risky behaviors such as disobedience, unhealthy lifestyle changes (such as smoking, drinking alcohol) and engaging in sexual practices that are not secure. Patients with TB experience high levels of stress and decreased the quality of life. Psychological interventions increase life expectancy and adherence to medication and treatment outcomes\(^{(26)}\).

**Model Case:** Mr.A 34-year-old is a head of household with 2 children who was diagnosed with pulmonary TB and undergoing treatment for 2 weeks. Mr.A lives in a low-income country. Ayu is a nurse in community who assigned to take care of Mr.A who is taking medication again. Nurse Ayu has reviewed Mr. A and found the data that Mr.A is still coughing and looks very thin, the weight only 45 kg with a height of 170 cm. Based on result interview, nurse Ayu found data about Mr.A had a not good knowledge about TB especially the cause of the illness and the danger of TB transmission. Mr.A also felt embarrassed and stressed by his illness because the people around him shunned him and were fired from his job.

**Analysis:** This case illustrates the complexity problems by TB patients. Thus, this case can not only be treated with treatment alone but also requires additional treatment. Poor patient condition, lean, low knowledge and embarrassment of having TB disease require a pulmonary rehabilitation program to maintain the condition. Pulmonary rehabilitation programs with home visits will help to maintain the condition of TB patients. Giving education related to TB disease, will help improve TB patient behavior regularly and complete TB treatment and prevent further transmission. Giving education is also given to the family as a support system for TB patients. Physical and breathing exercises and nutritional support will help maintain the physical condition of TB patients. Psychological interventions are conducted to increase the confidence of TB patients and not feel ashamed of their condition.

**Antecedents and Consequence:** Walker and Avant have defined antecedents as incidents that happen before the existing concept and consequence as incidents that happen as results of the concept\(^{(12)}\). Until recently, there has been no clarity of the duration of standard lung rehabilitation programs to be applied, but several studies show that the longer the lung rehabilitation is applied giving the better benefit\(^{(27)}\). Bolton et al recommended lung rehabilitation performed 6-12 weeks to provide significant benefits to improve the health status of patients with chronic respiratory disorders\(^{(18)}\). Other studies have shown that pulmonary rehabilitation programs improve quality of life and peak VO\(_2\) \((n = 8)\) in the lung TB group Sequelae for 8 weeks\(^{(28)}\). Pulmonary rehabilitation above 9 weeks was able to improve significantly the post-TB group \((n = 30)\) in activity scores, MRC, dyspnea transition index at the same level of disability in chronic obstructive pulmonary disease but not significant in lung expiratory volume and 6 MWT\(^{(29)}\).

Several conditions contraindicated with pulmonary rehabilitation such as heart failure, pulmonary hypertension, inability to exercise for orthopedic reasons, unstable diabetes, psychiatric illness, dementia, lack of motivation, disobedience and unwillingness to rehabilitate\(^{(30, 31)}\). Other studies have reported obstacles following the pulmonary rehabilitation program to be present and submissive like patients who cannot quit smoking, live alone and in poor condition. Therefore, prior to pulmonary rehabilitation is very important to assess the history, ability and willingness of patients with pulmonary TB in supporting the success of pulmonary rehabilitation programs\(^{(32)}\).

**Defining Empirical Referents:** Defining empirical referents is the final step of Walker and Avant’s method of concept analysis. Empirical references present how the concept is to be measured or evaluated. Several instruments can be used to measure and evaluate of pulmonary rehabilitation program.

Physical exercise can be measured using a 6-minute (or 12-minute) walking test (SMWT) or Shuttle Walk Test (SWT)\(^{(33)}\). SMWT is the most commonly used test for pulmonary rehabilitation, the way is to ask the patient to walk as far as possible at the appointed time\(^{(34)}\).

To measure the degree of shortness of breath can use the Medical Research Council (MRC) dyspnoea scale or Modified Borg Scale. The Medical Research Council (MRC) dyspnoea scale is a measuring tool
for assessing the effects of shortness of breath on daily activities consisting of five statements. While Modified Borg Scale is a scale used to measure the degree of shortness of breath during exercise by selecting the number corresponding to the congested condition at the time (30).

To measure the quality of life in general it is possible to use the Short-Form 36-item questionnaire (SF-36) or for respiratory diseases can use Chronic Respiratory Disease Questionnaire (CRQ), Self-reported Chronic Respiratory Questionnaire (CRQ-SR), St. George’s Respiratory Questionnaire (SGRQ). They are all valid life quality measures (30, 35).

To measure the condition of psychology can use Hospital Anxiety and Depression scale (HAD). This scale consists of 14 assessment items to measure the condition of anxiety and depression of the patient (30).

**Conclusion**

Pulmonary rehabilitation is an evidence-based intervention for patients with various chronic respiratory diseases like TB. Appropriate home-based lung rehabilitation includes physical exercise, breathing exercises, education, nutritional support and psychological intervention. The analysis in this paper can encourage nurse to provide effective nursing intervention for people with TB through pulmonary rehabilitation.

**Conflict of Interest:** There was no personal matters that may pose a conflict of interest in this study.

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**Ethical Clearance:** Ethical Clearance taken from the Ethics Committee of the Faculty of Nursing of Universitas Indonesia No. 147/UN2.F12.D/HKP.02.04/2017.

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Physiological Mechanisms of Rehabilitation in Vegetative Vascular Dystonia

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Abstract

Vascular dystonia is manifested in several variants. Its cardiac type is characterized by tachycardia, arrhythmia and cardialgia. Vegetative-vascular dystonia by hypertonic type is manifested by increased pressure. Hypotonic neurocirculatory dystonia is manifested by the phenomena of vascular insufficiency. Frequent symptoms here are low blood pressure, headaches, muscle weakness and chills. Great difficulty is the diagnosis of vascular dystonia by hypertensive type, as the symptoms are characteristic of many diseases. For the rehabilitation of patients with vascular dystonia need to use a set of therapeutic measures, which should be based on physical therapy. Its basis for vascular dystonia are feasible physical exercises of a General developing nature, breathing exercises, therapeutic walking, walking barefoot, with the use of wipes with cold water, therapeutic massage, physiotherapy.

Keywords: Vascular dystonia, vessels, heart, pathology, physiology.

Introduction

Vegetative-vascular dystonia is a polyetiological syndrome caused by violations of vegetative regulation of the heart, vascular tone, functioning of internal organs and endocrine glands, leading to a decrease in the adaptive capacity of the body1,2.

Diagnosis of vascular dystonia is not defined in the International classification of diseases-10 as a separate nosological unit3. Vegetative disorders similar to vegetative-vascular dystonia can often be a part of a number of diseases: endocrine pathology, hypertension, coronary heart disease4,5.

In neurocirculatory dystonia, the patient usually complains of cardiac abnormalities or pressure surges6. Therefore, vascular dystonia is often considered as a group of symptoms7,8.

The presence of concomitant diseases in vascular dystonia is one of the main problems in the diagnosis of dystonia9,10. For example, in case of vegetative-vascular dystonia, the patient may be diagnosed with hypertension according to the hypertensive type, taking into account the sharp pressure jumps11. In this case, despite the fact that every effort is made to treat this disease, it may not be entirely successful12. In this regard, the paper aims to consider the main issues of vascular dystonia.

Variants of vegetative-vascular dystonia. Cardiac type of vascular dystonia is characterized by rapid heartbeat, tachycardia, arrhythmia and cardialgia. Vascular dystonia of hypertensive type is manifested by an increase in pressure that occurs imperceptibly for a person, for the detection of this symptom, regular measurement of blood pressure is necessary13,14. Hypotonic neurocirculatory dystonia is manifested by some vascular insufficiency. Frequent symptoms are low blood pressure, headaches, muscle weakness and chills15. It is the diagnosis of neurocirculatory dystonia of the hypertensive type that causes great difficulty, since the symptoms are typical for many diseases16,17.
Now the issues of terminology, pathogenesis, classification, diagnosis and treatment of vegetative disorders are discussed\textsuperscript{18}. Neurocirculatory dystonia can simulate rheumatism, hypertension, non-rheumatic myocarditis\textsuperscript{19}.

** Syndromes of vascular dystonia:** Cardialgic syndrome is observed in 80-100% of patients with vascular dystonia. It is based on violation of the tone of coronary arteries, hyperventilation of the lungs, hypercatecholaminemia and irritation of the sympathetic plexus of the heart\textsuperscript{20,21}.

The features of cardialgic syndrome in vegetative-vascular dystonia are various kinds of pain in the heart—patients complain of burning, gnawing, pressing pain in the heart, which can be of different intensity and localization, most often in the apex of the heart. There may also be chest pain, which are migratory in nature, and their duration varies from a few minutes to several hours\textsuperscript{22}. There is a clear connection between the occurrence of cardialgia with psychoemotional stress situations, mental and physical overstrain, alcohol intake, weather change, with the premenstrual period and sleep disorders\textsuperscript{23}. The rhythmic nature of pain is peculiar – disappearance or significant reduction of cardialgia in the distraction of the patient’s attention and their resumption when the patient’s attention returns to normal daily life\textsuperscript{24}. Pain in vascular dystonia in the heart always occurs at the wrong time, and after physical or emotional stress\textsuperscript{25}.

For patients with vascular dystonia with hypertensive syndrome characterized by a significant increase in cardiac output minute mainly due to the shock volume of the heart. At the same time, the total peripheral resistance may decrease\textsuperscript{26}. The main manifestation of the hypertensive syndrome is complaints of heartbeat, pulsation of the vessels of the neck or head, “fading”, “stopping” of the heart\textsuperscript{27}. With excitement, changing the position of the body, hyperventilation of the lungs, there is an increase in the pulse. In connection with ventricular extrasystole, there are feelings of “stopping” and “fading” of the heart\textsuperscript{28}. Physical activity leads to a decrease in the frequency of extrasystoles or to their complete disappearance\textsuperscript{29}. There is no atrial fibrillation and no signs of congestive heart failure\textsuperscript{30,31}.

Hypotonic syndrome is manifested by a decrease in blood pressure on emotional stress, physical activity, the transition from a horizontal to a vertical position. Lowering of blood pressure is tolerated by patients in different ways\textsuperscript{32}.

Foundations of physical rehabilitation in dystonia. Taking medication is not key in the treatment of vascular dystonia. The basis in the fight against it is to strengthen the body’s ability to adapt to changes in the environment, increasing resistance to nervous overstrain\textsuperscript{33}.

For the treatment of hypertensive type of vascular dystonia requires a radical change in lifestyle and clear self-control. An important role is played by compliance with the diet and sleep. Practice of the treatment of vascular dystonia on hypertonic type shows that in many cases much more effective than medical treatment are auto-trainings and rational psychotherapy\textsuperscript{34}.

Vascular dystonia hypotonic type requires a comprehensive approach to treatment, taking into account the existing symptoms. At the same time, special emphasis should be placed on the combination of drugs\textsuperscript{35}.

Discussion with a psychologist stressful situations that cause vascular dystonia, can gradually reduce the frequency and duration of pain in the heart or blood pressure disorders, and eventually completely get rid of them. Meditation also has a positive effect on the course of treatment, which helps to deal with the cause of all forms of vascular dystonia, if they are due to psychological factors\textsuperscript{36}.

The basis of medical treatment for vegetative-vascular dystonia is natural adaptogens, stimulants, vitamin and mineral complexes. Patients with vascular dystonia must be prescribed intake of b vitamins and magnesium preparations. From sedatives prefer drugs of plant origin. As a General tonic for vascular dystonia, means improving tissue metabolism are used. Medicines with a tonic effect it is advisable to appoint a stimulant of the Central nervous system\textsuperscript{37,38}.

To quickly restore the physiological balance in the cardiovascular system in vegetative-vascular dystonia, it is necessary to use a set of therapeutic measures, which should be based on physiotherapy\textsuperscript{39,40}. Its basis for dystonia are feasible exercise General developmental nature, breathing exercises, exercises for the calf muscles, therapeutic walking, Walking barefoot, using wipes with cold water, therapeutic massage, therapeutic exercise\textsuperscript{41,42}. Also, the rehabilitation complex should include massage, therapeutic showers and baths, reflexology\textsuperscript{43,44}. 

Conclusion. Vascular dystonia is becoming more common in the modern world. Manifested heart type hypertonic type hypotonic and type. To quickly restore the physiological optimum in the cardiovascular system with vascular dystonia, a set of therapeutic measures should be used, which should be based on physical therapy. It is based on vascular dystonia are feasible physical exercises of a General developing nature, breathing exercises, therapeutic walking, Walking barefoot, with the use of napkins with cold water, therapeutic massage, physical therapy.

Conflict of Interest: No Conflict of Interest is declared.

Sources of Financing: The study was conducted at the expense of the authors.

Ethics Committee Resolution: The study was approved by the local ethics committee of the Russian State Social University on September 15, 2017 (protocol №11).

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Assessment of Nurses Staff Knowledge Regarding Chest Pain Management and Respiratory Maintains in Cardiac Care Unit

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Abstract

Background: Chest pain is a common complaint and encompasses a broad differential diagnosis that includes several life-threatening causes.

Objective: The study aimed to assess nurses knowledge regarding chest pain management and respiratory maintains in Cardiac Care Unit.

Methodology: A quantitative design (a descriptive study) was carried out to assess nurses knowledge regarding chest pain management and respiratory maintains in cardiac care unit. A non-probability (purposive) sample of (44) nurses who work in CCU unit at Azady teaching hospital and Kirkuk general hospital in Kirkuk city. The tools of data collection consisted of (25) items which divided to three parts. Part one, Nurses demographic characteristics, Part two deal with chest pain and part three is the respiratory maintains assessment. The data were collected through the utilization of constructed questionnaire, interview technique. The data were analyzed through descriptive statistical analysis and inferential statistical analysis.

Results: A total of 44 nurses participate in the study, the study shows that (61.4%) of the samples age were (20-30) years old, (63.6%) were male, (68.2%) of them Graduate B.Sc. of Nursing, and (45.5%) of the sample has 1-5 years’ experience in Cardiac Care Unit. The relative sufficiency for the chest pain assessment was (69.1) while the relative sufficiency for the maintains respiratory was (87.8).

Conclusions: Based on the result, the study concluded that most of the samples were between (20-30) years, male, Graduate B.Sc. of Nursing, has 1-5 years’ experience in Cardiac Care Unit. According to the grand mean of scores, the nurses has moderate knowledge regarding chest pain management while they have high knowledge regarding respiratory maintains.

Keywords: Chest Pain, Respiratory Maintains, Cardiac Care Unit, Heart Disease, Knowledge.

Introduction

The cardiac care unit is a place which produce a highly technological management to critical heart condition.¹ The care in the CCU focus on relief of chest pain and provide adequate air way maintains.² The cardiac care nurse have the responsibility of ensuring that all critically conditions will receive optimal nursing.³ The nurse who work in the CCU is more important than the equipment, therefore, nurses must have adequate knowledge and skills to manage these critical illness.⁴ The CCU nurse’s knowledge and skill must be directed towards reliving chest pain and maintains air ways.⁵ Chest pain is a common complaint and signs in heart disease and encompasses a broad differential diagnosis that consist series causes. Coronary heart disease is the cause in up to 25% of cases. Because acute chest pain, depending on its etiology, may be associated with a high risk of death, rapid, goal-oriented management is mandatory.⁶ Chest pain assessment and management can be a faces clinical problem for nurses; assessment of the pain is especially difficult when done retrospective as commonly occurs into outpatient settings and during

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hospital admission procedure. The ability of cardiac patient to explain the characteristic of their suffering from pain influence the processes of diagnosis and therapeutic management. Chest pain is the most common presenting symptom of coronary heart disease (CHD). The effective assessment and management of patients with chest pain is central to any strategy to reduce the burden of coronary disease. The airway suctioning was one of the most common expert interventions which were used for patients with respiratory disorders. The airway suctioning is an essential component in airway management in patients on mechanical ventilation, being one of the most frequently performed invasive procedures in the Intensive Care Unit (ICU). Its main goal is to remove accumulated lung secretions in order to maintain the airway’s permeability; provide adequate oxygenation; reduce the risk of Ventilator-Associated Pneumonia (VAP) and prevent pulmonary consolidation and atelectasis. Therefore, it is imperative that this procedure is performed with professional competence, which means not only having the necessary skills, but also knowledge based on updated scientific evidence, guaranteeing efficiency and the safety of the patient.

Nurses to be skillful at the airway management, they must have knowledge of the important anatomical, physiological, and pathological features related to the airway as well as knowledge of the various tools and methods that have been developed for this purpose. Considering the importance of nurses’ responsibility in chest pain management as well as their responsibilities in maintaining of respiratory, the aim of the study was to assess nurses knowledge regarding chest pain management and respiratory maintains in cardiac care unit.

Methodology

Design and Sample: A quantitative design (a descriptive study) was carried out to assess nurses knowledge regarding chest pain management and respiratory maintains in cardiac care unit. A nonprobability (purposive) sample of (44) nurses who work in CCU unit at Azady teaching Hospital and Kirkuk general Hospital in Kirkuk city. To reach the purpose of the study, A pilot study was carried out to determine the questionnaire reliability through the use of (Test – Retest). The questionnaire was constructed based up on the extensive review of related literature of researchers, the tools of data collection consisted of (25) items which divided to three parts. Part one, Nurses demographic characteristics, which concern with the personal information and it contains four items which includes ( Nurses age, gender, level of education, years of experience in CCU). Part two deal with chest pain assessment and it is composed from 13 items, and part three is the respiratory maintains assessment which contain eight items. The data were collected through the utilization of constructed questionnaire, interview technique with nurse work in CCU. Consent informed was granted from nurses for participation in the present study was obtained and the interview was carried out individually. The data were organized and coded into computer files by using the Statistical Package for Social Science (SPSS) version 15 with application of descriptive statistical analysis which include (frequency, percentage, mean, and grand mean of score) and inferential statistical analysis which include (relative sufficiency).

Results

Table (1): Nurses demographic characteristics

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<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>28</td>
<td></td>
<td>63.6</td>
</tr>
<tr>
<td>Female</td>
<td>16</td>
<td></td>
<td>36.4</td>
</tr>
<tr>
<td>Total</td>
<td>44</td>
<td></td>
<td>100</td>
</tr>
<tr>
<td>Educational level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Junior Nursing</td>
<td>4</td>
<td></td>
<td>9.1</td>
</tr>
<tr>
<td>Graduate Diploma of Nursing</td>
<td>10</td>
<td>22.7</td>
<td></td>
</tr>
<tr>
<td>Graduate B.Sc. of Nursing</td>
<td>30</td>
<td>68.2</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>44</td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>
Table (1) shows demographic characteristics of the nurse, regarding the age of the sample, most of the samples ages were (20-30) years old who were accounted (61.4%). Most of them were male (63.6%). Most of them Graduate B.Sc. of Nursing (68.2%). (45.5%) of the nurses has (1-5) Years of experience in cardiac care unit.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Groups</th>
<th>F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Years of Experience in Cardiac Care Unit</td>
<td>&lt; 1 year</td>
<td>15</td>
<td>34.1</td>
</tr>
<tr>
<td></td>
<td>1 - 5 yrs.</td>
<td>20</td>
<td>45.5</td>
</tr>
<tr>
<td></td>
<td>6 - 10 yrs.</td>
<td>6</td>
<td>13.6</td>
</tr>
<tr>
<td></td>
<td>&gt; 11 yrs.</td>
<td>3</td>
<td>6.8</td>
</tr>
<tr>
<td>Total</td>
<td>44</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Table (2): Chest Pain Assessment

<table>
<thead>
<tr>
<th>No</th>
<th>Items</th>
<th>Never</th>
<th></th>
<th></th>
<th>Sometimes</th>
<th></th>
<th></th>
<th>Always</th>
<th></th>
<th></th>
<th>MS</th>
<th>RS%</th>
<th>Ass</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Assess location of pain</td>
<td>17</td>
<td>38.6</td>
<td>21</td>
<td>47.7</td>
<td>6</td>
<td>13.6</td>
<td>1.75</td>
<td>58.3</td>
<td>High</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Assess intensity of pain</td>
<td>27</td>
<td>38.6</td>
<td>20</td>
<td>45.5</td>
<td>7</td>
<td>15.9</td>
<td>1.77</td>
<td>59.0</td>
<td>High</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Notify the doctor for any characteristic of pain</td>
<td>17</td>
<td>38.6</td>
<td>7</td>
<td>15.9</td>
<td>20</td>
<td>45.5</td>
<td>2.07</td>
<td>69.0</td>
<td>High</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Record severity of pain chart</td>
<td>19</td>
<td>43.2</td>
<td>22</td>
<td>50</td>
<td>3</td>
<td>6.8</td>
<td>1.64</td>
<td>54.7</td>
<td>High</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Assess the associated symptoms such as nausea, vomiting, SOB</td>
<td>16</td>
<td>36.4</td>
<td>22</td>
<td>50</td>
<td>6</td>
<td>13.6</td>
<td>1.77</td>
<td>59.0</td>
<td>Mod.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Notify the doctor for associated symptoms with pain</td>
<td>12</td>
<td>27.3</td>
<td>15</td>
<td>34.1</td>
<td>17</td>
<td>38.6</td>
<td>2.11</td>
<td>70.3</td>
<td>Mod.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Record any abnormal signs associated with pain</td>
<td>14</td>
<td>31.8</td>
<td>13</td>
<td>29.5</td>
<td>17</td>
<td>38.6</td>
<td>2.07</td>
<td>69.0</td>
<td>Mod.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Put the patient in comfortable position according to his condition</td>
<td>3</td>
<td>6.8</td>
<td>24</td>
<td>54.5</td>
<td>17</td>
<td>38.6</td>
<td>2.32</td>
<td>77.3</td>
<td>Mod.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Teach the patient for deep breathing exercise</td>
<td>22</td>
<td>50</td>
<td>16</td>
<td>36.4</td>
<td>6</td>
<td>13.6</td>
<td>1.64</td>
<td>54.7</td>
<td>Low</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Give the patient medication as order</td>
<td>0</td>
<td>0.0</td>
<td>3</td>
<td>6.8</td>
<td>41</td>
<td>93.2</td>
<td>2.93</td>
<td>97.7</td>
<td>High</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Record name of drugs, dose, route and</td>
<td>0</td>
<td>0.0</td>
<td>4</td>
<td>9.1</td>
<td>40</td>
<td>90.9</td>
<td>2.91</td>
<td>97.0</td>
<td>High</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Notify the doctors for side effect of drug</td>
<td>5</td>
<td>11.4</td>
<td>17</td>
<td>38.6</td>
<td>22</td>
<td>50</td>
<td>2.39</td>
<td>79.7</td>
<td>High</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Record response of drug</td>
<td>18</td>
<td>40.9</td>
<td>14</td>
<td>31.8</td>
<td>12</td>
<td>27.3</td>
<td>1.86</td>
<td>62.0</td>
<td>Mod.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Scored by (Low, Mod., and High) through the intervals (“33.33 - 55.54”, “55.55 - 77.76”, and “77.77 - 100”) respectively, that shows high significant in all items.

Table (2) shows that most of the samples were high significant, except items (Assess the associated symptoms such as nausea, vomiting, SOB, Notify the doctor for associated symptoms with pain, Record any abnormal signs associated with pain, Put the patient in comfortable position according to his condition, Record response of drug, as well as low significant for the item (Teach the patient for deep breathing exercise).

Table (3): Respiratory Maintains Assessment

<table>
<thead>
<tr>
<th>No</th>
<th>Items</th>
<th>Never</th>
<th></th>
<th></th>
<th>Sometimes</th>
<th></th>
<th></th>
<th>Always</th>
<th></th>
<th></th>
<th>MS</th>
<th>RS%</th>
<th>Ass</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Check humidifier for adequate fluid</td>
<td>5</td>
<td>11.4</td>
<td>8</td>
<td>18.2</td>
<td>31</td>
<td>70.5</td>
<td>2.59</td>
<td>86.3</td>
<td>High</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Give the O2 by clean mask or tube</td>
<td>1</td>
<td>2.3</td>
<td>6</td>
<td>13.6</td>
<td>37</td>
<td>84.1</td>
<td>2.82</td>
<td>94.0</td>
<td>High</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Assist the patient to take comfortable position</td>
<td>5</td>
<td>11.4</td>
<td>22</td>
<td>50</td>
<td>17</td>
<td>38.6</td>
<td>2.27</td>
<td>75.7</td>
<td>Mod.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Increase inspired O2 concentration as doctor order</td>
<td>3</td>
<td>6.8</td>
<td>12</td>
<td>27.3</td>
<td>29</td>
<td>65.9</td>
<td>2.59</td>
<td>86.3</td>
<td>High</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Give drugs as doctor order</td>
<td>0</td>
<td>0.0</td>
<td>3</td>
<td>6.8</td>
<td>41</td>
<td>93.2</td>
<td>2.93</td>
<td>97.7</td>
<td>High</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Observe any signs of cyanosis</td>
<td>6</td>
<td>13.6</td>
<td>17</td>
<td>38.6</td>
<td>21</td>
<td>47.7</td>
<td>2.34</td>
<td>78.0</td>
<td>High</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Notify the doctor for abnormal breathing signs</td>
<td>4</td>
<td>9.1</td>
<td>3</td>
<td>6.8</td>
<td>37</td>
<td>84.1</td>
<td>2.75</td>
<td>91.7</td>
<td>High</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Record any abnormal signs in chart</td>
<td>3</td>
<td>6.8</td>
<td>4</td>
<td>9.1</td>
<td>37</td>
<td>84.1</td>
<td>2.77</td>
<td>92.3</td>
<td>High</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Scored by (Low, Mod., and High) through the intervals (“33.33 - 55.54”, “55.55 - 77.76”, and “77.77 - 100”) respectively. It shows that there is high significant in all items.
Table (4): Main domains responses with grand mean of score, relative sufficiency (RS %)

<table>
<thead>
<tr>
<th>Questionnaire’s Items</th>
<th>No.</th>
<th>GMS</th>
<th>RS %</th>
<th>Ass.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assess chest pain</td>
<td>44</td>
<td>2.073</td>
<td>69.1</td>
<td>Mod.</td>
</tr>
<tr>
<td>Maintenance respiration</td>
<td>44</td>
<td>2.634</td>
<td>87.8</td>
<td>High</td>
</tr>
</tbody>
</table>

Scored by (Low, Mod., and High) through the intervals (“33.33 - 55.54”, “55.55 - 77.76”, and “77.77–100”) respectively.

Table (4) the results shows a moderate assessment of chest pain assessment while there is high assessment for maintenance respiration.

Discussions

Chest pain is one of the most common symptoms for which adults seek the care of a physician. Because the probable etiology often can be determined from the history alone., the nurse should systematically evaluate characteristics of the pain. (14) Many patients present to the CCU department with chest pain. It is important to identify those patients with acute coronary syndromes (unstable angina, acute myocardial infarction, or evolving infarction). (15) Studies reported an improvement in outcome for patients followed up by a multidisciplinary care team in which a nurse was a key player. Such level of care is now recognized in international guidelines. (16) More recent emphasis on the management of heart disease has led to a focus on the contribution by nurses to the entire chest pain their roles in improving patient outcome and the delivery of quality care. (17) The management of acute breathlessness or cardiopulmonary instability is generally carried out simultaneously with diagnosis. Nurse have used consensus methodology to map clinical knowledge and skills as a process to develop ongoing educational and training activities. (18) This review reports the exploration of evidence based-respiratory clinical guidelines as a frame of reference for the essential clinical skills and knowledge required at ward level to ensure registered nurses are adequately prepared to provide the highest level of clinical care to adult patients. (19) This respiratory knowledge and skills could be the basis for education and skill development training for ward-based nurses to reduce any inconsistencies in the delivery of bedside care to the patient of equal importance is the maintenance of ward-based nurses’ ability to carry out technical and non-technical skills through regular opportunities to update their knowledge of the latest evidence associated with their ward-based practice. (20)

Conclusion

Based on the results of the study, it is concluded that the nurse staff have inadequate knowledge regarding chest pain management, while they have adequate knowledge regarding respiratory maintains.

Ethical Clearance: Taken from Institutional ethics committee.

Source of Funding: Self

Conflict of Interest: Nil

References


Morphological and Molecular Study of Contracaecum Larvae with a New Record of Contracaecum Septentrionale in Al-Sanaf Marsh Southern Thi-Qar Province, Iraq

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¹Department of Biology, College of Education for Pure Sciences, Thi-Qar University, Iraq

Abstract

Contracaecum nematodes are the most significant genus of the Anisakidae because of their wide range of host species involved in their life cycles, large number of their species and their health impacts. The current study aims to present the morphological and molecular characters of fourth stage larvae of Contracaecum that isolated from N. nycticorax proventriculus as free larvae in Al-Sanaf marsh, southern Iraq. Larvae of Contracaecum spp. collected from proventriculus of N. nycticorax aquatic birds were studied morphologically and their genomic DNA isolated, the ITS-1 regions of rDNA amplified by PCR technique. Sequences alignments carried out to screen nucleotide variation in ITS-1 among samples. The alignment of the sequences between Contracaecum larvae in current study with the previously reported reference gene sequences in the GenBank showed two distinct species. The first Contracaecum septentrionale recorded for the first time in Iraq and submitted to GenBank with the accession numbers MK424799.1, the second Contracaecum microcephalum submitted to GenBank with the accession numbers MK424795. The analysis of the ITS-1 data for Contracaecum larvae supported the distinction between species of Contracaecum larvae.

Keywords: Contracaecum, Larvae, ITS-1, Southern Iraq.

Introduction

The genus Contracaecum (Railliet & Henry, 1912) are parasitic nematodes with global distribution, they belonging to the family Anisakidae¹. Contracaecum nematodes are the most significant genus of the Anisakidae because of their wide range of host species involved in their life cycles, large number of their species and their health impacts². Contracaecum throughout its life cycle is able to infect both terrestrial and aquatic animals (marine and freshwater), which include a wide range of vertebrates and invertebrates. This genus related to Anisakidae family and has over 100 species. If humans are excluded from their host list, it is the only member of Anisakidae with zoonotic significance³. Free or encapsulated third-stage larvae of Contracaecum species infect invertebrates and fish as their intermediate and paratenic hosts; whereas, adult nematodes infect piscivorous birds and marine mammals as their definitive hosts infect⁴. Contracaecum larvae in humans cause a severe and painful condition following ingestion of under-cooked or raw fish which carrying third-stage larvae. These larvae cannot be identified to species level without the aid of molecular tools¹. In Iraq Contracaecum nematodes were isolated from many intermediate and final hosts⁵-⁹ there is no specific identification based on genetic characterization for Contracaecum larvae, according to current standards for identification of these parasites. The current study aims to present the morphological and molecular characters of fourth stage larvae of Contracaecum that isolated from N. nycticorax proventriculus as free larvae in Al-Sanaf marsh, southern Iraq.

Material and Method

Larvae of Contracaecum spp. collected from N. nycticorax proventriculus as free larvae, physiological
saline used for washing larvae extensively then a small piece of the mid-body of each individual larva removed for molecular study; the rest fixed in 70% ethanol then cleared in lactophenol for morphological examination. Light microscopy used for studying the collected larvae morphologically and characters of systematic importance measured. All measurements made directly with an eyepiece micrometer and drawings made to scale with the aid of a camera lucida. Larvae of *Contracaecum* morphologically identified according to the identification keys of Deardorff and Overstreet, Peter and Maillard.

Genomic DNA from *Contracaecum* larvae isolated by DNA kit (Geneaid, Tywan). The ITS-1 regions of rDNA was amplified by PCR with oligonucleotide primers (Macrogeny, Korea). The forward (5'-TTC CCC CTT TGT GAA CCT GC-3') and reverse (5'-CGA TCC ACG AAC CGA GTG AT-3'). The PCR (in 20μl) performed in 5μl Master Mix, 1 μl of forward primer, 1 μl of reverse primer, 5 μl of DNA template and 8 μl of PCR water (Bioneer, Korea) in a thermocycler (Biometra) under the following cycling conditions: 95°C for 2min (initial denaturation), followed by 30 cycles of 95°C, 30s (denaturation), 59°C, 30s (annealing), 72°C, 60s (extension) and a final extension of 72°C for 5min. One microlitre (10–20ng) of genomic DNA was added to each PCR reaction. An aliquot (5μl) of each amplicon examined on a 1%w/v agarose gel, stained with ethidium bromide, and photographed.

**Results**

The *Contracaecum* larvae were whitish nematodes, they were in fourth developmental stage, characterized with relative thick body and annulated cuticle forming collar at the anterior end. Anterior end was with three lips, excretory pore found at anterior end of body at the base of the lips, muscular esophagus was ending near the round ventriculus, gonads not developed. Ventricular appendix was narrower than broad intestinal caecum. The body characterized with broad intestine filling remainder of it. Three anal glands present. Tail with spine and sharply pointed. Total body length 12-14 (13) mm, width 0.35-0.38 (0.37) mm, head diameter 0.11-0.12 (0.11) mm. The position of nerve ring to the anterior end 0.29-0.36(0.33) mm. Deirids position to the anterior end 0.37-0.43(0.40) mm, esophagus length 2.12-2.20 (2.16) mm and about 15%-17% (16%) to the body length. Ventricular appendix 0.80-0.82 (0.81) mm and about 37% to esophagus length, intestinal caecum length 1.56-1.74 (1.65) mm. Intestinal caecum long to ventricular appendix long about 73%-79% (76%), the tail length 0.09-0.15 (0.12) mm and about 0.7%-1% (0.9%) to total body length (Fig. 1, 2).

**Fig. 1.** *Contracaecum* larva: A anterior end of nematode showing N.r. (Nerve ring), Eso (Esophagus), Ic. (Intestinal cecum), V.ap. (Ventricular appendix), scale bar= 0.8 mm, B posterior end of nematode showing An. (Anus), scale bar=0.33 mm. Camera Lucida.

**Fig. 2.** *Contracaecum* larva: A anterior end of nematode showing Eso (Esophagus), 40X, B posterior end of nematode showing An. (Anus), 100X. Light microscope.

PCR analysis of representative ITS amplicons for all *Contracaecum* larvae isolated from proventriculus of *N. nycticorax* birds in Al-Sanaf marsh (Fig. 3).
In the present study, *Contracaecum* larvae isolated from proventriculus of *N. nycticorax* birds in Al-Sanaf marsh observed in the ITS-1 gene. The sequences of ITS1 of *Contracaecum* submitted to GenBank with the accession numbers MK424799.1 and MK424795.1 and compared with the previously reported reference gene sequences in the GenBank. The first isolate with accession number MK424799.1 matched 99% of the previously reported reference gene sequences in the GenBank *C. septentrionale* with accession number AJ634784.1 *C. septentrionale* recorded for the first time in Iraq by present study. The second isolate with accession number MK424795.1 matched 99% of the previously reported reference gene sequences in the GenBank *C. microcephalum* with accession number FM177523.1. 

**Discussion**

Morphological identification used to identify larvae of *Contracaecum* spp. to the genus level in Iraq\(^ {12-14}\). Somereports indicated presence of the larval stage of *Contracaecum* in esophagus and proventriculus of aquatic birds. In Iraq Mhaisen\(^ {15}\) recorded *Contracaecum* spp. larvae from *P. carbo* and Awad *et al.* \(^ {16}\) isolated *Contracaecum* spp. larvae from *Egretta alba* and *Platalea leucordia* and in Poland, Kanarek and Bohdanowicz\(^ {17}\) showed that stomachs of *P. carbo* were found to contain adult *C. rudolphii* and its larvae which were identified as the third and fourth stages. The *Contracaecum* nematodes embedded in the proventriculus of infected birds causing many lesions in their anchoring sites especially when infection is high, others penetrated into the outer layers and some also noticed free or in the gills and penetrating the flesh of ingested fish\(^6\). In the current study, the ITS-1 regions sequenced for the first time for *Contracaecum* larvae in Iraq, the isolated larva with accession number MK424799.1 matched 99% of the previously reported reference gene sequences in the GenBank *C. septentrionale* adult with accession number AJ634784.1 *C. septentrionale* recorded for the first time in Iraq by present study. The second isolate with accession number MK424795.1 matched 99% of the previously reported reference gene sequences in the GenBank *C. microcephalum* with accession number FM177523.1. 

Phylogenetic relationships between *C. septentrionale* and *C. microcephalum* from the present study and other *Contracaecum* species as inferred by maximum likelihood obtained from ITS-1 gene. The phylogenetic tree was constructed using Unweighted Pair Group method with Arithmetic Mean (UPGMA tree) in (MEGA 6.0 version).

Adult of *C. septentrionale* nematod was isolated from *Phalocrocorax aristotelis* from Iceland\(^ {27}\) and from *P. aristotelis* and *P. carbo* from the coasts of both Iceland and Norway\(^ {28,29}\). The morphologically described of this species based on differences at anterior end of the adult worm and in the length of spicules in
the male. This species considered as a closely related species to *Contracaecum rudolphii* in cormorants. Reports of *C. septentrionale* have been rare. *Li et al.* identify genetically *C. septentrionale* and provide support for the validity of this parasite as a separate species by using ITS-1 and ITS-2 regions of rDNA and they suggested this clear genetic differentiation need for a detailed morphologic description of this parasite. The molecular identification of larval stages of *Contracaecum* spp. are very limited as *Shamsi and Aghazadeh-Meshgi*; *Shamsi et al.*; *Jabbar et al.*; *Dezfuri et al.*; *Pekmezci and Yardimci*. Furthermore, in Iraq molecular identification of *Contracaecum* larvae in fish species have also not been studied, and there is still no correct identification of the *Contracaecum* species fish species from Iraqi waters and this is the first report in Iraq about molecular identification of *Contracaecum* larvae in fourth larval stage isolated from proventriculus of birds with ingested fishes during bird feeding. Adult *C. microcephalum* previously reported from some fish eating birds in Iraq: *Ardeapurpurea*, *Phalocrocorax pygmeus* and *Egrenta grazetta* in Iraq, *Ardeola ralloides*, *Ardea cinerea* and *Ixobrychus minutus*. There is no identification of *C. septentrionale* as an adult stage from fish-eating birds in Iraq, therefore the molecular identification of *C. septentrionale* larvae was recorded this species for the first time in Iraq. The alignment of the sequences between larval stages and adult of *Contracaecum* nematodes can be promising for identification of these parasites. By using molecular identification *Shamsi and Aghazadeh-Meshgi* reported that the *Contracaecum* larvae in Iran belong to *C. multipapillatum sensu lato*, *Pekmezci and Yardimci* showed that the *Contracaecum* larvae in Turkey belong to *Contracaecum overstreeti*. In current study *Contracaecum* larvae related to two distinct species *C. septentrionale* larvae and *C. microcephalum*. The molecular diagnosis nematodes in different hosts and at any developmental stage is very important for studying their population ecology and biology, systematics and for controlling the diseases, they cause.

**Conclusion**

The analysis of the ITS-1 data for *Contracaecum* larvae supported the distinction between species of *Contracaecum* larvae.

**Conflict of Interest:** None

**Funding:** Self

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**References**

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Anthropometric with Thryroxine Hormons in Iraqi Women

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Abstract

Polycystic ovarian syndrome (PCOS) is a common heterogeneous, multifactorial and chronic endocrine disorder characterized by multiple hormonal imbalances, occupied by manifestations of hyperandrogenism and many a times with hyperthyroidism. Clomiphene is a well known drug for its safety, effectiveness and relatively low cost as compared to other drugs. The aim of the present study is to evaluate the effect of clomiphene on anthropometry measurement and thyroxine hormones in Iraqi women. Seventy three infertile patients with polycystic ovary syndrome (PCOS) were enrolled in the present study. They were randomly divided into three groups. Three doses of clomiphene (50, 100 and 150mg) were given to enrolled patients (n=72). Lower concentration of clomiphene showed decreases in the body mass index and waist-hip ratio of obese and overweight individuals. Lower dose (50mg) of the clomiphene is effective while higher dose (100 and 150mg) showed non-significant increase in the serum T3 level. The present study concluded that clomiphene act effectively on the obesity and patients treated with this showed a positive effect.

Keywords: Polycystic ovarian syndrome, hyperthyroidism, thyroid hormones, T3 and T4 levels.

Introduction

Polycystic ovarian syndrome (PCOS) is a common heterogeneous, multifactorial and chronic female endocrine disorder characterized by multiple hormonal imbalances, conquered by manifestations of hyperandrogenism affecting around 7-10% of women in reproductive age. PCOS is associated with obesity and multiple ovarian cysts that lead to infertility. It has multiple clinical manifestations such as differential insulin sensitivity, abnormal steroid hormone metabolism, and adipocytokine secretion. PCOS is the widespread metabolic disorder affects women in their reproductive age and often accompanied by increased levels of free testosterone, and luteinizing hormone (LH). It is also reported to have thyroid abnormalities like hypothyroidism can cause ovulatory and menstrual dysfunction. Barber et al. reported a close correlation between adiposity and symptom severity in women with PCOS, and even modest reductions in weight generally translate into significant improvements in menstrual regularity, fertility and hyperandrogenic features.

About more than 99% of thyroid hormones (T4 and T3) are bind to the transport proteins. Remaining 1% of thyroid hormone is unbound or free and biologically active. The transporter of this hormone is Thyroxine Binding Globulin (TBG). Its serum concentration is influenced by numerous conditions which can leads to significant increase or decrease in total T4 concentration. Serum estrogens, pregnancy, hyperthyroidism, acute hepatitis levels are usually increase while androgens, corticosteroids, systemic syndrome levels decreased in response with TBG level.

Drugs like, clomiphene is a well known drug for its safety, effectiveness and relatively low cost as compared to other drugs. It is usually used to treat irregular or absent menstrual cycles which is commonly known as ‘luteal phase defect’. It increases progesterone secretion during the second half of the cycle and allow to predict the lengths of menstrual cycle. Thereby the time of intercourse or artificial insemination can be calculated.

Despite of high occurrence, the etiology of PCOS remains unknown due to the heterogeneity of clinical symptoms. Symptoms of PCOS frequently occur around puberty; however the starting point may be as early as during fetal development. The elevated level of androgen affects around 60-80% of PCOS women and can consequence in the signs such as hirsutism, acne, and...
alopecia. In PCOS, high circulating levels of androgens, estrogens, sex steroid precursors and glucuronidated androgen metabolites have been confirmed. The cause of LH hypersecretion in PCOS is possibly due to improved pituitary sensitivity to gonadotropin releasing hormone (GnRH). It appears due to the acquired impaired sensitivity of the hypothalamic pulse generator to the negative feedback of estrogen and progesterone in PCOS. Levels of follicle stimulating hormone (FSH) in PCOS is low or within the lower follicular range, and response to GnRH is relatively similar to ovulatory controls. Alteration in sex steroid production, metabolic dysfunction, and obesity might be contributed to the change in LH secretion pattern. In the present study effect of clomiphene were evaluated on anthropometry measurement and thyroid hormones in the Iraq women.

**Material and Method**

**Enrollment of the patients:** Seventy three infertile patients with polycystic ovarian syndrome (PCOS) were enrolled in the present study. Oral consent was obtained before enrollment.

**Treatment of Clomiphine:** The enrolled patients were randomly divided into three groups on the bases on their clomiphene treatment. The patients were given Clomiphine at various doses such as 50mg (n=21), 100mg (n=23) and 150mg (n=28).

**Blood collection and its separation:** The blood was collected before (pre-treatment sample) and after (post-treatment sample) treatment to check its effect. The collected samples were centrifuged at 3000rpm for 10 minutes, and serum was separated within 30 minutes from the time of blood collection. Serum was aliquots in an eppendorf tube and frozen in the deep freeze at -40°C.

**Estimation of TSH, T3 and T4 from blood:** Serum of all patients was subjected for the estimation of thyroid-stimulating hormone (TSH) and two thyroid hormones (T4 and T3). The estimation of TSH, T3 and T4 were carried out as per manufacturer’s instruction (VIDAS® system, Biomerieux, Italy).

**Statistical Analysis:** The results were represented as mean ± Stand error (n=21). The data were processed in the Microsoft excel program and graphpad prism 5 (version 5.01).

**Results**

**Effect of Clomiphene on anthropometry: Body mass index (BMI):** Clomiphene has a positive effect on the body mass index (BMI). Lower concentration of clomiphene showed decreases in the BMI of obese and overweight individuals. However, higher concentration has reversed effect on the BMI of normal individuals. The effects clomiphene were depicted in Figure 1.

![Body mass index BMI (Kg/m²)](image)

**Figure 1:** Body mass index of PCOS diagnosed women before and after treatment of clomiphene.

Values are expressed as mean of enrolled patients.

**Waist-hip ratio (WHR):** The waist-hip ratio of enrolled women are depicted in Figure 2. Lower dose has effectively reduced waist-hip ratio.

![Waist-Hip ratio (WHR)](image)

**Figure 2:** Waist-hip ratio (WHR) of PCOS diagnosed women before and after treatment of clomiphene.

Values are expressed as mean of enrolled patients.

**Serum thyroid-stimulating hormone (TSH) level remains unchanged after treatment:** The effect of various concentrations clomiphene on blood TSH level was depicted in the Figure 3. The clomiphene has not shown any effect on the serum TSH level.
Figure 3: Effect of various concentrations clomiphene on blood TSH level

Values are expressed as mean of enrolled patients.

Clomiphene (100 and 150g) non-significantly increase serum T3 and T4 level

The lower dose of the clomiphene is effective while higher dose (100 and 150mg) showed non-significant increase in the serum T3 level (Figure 4). Similar results were found in the serum T4 level.

Discussion

Thyroid disorder and PCOS are closely associated with each other. Various reports, including comparative study in normal and PCOS women are available in support with above relationship7-10. Cases of congenital hypothyroidism, if untreated for a longer period, it may lead to change in ovarian morphology and can even be mistaken for ovarian malignancies11.

In the past two decades, the number of PCOS patients with thyroid disorders has been increased. Sinha et al10 reported higher prevalence of goître’s (27.5% vs 7.5%) and subclinical hypothyroidism (22.5% vs 8.75%) in PCOS patients in PCOS and normal women, respectively (case-control study, n=80). An abnormally high level of thyroid stimulating hormone (TSH) with normal level of free thyroxine (T4) and absence of frank symptoms of hypothyroidism is known as subclinical hypothyroidism is known as subclinical hypothyroidism (SH)12. In general population, the prevalence of SH is about 4% to 8.5%13,14 and it is significantly higher in patients with infertility15. The thyroid hormones increased during pregnancy can lead to an aggravation of SH in pregnant women13. Some complications related with hypothyroidism are disturbances in menstruation, infertility, increased risk of miscarriages, obstetrical difficulties and adverse outcomes in the offsprings15.

The granulose cells, corpus luteum and oocyte have direct effect of thyroid hormone. Therefore, increased levels of thyroid stimulating hormone (TSH) and thyrotropin releasing hormone (TRH) can cause ovulatory dysfunction, or dysfunction of corpus luteum17. Franklyn18 reported that 11% to 24% of infertile women having ovulatory dysfunction or corpus luteum problems have subclinical hypothyroidism (SH). American association for clinical chemistry19 suggested that the upper limit (2.5mIU/L) of serum TSH value in population requiring careful screening to exclude thyroid disease.

In the present study, enrolled patients were classified into normal, overweight and obese depends on their BMI and WHR. Several studies reported the direct correlation of PCOS and BMI/WHR1. Koppalli et al.1 reported BMI and WHR were higher in the PCOS patients. The serum levels of sex hormone binding globulin (SHBG), vitamin D, calcium, dehydroepiandrosterone sulphate (DHEAS), follicle stimulating hormone (FSH), estradiol and luteinizing hormone (LH) levels were also altered in the PCOS patients.
Conclusion

The study concluded that the lower dose of clomiphene (50mg) decreased serum thyroid-stimulating hormone, T3 and T4 level as compared to the higher dose (150mg). Clomiphene act effectively on the obesity and patients treated with this showed a positive effect.

Ethical Statement: The study design was approved from the Institutional ethical committee, College of medicine, Aliraqia University, Baghdad, Iraq. Oral consent was obtained before enrollment.

Funding: Self funding

Conflict of Interest: Nil

References


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thyroid stimulating hormone, luteinizing hormone, melatonin and cortisol in infertile women with subclinical hypothyroidism. Human Reproduction 1997;12:896-904.


Abstract

Objective: To isolate and identify bacterial species from refrigerators in Basrah city.

Method: A total of 37 household refrigerators were sampled in Basrah city. With the consent of householders swabs moistened soaked with Buffered Peptone Water were collected from the base, shelves and sides of the refrigerator and were transported to laboratory under chilled conditions (4°C ± 1.0). Each sample collected was plated out on many culture media.

Results: *Citrobacter freundii* was the most frequently isolated pathogen in this study, being recovered from 31.57 % of refrigerators. *Listeria monocytogenes* and *Pseudomonas spp*. were recovered from 17.55 % of refrigerator surfaces, *Salmonella spp.* from 14.03 %. *Escherichia coli* from 10.63% and *Listeria innocua* from 8.77 %.

Conclusions: This study concludes that most of the refrigerators under study were contaminated with some bacterial species and some of these are pathogenic and lead to diseases such as *Listeria* and *Salmonella*. Continuous cleaning and using disinfectant agents reduces bacterial contamination.

Keywords: Isolation, Bacteria, Contamination, Basrah.

Introduction

Food-borne diseases which caused by ingesting contaminated foodstuffs are widespread and growing public health problem. The global incidence of food-borne disease is difficult to estimate, but it has been reported that in 2005 alone, 1.8 million people died from diarrhoeic diseases. Stored foods in domestic refrigerators may be contaminated when introduce contaminated foods, leaking packages, hands, and surfaces which may attach to the internal surface of the refrigerator leading to indirect longer term contamination during activities of subsequent food preparation. Most studies focused on the contamination of surfaces in kitchens and rest rooms by bacteria. Some pathogenic bacteria can survive on the surfaces in these environments for some time, and contaminate food leading to illness.

Because refrigerators are used to store food, Microbial contaminations of refrigerators have been studied. Moisture and nutrients in refrigerators provide favorable growth conditions for contaminating bacteria. Refrigeration is used to control the rate of certain chemical and enzymatic reactions and the rate of growth of food microorganisms. The refrigerator reduces the rate of spoilage by reducing the reproduction rate of bacteria. When there is contamination with microbes, this can cause food spoilage (change in characteristics of food rendering it unacceptable or unsafe for consumption) and food borne diseases (defined by WHO, as any disease of an infectious or toxin nature caused by or thought to be caused by the consumption of food or water). In the light of the above, the present study aimed to isolation and identification of bacterial species from refrigerators in Basrah city.

Materials and Method

**Sampling procedure:** A total of 37 household refrigerators were sampled in Basrah city. With the...
consent of householders swabsmoistened soaked with Buffered Peptone Water (BPW, Oxoid) were collected from the base, shelves and sides of the refrigerator and were transported to the laboratory under chilled conditions (4°C ± 1.0). Each sample collected was plated out on the following commercially available culture media in the laboratory listed in Table 1.

Table 1: Media used for isolation of bacteria (origin - Paris, France) from refrigerators

<table>
<thead>
<tr>
<th>Culture media</th>
<th>Isolated bacteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Listeriachromagar</td>
<td>Listeria monocytogenes and Listeria innocua</td>
</tr>
<tr>
<td>E. coli chromagar</td>
<td>Escherichia coli and other gram negative bacteria</td>
</tr>
<tr>
<td>Salmonellachromagar</td>
<td>Salmonella spp.</td>
</tr>
<tr>
<td>Pseudomonaschromagar</td>
<td>Pseudomonas aeruginosa</td>
</tr>
</tbody>
</table>

Study protocol (questionnaire distribution):

Thirty seven households participated in the study that randomly selected were participated in the evaluation of their knowledge in relation to the use of refrigerator by giving an Oluwafemi et al. with modifying questionnaires consisting of questions covering social demographics, refrigeration practices, refrigerator maintenance practices, etc. to each householder.

Results

*Citrobacter freundii* was the most frequently isolated pathogen in this study, being recovered from 31.57 % of refrigerators. *Listeriamonocytogenes* and *Pseudomonas spp.* were recovered from 17.55 % of refrigerator surfaces, *Salmonella spp.* from 14.03 %. *Escherichia coli* from 10.63% and *Listeria innocua* from 8.77% (Table 2). The use of chromo agar media provide easy and rapid diagnosis of bacteria as shown in Figure (1).

Table 2: Frequency of bacterial species isolates from refrigerators

<table>
<thead>
<tr>
<th>Bacterial isolates</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Citrobacter freundii</em></td>
<td>18</td>
<td>31.57 %</td>
</tr>
<tr>
<td>Listeria monocytogenes</td>
<td>10</td>
<td>17.55 %</td>
</tr>
<tr>
<td><em>Pseudomonas spp.</em></td>
<td>10</td>
<td>17.55 %</td>
</tr>
<tr>
<td><em>Salmonella spp.</em></td>
<td>8</td>
<td>14.03 %</td>
</tr>
<tr>
<td><em>Escherichia coli</em></td>
<td>6</td>
<td>10.63 %</td>
</tr>
<tr>
<td><em>Listeria innocua</em></td>
<td>5</td>
<td>8.77 %</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>49</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

The social demographic result shows, refrigerator maintenance practices and food safety knowledge of the householders participated in the study. Educational levels of respondents ranging from primary school to doctorate degree. 67.6 % of respondents did not clean vegetables and fruits before keeping in refrigerators. Another factor that could have affected the microbial quality of refrigerators was the cleaning regimes and the type of cleaning. Most respondents reported varying degrees of cleaning regimes. 45% of respondents reported cleaning their refrigerators weekly while only 8.1 % of respondents reported cleaning their refrigerators daily. 18.9% of householders only used disinfectants in cleaning their refrigerators while most of them (43.2%) used water and soap. Many of respondents (72.9%) have knowledge about food borne diseases from different sources.

Fifteen refrigerators (40.5%) provided no bacterial growth, the owners of most of them cleaned them weekly and often did not store leftovers for more than 24 hours (table 3).

Table 3: Frequency of refrigerators, according to bacterial isolates

<table>
<thead>
<tr>
<th>Bacterial type</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>No bacterial isolate</td>
<td>15</td>
<td>40.5</td>
</tr>
<tr>
<td><em>C. freundii</em></td>
<td>5</td>
<td>13.5</td>
</tr>
<tr>
<td><em>L. monocytogenes</em></td>
<td>1</td>
<td>2.7</td>
</tr>
<tr>
<td><em>Pseudomonas spp.</em></td>
<td>1</td>
<td>2.7</td>
</tr>
<tr>
<td>More than one bacterial type</td>
<td>15</td>
<td>40.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>37</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

![Figure 1: Bacterial isolates on chromagar media](image)
As shown in Table 4, about 45.8% of samples collected from refrigerators from urban areas provided no bacterial growth compared with 38.5% samples from rural areas.

### Table 4: Relation between bacteria present and area of samples

<table>
<thead>
<tr>
<th>Area</th>
<th>Bacteria absent</th>
<th>Pathogenic bacteria</th>
<th>Non-pathogenic bacteria</th>
<th>Mixed bacteria</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban</td>
<td>11 (45.8%)</td>
<td>2 (8.3%)</td>
<td>5 (20.8%)</td>
<td>6 (25.1%)</td>
<td>24 (100.0%)</td>
</tr>
<tr>
<td>Rural</td>
<td>5 (38.5%)</td>
<td>1 (7.7%)</td>
<td>2 (15.4%)</td>
<td>5 (38.4%)</td>
<td>13 (100.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>16 (43.2%)</td>
<td>3 (8.1%)</td>
<td>7 (18.9%)</td>
<td>11 (29.8%)</td>
<td>37 (100.0%)</td>
</tr>
</tbody>
</table>

Chi-Square = .757 df = 3

### Discussion

_Citrobacter freundii_ was the most frequently isolated bacteria in this study. _C. freundii_ is a common component of the gut microbiome of healthy humans. While most strains are beneficial, some rare strains of _C. freundii_ have been associated with opportunistic infections of the respiratory tract, urinary tract, blood, and many other normally sterile sites in immunocompromised patients. _Listeria monocytogenes_ and _Pseudomonas spp._ were the most frequently pathogens in this study and were recovered from 17.55% of the refrigerators examined. _Listeria monocytogenes_ is the species of pathogenic bacteria that cause _listeriaiosis_ infection. It can grow and reproduce inside the host's cells and is one of the most virulent foodborne pathogens, with 20 to 30% of foodborne listeriosis infections in high-risk individuals may be fatal. _Pseudomonas spp._ are found widely in the environment, such as in soil, water, and plants. They usually do not cause infections in healthy people. Infectious species include _P. aeruginosa_, _P. oryzihabitans_, and _P. plecoglossicida_. _P. aeruginosa_ flourishes in hospital environments. It is the second-most common infection in hospitalized patients (nosocomial infections).

_E. coli_ was isolated from 10.63% of refrigerators in this study widely. It is accepted indicator of fecal contamination suggesting that the refrigerator internal surfaces are frequently contaminated by the import of contaminated raw foods or by poor personal hygiene.

_Salmonella_ sp. was recovered from 14.03% refrigerators. It is a frequent contaminant of many retail foods poses public health challenges in terms of potential cross contamination to food and food preparation surfaces during routine food preparation. _Salmonella_ sp. are equally easily spread through the domestic environment where they can persist for up to four days. Surface associated _Salmonella_ sp. still because a significant cross contamination risk means this pathogen can multiply under condition of mild temperature abuse in cross contaminated foods. _Salmonella_ sp. was found to be easily spread throughout the domestic environment. _E. coli_ was identified in this study, which is relatively rare occurrence of the low infectious dose pathogens in the human food chain and its ability to form viable non-culturables.

From 37 refrigerators (45.8%) of them were from urban areas showed no bacterial growth compared with those from rural areas (38.5%). Householders from urban areas may be more interested in cleaning and maintenance of refrigerators and preparing healthy food according to their knowledge about foodborne diseases. The results showed that 67.6% of respondents did not clean vegetables and fruits before keeping in refrigerators may because of the common belief that store them without washing makes them resistant to rot for longer time. That action leads to spread of bacteria in refrigerators. The use of chromagar media give rapid detection to differentiate between the bacterial colonies by color and morphology characteristics.

It is impossible to completely exclude food pathogens from the kitchens; however their spread, growth and survival can be controlled with correct food storage and preparation of practices and regular cleaning and disinfection of food contact site. This study concludes that most of the refrigerators under study were contaminated with some bacterial species and some of these are pathogenic and lead to diseases such as _Listeria and Salmonella_. Continuous cleaning and using disinfectant agents reduces bacterial contamination.

**Ethical Clearance:** Approval to conduct the study was obtained from the dean of college of Nursing, University of Basrah.
Source of Funding: Self

Conflict of Interest Statement: Nil.

References

Motivation for Choosing Medicine as a Career, among Students of Baghdad Medical College

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Abstract

Purpose: To determine the type of motivation for medicine, its gender-difference, and the relative impact of motivational factors.

Method: An observational cross sectional survey study where 182 students were taken from College of Medicine/University of Baghdad “CM/UB” from both genders and all six grades, from the 10th of April, 2017 to the 1st of June, 2017. Self-administered structured questionnaire surveys were given, which included specific motivational factors and participants were asked to rank them according to priority in motivating them.

Results: A total of 180 students responded to the survey; of those: for first priority motivation: 96 (53%) chose a controlled factor, while 84 (47%) chose an autonomous factor. Of all 82 males: 51 (62%) chose a controlled factor, while 31 (38%) chose an autonomous factor. Of all 98 females: 45 (46%) chose a controlled factor, while 53 (54%) chose an autonomous factor. High school scores, helping others, passion in medicine, and family pressure had the highest motivational influence at overall and first priority levels.

Conclusion: Controlled motivation was found to be the main type of motivation, with males being influenced by it more than females. High school scores, helping others, passion in medicine, and family pressure had the highest motivational influence.

Keywords: Motivation, Medicine, students.

Introduction

Definitions: Motivation can be defined as one’s direction of behavior or the cause of wanting to repeat a behavior or refrain from it. Motivation is divided into: Intrinsic motivation and Extrinsic. Self-determination theory “SDT” divides motivation into: Autonomous motivation “AM” which includes intrinsic motivation or extrinsic motivation that is identified by the individual with an activity’s value and a feel of alignment with their sense of self; and Controlled motivation “CM” which is either due to external rewards and punishment or one that arises from only partially internalized activities and values such as seeking approval, avoiding shame, and protecting the ego.

Motivation for Medicine: There are indicators of change in the reasons to study medicine over time and it is felt that care about others and wanting to help people as part of their job is the reason why many students are choosing this career. Around two-thirds of the students in the study reported they were intrinsically motivated in applying for medical school. On the other hand family pressure is one of the reasons to study medicine, mainly being in third world countries.

Most studies prefer autonomous motivation to controlled motivation for medicine as regards its correlation with better learning and outcomes at future career.
In Iraq, the only criterion for admission to medical colleges is high secondary school scores\textsuperscript{11}. Motivational factors in Iraqi students included: interest in helping people (42.8%), family pressure (45.4%), passion in medicine or childhood dream (36.2%), high average score of sixth secondary school grade (28.3%), prestigious job (32.2%), profiting profession (13.2%), and presence doctors in the family (9.2%). So the higher percentage (61.8%) was “personal preference” which is autonomous, followed by “My parents vision and choice” (45.4%) which is controlled motivation\textsuperscript{12}.

Knowledge of the motivational factors for studying medicine might prove helpful in student selection and support\textsuperscript{13}. The effect of Gender: despite the increment in number of females in medicine, still there are issues of gender that continue to have a substantial impact on their medical education\textsuperscript{14}. Female selection for medicine as a career is increasingly noticed in the past few years\textsuperscript{15}. In Iraq females constituted around 69.1% of medical students in recent years\textsuperscript{12}.

Both genders have been shown to have common factors for choosing careers, men place greater emphasis on manual dexterity skills and financial advantages, while women place greater emphasis on people education and type of people encountered\textsuperscript{16}. Primary motivational factors in girls were patient care, interest in science, career opportunity and personal skills, while in boys they were patient care, interest in science, status-security, self–employment, however no statistically significant differences were found between both genders. But there was significance in getting encouragement from family being more by girls\textsuperscript{17}.

Objectives: The principle aims of our research are to elucidate the:

1. Type of motivation (autonomous\controlled), and its relation to gender.
2. Motivational impact of specific factors

Subjects and Method

Study design: Observational cross sectional analysis.

Location: CM\UB

Inclusion criteria: All students of CM\UB from first to sixth year.

Study sample: 182 student surveys collected from the study population from the 10\textsuperscript{th} of April, 2017 to the 1\textsuperscript{st} of June, 2017

Sampling method: Convenience sampling.

Data collection: We gave the participants printed papers containing a structured self-administered questionnaire survey form. We divided the survey papers equally between us, the survey questionnaire were offered to students after taking permission and explaining to them the aim of the study. The study was conducted in accordance with the latest version of the principles of the Declaration of Helsinki (2013). We explained to all participants the purposes of the study, its confidential nature and they were free not to answer. The questionnaire gathered information about Age, Gender, Grade, and factors of:

- Family/friends pressure;
- High-school score;
- Prestige; Improving socioeconomic status (Profitable);
- Intellectual challenge (need to be number one in everything);
- Passion in medicine;
- Interest in helping people;
- Presence of doctors in the family or among friends;
- and others as mentioned by the students.

We requested from all participants to order their choice of motivational factors according to priority in motivating them from the highest priority to the lowest.

Study variables: Those are divided into two categories, according to SDT\textsuperscript{4,5}.

1. Autonomous Motivation (AM): those are the last 3 specific factors present in the above list, where the first two are intrinsic and the third is extrinsic, and all other factors that the students chose that are deemed autonomous according to the lines presented in the introduction of this research.

2. Controlled Motivation (CM): those are the first five factors present in the above list.

We only studied two aspects of motivation: first priority motivation, were the student’s type of motivation was decided from the student’s choice of the factor at that level and the categorization of autonomous and controlled motivation. The second aspect is the overall motivation per factor which is calculated without respect to priority, and it is the total number of students who chose that factor at any priority level.

Statistical analysis: We enrolled the data obtained from the survey forms, sorted and tabulated them on a
personal computer, and did the relevant analysis using SPSS Statistics 17.0 (SPSS Inc. Chicago, Illinois, US). We expressed data using descriptive statistics of proportions, standard deviations “SD” and 95% confidence intervals “CI”; We tested significance of results using the one sample proportion z-test against chance probably of 50%, Chi-Square test when all expected values were higher or equal to 5, and Fisher’s exact test when some expected values were lower than 5.

Finding

General characteristics: We offered the survey to a total of 182 medical students out of all students of Baghdad medical college, only two students didn’t agree to take the survey (rejected), and all of rest 180 students have fully participated in the survey, so the response rate is 99%. The Average age of the participants is 21 (Range: 18 - 24 years). The gender distribution is: female 98 (54.4%) and male 82 (45.6%), the female to male ratio is 1.195. The number of students who participated in our survey from each grade (year of study) is: First grade 26 (14.4%), second grade 30 (16.6%), third grade 37 (20.5%), fourth grade 31 (17.2%), fifth grade 29 (16.1%) and sixth grade 27 (15%).

Overall motivation: Two major trends regarding overall motivational factors, with the higher reported group being: high school score, helping others, family pressure, and passion in medicine; and the rest of the factors constituting the lower reported group. Figure (1).

Figure 1 The percentages of motivational factors in the overall sample of 180 students from College of Medicine\University of Baghdad at year 2017

Table 1 depicts the descriptive statistics of the motivational factors (irrespective of priority) per gender and the statistical significance of gender-wise differences between them. Gender-wise significant differences were observed regarding factors: helping others, presence of doctor in the family, socio-economic (profitable), and prestige. The highest reported factor in the whole sample was high school score 84 (47%), and the lowest being prestige 20 (11%).

Table 1: Descriptive statistics and significance of genderwise differences in overall motivational factors in 180 students of CM\UB at year 2017

<table>
<thead>
<tr>
<th>Factors (Overall motivation)</th>
<th>Females (Total 98)</th>
<th>Males (Total 82)</th>
<th>$\chi^2$ test statistic</th>
<th>p-value (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Mean (%)</td>
<td>SD (%)</td>
<td>Frequency</td>
</tr>
<tr>
<td>High-school score</td>
<td>44</td>
<td>45</td>
<td>5.03</td>
<td>40</td>
</tr>
<tr>
<td>Helping others</td>
<td>49</td>
<td>50</td>
<td>5.05</td>
<td>24</td>
</tr>
<tr>
<td>Family pressure</td>
<td>44</td>
<td>45</td>
<td>5.03</td>
<td>27</td>
</tr>
<tr>
<td>Passion in medicine</td>
<td>37</td>
<td>38</td>
<td>4.90</td>
<td>31</td>
</tr>
<tr>
<td>Doctors in family</td>
<td>21</td>
<td>21</td>
<td>4.11</td>
<td>8</td>
</tr>
<tr>
<td>Profitable</td>
<td>8</td>
<td>8</td>
<td>2.74</td>
<td>20</td>
</tr>
<tr>
<td>Intellectual challenge</td>
<td>12</td>
<td>12</td>
<td>3.28</td>
<td>13</td>
</tr>
<tr>
<td>Prestige</td>
<td>5</td>
<td>5</td>
<td>2.20</td>
<td>15</td>
</tr>
</tbody>
</table>
First priority motivation: Of all 180 students: for first priority motivation: 96 (53%) (SD 3.7%, 95%CI [46% - 60%]) chose a controlled factor, while 84 (47%) (SD 3.7%, 95%CI [40% - 54%]) chose an autonomous factor, which is not statistically significant (z-test statistic=0.81, p=0.42) against 50% chance probability of all 82 males 51 (62%) (SD 5.4%, 95% CI [51%-73%]) chose controlled factors, while 31(38%) (SD 5.4%, 95% CI [27%-49%]) chose autonomous factors, which is found to be a statistically significant result compared to a chance determined mean of 50% (z= 2.173, p=0.03) of all 98 females 45 (46%) (SD 5%, 95% CI [35.88% to 56.37%]) chose controlled factors, while 53 (54%) (SD 5%, 95% CI [43.63% to 64.12%]) chose autonomous factors, which is not statistically significant (z=0.792, p=0.43) against chance. However the difference in type of motivation per gender at first priority level was found to be significant ($\chi^2$=4.7522, p=0.03). (Figure 2)

![Type of first priority motivation per gender](image)

Figure 2 First priority motivation per gender in 180 students of College of Medicine\University of Baghdad year 2017

Figure 3 generally shows the same bi-trend seen with overall motivational factors.

![First priority motivational Factors in the total sample](image)

Figure 3 showing the relative impact of motivational factors at 1st priority level in a total sample of 180 students from College of Medicine\University of Baghdad at year 2017

Table 2 shows the descriptive statistics of first priority motivational factors per gender, and the statistical significance of gender-wise differences between them, all of which were not significant except for socio-economic (profitable) motivation which was more with males.
Table 2 Descriptive statistics and significance of gender-wise differences of 1st priority motivational factors in 180 students of CM/UB at year 2017

<table>
<thead>
<tr>
<th>Factors (1st priority)</th>
<th>Females</th>
<th></th>
<th>Males</th>
<th></th>
<th>p-value (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Mean (%)</td>
<td>SD (%)</td>
<td>Frequency</td>
<td>Mean (%)</td>
</tr>
<tr>
<td>Passion in medicine</td>
<td>26</td>
<td>27</td>
<td>4.46</td>
<td>15</td>
<td>18</td>
</tr>
<tr>
<td>High school score</td>
<td>21</td>
<td>21</td>
<td>4.14</td>
<td>24</td>
<td>29</td>
</tr>
<tr>
<td>Helping others</td>
<td>20</td>
<td>20</td>
<td>4.07</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>Family pressure</td>
<td>18</td>
<td>18</td>
<td>3.91</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>Intellectual challenge</td>
<td>5</td>
<td>5</td>
<td>2.22</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td>doctors in family</td>
<td>4</td>
<td>4</td>
<td>2.00</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Profitable</td>
<td>1</td>
<td>1</td>
<td>1.02</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td>Prestige</td>
<td>0</td>
<td>0</td>
<td>0.00</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Others</td>
<td>3</td>
<td>3</td>
<td>1.74</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>98</td>
<td>100</td>
<td></td>
<td>82</td>
<td>100</td>
</tr>
</tbody>
</table>

^a Fisher’s exact test, * Chi-square test

**Dissuasion**

There was no significant difference in the proportion of all students who has controlled motivation from those who were autonomously motivated at first priority level (53% CM; 47% AM). As for overall motivation per factor: High secondary school score ranked even higher than the will to help others (84(47%) versus 73(41%)), while family pressure came third (39%) just slightly lower than helping others. These findings are incompatible with results of most recent studies.6-8. Our results even comes in conflict with results of a recent study done in the same college of ours, where autonomous motivation was found to be the main motivation (61.8%)12. The differences with studies conducted in other countries might signal cultural or social differences. The differences with the local study might be due having higher percentage of females in their study.

Focusing on gender differences is gaining an increasing interest when studying medical vocation, as increasing numbers of women are entering medical schools worldwide.18. In the present study females constituted more than 50%, and this even reached up to 69% in other local studies.12.

As regards gender differences, our study showed that: At first priority: 51(62%) of the entire 82 male sample chose controlled factors while 31(38%) chose autonomous factors (p<0.05). On the other hand: of 98 females, those who chose controlled factors were 45(46%), while 53(54%) chose autonomous factors as first priority with p>0.05. However statistically significant difference in type of first priority motivation per gender was found in our study with females being more autonomously motivated than males and the latter having more controlled motivation. This is consistent with results from earlier studies were males had higher CM and lower AM than females.10. Other studies revealed that male students are more motivated by prestige status and income while female students have a care oriented motive17,19-21, and our study agrees with all of these results. For individual factors, there is agreement with a local study12 regarding factors: interested in helping people, passion in medicine, family pressure, and socio-economic status; while it conflicts with it regarding factors of: prestige, high school score and presence of doctors in the family. This variation in type of motivation between the two studies despite having near sample sizes might be due to the difference in inclusion criteria where our study included students from all grades of CM/UB, while their study only focused on first year students.12. Also their study had higher percentage of females than ours.12. The difference in presence of doctors in the family might be explained by these sampling differences, since it can naturally vary from a year to another, however the difference in prestige and high school score impact has no clear explanation.

**Conclusion**

1 Males have more controlled motivation than females.
Ethical Clearance: Given by Research Committee at Medical Education Unit/College of Medicine-University of Baghdad.

Funding: Self

Competing Interests Statement: Nil

References

Thyroid Dysfunction and Abnormal Uterine Bleeding

Tara Hasan Al-Bajalan1, Srwa Ismael Khalid1

1Department of Obstetrics and Gynecology, Maternity Teaching Hospital, Erbil, Iraq

Abstract

Objective: Measure the prevalence of thyroid dysfunction in women presented with abnormal uterine bleeding in Erbil city.

Method: A case control study conducted in the outpatient Clinic at Maternity Teaching Hospital in Erbil city from 1st of September, 2017 to 30th of June, 2018 on 100 women (50 women with abnormal uterine bleeding and 50 women with a normal cycle selected as control cases. The general and menstrual history in addition to investigations and thyroid function test of both study groups were assessed.

Results: There was a significant association between high thyroid stimulating hormone level and women with abnormal uterine bleeding (p=0.002). Women with abnormal uterine bleeding were significantly associated with low T4 level (p=0.04). A significant association was observed between women with abnormal uterine bleeding and hypothyroidism (p=0.003).

Conclusions: The thyroid dysfunction is common cause of abnormal uterine bleeding among women at reproductive age.

Keywords: Abnormal uterine bleeding, Thyroid dysfunction, Reproductive age women, case control study, maternal health.

Introduction

The abnormal uterine bleeding (AUB) is defined as a symptom that represent the frequent complaint of women attending Gynecology clinics. The AUB is affecting women in pre- and postmenopausal age periods1. Clinically, it presented in many forms like menorrhagia, metrorrhagia, menometrorrhagia, polymenorrhea, polymenorrhagia and oligomenorrhea2. New classification system was developed by International Federation of Gynecology and Obstetrics used to categorize the causes of AUB in reproductive age and based on acronym (polyps, adenomyosis, leiomyoma, malignancy and hyperplasia–coagulopathy, ovulatory disorders, iatrogenic, not classified)3. The causes of AUB might be related to hormonal balance disturbances or it might be clinical presentation for benign or malignant lesions of female genital tract in reproductive age group woman. The dysfunctional uterine bleeding (DUB) is adopted in the absence of abnormal pathological changes3. AUB in most of Iraqi women younger than 60 years age is found to be predominantly dysfunctional in origin. However, it is related to abnormal pathology in others4,5.

The thyroid dysfunctions are common all over the world and the thyroid diseases are 10 times more prevalent among women than men6. In Iraq, non-toxic goiter presents in about one third of women and the toxic goiter in about 25% of women; while the hypothyroidism is detected in about 14.5% of women7. The thyroid dysfunction in women is related to abnormal menstrual cycle8. Thyroid hormones are responsible in initiation of many physiological processes in females like pubertal growth & development, menarche, menstrual cycles, fertility and menopause9.

The mechanism by which the thyroid disorders is associated with AUB may be explained by altering thyroid stimulating hormone (TSH) response, increasing prolactin levels, altering luteinizing hormone (LH) response, affecting peripheral conversion of androgens.
to estrogens, altering sex hormone binding globulin (SHBG) and affecting coagulation pathways in addition to effect on lipid profile\textsuperscript{10}.

The hypothyroidism is a frequent cause of multiple disorders in women at reproductive age ranged from sexual dysfunction, menstrual abnormalities and infertility\textsuperscript{11}. Disturbed cycles and abnormal blood flow are the first menstrual problems for women with hypothyroidism\textsuperscript{6, 11}. The occult menorrhagia is an earlier presentation for women with subclinical hypothyroidism\textsuperscript{12}. The menstrual irregularity was the presenting symptom of 24\% of Iraqi women diagnosed with hypothyroidism\textsuperscript{13}.

For hyperthyroidism, it delays the onset of menses if occurs before puberty\textsuperscript{6}, while in reproductive age group, it is related to oligomenorrhea and amenorrhea\textsuperscript{14}. In Erbil, the women have four times risk in developing hyperthyroidism than men\textsuperscript{15}. Menstrual disturbances in women with thyroid dysfunction are sometimes the first symptoms which help in diagnosis, however, the subclinical thyroid cases (hyper- and hypothyroidism), might be neglected for many years\textsuperscript{6}.

There is evolutionary increase in the number of women attending with AUB to medical clinics in our country\textsuperscript{4}. The rationale of this study which aimed to measure the prevalence of thyroid dysfunction in women that presented with abnormal uterine bleeding in Erbil city.

**Method**

This study is a case control study conducted in the outpatient Clinic at Maternity Teaching Hospital in Erbil city from 1\textsuperscript{st} of September, 2017 to 30\textsuperscript{th} of June, 2018 (10 month). Ethical approval of the study was taken from Ethical Committee of Kurdistan Board of Medical Specialties and administration of the Maternity hospital. Confidentiality was taken in consideration and written consent was taken before enrolling women in the study. We recruited all the women that presented with abnormal uterine bleeding (AUB) to the clinic. The inclusion criteria were women in reproductive age group (18-42 years) with clinical presentation of AUB. The exclusion criteria were pregnancy related bleeding, bleeding disorders, use of intrauterine contraceptive device. A convenient sample of 50 women with AUB was selected after eligibility to inclusion and exclusion criteria. Another sample of 50 women with normal cycle selected as control cases.

The data was collected by researcher through direct interview with the selected women and completed prepared questionnaire. The questionnaire was designed by the supervisor and researcher. It included the socio-demographic characteristics of the participants (age, occupation and marital status), parity history, body mass index, smoking history, contraception history, drugs history (anti-coagulants and anti-thyroid), LMP frequency, menstrual bleeding patterns, post coital bleeding, inter-menstrual bleeding, thyroid stimulating hormone level, triiodothyronine level, thyroxin level.

After taking full history and examination, the eligible women were referred to Laboratory and Radiology department of Erbil Maternity Teaching Hospital to complete the investigations. The thyroid function tests were carried out by the Mini Vidas ELFA (enzyme linked fluorescent assay) method and immunoradiometric assay (IRMA). The normal limit values of TSH, T3 and T4 were 0.4-5 µU/ml, 3.5-6.5 pmol/L and 8.5-15.2 pmol/L, respectively.

All women’s data entered using computerized statistical software; Statistical Package for Social Sciences (SPSS). Descriptive statistics presented as (mean ± standard deviation) and frequencies as percentages. Multiple contingency tables conducted and appropriate statistical tests performed. In all statistical analysis, level of significance (p value) set at ≤ 0.05 and the result presented as tables and/or graphs.

**Result**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years), mean ± SD</td>
<td>32.4±12.9</td>
</tr>
<tr>
<td>&lt;20 years, n (%)</td>
<td>6 (12.0)</td>
</tr>
<tr>
<td>20-29 years, n (%)</td>
<td>15 (30.0)</td>
</tr>
<tr>
<td>30-39 years, n (%)</td>
<td>17 (34.0)</td>
</tr>
<tr>
<td>≥40 years, n (%)</td>
<td>12 (24.0)</td>
</tr>
<tr>
<td>Occupation, n (%)</td>
<td></td>
</tr>
<tr>
<td>Housewife</td>
<td>35 (70.0)</td>
</tr>
<tr>
<td>Student</td>
<td>9 (18.0)</td>
</tr>
<tr>
<td>Employed</td>
<td>6 (12.0)</td>
</tr>
<tr>
<td>Marital status, n (%)</td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>41 (82.0)</td>
</tr>
<tr>
<td>Single</td>
<td>9 (18.0)</td>
</tr>
<tr>
<td>Parity, n (%)</td>
<td></td>
</tr>
<tr>
<td>Nulliparous</td>
<td>7 (17.1)</td>
</tr>
<tr>
<td>Variable</td>
<td>Value</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>1-2 children</td>
<td>13 (31.7)</td>
</tr>
<tr>
<td>3-4 children</td>
<td>13 (31.7)</td>
</tr>
<tr>
<td>&gt;4 children</td>
<td>8 (19.5)</td>
</tr>
<tr>
<td>Smoking, n (%)</td>
<td></td>
</tr>
<tr>
<td>Smoker</td>
<td>4 (8.0)</td>
</tr>
<tr>
<td>Non-smoker</td>
<td>46 (92.0)</td>
</tr>
<tr>
<td>BMI (kg/m²), mean ± SD</td>
<td>27.8 ± 4.6</td>
</tr>
<tr>
<td>Normal, n (%)</td>
<td>16 (32.0)</td>
</tr>
<tr>
<td>Overweight, n (%)</td>
<td>13 (26.0)</td>
</tr>
<tr>
<td>Obese, n (%)</td>
<td>21 (42.0)</td>
</tr>
<tr>
<td>History of contraception, n (%)</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>17 (34.0)</td>
</tr>
<tr>
<td>No</td>
<td>33 (66.0)</td>
</tr>
<tr>
<td>History of anti-thyroid drugs, n (%)</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>2 (4.0)</td>
</tr>
<tr>
<td>No</td>
<td>48 (96.0)</td>
</tr>
</tbody>
</table>

**Table 2: Menstrual disturbances and thyroid function of women with AUB**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LMP frequency, n (%)</td>
<td></td>
</tr>
<tr>
<td>Regular</td>
<td>18 (36.0)</td>
</tr>
<tr>
<td>Irregular</td>
<td>32 (64.0)</td>
</tr>
<tr>
<td>Menstrual cycle problems, n (%)</td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>5 (10.0)</td>
</tr>
<tr>
<td>Menorrhagia</td>
<td>21 (42.0)</td>
</tr>
<tr>
<td>Oligomenorrhea</td>
<td>23 (46.0)</td>
</tr>
<tr>
<td>Polymenorrhea</td>
<td>1 (2.0)</td>
</tr>
<tr>
<td>Post coital bleeding, n (%)</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>2 (4.0)</td>
</tr>
<tr>
<td>No</td>
<td>48 (96.0)</td>
</tr>
<tr>
<td>Inter-menstrual bleeding, n (%)</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>5 (10.0)</td>
</tr>
<tr>
<td>No</td>
<td>45 (90.0)</td>
</tr>
<tr>
<td>History of pap smear, n (%)</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>3 (6.0)</td>
</tr>
<tr>
<td>No</td>
<td>47 (94.0)</td>
</tr>
<tr>
<td>TSH (µU/ml), mean ± SD</td>
<td>2.7 ± 2.2</td>
</tr>
<tr>
<td>Normal, n (%)</td>
<td>35 (70.0)</td>
</tr>
<tr>
<td>Low, n (%)</td>
<td>3 (6.0)</td>
</tr>
<tr>
<td>High, n (%)</td>
<td>12 (24.0)</td>
</tr>
<tr>
<td>T3 (pmol/L), mean ± SD</td>
<td>1.6 ± 0.6</td>
</tr>
<tr>
<td>Normal, n (%)</td>
<td>49 (98.0)</td>
</tr>
<tr>
<td>Low, n (%)</td>
<td>1 (2.0)</td>
</tr>
<tr>
<td>T3 (pmol/L), mean ± SD</td>
<td>85.2 ± 30.2</td>
</tr>
<tr>
<td>Normal, n (%)</td>
<td>45 (90.0)</td>
</tr>
<tr>
<td>Low, n (%)</td>
<td>5 (10.0)</td>
</tr>
</tbody>
</table>

**Table 3: Distribution of women baseline characteristics according to study groups**

<table>
<thead>
<tr>
<th>Variable</th>
<th>AUB</th>
<th>Control</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
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<td>50</td>
<td>-</td>
</tr>
<tr>
<td>Age, n (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;20 years</td>
<td>6 (12.0)</td>
<td>8 (16.0)</td>
<td></td>
</tr>
<tr>
<td>20-29 years</td>
<td>15 (30.0)</td>
<td>13 (26.0)</td>
<td>0.9</td>
</tr>
<tr>
<td>30-39 years</td>
<td>17 (34.0)</td>
<td>16 (32.0)</td>
<td></td>
</tr>
<tr>
<td>≥40 years</td>
<td>12 (24.0)</td>
<td>13 (26.0)</td>
<td></td>
</tr>
<tr>
<td>Occupation, n (%)</td>
<td></td>
<td></td>
<td>0.9</td>
</tr>
<tr>
<td>Housewife</td>
<td>35 (70.0)</td>
<td>33 (66.0)</td>
<td></td>
</tr>
<tr>
<td>Student</td>
<td>9 (18.0)</td>
<td>10 (20.0)</td>
<td></td>
</tr>
<tr>
<td>Employed</td>
<td>6 (12.0)</td>
<td>7 (14.0)</td>
<td></td>
</tr>
<tr>
<td>Marital status, n (%)</td>
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</tr>
<tr>
<td>Married</td>
<td>41 (82.0)</td>
<td>36 (72.0)</td>
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</tr>
<tr>
<td>Single</td>
<td>9 (18.0)</td>
<td>14 (28.0)</td>
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<tr>
<td>Parity, n (%)</td>
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<td>Nulliparous</td>
<td>7 (17.1)</td>
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<tr>
<td>1-2 children</td>
<td>13 (31.7)</td>
<td>5 (55.6)</td>
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<td>3-4 children</td>
<td>13 (31.7)</td>
<td>2 (22.2)</td>
<td></td>
</tr>
<tr>
<td>&gt;4 children</td>
<td>8 (19.5)</td>
<td>2 (22.2)</td>
<td></td>
</tr>
<tr>
<td>BMI, n (%)</td>
<td></td>
<td></td>
<td>0.3</td>
</tr>
<tr>
<td>Normal</td>
<td>16 (32.0)</td>
<td>18 (36.0)</td>
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<tr>
<td>Overweight</td>
<td>13 (26.0)</td>
<td>18 (36.0)</td>
<td></td>
</tr>
<tr>
<td>Obese</td>
<td>21 (42.0)</td>
<td>14 (28.0)</td>
<td></td>
</tr>
<tr>
<td>Smoking, n (%)</td>
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<td>0.1</td>
</tr>
<tr>
<td>Smoker</td>
<td>4 (8.0)</td>
<td>1 (2.0)</td>
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</tr>
<tr>
<td>Non-smoker</td>
<td>46 (92.0)</td>
<td>49 (98.0)</td>
<td></td>
</tr>
<tr>
<td>History of contraception, n (%)</td>
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<td>0.001</td>
</tr>
<tr>
<td>Yes</td>
<td>17 (34.0)</td>
<td>4 (8.0)</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>33 (66.0)</td>
<td>46 (92.0)</td>
<td></td>
</tr>
<tr>
<td>History of anti-thyroid drugs, n (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>2 (4.0)</td>
<td>2 (4.0)</td>
<td>1.0</td>
</tr>
<tr>
<td>No</td>
<td>48 (96.0)</td>
<td>48 (96.0)</td>
<td></td>
</tr>
</tbody>
</table>

**Table 4: Distribution of women menstrual disturbances and thyroid function according to study groups**

<table>
<thead>
<tr>
<th>Variable</th>
<th>AUB</th>
<th>Control</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LMP frequency, n (%)</td>
<td></td>
<td></td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Regular</td>
<td>18 (36.0)</td>
<td>48 (96.0)</td>
<td></td>
</tr>
<tr>
<td>Irregular</td>
<td>32 (64.0)</td>
<td>2 (4.0)</td>
<td></td>
</tr>
</tbody>
</table>
Menstrual cycle problems, n (%) 

<table>
<thead>
<tr>
<th>Problem</th>
<th>Yes (%</th>
<th>No (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>5 (10.0)</td>
<td>49 (98.0)</td>
</tr>
<tr>
<td>Menorrhagia</td>
<td>21 (42.0)</td>
<td>1 (2.0)</td>
</tr>
<tr>
<td>Oligomenorrhea</td>
<td>23 (46.0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Polymenorrhea</td>
<td>1 (2.0)</td>
<td>0 (0)</td>
</tr>
</tbody>
</table>

Post coital bleeding, n (%) 

<table>
<thead>
<tr>
<th>Problem</th>
<th>Yes (%</th>
<th>No (%)</th>
</tr>
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<tbody>
<tr>
<td>Yes</td>
<td>2 (4.0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>No</td>
<td>48 (96.0)</td>
<td>50 (100.0)</td>
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Inter-menstrual bleeding, n (%) 

<table>
<thead>
<tr>
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<th>No (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>5 (10.0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>No</td>
<td>45 (90.0)</td>
<td>50 (100.0)</td>
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History of pap smear, n (%) 

<table>
<thead>
<tr>
<th>Problem</th>
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<th>No (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>3 (6.0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>No</td>
<td>47 (94.0)</td>
<td>50 (100.0)</td>
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TSH, n (%) 

<table>
<thead>
<tr>
<th>Level</th>
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<th>No (%)</th>
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<tbody>
<tr>
<td>Normal</td>
<td>35 (70.0)</td>
<td>48 (96.0)</td>
</tr>
<tr>
<td>Low</td>
<td>3 (6.0)</td>
<td>1 (2.0)</td>
</tr>
<tr>
<td>High</td>
<td>12 (24.0)</td>
<td>1 (2.0)</td>
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T3, n (%) 

<table>
<thead>
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<th>Level</th>
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<th>No (%)</th>
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</thead>
<tbody>
<tr>
<td>Normal</td>
<td>49 (98.0)</td>
<td>48 (96.0)</td>
</tr>
<tr>
<td>Low</td>
<td>1 (2.0)</td>
<td>2 (4.0)</td>
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T4, n (%) 

<table>
<thead>
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<th>No (%)</th>
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</thead>
<tbody>
<tr>
<td>Normal</td>
<td>45 (90.0)</td>
<td>49 (94.0)</td>
</tr>
<tr>
<td>Low</td>
<td>5 (10.0)</td>
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</tr>
<tr>
<td>High</td>
<td>0 (0)</td>
<td>1 (2.0)</td>
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Thyroid function, n (%) 

<table>
<thead>
<tr>
<th>Function</th>
<th>Yes (%</th>
<th>No (%)</th>
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</thead>
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<tr>
<td>Euthyroid</td>
<td>36 (72.0)</td>
<td>48 (96.0)</td>
</tr>
<tr>
<td>Hypothyroidism</td>
<td>11 (22.0)</td>
<td>1 (2.0)</td>
</tr>
<tr>
<td>Hyperthyroidism</td>
<td>3 (6.0)</td>
<td>1 (2.0)</td>
</tr>
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</table>

Discussion

Abnormal uterine bleeding is accompanied by low quality of life attributed to treatment efforts of bleeding and outcomes of high blood loss like fatigability and anemia. The endocrine disturbances play a major role in pathogenesis of abnormal uterine bleeding.

In our study the most common AUB was oligomenorrhea (23%) followed by menorrhagia (21%) followed by inter menstrual bleeding (5%). These findings are consistent with reports of Fraser et al’s study in USA which included the oligomenorrhea and menorrhagia within the definition of abnormal uterine bleeding. Deshmukh et al and Byna et al reported the menorrhagia as the most common type of AUB. The intermenstrual bleeding in our study was significantly associated with AUB women (p=0.02). Similarly, Mohan et al documented that intermenstrual bleeding is a frequent presentation of abnormal uterine bleeding. Our study revealed predominance of contraception history among women with AUB (p=0.001). Previous American study documented that hormonal contraception is the major cause of AUB among women in reproductive age period.

This study revealed a significantly higher level of thyroid stimulating hormone among women with AUB in comparison to controls (p=0.002). This finding coincides with results of Attia et al’s study in Egypt which found a significant difference in TSH between women with AUB and controls. Our study also showed a significant association between low T4 hormone level and women with AUB (p=0.04). This finding is in agreement with results of large cohort study carried out in USA by Kang et al which stated that low T4 hormone level was significantly related to AUB. Abnormal thyroid hormones levels contributed to disturbances in ovulatory hormones and predisposing to irregular bleeding.

Our study showed that hypothyroidism constitutes 22% of women with AUB and hyperthyroidism did present in 6% of them. These findings are higher than results of previous Iraqi study conducted by Al-Hakeim which found that among women with menstrual disturbances, the hypothyroidism present in 16.1% of them and hyperthyroidism was present in 3.4% of them. This difference in thyroid dysfunction between two studies might be due to geographical variation and high prevalence of thyroid disorders in Kurdistan. Our study finding regarding hypothyroidism is also higher than that of Ajmani study in India 5 of 14% among women with menstrual disorders. Current study showed a significant association between women with AUB and hypothyroidism (p=0.003). This finding is similar to results of many previous studies. Whitaker et al documented the hypothyroidism is one of the common diseases that must be assessed among women with abnormal uterine bleeding. The prevalence of hypothyroidism is high in Iraq country and specifically in Kurdistan region. The mechanism by which the hypothyroidism can affect the menstrual cycle is not fully understood. However, some authors attributed this relationship to irregular or no ovulation that decreases the luteinizing hormone and elevating the estrogen leading to menstrual bleeding.

Conclusions

The thyroid dysfunction is common cause of abnormal uterine bleeding among reproductive age...
women. The oligomenorrhea and menorrhagia are the prevalent bleeding types. Thyroid hormones assessment should be taken in consideration in assessment of women with abnormal uterine bleeding.

Conflict of Interest: None

Ethical Clearance: Informed written consent was obtained from all the participants in the study, and the study and all its procedure were done in accordance with the Helsinki Declaration of 1975, as revised in 2000. The study was approved by the Kurdistan Board of Medical Specialties and administration of the Maternity hospital.

Source of Funding: The study supported by authors only.

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Prevalence of Helicobacter Pylori in Children with Type 1 Diabetes Mellitus and its Association with C-peptide and HbA1c

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¹Department of Biology- College of Education-Al-Iraqia University, ²The Specialized Center for Endocrinology & Diabetes

Abstract

Background: Helicobacter Pylori causes gastrointestinal tract infection as well as Extra-gastric disorders with increased infection rates in developing countries. It was recently observed that these bacteria may increase their prevalence in patients with diabetes mellitus type 2.

Aims: Therefore, the present study aimed to find out the prevalence H. pylori in DMT1 in children, and its association with C-peptide and HbA1c.

Patients and Method: A total of (204) samples 91 male (44.6%) and 113 female (55.4%) were collected form type 1 diabetic children with age range (1-15) years from the Specialist Center for Endocrinology and Diabetes, Ibn Al-Baladi Hospital for Children and Women. Ethical consent and case history were obtained from parents according predesigned questionnaire. Chromatographic immunoassay rapid test was used to detect H. pylori infection seropositivity and the immunoassay analyzer cobas e411 was used for HbA1c and C-peptide.

Results: H. pylori seropositivity 61(30%) cases out from total 204 type 1 diabetic case. The C-peptide results showed significant differences between H. pylori positive and negative groups (p=0.023). Significant differences were found among the H. pylori positive, negative type 1 diabetic cases and apparently healthy in both HbA1c and C-peptide (p ≤0.001).in addition, significant positive relationship between the H. pylori infection and C-peptide (Pearson correlation= 0.663 p≤0.001).

Conclusion: This study concluded that there is association between H. pylori infection and C-peptide in type 1 diabetic children.

Keywords: Helicobacter pylori, Type 1 diabetes mellitus, Children, C-peptide and HbA1c.

Introduction

Helicobacter Pylori (H. Pylori) is One of the most remarkable pathogens responsible for infection in the gastrointestinal tract (GIT)¹. Currently, in the world it is the most prevalent chronic infections.¹ ² H. pylori is a Gram-negative, spiral-shaped pathogen that colonizes the epithelium of stomach specifically and causes peptic ulcer, chronic gastritis or other intestinal and extraintestinal illness.¹ Affected population by H. pylori infection reach ~50% globally² ³ and it is recognized as the major acquired factor in the pathogenesis of chronic enteral gastritis, chronic atrophic gastritis, gastric cancer, and peptic ulcer disease.³ ⁴ Extra-gastric disorder such as cardiovascular diseases, metabolic syndrome⁵, hematologic, neurological, allergic, ocular, dermatological, hepatobiliary diseases⁶, Chronic prostatitis⁷, benign prostatic hyperplasia and prostate cancer were linked to H. pylori⁸. Recent reports of H. pylori infection have been linked to diabetes, especially
type 2 diabetes mellitus\(^{(9)}\). Diabetes mellitus Type 1 (DMT1), is the most common in children and teenagers\(^{(10)}\), is developed due to an auto-immune response\(^{(11)}\).

Current study aimed to find out the prevalence *H. pylori* in DMT1 in children, and its association with C-peptide and HbA1c.

**Materials and Method**

A cross-sectional study was conducted to achieve the objectives. The study samples were taken from the Specialist Center for Endocrinology and Diabetes, Ibn Al-Baladi Hospital for Children and Women in the Rusafa district of Baghdad from 31st December 2018 to 15th February 2019. The study included 204 cases 91 male (44.6%) and 113 female (55.4%), under supervision of specialist physician, control group include 15 apparently healthy children. Those for age range between 1–15 years old for both genders. Any patient on antibiotics and / or *H. pylori* therapy were excluded. Ethical consent and information were obtained from parents according to predesigned questionnaire which include (name, age, gender, clinical information, weight, height, BMI, number of months since the diagnosis of DMT1).

Blood and serum samples were taken from each child to perform HbA1c (blood), C-peptide and *H. pylori* rapid test (serum). For *H. pylori* rapid test SPECTRUM (REF: 1180001, Bioscience) was used. The positive results categorized into weak, moderate and strong reactions according to time required for band development (10-15, 3-10 and <3 minutes respectively) On other hand, cobas e411 (REF: 03184897, Roche) was used for C-peptide and HbA1c. All procedure carried out according to manufacture instructions.

The collected data was analyzed by computer using Statistical Package for Social Sciences (SPSS) version 23. P value of < 0.05 indicates significant.

**Results**

Rapid test for *H. pylori* detection gave 61 (30%) positive cases out from 204 tested DMT1 patient’s samples, from the total 61 positive results, 30 (49%) cases gave strong reaction, while only 14 (23%) cases were moderate and the rest 17 (28%) were weak reaction.

Statistical analysis with independent samples T-test for means of HbA1c and C-peptide to find out the differences between *H. pylori* positive (Hp+) and negative (Hp-) DMT1 patients groups showed that there were no significant differences (p=0.340) for HbA1c results. In contrast, the C-peptide results showed significant differences between two groups (p=0.046) with higher levels in *H. pylori* positive type 1 diabetic cases (See table 1).

<table>
<thead>
<tr>
<th>Cases</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error</th>
<th>95% Confidence Interval for Mean Lower Bound</th>
<th>Maximum</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>HbA1c</td>
<td>Hp+</td>
<td>9.7678</td>
<td>2.2142</td>
<td>2.8585</td>
<td>0.340</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hp-</td>
<td>9.3785</td>
<td>2.2419</td>
<td>2.8944</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C-peptide</td>
<td>Hp+</td>
<td>.32340</td>
<td>.704768</td>
<td>.090985</td>
<td>0.046</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hp-</td>
<td>.11855</td>
<td>.203492</td>
<td>.043385</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Furthermore, to find the differences among the *H. pylori* positive, negative and apparently healthy (non-diabetic) groups ANOVA test was used. The results showed that there were very significant differences among means of the three groups in both HbA1c and C-peptide (p ≤0.001) as shown in table 2.
Additionally, investigation of the association between *H. pylori* infection with HbA1c and C-peptide using Pearson correlation had shown that there was very significant negative relationship (Pearson correlation= -0.429 p≤0.001) between *H. pylori* infection and HbA1c. On other hand, there was strong significant positive relationship between the infection and C-peptide (Pearson correlation= 0.663 p≤0.001). eventually, there was very significant negative relationship (Pearson correlation= -0.527 p≤0.001) between HbA1c and C-peptide (See Table 3).

Table 3: Association among *H. pylori* infection, HbA1c and C-peptide

<table>
<thead>
<tr>
<th></th>
<th>HbA1c</th>
<th>C-Peptide</th>
</tr>
</thead>
<tbody>
<tr>
<td>H. pylori infection Pearson Correlation</td>
<td>-0.429</td>
<td>0.663</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>≤0.001</td>
<td>≤0.001</td>
</tr>
<tr>
<td>HbA1c Pearson Correlation</td>
<td>-0.527</td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>≤0.001</td>
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</tr>
<tr>
<td>C-Peptide Pearson Correlation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Discussion

Large number of local and international studies had reported different percentage of *H. pylori* prevalence among different populations. Locally, Abdulla and Muhanad(12) study showed that there was 12.53% of *H. pylori* positive cases in DMT2 patients, As well as in the study of Obaid(13) prevalence rate 40%, and Jumaa and Strak(14) the percentage was 43%. Moreover, infection rate reported by international studies were higher such as the results of Abu Jabal(15) 70%, and Reshma and Kamal(16) 71.4%. All the previously mentioned studies were conducted on DMT2 patients. Although, our result of 30% come in concordance with the local studies which are relatively consider high percentage. Since the infection route of *H. pylori* is fecal-orally(17) and the local habit of chewing the food before give it to the child, such high percentage is reasonable.

Approximately half of the positive cases (49%) show strong reaction this indicates that those patients are either have active or recent infection this result higher than Salloom(18) and Alzahrani (40%)(19) studies of DMT2 patients. The differences in the study design and the type of DM could be the reasons after the results dissimilarity.

The result of the non-significant differences of *H. pylori* positive and negative with HbA1c is in agreement with those of Yu Chen(20) which indicated that there was no association between *H. pylori* seropositivity with HbA1c levels, such results might be rational because the child’s dietary habits implicated in the glycosylated hemoglobin levels(21). On the contrary, The current study result is inconsistent with the results of Robert(21) and Fukuda et al.(22) studies in which they found that the presence of *H. pylori* bacteria was consistently associated with elevated levels of HbA1c.

Our findings of significant differences in C-Peptide means between *H. pylori* positive and negative in DMT1 children can be explain that *H. pylori* had immunomodulatory properties take place via several molecules(23) which can affect the auto-immune response against the β-cell.

This study identifies significant differences between the means of the C-peptide and HbA1c, among *H. pylori* +, *H. pylori* - and non-diabetic groups, which is supported by the above mentioned work(16,18,22) when a comparison is conducted with non-diabetic individuals.

If we can say fortunately, the current study with such design is conducted for the first time but the insufficient data and varied studies characteristics make the comparison, between our findings with other local and international research results, more difficult to carried out. Our finding of the association between *H. pylori* infection and C-peptide come inconsistently with Lu et al., 2010 and Zhou et al., 2012(24,25) studies, although, these studies design and settings could be the cause of the disagreement.

Conclusion

The most important new data in the present study is the documentation of the association of the *H. pylori* with C-peptide. In addition to the high prevalence of infection in type 1 diabetic children.

Conflict of Interest: We are declare that there is no any conflicts of interest, and this study has received no financial aid for any part of the work.

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Congenital Heart Defects in Children and the Main Approaches to Rehabilitation After their Surgical Treatment

Vladimir Yurevich Karpov¹, Svetlana Yuryevna Zavalishina², Angela Valerievna Romanova³, Mikhail Nikonorovich Komarov⁴, Viktor Ivanovich Sharagin⁵

¹Department of Physical Education and Sport, ²Department of Adaptive Physical Culture and Recreation, ³Department of General, Social and Clinical Psychology, ⁴College, ⁵Department of Scientific Foundations of Extreme Psychology, Faculty of Extreme Psychology, Moscow State University of Psychology and Education, St. Sretenka 29, Moscow, Russia

Abstract
Congenital heart defects are one of the leading causes of death among children. Congenital heart defects in children are formed in the process of intrauterine development under the influence of various adverse factors. Treatment of congenital heart defects is always surgical. Physical rehabilitation is obligatory for such children and is always applied after surgical treatment. It ensures the development of the heart muscle and the adaptation of the child to physical exertion. The main types of physical rehabilitation in children with congenital heart defects are physiotherapy exercises with elements of recreational aerobics, therapeutic massage, and physiotherapy. Their appointment is always carried out individually.

Keywords: Heart defects, childhood, rehabilitation, health, blood vessels.

Introduction
Congenital heart defects are a very large and diverse group of diseases of the heart and large vessels, accompanied by changes in blood flow, heart overload and insufficiency¹. The incidence of congenital heart defects is high and, according to various authors, ranges from 0.8 to 1.2% among all newborns². Congenital heart defects make up 10-30% of all congenital anomalies.

Many types of congenital heart defects are found not only in isolation, but also in various combinations with each other, which significantly aggravates the defect³,⁴. In about a third of cases, heart abnormalities are combined with extracardiac congenital defects of the nervous system, musculoskeletal system, urinary system⁵.

The most frequent variants of congenital heart defects occurring in cardiology include ventricular septal defects, atrial septal defects, aortic stenosis, aortic coarctation, open arterial duct, large major arterial vessel transposition, pulmonary artery stenosis⁶.

In the structure of mortality in newborns, congenital heart defects rank first. Without the provision of qualified cardiac surgery, 50-75% of children die within the first year of life⁵,⁶. Early detection and effective correction of congenital heart defects with the subsequent systematic use of rehabilitation measures can significantly improve the prognosis and increase the overall level of health of this cohort of patients⁹,¹⁰. Given the seriousness of the problem of congenital heart defects, the goal is set in the work: to consider the issues of congenital heart defects in children and the main approaches to their rehabilitation.

Anatomical and physiological features of the heart in children
In children at any age, one can observe the specific features of the cardiovascular system in the structure and nature of the activity. First of all, these features are in the age uneven development of the heart and blood vessels¹¹,¹².
The heart of children grows unevenly at different periods of child development. During puberty, at the age of 12 to 15 years, as well as in the first two years of life, an intensive growth of the heart is observed. At primary school age, from 7 to 10 years, there is a significant lag in the heart from an increase in body weight and body size.

The walls of the heart are formed by three shells: the epicardium, myocardium and endocardium. The outer membrane of the heart is called the connective epicardium. The middle shell, which is formed by muscle tissue, is called the myocardium. Cardiac muscle is classified as striated, but, unlike skeletal muscle, its activity does not depend on the will of the person.

In general, fundamental differences and physiological features of the heart in children can be distinguished, unlike adults. The heart mass of a child is 0.8% of the total body mass, while in an adult person the heart mass is 0.5%. The right and left ventricles are equal to each other, while in children the growth of the right ventricle of the heart lags behind the growth of the left ventricle. Also, children have relatively large sizes of atria and great vessels. The blood vessels in children are thin-walled, while the muscle fibers of the heart in children are thinner and denser arranged to each other.

In a newborn child, extraterine blood circulation is established, and small and large circles of blood circulation function. The left atrium is characterized by an increase in blood pressure due to large numbers of it. As a result, the valve of the oval window mechanically closes normally. The closure of the arterial duct occurs under the influence of muscle, nerve and torsion factors.

At the sixth week of a newborn’s life, the arterial duct closes, at 2 months - the venous canal closes, and in half a year - the oval window closes in the interatrial septum.

Etiology and pathogenesis of heart disease: Congenital heart defects are the most common birth defects found in about 6–8 out of 1,000 live births. The level of modern results of surgical interventions for congenital heart defects indicates the possibility of these patients reaching adult and mature age.

The reasons for the development of congenital heart defects are still not fully identified. In most cases, they are due to genetic factors. The cause of some congenital heart defects is due to chromosomal abnormalities and is associated with a combination of genetic factors and adverse environmental conditions.

Pathological effects can affect the closure of the partitions between the atria and the ventricles. As a result, the partitions can close out of time or incompletely, valves are incorrectly formed, as well as the formation of constricted or abnormally diverted vessels.

Very often there is a failure of the left atroventricular (mitral) valve, or mitral insufficiency. This is a pathological condition in which the leaflets of the bicuspid valve do not close the mitral orifice and during ventricular systole, backflow of blood from the left ventricle to the left atrium (the so-called mitral regurgitation) occurs.

The pathogenesis of mitral valve disease is incomplete closure of the valve leaflets. The mechanism of development of congenital heart disease is that it leads to the fact that part of the blood from the left ventricle returns to the left atrium at the time of systole. The left atrium accumulates a large amount of blood, and this leads to the development of its dilatation. An increased amount of blood also enters the left ventricle, which contributes to dilatation and compensatory hypertrophy. The blood additionally stretches the atrium, which leads to an increase in pressure in its cavity and myocardial hypertrophy.

With increasing pressure in the pulmonary circulation, dystrophic changes occur in the myocardium of the right ventricle: its contractile function decreases and congestion occurs in the pulmonary circulation.

Fundamentals of physical rehabilitation for heart defects: Physical rehabilitation of children who have undergone surgery for heart disease is an integral part of medical rehabilitation and is used in all its periods and stages.

Almost always, these patients use medical physical culture to adapt the heart muscle to the new conditions of blood circulation in the conditions of dosed exercise. The stages of physical rehabilitation, modes of physical activity of patients, means and forms of therapeutic physical culture are determined by what the nature of the defect and what is the current state of blood circulation.

Therapeutic physical culture is used in the form of therapeutic gymnastics, morning hygienic gymnastics and metered walks.
As part of therapeutic gymnastics classes, simple coordination exercises are used on all muscle groups with moderate muscle effort, static and dynamic breathing exercises of moderate depth with extended exhalation, dosed walking and walking on stairs: ups and downs. Classes are held two or three times a week and last for 30-40 minutes, of moderate density\textsuperscript{36}.

Recreational aerobics occupies a special place in the rehabilitation of children of primary school age who have been operated on for heart disease. Improving aerobics combines simple exercises with music, dancing, jumping and running. It promotes the development of physical qualities and improves the psycho-emotional state of the child.

Performing simple gymnastic exercises in the optimal pulse mode has a positive effect on the patient’s entire body, contributing to his enrichment with oxygen, improving ventilation of the lungs, increasing the reserve capacity of the heart muscle, enhancing the blood circulation of eternal and peripheral vessels, training new motor functions and skills. Group aerobic exercises also expands the social contacts of the child, strengthens his motivations for recovery, creates a positive emotional background, and contributes to the process of socialization\textsuperscript{37}.

Another type of physical rehabilitation is massage. It is performed in the original supine position with a raised headboard of the couch. Massage the lower limbs, abdomen, arms, chest. Then the patient turns on his right side and his back is massaged. Stroking, rubbing, kneading and vibration are used\textsuperscript{38}.

Physical therapy in children with this diagnosis is used to reduce the oxygen starvation of the organs and tissues of the body, activate the processes of inhibition in the brain, stimulate the immune system, increase the overall tone of the body. As antihypoxic Method uses sodium chloride baths, which improve the functioning of the sympatho-adrenaline system. For the same purpose, oxygen baths are used to promote the supply of organs and tissues suffering from hypoxia with oxygen. Carbon dioxide baths are also used, whose carbon dioxide, acting on the respiratory center, entails a compensatory increase in the diffusion of oxygen in the lungs and an increase in its level in the blood. With a calming purpose, iodine-bromine baths are prescribed to the patient, which contribute to the normalization of the balance of the processes of excitation and inhibition of the cerebral cortex\textsuperscript{39,40}.

**Conclusion**

The features of the heart of children can be considered a relatively large mass of the heart and relatively large wide openings of the heart and the lumens of the vessels. This is a factor facilitating blood circulation in children. Congenital heart defects in children are formed in the process of intrauterine development under the influence of various adverse factors. They can be defects without cyanosis and defects with cyanosis. Physical rehabilitation for heart defects is used after surgical treatment in order to stimulate the heart muscle and adapt the child to normal life. The main types of physical rehabilitation in children with congenital heart defects are physiotherapy exercises with elements of recreational aerobics, therapeutic massage, and physiotherapy. Their appointment is always carried out individually.

**Conflict of Interest:** No Conflict of Interest is declared.

**Sources of Financing:** The study was conducted at the expense of the authors.

**Ethics Committee Resolution:** The study was approved by the local ethics committee of the Russian State Social University on September 15, 2017 (protocol №11).

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Genotoxic and Teratogenic Effects of Mycophenolate Mofetil in Mice

Wajdi Sabeeh Sadeq1, Ruida Watheq Neama1

1Biology department, College of Science, Tikrit University/Iraq

Abstract

Mycophenolate mofetil (MMF) or cellcept is an immunosuppressive drug which used to suppress immune system activity and reduce the risk of organ rejection in transplant patients. The present study investigates the cytotoxic, genotoxic and teratogenic potential of MMF in white mice. Genotoxic effects of this agent were evaluated using micronucleus test, and skeletal malformations were investigated according to dose concentration as treatment was with 16.6 mg. kg⁻¹ and 33.3 mg. kg⁻¹ MMF. A significant difference was observed in MNiPCEs in both treated groups than negative control, and 33.3 mg. kg⁻¹ concentration showed significant differences in MNi than negative control. A significant malformation was found in abnormal bones of cranial, ribs, pelvic girdle and shoulder girdle bones in 16.6 mg. kg⁻¹ cellcept group, while there were no significant differences in bone total number. There was a high difference in bones total number of thoracic and neck vertebrae of 33.3 mg. kg⁻¹ treatment, while a high significant show in abnormal bones of thoracic, neck, tail, sacral and lumbar vertebrae in 16.6 mg. kg⁻¹ group. In conclusion, MMF has cytotoxicity and/or genotoxicity action it possesses a high teratogenic potential, these effects increase with increasing dose.

Keywords: MMF, Teratogenic Effects, cellcept.

Introduction

Mycophenolate mofetil (MMF, Cellcept) an immunosuppressive drug, approved for clinical use in the prevention of acute allograft rejection following organ transplantation and hematopoietic stem cell transplantation [1], and effective in treatment of autoimmune disease [2].

MMF is a noncompetitive, selective and reversible inhibitor of inosine monophosphate dehydrogenase, an important enzyme in the de novo synthesis of guanosine nucleotides in T and B lymphocyte [3], thereby blocking the de novo DNA synthesis pathway in these cells and providing effective immunosuppression in transplant patients [4].

MMF treatment associates with high genotoxic effects in primary and secondary lymphoid tissues via reduction the antioxidant defense mechanism and increase oxidative stress and DNA damage[5].

The use of MMF in transplant patients has increased over time. In U.S., MMF is now used by nearly 80% of kidney transplant patients, and about half of liver transplant patients. Off-label use for autoimmune diseases such as systemic lupus erythematosus (SLE) and dermatology conditions such as psoriasis, may lead to even wider use, [6].

Of the live born reported to the National Transplantation Pregnancy Registry (NTPR), a higher incidence of structural malformations was seen with MMF exposure during pregnancy, compared to the overall kidney transplant recipient offspring. Three of the four defects included microtia (ear deformity) suggesting a pattern of malformations. However live born outcomes without structural malformations have also been noted in the MMF cohort. The structural malformations seen in the MMF exposure group appear to support the package insert recommendations of prospectively discontinuing MMF at least six weeks prior to conception [7].
In October 2007 the Food and Drug Administration and the Drug Manufacturer revised the pregnancy category of MMF to a pregnancy category D drug (positive evidence of fetal risk), acknowledging the increased risk of first trimester pregnancy loss and congenital malformations.[8]

Anderka et al (2009), stated, that the pattern of malformations and minor facial anomalies is sufficiently consistent to support MMF as a likely teratogen. In a fetus or infant who has been exposed to MMF, detection of this pattern malformations (bilateral microtia, orofacial cleft, coloboma, hypertelorism, microglossia, conotruncal CHD, agenesis of the corpus callosum, esophageal atresia, digital hypoplasia) should prompt consideration of the embryopathy.[9]

**Method**

The study was conducted in white mice weighting 20-25 g, 6-8 weeks’ age. Animals were maintained under controlled ambient temperature 25°C, and a 12:12 hrs. light:dark cycle for two weeks prior to commencement the experiment.

The drug: MMF was a film coated tablets of 500 mg, which provided by Roche. It was freshly prepared before dosage via dissolving in adequate volume of sterile distilled water to obtain the desired concentration.

Micronucleus test (MN test): The first group of the animals was given 16.6 mg.kg⁻¹ and the second group 33.3 of MMF (cellcept). Mitomycin C (0.33 mg) was used as a positive control, while negative control was given distal mg.kg⁻¹ water, and 20 males were used 5 animals for each group. Treatment of animals in all groups continues for 5 consecutive days except positive control was single dose. After 18 hrs of the last dose, the animals were sacrificed. The experiment was conducted according to the method described by Schimed, 1975[10].

Teratogenic effects: In this test we used 20 females, the animals were mated with males in ratio 2 females:1 male, and left over night, in the next day females were examined to make sure there is vaginal plugs, which considered as the day 0 of pregnancy. Females were treated with MMF at 9, 10, 11 days of pregnancy, and incised in the 18 day to remove the embryos.

Treatment was as follow:

1. Negative control: 5 animals were treated with distal water,
2. Positive control: 5 animals were treated with 0.33 mg.kg⁻¹ mitomycin C,
3. 5 animals were treated with 16.6 mg.kg⁻¹ cellcept,
4. 5 animals were treated with 33.3mg.kg⁻¹ cellcept.

Fetuses were thoroughly skinned such as skin removal was to permit satisfactory penetration by the stain, the method was applied that described by Erdogan, 1995[11].

**Result and Discussion**

In the current study, no significant differences in polychromatic erythrocytes (PCEs) was found between negative and treatment groups, MNiPCEs and MNi count in MMF treated groups of mice. The Lowest concentration 16.6 mg. kg⁻¹ of MMF, showed no significant differences in micronuclei count in PCEs, while there were significant differences with higher concentration 33.3 mg. kg⁻¹, figure (1).

![Fig. (1): Polychromatic erythrocyte of mice, A. 1 PCE B. MNiPCE. Arrow indicate MN.](image)

MN frequencies consider as a biomarker of DNA damage for genotoxicity testing [12] Moreover, the micronucleus is composed either of small chromatin fragments which arise as a result of chromosome breaks after clastogenic action, or of whole chromosomes that do not migrate during anaphase as a result of aneugenic effects [13]. MN are produced from problem in cell division and their expression can occur after the DNA damage event at different stages of cell cycle[14], therefor increasing in MN frequency means increase the level of DNA damage, with respect our study increase in MNi observed in the bone marrow cells of MMF exposed mice showed that this drug is genotoxic.

Chronic kidney diseases (CKD) patients are characterized by presenting higher genomic damage
than general population, and high genetic damage levels have been correlated with adverse health outcomes. The accumulation of changes at the genome level, due to both endogenous and exogenous factors, genomic instability and deficiencies in base excision repair were identified in CKD patients. This genetic susceptibility, together with potential exposure to genotoxic agents (including immunosuppresses), would explain the tendency to accumulate genetic damage in kidney transplantation (KT) patients over time.\textsuperscript{[15]}

Cilião \textit{et al.}, 2016 concluded increased frequency of micronucleated mononucleated cells in relation to the transplantation time. Mycophenolatemofetil increased the MN frequency in mononucleated cells compared to the control group. The significant increase in MN frequency observed in this group suggest that the transplant patients have higher probability of developing cancer than the general population.\textsuperscript{[16]}

With regard to teratogenic effects two concentrations of MMF were used and with increased the dose we expected increasing in the defects in mice embryos. The 16.6 mg.kg\textsuperscript{-1} MMF dose leads to high morphological phenotypes but did not appear a same effect in 33.3 mg.kg\textsuperscript{-1} dose as expected due to dead most of embryos and be lethal effects.

We found no significant differences in total embryos number, right horn embryo number and left horn embryo number compared with negative control. Many studies described teratogenic effects of MMF in both animals and case reports in human, and this support which we found in this study. Some unpublished studies referred to the possibility of increasing risk of miscarriage in pregnant rabbits and rats.\textsuperscript{[17]} NTPR observed that 14 pregnancies among 32 related to 23 women terminated in spontaneous abortions.\textsuperscript{[18]}

NTPR also was reported about 6 non-renal transplant patients with 7 pregnancies who exposed to MMF. One pregnancy from one kidney/ pancreas transplanted and three from three liver transplanted and three from two heart transplanted. Between these seven pregnancies, four were spontaneous abortions and three were liveborn.\textsuperscript{[7]} Recent studies demonstrated that MMF exposure increase the risk of miscarriages. Results obtained by King \textit{et al.}, 2016 suggested that the miscarriages risk increased 9 times when the mother exposure to MMF during second-trimester of pregnancy compared with those who exposure during first-trimester of pregnancy or who discontinued MMF for 6 or more weeks prior to pregnancy. Discontinued cases for less than 6 weeks prior to pregnancy or discontinued during first-trimester increased the risk of malformation and fetal defects.\textsuperscript{[19]}

Product information observed fetal loss and birth defects at doses 0.5 times the human doses for kidney transplant patients based on body surface area,\textsuperscript{[6]} we note from the morphological phenotype that the malformations concentrated in pelvic girdle, lower limbs and tail, the tail was short and turned and curved limbs, oligodactyly was described as in figure (2)

![Fig. (2) Embryos of mice. A. embryonic skeleton of negative control, B. embryonic skeleton of 1000 mg group, C. embryonic skeleton of 2000 mg group. 1. Missing bones 2. bone atrophy 3. stereospondylous 4. abnormal vertebrae 5. Synaptic ribs 6. Oligodactyly 7. Deforming skull 8. Abnormal bones.](image-url)
It was found a deficiency in total number of neckbones in 33.3 mg.kg\(^{-1}\)group than negative control while there were no significant differences in total number in 16.6 mg.kg\(^{-1}\) and positive groups in related to negative control, but there was a higher significantly in abnormal bones of the neck in 16.6 mg.kg\(^{-1}\) group than negative control and not significant in 33.3 mg.kg\(^{-1}\) group compared with negative control.

There were significant differences in total number of thoracic vertebrae in 33.3 mg.kg\(^{-1}\) group than negative control and there was a high significant differences in the number of abnormal bones in group 16.6 mg.kg\(^{-1}\) than negative control.

Lumber vertebrae and sacral vertebrae showed no significant differences in total number bones in all groups compared with negative control, but showed significant differences in number of abnormal bones in group 16.6 mg.kg\(^{-1}\) than negative control.

Malformation in tail bones appear clarity in embryo there was a higher significant in group 16.6 mg.kg\(^{-1}\) compared with negative control while no significant differences in 33.3 mg.kg\(^{-1}\) group, and no significantly in total number of tail bones relative to negative group. The tail appear curvature prominently and quirky and this agree with results of Jiang et al., 2016 in Zebrafish embryos which show tail defects and quirky in angle compared with negative control.

Geranial bones give arise high significant in total number in group 33.3 mg.kg\(^{-1}\) impaired with negative control, but there was a high significant in abnormal bones in both 16.6 mg.kg\(^{-1}\) and positive group compared with negative control. Sternum bone did not show any differences never in total number or in number of abnormal bones in any group. As ribs did not show significant differences in total number in all groups, but there was a high significant in abnormal bones in 16.6 mg.kg\(^{-1}\) and positive group than negative control.

As there were no significant differences in total number of shoulder girdle this mean there was no loss of bones in all group relative to control group, but when compared number of abnormal bones there was a higher significant in 16.6 mg.kg\(^{-1}\) group compared with negative control, and no significant differences in 33.3 mg.kg\(^{-1}\) group compared with negative control. There were no significant differences in total number of bones of pelvic girdle, but there was high significant in number of abnormal bones in 16.6 mg.kg\(^{-1}\) and positive group than negative control, Table 2.

Many studies determined that the risk of birth defects increases with exposure to MMF in animal’s models. In rat’s malformation were exhibited at doses lower than or equivalent to clinical doses such as agnathia, anophthalmia and hydroencephaly. Malformations observed in both human case reports and animal’s studies which may appear in heart, ocular, diaphragmatic hernia and kidney. Microtia is the most common anomaly in human but animals do not show the same response, and rarely digital hypoplasia.

### Table 1: malformation in tail vertebrae.

<table>
<thead>
<tr>
<th>D.V</th>
<th>T(D) mg.kg(^{-1}).b.w</th>
<th>M.D ± S.D</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Tail vertebrae</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total number</td>
<td>N.C.</td>
</tr>
<tr>
<td></td>
<td>Mitomycin C (0.33)</td>
<td>1.00 ±1.00</td>
</tr>
<tr>
<td></td>
<td>Cellect (16.6)</td>
<td>0.00 ±1.00</td>
</tr>
<tr>
<td></td>
<td>Cellect (33.3)</td>
<td>2.80 ±1.00</td>
</tr>
<tr>
<td></td>
<td><strong>No of abnormal bones</strong></td>
<td>N.C.</td>
</tr>
<tr>
<td></td>
<td>Mitomycin C (0.33)</td>
<td>-0.2 ±0.98</td>
</tr>
<tr>
<td></td>
<td>Cellect (16.6)</td>
<td>-3.20 ±0.98*</td>
</tr>
<tr>
<td></td>
<td>Cellect (33.3)</td>
<td>-1.60 ±0.98</td>
</tr>
</tbody>
</table>

Tukey HSD, * mean difference is significant at 0.05 level, D.V= dependant variables, NC= Negative control, T= Treatment, D= Dosage, M.D= mean difference, S.E= standard error mean.

Geranial bones give arise high significant in total number in group 33.3 mg.kg\(^{-1}\) impaired with negative control, but there was a high significant in abnormal bones in both 16.6 mg.kg\(^{-1}\) and positive group compared with negative control. Sternum bone did not show any differences never in total number or in number of abnormal bones in any group. As ribs did not show significant differences in total number in all groups, but there was a high significant in abnormal bones in 16.6 mg.kg\(^{-1}\) and positive group than negative control.

### Table 2: malformations in pelvic girdle and shoulder girdle.

<table>
<thead>
<tr>
<th>D.V</th>
<th>T(D) mg.kg(^{-1}).b.w</th>
<th>M.D ± S.D</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Pelvic girdle</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total number</td>
<td>N.C.</td>
</tr>
<tr>
<td></td>
<td>Mitomycin C (0.33)</td>
<td>1.00 ±1.00</td>
</tr>
<tr>
<td></td>
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</tr>
<tr>
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<td>2.80 ±1.00</td>
</tr>
<tr>
<td></td>
<td><strong>No of abnormal bones</strong></td>
<td>N.C.</td>
</tr>
<tr>
<td></td>
<td>Mitomycin C (0.33)</td>
<td>-0.60 ±0.65</td>
</tr>
<tr>
<td></td>
<td>Cellect (16.6)</td>
<td>-2.20 ±0.65*</td>
</tr>
<tr>
<td></td>
<td>Cellect (33.3)</td>
<td>-0.60 ±0.65</td>
</tr>
<tr>
<td></td>
<td><strong>Shoulder girdle</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total number</td>
<td>N.C.</td>
</tr>
<tr>
<td></td>
<td>Mitomycin C (0.33)</td>
<td>1.00 ±1.00</td>
</tr>
<tr>
<td></td>
<td>Cellect (16.6)</td>
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<td>2.80 ±1.00</td>
</tr>
<tr>
<td></td>
<td><strong>No of abnormal bones</strong></td>
<td>N.C.</td>
</tr>
<tr>
<td></td>
<td>Mitomycin C (0.33)</td>
<td>0.00 ±0.50</td>
</tr>
<tr>
<td></td>
<td>Cellect (16.6)</td>
<td>-2.00 ±0.50*</td>
</tr>
<tr>
<td></td>
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</tbody>
</table>

Tukey HSD, * mean difference is significant at 0.05 level, D.V= dependant variables, NC= Negative control, T= Treatment, D= Dosage, M.D= mean difference, S.E= standard error mean.

Many studies determined that the risk of birth defects increases with exposure to MMF in animal’s models. In rat’s malformation were exhibited at doses lower than or equivalent to clinical doses such as agnathia, anophthalmia and hydroencephaly, and rarely digital hypoplasia.
In one case report exposure to 0.5 MMF given twice per day for 12 weeks of conception, this liveborn exhibited microtia and hearing loss, [6]. MMF exposure during pregnancy may lead to a phenocopy of Fryns syndrome, which arise by genetic causes and CDH (Congenital diaphragmatic hernia) is the most important anomaly in this syndrome. But the information about mechanism of MMF action refer to MMF may yield to potential genetic syndrome, [17].

In a study made on woman had been take MMF 1g twice/day for eight months with prednisolone and hydroxychloroquine at the same time. MMF taking go on until 12 weeks of pregnancy. Ultrasound examination at 21 weeks revealed micrognathia, ocular hypertelorism, bilateral microtia, external auditory duct atresia and a nasal bifid anomaly, [8].

**Conflict of Interest:** Nile

**Source of Funding:** Self- Funded

The ethical committee of the concerned institute approved the research protocol, the purpose and procedures of the study were to be explained to all the study subjects, and informed consent was to be obtained from them.

**References**


Toxic Effects of Acute Cadmium and Lead Exposure in Rat Blood, Liver, and Kidney

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Abstract

Background: The substances; Cadmium and lead are globally spread substances which are unchangeable and therefore harmful to the environment. They pollute the surroundings and are of considerable concern to individuals’ well-being. In real life situations, we have exposure to combinations of chemical substances as opposed to one form of chemical. It is hence of utmost significance in order to evaluate their toxic level. This experimentation was oriented towards studying the toxic consequences of acute cadmium in the blood and kidneys of rats. The former was also studied after being exposed to lead. In addition; the variations in the plasmatic hormonal profile, roles of the kidney and liver- from routinely being exposed to lead and cadmium, in cows, were also considered. The aforementioned was done by measuring proportions of cadmium in the livers and kidneys of rats. Alterations in the; hormonal, enzymatic and hematological state of rats, was also examined.

Keywords: Acute Cadmium, Lead Exposure, Kidney.

Introduction

The crust of the earth and soil being exposed naturally to: significant amounts of lead, anthropogenically conducted processes (e.g. burning of combustible materials such as coal and mineral oils, extracting metal from its ore by burning/melting, excavating to obtain coal or other minerals from a mine, process of alloy, painting activities in the industrial sector) are significant reasons for lead and cadmium in animals in the surroundings of industries. Moreover, various manufacturing processes have been identified as reasons for the contamination of the hunt of animals. Additionally, increased amounts of blood lead and cadmium were found in livestock whose habitats were located by these manufacturing divisions[1].

After absorption, Cadmium and lead are distributed in the organisms via red blood cells or proteins. A major amount of Cd in erythrocytes can potentially cause high-molecular-weight proteins, while a minor amount is bound to hemoglobin. However, when lead goes into the cell, most of it is bound to hemoglobin rather than the membrane of red blood cells. The hematopoietic system is amongst the most sentient of systems and blood symbolizes both the mode of transport and the critical toxicity goal of Cadmium and lead. Both metals may lead to anemia by various mechanisms. Cadmium and Pb are transported to the liver, in which they can cause damage and disturbed function. Liver damage can be confirmed by histopathological findings and is often accompanied by increased blood enzyme levels and reduced protein synthesis. Toxic effects on kidneys are represented through the structural damage of kidneys and changes in the excretory function[2].

Research into the sub-chronic oral toxicity with varying Cd and Pb doses indicated that the dominantly targeted organs were; the blood, liver, and kidneys. After 15 days of administering the peritoneum (i.p.) of a Cd and Pb combination[3], identified that Cd reacted more amongst the two metallic substances, while[4] suggested a possible antagonistic effect between Cd and Pb. Clearly, the interactions between the two metals in a combined mixture are complex and warrant further investigation.

We decided to investigate the toxicity of a Cd and Pb combination in a model organism after a single exposure. An investigation was conducted into the consequences of being exposed to single metallic substances and their combinations on hematologic and biochemical frameworks. The status of redox in the plasmatic substances, liver, and kidneys of rats (that were given treatment) was also studied. Furthermore, the
distribution of metals and bio-elements was investigated in selected tissues, as well as their histopathology.

Materials and Procedure

Chemical substances: Each substance utilized in the chemical analysis and the relevant chemical substances were of analytical grade quality (i.e. extremely pure). Cadmium chloride (CdCl2xH2O, Merck, Germany) and lead acetate (Pb(CH3COO)2x3H2O, Centrohem, Serbia) were used for oral administration solutions. Solutions which contained a precise a precise concentration of the following elements; Cd, Pb, copper (Cu), and zinc (Zn) (Merck, Germany) were used to create calibration curves for toxic metals and bioelements analysis, while cHNO3 (65%, Merck, Germany) and H2O2 (30%, Sigma-Aldrich, Germany) were used for tissue mineralization. All chemical and reagents for the examination of antioxidant status were purchased from Sigma-Aldrich Chemie (Germany).

Animals: Laboratory rats (masculine Wistar rats) were bought from the Military Medical Academy (Belgrade, Serbia). These rats weighed roughly 250 grams. They were kept in conditions with standard control (degree of heat intensity 25 ± 3 degree centigrade, comparative humidity of 35 percent to 60 percent, twelve-hour circadian rhythm). Laboratory rats (masculine Wistar rats) were bought from the Military Medical Academy (Belgrade, Serbia). These rats weighed roughly 250 grams. They were kept in conditions with standard control the Ethical Committee on Animal Experimentation of the University of Belgrade, Faculty of Pharmacy.

Study Design and Experimental Procedure

After 2 weeks of being acclimatized, a process of random division of the rats into three different categories. This included a control group and two experimental groups.

1-Control group: was only given access to water.

2-Cadmium treated groups: 25 rats were given one treatment of an aqueous solution of CdCl2 and/or Pb(CH3COOH)2 in dosages: 15 milligrams of cadmium per kilogram of body weight (b.w.) (Cd15 group),

3-Lead treated groups:

25 rats: received 150 mg Pb/kg b.w. (Pb150 group).

The selection of experimental doses was based on our previous research, as well as literature data (Buha et al., 2012). Every rat was given a treatment with a volume of 1 mL/kg b.w. that was administered by force. They were sacrificed twenty-four hours following being treated. This was conducted under light anesthesia.

Sampling: An aggregate of fifty specimens of; livers, kidneys and thigh muscles (twenty of everyone) were accumulated at random from the carcass of each rat. These were investigated in clinical observation.

Blood specimens (twenty from every farm) were obtained from the jugular vein. Blood (prevented from coagulation using disodium-EDTA (2.5 milliliters) was utilized for complete blood count (CBC). Seven point five (7.5) milliliters was shifted to a serum separator tube for later blood metabolite examination. Additionally, ten milliliters of blood were stocked in tubes (to which heparin was added to prevent coagulation)in order to identify metallic substances’ concentration. Every tube was kept instantly over frozen water and shifted to the lab. Blood (prevented from coagulation) was examined soon. This was following the accumulation for quantification of hematocrit (PCV), total leukocyte count (WBC), and hemoglobin (Hb) by microhematocrit, cyanmethemoglobin, and routine hand-operated procedures, in the afore-mentioned order (4). Contrasting leukocyte calculations were carried out on frequently assembled Giemstained blood films utilizing the cross-sectional method (5). A polarogram was obtained following a scan of the potential from −980 to +30 megavolts. An observation of the highest point was made at −560 and −380 megavolts for cadmium, and lead. Systematic correctness was identified with the usage of CRM of the Community Bureau of Reference standard for trace constituents in bovine blood. 2 blanks with no blood and two specimens for referencing purposes were in each batch of fifteen blood specimens. The acceptance of analysis was on the condition that the range of recoveries was in-between 90 % and 110 % of the certified values.

Results

Results in Table (1) show that the cadmium levels vary quite notably (P < 0.01) this was followed by liver (0.172 ppm/wet.wt) and the least level observed in the muscle (0.007 ppm/wet.wt).
Table (1): Content of cadmium (ppm/wet wt.) in different tissues of rats.

<table>
<thead>
<tr>
<th>Organ</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean±S.E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liver</td>
<td>0.123</td>
<td>0.251</td>
<td>0.172±0.011B</td>
</tr>
<tr>
<td>Kidney</td>
<td>0.121</td>
<td>0.349</td>
<td>0.227±0.013A</td>
</tr>
<tr>
<td>Muscle</td>
<td>0.003</td>
<td>0.010</td>
<td>0.007±0.001C</td>
</tr>
</tbody>
</table>

Means in one column of varying litters are notably contrastive at 9P < 0.01).

Results in Table (2) show that the lead levels vary notably (P < 0.01) amongst the various organs studied. The greater lead level found in the kidney (0.610 ppm/wet wt.), followed by liver (0.604 ppm/wet wt.) and the least level observed in the muscle (0.299 ppm/wet wt).

Table (2): Content of lead (ppm/wet wt.) in different tissues of sheep and cattle slaughtered at Damanhour City Abattoir, Egypt

<table>
<thead>
<tr>
<th>Organ</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean±S.E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liver</td>
<td>0.200</td>
<td>1.067</td>
<td>0.604±0.08B</td>
</tr>
<tr>
<td>Kidney</td>
<td>0.282</td>
<td>1.031</td>
<td>0.610±0.06A</td>
</tr>
<tr>
<td>Muscle</td>
<td>0.111</td>
<td>0.687</td>
<td>0.299±0.06C</td>
</tr>
</tbody>
</table>

Means in one column of varying litters are notably contrastive at 9P < 0.01).

The contaminated flesh and inner body parts of slaughtered livestock, with cadmium and lead, are a significant source of meat in Egypt. Henceforth, the amount of slaughter of cattle is significantly greater than that of other creatures. Following slaughter, they are generally moved from the slaughterhouses in open trucks. This poses a great risk to the meat. It can become contaminated because of the harmful gases let out from vehicles (that have a high content of lead and cadmium).

The table 4 indicates that the average for the cadmium EDI in samples of cattle had range from .007 to .767 μg/kg/day. The HR for average cadmium content in tissues that went under examination was ranged from the value of 0.007 to 0.767, but, there were over age kidney specimens that had the greatest concentrations of Cd with HR value of 2.151, as opposed to the EDI of lead that ranged from the value of 0.205 to 0.745 (as shown in Table 4). The HR value for mean lead concentrations was ranged from .051 to .186 (as shown in Table 4). The greatest value of HI for the ingestion of cattle meats contaminated with Cd &Pb was 2.465 in over age specimens of kidney, followed by 1.165 in aged livers (Table 4). The values of HR taken note of in this study were lesser than Min et al. (2012), whose findings shows a threat ratio for lead as 1.24 and for Cadmium as 1.27 and recommended that high blood levels of Pb and Cd in the body of human beings has the potential to link with vestibular dysfunction in a general sample of adult U.S citizen. Strangely, smaller values were showed by the findings of(6), who noted .58 and .28 as HI for adults and children.

The present study identified that the approximate high and mean level exposures to Cd of each specimen that went under examination (equal to 1 μg/kg bw/day) were in between or insignificantly greater in comparison to the TWI stated by WHO. In 2009, EFSA issued its scientific view on Cd in food and set up a reassessed TWI for Cd of 2.5 μg/kg bw (equal to .36 μg/kg bw per day). The average dietary contact across European republics was assessed to be 2.3 μg/kg bw per 7 days, with great levels if exposure approximated to be 3 μg/kg bw per 7 days. In spite of the fact that unfavorable consequences on kidney function are not likely to happen at exposures two times larger than the TWI, the EFSA has come to a conclusion that exposure to cadmium at the population level must be lessened. On considering the latest values of TWI for Cd, it is evidently identifiable that the intake of offal has the potential to put forth a public health hazard.

High and mean level everyday consumption of lead for both sheep and cattle specimens did not exceed tolerable levels set up by WHO on everyday consumption (3.6 μg/kg bw per 24 hours). The HI and HR for average levels of Cadmium and lead were <1; on the other hand, the intake of great quantities of both poisonous metallic substances has the potential to be a public health hazard.
Table (3): Hormonal and enzymatic levels among control and industrial areas

<table>
<thead>
<tr>
<th></th>
<th>Control</th>
<th>Cadmium treated group</th>
<th>Lead treated group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thyroxine (T4) nmol/L</td>
<td>35.45 ± 3.44B</td>
<td>37.13 ± 1.12 A</td>
<td>41.12 ± 2.90 A</td>
</tr>
<tr>
<td>Tri-iodothyronine (T3) nmol/L</td>
<td>1.89 B ± 0.22 B</td>
<td>2.15 ± 0.28 A</td>
<td>2.44 ± 0.026 A</td>
</tr>
<tr>
<td>Cortisol nmol/L</td>
<td>1.99 ± 0.70 B</td>
<td>2.15 ± 1.19 A</td>
<td>4.03 ± 1.96 A</td>
</tr>
<tr>
<td>Estradiol pg/ml</td>
<td>22.8 ± 3.9 B</td>
<td>35.15 ± 3.15 A</td>
<td>47.2 ± 5.16 A</td>
</tr>
<tr>
<td>Progesterone ng/ml</td>
<td>3.49 ± 0.84 B</td>
<td>5.17±0.16 A</td>
<td>6.49±0.46 A</td>
</tr>
<tr>
<td>ALT (IU/l)</td>
<td>36.89 ± 11.03 B</td>
<td>37.38 ± 2.17 A</td>
<td>43.06 ± 9.39 A</td>
</tr>
<tr>
<td>AST (IU/l)</td>
<td>70.50 ± 22.32 B</td>
<td>80.19 ± 12.13 A</td>
<td>84.69 ± 22.08 A</td>
</tr>
<tr>
<td>ALP (IU/l)</td>
<td>145.0 ± 16.9 B</td>
<td>160.18 ± 10.18 A</td>
<td>188.9 ± 15.14 A</td>
</tr>
</tbody>
</table>

Means in one row of various litters are notably contrasting at (P < 0.01)

The results of this study is attributable to the heightening levels of cadmium and lead in the body of cattle causes severe stress conditions on the animals that causes a harmful effect on the liver, kidney, thyroid gland, ovary and tests functions that will in-crease the level of stress hormones, serum enzymes, thyroxine, tri-iodothyronine and cortisol level.

The latter is especially dependent on the status of liver function (6). Lead has been involved in the induction of hepatic dysfunction in research that used laboratory experiments(7) agreed to the result of this study in observing greater quantities of serum AST and ALT concentration in dairy cows exposed in the environment to lead and cadmium around various manufacturing locations. The current findings of a notably greater quantity of serum ALT and AST activities suggest with clarity the hepatic dysfunction in cows around Pb–Zn smelter with greater levels of Pb blood.

Table (4): Blood hematological parameters in dairy cows in control and industrial areas

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Control group (n = 25)</th>
<th>Cadmium treated group</th>
<th>Industrial area (n = 25)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HCT (PCV) (%)</td>
<td>27.54 ± 2.87</td>
<td>20.25 ± 1.22</td>
<td>25.38 ± 2.23</td>
</tr>
<tr>
<td>RBC (10^6/µL)</td>
<td>5.38 ± 0.52</td>
<td>6.17 ± 0.60</td>
<td>6.79 ± 0.69</td>
</tr>
<tr>
<td>Hb (g/dl)</td>
<td>9.48 ± 1.00</td>
<td>8.67 ± 1.02</td>
<td>9.67 ± 1.04</td>
</tr>
<tr>
<td>MCV (fl)</td>
<td>45.70 ± 3.83</td>
<td>46.19 ± 4.21</td>
<td>48.97 ± 4.29</td>
</tr>
<tr>
<td>MCH (pg)</td>
<td>16.36 ± 0.86</td>
<td>16.20 ± 0.91</td>
<td>17.40 ± 0.93</td>
</tr>
<tr>
<td>MCHC (%)</td>
<td>36.07 ± 2.40</td>
<td>32.45 ± 1.71</td>
<td>33.44 ± 1.77</td>
</tr>
<tr>
<td>WBC (10^3/µL)</td>
<td>8.12 ± 2.77</td>
<td>9.60 ± 2.21</td>
<td>9.65 ± 2.26</td>
</tr>
<tr>
<td>Neut (%)</td>
<td>51.94 ± 2.80</td>
<td>53.81 ± 3.31</td>
<td>54.86 ± 3.38</td>
</tr>
<tr>
<td>Lymph (%)</td>
<td>44.11 ± 7.07</td>
<td>40.51 ± 5.91</td>
<td>42.57 ± 5.99</td>
</tr>
<tr>
<td>Mono (%)</td>
<td>7.46 ± 3.43</td>
<td>7.81 ± 1.81</td>
<td>7.87 ± 1.83</td>
</tr>
<tr>
<td>Eo (%)</td>
<td>1.80 ± 0.83</td>
<td>2.76 ± 1.21</td>
<td>3.77 ± 1.29</td>
</tr>
</tbody>
</table>

It indicates within the similar row of several litters are expressively different at (P < 0.01).

The reduction in the content of Hb in cows around the closed lead zinc smelter is attributable to the secondary shortage of copper, which can have a negative impact on iron metabolism. These outcomes have been facilitated by inferior levels of conc. of copper in cows who have exposure to atmospheric lead pollution as shown in Table 1. The same results are indicated for dairy cows following lead exposure and for goats (7) following Mo poisoning(8).

A reduction much alike in the value of PCV has been identified by (9) in lead exposed dairy cows and (10) identified in goats after great levels of administration of molybdenum. Furthermore(11) also identified reduced
levels of hematocrit in house mice that were exposed to atmospheric contamination from a coal-fired power plant. The past research on rats and also detected reduced values of hematocrit after the exposure to lead or cadmium.

Conclusion

Our study concluded that, cattle bred and managed near the industrial areas in Egypt can expose to the cadmium and lead toxicity through pollution of its food and water that results in alterations in the quantities of Cd and Pb in the muscle, liver and kidney in addition to variations in the profile of plasma hormones and function of liverin cows with natural exposure to Pb and Cd around various manufacturing locations.

Conflict of Interest: Nil

Source of Funding: Self

Ethical Clearance: Not required

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Celiac and Thyroid Diseases in Some of Iraqi Patients with Juvenile Rheumatoid Arthritis

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²Medical City / Ghazi Alhariry Hospital/ Ministry of Health

Abstract

The present study was accomplished on 76 patients with different autoimmune diseases, all patients were with juvenile rheumatoid arthritis (JRA). Thyroid function (TF), thyroglobuline antibodies (TGA) and antitissuetransglutaminase antibodies (AGA) were estimated by enzyme linked immunosorbant assay (ELISA). Twenty nine patients (38.2%) were with hypothyroidism, 16 (21.1%) were with autoimmune thyroiditis and 31 (40.7%) were with celiac disease. It could be concluded that the above immunological and biochemical markers are of importance for early diagnosis to some autoimmune diseases.

Keywords: Juvenile rheumatoid arthritis, autoimmune thyroiditis, thyroid disease and celiac disease.

Introduction

One of the most common chronic rheumatic diseases worldwide is the JRA which is enclosed to several disorders before sixteen years old, it is accompanied by a heterogeneous group of conditions characterized by inflammation of the connective tissues (example; joints) and it is also defined as the fifth most common chronic disorder in the children who come who arthritis without known cause for the first six weeks and persist for 6 months. In France one in five thousands children are affected with the most frequent clinical forms, is oligoarthitis JRA, which is characterized by four joints involvement in the first six months especially in female. JRA have bad prognosis if it comes with uritis associated with dangerous advances. In some cases like Still’s disease which is systemic JRA and polyarticular disease, inflammation could continue till adulthood. A poor functional prognosis is associated with the involvement of severe hip and severe polyarticular forms. Celiac disease and autoimmune thyroiditis in adolescence have been described. Few information at hand for large of JRA in the present study thyroid function, antithyroid antibodies and celiac disease screen were evaluated children with JRA.

Patients and Method: Seventy six of patients and 12 control healthy individuals, all patients included in this study fulfilling diagnosis criteria for JRA. Fifty five (72.4 %) females and 21(27.6 %) males, ages ranges (4-17) yrs. All patients were admitted to Alfanar clinical Lab since 2015. All patients have family history of autoimmune thyroiditis, RA, psoriasis, type 1 diabetes and celiac disease, 12 control healthy individuals were included in this study 6 girls and 6 boys (4-17) yrs. mean age was 8.

Sample collection: “Three milliliters of blood were withdrawn from patients and control by vein puncture. Sera were separated by centrifuge at 3000 rpm for 15 minutes. Samples were kept in the freezer at -4°C until ELISA assay performance.” Sera of patients were tested for AGA-IgA, thyroid function and antithyroglobulin antibody by ELISA. Thyroid function was accomplished by (ELISA kit-Biocheck), while AGA-IgA and TGA were accomplished by (BioHit,ELISA).

Results and Discussion

Diagnosis of celiac disease was confirmed by jejuna biopsy. Table below showed in hypothyroidism 4 patients with autoimmune thyroiditis, 13 with celiac and 3 with autoimmune thyroiditis and celiac together;
in patients with autoimmune thyroiditis 4 patients were with hypothyroidism and 7 with celiac disease while in patients with celiac disease 15 patients were with autoimmune thyroiditis and 13 with hypothyroidism.

**Table (1): Number and percent of patients in relation to diseases.**

<table>
<thead>
<tr>
<th>Disease</th>
<th>Female</th>
<th>Male</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>JRA</td>
<td>55(72.4%)</td>
<td>21(27.6%)</td>
<td>76(100%)</td>
</tr>
<tr>
<td>Hypothyroidism TSH ≥ 6 U/L</td>
<td>19(65%)</td>
<td>10(35%)</td>
<td>29(100%)</td>
</tr>
<tr>
<td>Autoimmunity TGA +ve</td>
<td>11(68.75%)</td>
<td>5(31.25%)</td>
<td>16(100%)</td>
</tr>
<tr>
<td>Celiac disease AGA +ve</td>
<td>25(80.65%)</td>
<td>6(19.35%)</td>
<td>31(100%)</td>
</tr>
</tbody>
</table>

Only 17 (22.4%) patients came without other diseases hypothyroidism, autoimmune thyroiditis and celiac disease. Although the mystery of coincidence of abnormal thyroid function in CD, these diseases shared the same HLA haplotype and the same cytotoxic t lymphocyte associated Ag-4 gene. Ch’ng stated in his review percents of prevalence of celiac disease in autoimmune thyroiditis 2%-7.8%. In comparison to control the prevalence of hypothyroidism, autoimmune thyroiditis and celiac disease was elevated in JRA patients p value < 0.001. Some researchers demonstrated a similar p value and far from others to that of Cassidy the percentage was 14%. The present data recommends regularly checking of thyroid tests, thyroid Abs, and Abs of celiac disease in children with JRA. Stagi and his colleagues stated 6.6% of JRA patients had celiac disease, the results of the present work goes with that of Stagi. There is a genetic correlation between JRA and other autoimmune disorders Susan, et al. suggests a susceptible loci share with other diseases. There are a multi different determinants have a role in initiation of RA in adults and in children such as social, genetic, economic, and environmental. The above results go with the fact that thyroid function in JRA may be defected in any case if patient comes with or without ano+ther autoimmune association and while others were in comparison with this opinion. Many other studies stated controversial opinions about the association between celiac disease and RA. The present study showed significant differences between patients and control regarding celiac disease this result goes with that of a p value ≤0.07, while another researcher showed a different results. The present work showed a considerable percentage of RA (25%), psoriasis (50%) and autoimmune thyroiditis, among the relatives of patients included in this study of 1st and 2nd family history, previous works describe family history some of them in agreement with ours while the others were disagree. It could be concluded a higher prevalence of familial autoimmunity among patients with JRA, this may be due to a close genetic relation between celiac disease, autoimmune thyroiditis and JRA. This work serves as an early diagnosis to autoimmune diseases comes with JRA in order to decrease the risk of these diseases.

**Conflict of Interest:** I don’t have a little Conflict of Interest here with any

**Source of Funding:** Self

**Ethical Clearance:** I declare that my research is not previously published or accepted for publication.

**References**


Sequence Analysis of Telomerase RNA Component (TERC) in Iraqi Patients with Breast Cancer Using Bioinformatics Method

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Abstract

Objective: Analyze sequence of telomerase RNA component (TERC) in Iraqi patient’s with breast cancer

Method: 17 Iraqi patients with breast cancer included in the current study, their age ranged (17-60 years). The DNA was extracted and TERC gene was amplified by polymerase chain reaction (PCR) using one primer then gel electrophoresis was used to detect the gene, then BLAST software used to analyze the sequence of TERC gene as compared with the reference sequence of this gene in the GenBank.

Results: Eighty mutations found in the sequence of TERC gene. An insertion mutation between the sites 135 and 136 appeared in all patients as compared with the sequence of TERC gene in the GenBank at NCBI database. This mutation was found to be related with breast cancer.

Conclusions: The insertion mutation between the sites 135 and 136 associated with breast cancer

Keywords: Bioinformatics Method, breast cancer, mutation, telomerase RNA component gene.

Introduction

Bioinformatics is an interdisciplinary approach between biological and computer sciences1. Human telomerase RNA component (hTERC) encoded by the hTERC gene mapping on the chromosomal region (3q26), it is a component of the telomerase2. Telomerase is a ribonucleoprotein, this enzyme adds a repeat sequence to the 3' end of telomeres. A telomere is a region of sequences found at each end of chromosomes, it keep the end of the chromosome from DNA fusion or from damage with neighboring chromosomes3. Telomerase consists of two important elements, a telomerase RNA component (TERC) that contains the template for telomere DNA addition and a catalytic reverse transcriptase (TERT). The studies suggests an essential role for the regulation of TERC in maintenance of telomere and perhaps other functions in human cancer4.

Cancer consider one of the important health problems of the present era as well as the one of the important cause of death among population. Cancer defined as a malignant neoplasm, it includes a set of diseases that involve abnormal growth of the cell with the possibility to invasion or spread to other parts of the body5. Breast cancer is the most common type of cancer among female worldwide and its occurrence has raised in recent years, it with an evaluated (1.67 million) new cases, additionally 521,900 deaths represented for (25%) of all cases of cancer and (15%) of all deaths by cancer women in 20126. The pathogenesis of breast cancer is not yet completely clear, in general researchers believe that a diversity of genetic factors and environmental factors together lead to the incidence of breast cancer7. The aim of the present study is to analyze sequence of TERC gene for patients with breast cancer by bioinformatics Method.

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Method

The study included 17 female Iraqi patients with breast cancer, aged ranged (17-60 years), the patients selected from “Al-Amal National Hospital for Cancer Treatment” in Baghdad/Iraq during November 2018. The samples of blood were collected from patients and stored at (−20°C) to be later analysis8, 9.

The DNA was extracted from blood samples using Quick-gDNA™ Blood Mini Prep DNA extraction kit (Cat.No.: D3072 & D3073) Zymo/USA according to the manufacturer’s protocol, and agarose gel electrophoresis used to confirm the presence of extracted DNA.

The TERC gene sequences were taken from the (GenBank) database at “national center for biotechnology information” NCBI, where the NCBI reference sequence: NR_001566.1. The primer was designed for one exon of TERC gene using primer 3 plus10, and provided by Integrated DNA Technologies company, Canada. The name and sequence of forward and reverse primers are shown in Table (1).

Table (1): Name and sequence of the primer used for TERC gene amplification.

<table>
<thead>
<tr>
<th>Name of primer</th>
<th>Sequence of Forward F and Reverse R primers</th>
<th>Product size</th>
</tr>
</thead>
</table>
| TERC primer    | Forward (F) 5’- TAA CCC TAA CTG AGA AGG GCG T - 3’  
Reverse (R) 5’- GCA TGT GTG AGC CGA GTC C - 3’ | 420 bp |

The TERC primer used for amplify TERC gene by PCR using PCR Pre Mix Kit, Intron company/Korea according to the manufacturers instruction. Where the mixture of PCR solution are shown in Table (2).

Table (2): The components of PCR solution for amplification of TERC gene

<table>
<thead>
<tr>
<th>Components</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taq PCR Pre Mix</td>
<td>5µl</td>
</tr>
<tr>
<td>Forward primer</td>
<td>10 picomols/µl (1µl)</td>
</tr>
<tr>
<td>Reverse primer</td>
<td>10 picomols/µl (1µl)</td>
</tr>
<tr>
<td>DNA</td>
<td>1.5µl</td>
</tr>
<tr>
<td>Distill water</td>
<td>16.5 µl</td>
</tr>
<tr>
<td>Final volume</td>
<td>25µl</td>
</tr>
</tbody>
</table>

The conditions of PCR reaction to amplify TERC gene are shown in Table (3)

Table (3): The optimum conditions of detection TERC gene

<table>
<thead>
<tr>
<th>No.</th>
<th>Steps</th>
<th>Temperature in (°C)</th>
<th>Time</th>
<th>No. of cycles</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Initial Denaturation</td>
<td>95 °C</td>
<td>3 min.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Denaturation -2</td>
<td>95 °C</td>
<td>45 sec.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Annealing</td>
<td>66 °C</td>
<td>30 sec.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Extension-1</td>
<td>72 °C</td>
<td>45 sec.</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Extension -2</td>
<td>72 °C</td>
<td>7 min.</td>
<td>40 cycle</td>
</tr>
</tbody>
</table>

The gel electrophoresis was performed using 2% agarose gel, and the gel was visualized using UV-light after staining with red safe and the amplicons were checked and photographed. The amplicons were estimated by (100) bp DNA ladder Kapa/USA.

Amplified PCR products of TERC gene for 17 patients with breast cancer were sent to Macrogen Company/Korea for sequencing the one exon of TERC gene and compared with the reference sequence of TERC gene in the GenBank by “Basic Local Alignment Search Tool” (BLAST) software11 to detect variations in the sequence of gene.

Result

Detection of TERC Gene by PCR Technique:
The results were showed using the primer (TERC primer F and TERC primer R) to amplify of TERC gene in patients with breast cancer by PCR technique showed the amplicons had size (420 bp) and it gave a clear bands using gel electrophoresis on 2% of agarose gel for 90 min at 75 volt as shown in Figure (1 and 2).

Figure (1): Products of PCR electrophoresed on 2% agarose gel, showing a clear bands had size 420 bp for one exon of TERC gene. Lane M: 100 bp DNA Ladder. Lane (1-15): Bands for breast cancer patients.
Figure (2): Products of PCR electrophoresed on 2% agarose gel, showing a clear bands had size 420 bp for one exon of TERC gene. Lane M: 100 bp DNA Ladder. Lane (16, 17): Bands for breast cancer patients.

Sequence Alignment of TERC Gene: The results of TERC gene sequences for 17 patients with breast cancer were received from Macrogen Company/Korea, then analyzed using BLAST software, where the results showed 80 mutations in the sequence of gene for all patients as compared to the sequence of gene in the GenBank.

In the first patient, four mutations appeared which were: In the site 101 thymine (T) was substituted with adenine (A). Also between the sites 135 and 136 adenine (A) was inserted in the sequence. In the site 442 thymine (T) was substituted with cytosine (C). Also between the sites 443 and 444 cytosine (C) was inserted in the sequence.

In the second patient, eight mutations appeared which were: In the site 101 thymine (T) was substituted with adenine (A). Also between the sites 115 and 116 adenine (A) was inserted in the sequence. Also between the sites 132 and 133 adenine (A) was inserted in the sequence. Also between the sites 135 and 136 adenine (A) was inserted in the sequence. Also between the sites 434 and 435 guanine (G) was inserted in the sequence.

In the third patient, five mutations appeared which were: In the site 101 thymine (T) was substituted with adenine (A). Also between the sites 115 and 116 adenine (A) was inserted in the sequence. Also between the sites 132 and 133 adenine (A) was inserted in the sequence. Also between the sites 135 and 136 adenine (A) was inserted in the sequence. Also between the sites 434 and 435 guanine (G) was inserted in the sequence.

In the fourth patient, six mutations appeared which were: In the site 88 cytosine (C) was substituted with thymine (T). In the site 90 cytosine (C) was substituted with thymine (T). Also between the sites 115 and 116 adenine (A) was inserted in the sequence. Also between the sites 135 and 136 adenine (A) was inserted in the sequence. In the site 441 cytosine (C) was substituted with adenine (A). In the site 442 thymine (T) was deleted from the sequence.

In the fifth patient, three mutations appeared which were: In the site 101 thymine (T) was substituted with adenine (A). Also between the sites 132 and 133 adenine (A) was inserted in the sequence. Also between the sites 135 and 136 adenine (A) was inserted in the sequence.

In the sixth patient, six mutations appeared which were: Between the sites 115 and 116 adenine (A) was inserted in the sequence. Between the sites 132 and 133 adenine (A) was inserted in the sequence. Between the sites 135 and 136 adenine (A) was inserted in the sequence. In the site 442 thymine (T) was deleted from the sequence. In the site 444 adenine (A) was substituted with guanine (G). Between the sites 446 and 447 adenine (A) was inserted in the sequence.

In the seventh patient, five mutations appeared which were: In the site 101 thymine (T) was substituted with adenine (A). Between the sites 115 and 116 adenine (A) was inserted in the sequence. Between the site 135 and site 136 adenine(A) was inserted in the sequence. In the site 440 guanine (G) was deleted from the sequence. Between the sites 444 and 445 adenine was inserted in the sequence.

In the eighth patient, six mutations appeared which were: In the site 101 thymine (T) was substituted with adenine (A). Between the sites 115 and 116 adenine (A) was inserted in the sequence. Between the sites 135 and 136 adenine (A) was inserted in the sequence. In the site 440 guanine (G) was substituted with cytosine (C). In the site 442 thymine (T) was substituted with guanine (G). In the site 444 adenine (A) was deleted from the sequence.
In the ninth patient, four mutations appeared which were: In the sites 101 thymine (T) was substituted with adenine (A). Between the sites 115 and 116 adenine (A) was inserted in the sequence. Between the sites 132 and 133 adenine (A) was inserted in the sequence. Between the sites 135 and 136 adenine (A) was inserted in the sequence.

In the tenth patient, five mutations appeared which were: In the site 101 thymine (T) was substituted with adenine (A). Between the sites 115 and 116 adenine (A) was inserted in the sequence. Between the sites 132 and 136 adenine (A) was inserted in the sequence. In the site 441 cytosine (C) was substituted with adenine (A). In the site 442 thymine (T) was substituted with cytosine (C).

In the eleventh patient, seven mutations appeared which were: In the site 101 thymine (T) was substituted with adenine (A). Between the sites 115 and 133 adenine (A) was inserted in the sequence. Between the sites 135 and 136 adenine (A) was inserted in the sequence. In the site 441 cytosine (C) was substituted with adenine (A). In the site 442 thymine (T) was substituted with adenine (A). In the site 443 cytosine (C) was substituted with guanine (G).

In the twelfth patient, four mutations appeared which were: Between the sites 135 and 136 adenine (A) was inserted in the sequence. In the site 442 thymine (T) was substituted with adenine (A). In the site 443 cytosine (C) was substituted with guanine (G).

In the thirteenth patient, three mutations appeared which were: In the site 101 thymine (T) was substituted with adenine (A). Between the sites 115 and 133 adenine (A) was inserted in the sequence. Between the sites 135 and 136 adenine (A) was inserted in the sequence.

In the fourteenth patient, four mutations appeared which were: In the site 101 thymine (T) was substituted with adenine (A). Between the sites 115 and 133 adenine (A) was inserted in the sequence. Between the sites 135 and 136 adenine (A) was inserted in the sequence.

In the fifteenth patient, one mutations appeared which were: Between the sites 135 and 136 adenine (A) was inserted in the sequence.

In the sixteenth patient, five mutations appeared which were: Between the sites 115 and 136 adenine (A) was inserted in the sequence. Between the sites 442 thymine (T) was substituted with cytosine (C). In the site 443 cytosine (C) was substituted with guanine (G). In the site 445 cytosine (C) was deleted from the sequence.

In the seventeenth patient, four mutations appeared which were: In the site 101 thymine (T) was substituted with adenine (A). Between the sites 135 and 136 adenine (A) was inserted in the sequence. Between the sites 132 and 133 adenine (A) was inserted in the sequence. Between the sites 135 and 136 adenine (A) was inserted in the sequence.

In all patients with breast cancer, an insertion mutation has been appeared in the sequence of TERC gene when the adenine (A) was inserted between the sites 135 and 136 as shown in Figure (3) showing the insertion of adenine (A) between the sites 135 and 136 in the sequence of TERC gene for a patient out of all patients with breast cancer as compared with the sequence of TERC gene in the GenBank at NCBI as a part of the results by BLAST software.

Figure (3): The results of alignment between the sequence of TERC gene for patient No.1 (query) and sequence of TERC gene in the GenBank (sbjct) by BLAST program, where the insertion mutation appeared between the sites 135 and 136 (indicated by the red arrow) by insertion of adenine (A) in the sequence of TERC gene of the patient.
Discussion

The presence of insertion mutations between the sites 135 and 136 in the sequence of TERC gene for all patients with breast cancer indicates a relationship between this mutations in the sequence of gene for patient’s and breast cancer, this indicate that this insertion mutation as one of the causes of breast cancer. These results were in agreement with other studies\textsuperscript{12, 13} which showed that the mutations in the neurofibromin 1 gene caused neurofibromatosis. Also the results were in agreement with another study\textsuperscript{14} demonstrating that a “mutation” in the CFTR gene caused cystic fibrosis. Also the results were agreement with another study\textsuperscript{15} which demonstrated that the mutation in the PAH gene caused phenylketonuria.

Conclusions

The insertion mutation between the sites 135 and 136 associated with breast cancer

Conflict of Interest: None

Ethical Clearance: Informed written consent was obtained from all the participants in the study, and the study and all its procedure were done in accordance with the Helsinki Declaration of 1975, as revised in 2000. The study was approved by the Department of Applied Sciences University of Technology.

Source of Funding: The study supported by authors only.

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Validity and Reliability of the Indonesia Version of HIV Treatment Adherence Self-Efficacy Scale (HIV-ASES) in Men who have Sex with Men in West Sumatra

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Abstract

The aim of this study was to translate the HIV Treatment Adherence Self-Efficacy Scale (HIV-ASES) and evaluate its validity and reliability in Men Who Have Sex With Men Seropositive HIV in West Sumatera Indonesia. The original HIV-ASES was translated from English into Indonesian. Validity and reliability testing is done by reliability scale analysis technique. The question item validity is seen from the magnitude of \( r \)-table value with \( r \)-count and reliability seen through Cronbach’s alpha coefficient. The results of this study show the HIV-ASES in the context of Indonesian all items of valid and reliable.

Keyword: Indonesian, adherence, self-efficacy, HIV/AIDS, MSM, Seropositive HIV.

Introductions

HIV is a chronic infections disease affecting people worldwide. There were approximately 36.7 million people living with HIV at the middle 2017 with 20.9 million people living with HIV (PLWHIV) currently receiving antiretroviral therapy (ART)¹. Indonesia reported the currently receiving antiretroviral therapy (ART) increased from 63,066 in 2015 to 77,780 in 2017 in Indonesia².

The use of antiretroviral (ARV) is an attempt to improve the quality of life and reduce the incidence associated morbidity and mortality³⁻⁵. ARVs serve to suppress the proliferation of HIV in the human body to increase CD4 cell counts. The lifetime use ART in people living with HIV make them vulnerable to non-adherence that can lead to resistant virus⁶. The use of ART requires a high adherence rate 90-95% in order to achieve treatment success and may lead to the onset of drug resistance⁷. Therefore, high treatment adherence has important in treatment of HIV/AIDS.

High level of adherence to antiretroviral therapy (ART) was influenced by internal motivation factor of self-efficacy about ARV. Self-efficacy is the determination of whether a person has ability to complete a certain behavior⁸. The self-efficacy of treatment beliefs has an effect on adherence to ART⁹,¹⁰. Non-adherence to ART may be affected by low level of education⁹. The meaning there is a good treatment success is directly proportional to the high expectation and inversely proportional to the level of depression.

The HIV Treatment Adherence Self-Efficacy Scale (HIV-ASES)¹¹, have 12-item measurements using Likert scale with range 0-10 “cannot do at all” to “completely certain can do” with total score 120, where someone have good self-efficacy when have score 50⁠¹⁰. The purpose of this study was to perform the validity and reliability in Indonesian version of HIV-ASES of Men Who Have Sex With Men (MSM) seropositive population by comparing the r-tab values with r-count and looking at the crobanch’s alpha value.

Method And Material

The analyses presented in this study are based on a total of 20 HIV+ at NGOs SaiyoSakato Bukit Tinggi West Sumatra. Eligible participants the following criteria: be at least 18 years old, have provided written informed consent, and have not side effect HIV treatment.
Questionnaires were completed by participants themselves. The research protocol was approved by the ethical committee of the Faculty of Medicine, Andalas University in Padang. Random sampling used to recruit participant receiving at the NGOs SaiyoSakato Bukit Tinggi in September 2017. Conducted research to examine self-efficacy about ARV using the English version of HIV-ASES. Researcher translate it into bahasa Indonesia. After a process of evaluation of the results of the translation, the researcher tested the validity and reliability of bahasa Indonesia HIV-ASES version.

Test validity is the extent to which a test accurately measures what it is supposed to measure. Reliability is the degree to which an assessment tool produces stable and consistent result in this case is a questionnaire can be used more than once, at least by the same respondent who will produce consistent data (12–14). Validity test was done by doing the correlation between scores of each variable with total score. Correlation technique used Pearson Product Moment correlation. The test decision compared the r value of each item statement with r table. The r value of the result was seen in the Corrected Item-Total Correlation column and the r table value was seen at the 5% significance level. If r results ≥ r table then the question item is valid and otherwise if r result < r table then the question is invalid. Invalid question items were omitted. Test reliability was done by comparing Alpha Cronbach’s (0.6) with r table. If Alpha Cronbach’s ≥ r table then the instrument is reliable, and otherwise if Alpha Cronbach’s < r table then the instrument is not reliable (12–14). HIV-ASES version in Bahasa Indonesia which amounted to 12 items questions obtained r-count value ranged from 0.729-0.929. With the number of respondents 20 then got the value of r-table 0.468, due to the value of r-table seen from the number of respondents minus 2 means the value of r-table used is at number 48.

The first question item has r-count 0.907 which means greater than 0.468 it can be concluded that question number 1 is valid. The second question item has a value of r-count 0.929 which means greater than 0.468 it can be concluded that question number 2 is valid. The third question item has a value of r-count 0.792 which means greater than 0.468 it can be concluded that question number 3 is valid. The fourth question item has a value of r-count 0.879 which means greater than 0.468 it can be concluded that question number 4 valid. The fifth question item has a value of r-count 0.903 which means greater than 0.468 it can be concluded that question number 5 is valid. The sixth question item has a value of r-count 0.869 which means greater than 0.468 it can be concluded that question number 6 is valid. The seventh question item has a value of r-count 0.870 which means greater than 0.468 it can be concluded that question number 7 is valid. Item eighth question has a value of r-count 0.809 which means greater than 0.468 it can be concluded that question number 8 is valid. The ninth question item has a value of r-count 0.880 which means greater than 0.468 it can be concluded that question number 9 is valid. The ten Item tenth question has a value of r-count 0.856 which means greater than 0.468 it can be concluded that question number 10 valid. The eleven Item tenth question has a value of r-count 0.729 which means greater than 0.468 it can be concluded that question number 11 valid. And the last Item tenth question has a value of r-count 0.842 which means greater than 0.468 it can be concluded that question number 12 valid (table 1). Thus, it can be concluded that the HIV-ASES version in Bahasa Indonesia of all items of question is valid.

Validity test was done by doing the correlation between scores of each variable with total score. Correlation technique used Pearson Product Moment correlation. The test decision compared the r value of each item statement with r table. The r value of the result was seen in the Corrected Item-Total Correlation column and the r table value was seen at the 5% significance level. If r results ≥ r table then the question item is valid and otherwise if r result < r table then the question is invalid. Invalid question items were omitted. Test reliability was done by comparing Alpha Cronbach’s (0.6) with r table. If Alpha Cronbach’s ≥ r table then the instrument is reliable, and otherwise if Alpha Cronbach’s < r table then the instrument is not reliable (12–14).

Results And Discussion

This study focused on the translations and assessment of the reliability and validity of the HIV-ASES Indonesian version among Men Who Have Sex With Men Living With HIV, providing strong support for the evaluation of this translated scale and confirming that it can be applied in assessing the adherence self-efficacy of MSM HIV+ in Indonesia. Target interventions for low-scoring items can be implemented to improve medication adherence.

Validity test was done by doing the correlation between scores of each variable with total score. Correlation technique used Pearson Product Moment correlation. The test decision compared the r value of each item statement with r table. The r value of the result was seen in the Corrected Item-Total Correlation column and the r table value was seen at the 5% significance level. If r results ≥ r table then the question item is valid and otherwise if r result < r table then the question is invalid. Invalid question items were omitted. Test reliability was done by comparing Alpha Cronbach’s (0.6) with r table. If Alpha Cronbach’s ≥ r table then the instrument is reliable, and otherwise if Alpha Cronbach’s < r table then the instrument is not reliable (12–14).
The validity and reliability test were supported by several general researches that perform validity and reliability\(^{(1)}\), which is the creator of the questionnaire.

At the first test it was found that the seventh question there was a mistake in writing so that the researchers revised again and redistributed. From the results of the validity and reliability test it can be concluded that all items are valid questions and the HIV-ASES version in Bahasa Indonesia was reliable or feasible to be used in seropositive Men Who Have Love Sex With Men population.

Table 1. Validity and reliability HIV-ASES Indonesian Version

<table>
<thead>
<tr>
<th>Question Items</th>
<th>M</th>
<th>SD</th>
<th>Corrected Item-Total Correlation</th>
<th>Cronbach's Alpha if Item Deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Stick to your treatment plan even when side effects begin to interfere with daily activities?</td>
<td>7.45</td>
<td>1.761</td>
<td>.907</td>
<td>.968</td>
</tr>
<tr>
<td>2. Integrate your treatment into your daily routine?</td>
<td>7.55</td>
<td>1.701</td>
<td>.929</td>
<td>.968</td>
</tr>
<tr>
<td>3. Integrate your treatment into your daily routine even if it means taking medication or doing other things in front of people who don’t know you are HIV-infected?</td>
<td>6.80</td>
<td>2.191</td>
<td>.792</td>
<td>.971</td>
</tr>
<tr>
<td>4. Stick to your treatment schedule even when your daily routine is disrupted?</td>
<td>7.20</td>
<td>1.989</td>
<td>.897</td>
<td>.968</td>
</tr>
<tr>
<td>5. Stick to your treatment schedule when you aren’t feeling well?</td>
<td>7.35</td>
<td>1.954</td>
<td>.903</td>
<td>.968</td>
</tr>
<tr>
<td>6. Stick to your treatment schedule when it means changing your eating habits?</td>
<td>7.35</td>
<td>1.755</td>
<td>.869</td>
<td>.969</td>
</tr>
<tr>
<td>7. Continue with your treatment even if doing so interferes with your daily activities?</td>
<td>7.45</td>
<td>1.932</td>
<td>.870</td>
<td>.969</td>
</tr>
<tr>
<td>8. Continue with the treatment plan your physician prescribed even if your T-cells drop significantly in the next three months?</td>
<td>7.60</td>
<td>1.759</td>
<td>.886</td>
<td>.969</td>
</tr>
<tr>
<td>9. Continue with your treatment even when you are feeling discouraged about your health?</td>
<td>7.55</td>
<td>1.932</td>
<td>.908</td>
<td>.968</td>
</tr>
<tr>
<td>10 Continue with your treatment even when getting to your clinic appointments is a major hassle?</td>
<td>7.00</td>
<td>1.806</td>
<td>.856</td>
<td>.969</td>
</tr>
<tr>
<td>11. Continue with your treatment even when people close to you tell you that they don’t think that it is doing any good?</td>
<td>7.00</td>
<td>2.828</td>
<td>.729</td>
<td>.976</td>
</tr>
<tr>
<td>12. Get something positive out of your participation in treatment, even if the medication you are taking does not improve your health?</td>
<td>7.45</td>
<td>2.114</td>
<td>.842</td>
<td>.970</td>
</tr>
</tbody>
</table>

**Conclusion**

The HIV-ASES Indonesian Version is a valid and reliable instrument for measuring medication adherence rate of MSM. The Present finding providing HIV-ASES Indonesian Version can use in all community PLWHIV. Prospective studies can be conducted to investigate items and MSM with low adherence rate and efficiency of HIV follow-up studies.

**Ethical Clearance:** This study has passed and granted ethical clearance from the Faculty of Medicine University of Andalas No.346 /KEP/FK/ 2018.

**Source of Funding:** Self-funding

**Conflict of Interest:** None

**Bibliography**


The Association between Meaning in Life and Adherence to Antiretroviral Therapy (ART) of HIV-Seropositive within Men who have Sex with Men (MSM); Mixed Method

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Abstract

Purpose: To identify the distribution of meaning in life frequency and adherence to antiretroviral therapy (ART) as well as to perceive and explore the association between meaning in life and adherence to antiretroviral therapy (ART) of HIV-seropositive within MSM in Padang City, West Sumatra, Indonesia.

Method: This research used a mixed method with an approach of exploratory sequence design, which was in quantitative stage through a cross-sectional design approach that intended to know the relationship between variables. 102 sample size. In the qualitative stage, the researchers used the conceptual content cognitive map (3CM) method as a data retrieval technique and then continued with the interview.

Results: Characteristics of MSM in West Sumatra more than half were gay with early adulthood who were mostly on ART treatment less than one year. Almost all MSM were middle and upper educated, and they worked in sixteen sectors of employment in which the private sector was the largest. Most MSM had a meaningful life. More than half of MSM were discipline to go through ART treatment. There was a significant correlation between the meaning in life and the adherence of ART p (0,000) with the identification of several aspects that related to the meaning in life and ART adherence. They were spiritualism, lifestyle, psychological, life purpose, life achievement, knowledge, and motivation.

Conclusion: The importance of meaning in life within HIV-seropositive MSM that might influence the ART adherence. Therefore, the researchers recommend to conduct a compliance monitoring activity and provide logotherapy for MSM whose life is not meaningful.

Keywords: MSM, Meaning in life, ART adherence, HIV/AIDS, 3CM.

Introduction

The use of ARV requires a high adherence rate of 90-95% in order to achieve therapy success and can prevent the emergence of drug resistance¹,². WHO has a target that 90% of People Living with HIV/AIDS (PLWHA) already underwent ART by 2016, but the target realization is only 53%. PLWHA who undergo antiretroviral therapy is increasing. In 2016, there are 19.5 million or about 53% of the total number of PLWHA, and in mid-June 2017 the number has progressed to 20.9 million or about 56.9% of the total number of PLWHA³. Meanwhile, PLWHA in Indonesia who have undergone ART based on Ministry of Health report (2016), in 2015 there were 63,066 people where 2,056 of them experienced ART on the second line, and by 2017, PLWHA who had accessed antiretroviral therapy were 77,780 people where 2,374 people were on ART on the second line. From the data above, we can conclude that there are still many PLWHA who have not accessed ART, while the number of PLWHA in the second line shows improvement from year to year⁴.

According to research by Audet, Wagner, & Wallston (2015), meaningfulness of life by PLWHA associated with the psychological welfare of patients⁵. There has been no research on the relation of meaning in life toward ART, but based on research conducted by Corless et al.,(2006), about the relation of meaning in life to TB treatment adherence, it can conclude that
there is a relationship between the meaning in life and the level of TB treatment adherence. The meaning of life is a daily experience in life that is real in both pleasant and unpleasant situations and if someone can live every event to means then his life will be happy. The feeling of happiness can be achieved if someone who can achieve his life goals.

Researchers in preliminary study at NGOs Taratak Jiwa Hati with interview six participant find that all PLWHA are still difficult to remember to consume medicine and sometimes late to consume it and there are still MSM who feel their lives are meaningless. This study is important to undertake because it can give a description of ART adherence and the meaning in life of HIV-seropositive MSM. This study aims to identify the characteristics of HIV-seropositive Men who have sex with men (MSM), the distribution of meaning in life frequency and adherence to antiretroviral therapy (ART) as well as to perceive and explore the association between meaning in life and adherence to antiretroviral therapy (ART) of HIV-seropositive within MSM in Padang City, West Sumatra, Indonesia.

**Material and Method**

This research was mixed method through explanatory sequel design approach, where the qualitative data that was obtained in the research will help the explanation of the quantitative data result. In quantitative phase, researchers used a cross-sectional design. Total sampling use in this research with 102 Sample size MSM with HIV at NGOs Taratak Jiwa Hati West Sumatra Indonesia. Before conducting the research, the researchers tested the validity and reliability of the Meaning in Life Questionnaire (MLQ) in Indonesian version and Morisky-8 Scale also in Indonesian version, and all question items of both questionnaires were valid and reliable. In the qualitative phase, the researchers used The Conceptual Content Cognitive Map (3CM) method as a data retrieval technique. This method was a method developed by Kearny & Kaplan by using open-ended questions that were used to deeply understand the important concepts of informants’ perceptions concerning the relationships between the meaning in life and ART adherence.

**Results and Discussion**

**Research Sample:** The characteristics of respondents including sexual orientation, age, education level, duration of ART, and occupation. More than half of the MSM were gay with early adulthood, a majority of them were on ART for less than one-year treatment, almost all MSM were middle and upper educated, and they worked in sixteen sectors of employment in which the private sector was the largest. Based on research that the respondents who have sexual orientation as gay was 56 people and as bisexual men were 46 people. The age range of respondents was in the adulthood age between 25-45 years old, where this age range was for both early and late adulthood. The education level of respondents, most of them, was in the middle and upper education with a percentage of 81.4%. Various researches indicated that the level of education was one of the factors that will interact in health status. Where, if a person had a higher educational status, it could reduce mortality and increase the income, even reduce twice as much mortality either directly or indirectly. In terms of time span on undergoing antiretroviral treatment, more than half or 54% of respondents were categorized as a newbie because it was still under one year time.

**Meaning in life of HIV-seropositive MSM:** The majority of respondents (64.71%) had a meaningful life and about 35.29% felt a meaningless life of the 102 respondents, 72.5% felt that there was no distinct purpose in life, and almost all respondents (91.2%) were looking for something that made their life meaningful. Meaning in life had a different function for each individual, but according to Mackenzie & Baumeister (2014), the function of meaning in life could be divided into three function themes. The meaning in life according to Starck (2014), was said to be the phase where a person reached his life goal. According to Audet et al. (2015), the low meaning in life indicated non-adherence ART and provided a stimulus of management for handling the suffered disease. We were able to analyze that most respondents had been able to find the meaning of their lives although the meaning in life that was found was from an unpleasant experience. The need for counseling to improve the meaningfulness of life of seropositive MSM (35.9%). By doing so, MSM population especially seropositive one will get more external support or motivation and can improve their meaningfulness in life.

**ART treatment adherence of HIV-seropositive MSM:** From the research results obtained that 57.8% respondents were adherence to antiretroviral therapy and the rest did not comply as much as 43 respondents or 42.2%. This level of adherence was seen from the accuracy of the dosage and the frequency of time-consuming ARV. According to Bangsberg, Kroetz, &
Deeks, (2007), ART adherence should be observed to discern the compliance level of the treatment, as some studies indicate that with treatment adherence of (95%) or more indicates the effectiveness of antiretroviral therapy(23), but on adherence (75%) shows a rise of viruses with retention against drugs(24). Some patients fail to maintain ART adherence(25). Treatment and handling management of HIV are part of the management of chronic diseases, which have principles of medication adherence, prevention of drug retention, and morbidity prevention management(25). This condition becomes a challenge for health workers. Nurses can maximize counseling services particularly for HIV counselor and psychiatric nurses that can provide special therapies to turn negative behaviors into the positive. Apart from health workers, peer advocates also need to improve their role to remind the companions to take the drugs in a timely and appropriate dose given.

The relationship of meaning in life with ART adherence treatment within HIV-seropositive MSM

Table 1: The relationship of meaning in life with ART adherence treatment within HIV-seropositive MSM

<table>
<thead>
<tr>
<th>Meaning in life</th>
<th>ART adherence</th>
<th>Total</th>
<th>p</th>
<th>OR (CI95%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Non-adherence</td>
<td>Adherence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-adherence</td>
<td>f</td>
<td>%</td>
<td>f</td>
<td>%</td>
</tr>
<tr>
<td>Meaningless</td>
<td>31</td>
<td>86.1</td>
<td>5</td>
<td>13.9</td>
</tr>
<tr>
<td>Meaningful</td>
<td>12</td>
<td>18.8</td>
<td>54</td>
<td>81.8</td>
</tr>
</tbody>
</table>

Table 1 showed that there was a relationship between meaning in life and ART adherence. When a person whose life was meaningless will have 27.90 times risk to be non-adherence in undergoing antiretroviral therapy than a person whose life was meaningful.

Farber et al (2003), the meaning of the success of good treatment is directly proportional to the high expectation and inversely proportional to the level of depression(26). There has been no research on the relation of the meaning in life to the level of ART adherence, but based on a research that conducted by Corless et al (2006), about the relation of meaning in life to TB treatment adherence, it can conclude that there is a relationship between the meaning in life and the level of TB treatment adherence(6).

The exploration of the relationship between the meaning in life and ART adherence can occur due to the fulfillment of the basic components of the formation of meaning. According to Mackenzie & Baumeister (2014), there are four basic components that form the meaning in life. First is the necessity for a purpose of life which can be categorized into results attainment and fulfillment of more abstract desire(22). The exploration result from this life purpose component was that the participant had a life purpose to get married “... Although I am an LGBT, I have a plan to have a wife (P2) ”.

The life accomplishing of each participant was unique and different in interpreting the achievement of their life. “...Can overcome all by thinking positively... experiencing the life...just like before HIV... (P1)”.

The other achievement of the meaning in life was always being motivated to experience the life “...Always keep the spirit, always optimistic and not pessimistic... (P3)” In addition, the participants also live his life by becoming a better person “...experiencing the life...by becoming a better person... (P4)”.

The next necessity is trust and faith. Participant’s spirituality indicated the existence of belief or faith by placing his trust in God “...Pray regularly...ask God by tahajud prayer (Moslem’s prayer near midnight), what is the crux of this problem so that it can be solved well (P3)”. Participants believed that by counseling their life purpose can be achieved, following the participant’s statement;

“...According to the hospital, as a person with HIV, I can have a wife and have offspring without spreading the disease by doing the program (P2)”

The last necessity is that one must have positive self-esteem. The meaning in life according to Starck (2014), by having a sensitive feeling with the experience of how to love his life(10).
“...meet other people living with HIV.. feeling no burden of thinking and ... should be motivated in undergoing this antiretroviral therapy.. there is a desire to behave better again ... optimist to maintain health ... be firm in facing this life and keep struggling do not get desperate (P3)”.

The freedom to choose what the participants did was to live a healthier life“...enough exercise, a good diet and have a deeper understanding of what HIV is (P2)”. Human suffering is the third concept of the meaningful theory.

“...with despairing by not taking ARV (P3) and why doing a healthy life while I’ve HIV and no one willing to befriended me, to approach me...(P2)”.

The uniqueness of a person’s meaningful life that is stimulated by various things ultimately can make someone adherence to undergoing antiretroviral therapy. However, to gain meaningfulness of life, one must be able to accept who they are and where their position now. The meaningfulness of life can be obtained not only in a pleasurable event but also be found from unpleasant events. HIV-seropositive is an unpleasant experience for everyone especially the respondents. Thus, health workers need to assist respondents in order to rediscover the purpose of their life so that they have the meaning in life as before HIV-seropositive.

Conclusion

PLWHA adherence to consume ART was influenced by the meaning in life, where, when PLWHA had a clear purpose that he wanted to accomplish in life, then that PLWHA will adherence to consuming ART. Meanwhile, PLWHA adherence was also influenced by peers, information attainment, and self-motivation. This research provides important suggestions for health workers to be actively involved in enhancing the motivation of PLWHA, especially MSM to behave openly so that the quality of life monitoring can be done.

Ethical Clearance: This study has passed and granted ethical clearance from the Faculty of Medicine University of Andalas No.346 /KEP/FK/ 2018.

Source of Funding: Self-funding

Conflict of Interest: None

Reference


Prevalence of Lower Back Pain among Health Care Providers Working in Operation Rooms in Mosul City Hospitals

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¹Mosul University, College of Nursing, Mosul, Iraq

Abstract

Background: The pain in the lower back is one of the most common health problems in the operating rooms in our hospitals due to the specificity of these places due to the limitation of movement and length period of standing on the feet and increase the number of operations per day and not taking enough rest or lack of breaks for rest with presence of risk factors may lead to exacerbate the problem of health workers.

Aim: this study aimed to determine the prevalence and risk factors for lower back pain amongst health care providers who are working in operation rooms at Mosul city hospitals including nurses, surgeon, and anesthetist.

Material and method: Descriptive study design was carried out in order to achieve the objectives of the present study. Constructed questionnaire was dependent for this study includes demographical data, nature of pain and some attributes of pain. Data were collected during two months from the 30th of December 2017 to 1st of March 2018. The study subjects consist of (157) persons who were working inside operation rooms in four hospitals Al-Salam, AL-Jumhory, Alkanssa, and Ibn-Sena Teaching Hospitals.

Results: Most respondents (80.9%) had experienced lower back pain, and there was a significant relationship between age and lower back pain, also there was significant relationship between tenure and lower back pain.

Conclusion: Lower back pain is a terrible problem inside operation rooms, and suffering from occurrence of lower back pain was increased with advanced age and with long period of years working inside operation rooms.

Recommendation: Some steps should be following to reduce lower back pain such as scheduling rest periods, and development of educational programs which enhance the ideal or proper use of body mechanics when lifting and transferring of patients and heavy objects.

Keywords: Lower Back Pain, Health Care Providers, Operation Rooms.

Introduction

International association for the study of pain defined pain as an unpleasant sensory and emotional experience associated with actual or potential tissue damage. It is a main symptom in many medical personnel inside operation rooms, and can interfere with a person’s quality of life and general health and functioning(1). The incidence of reported low back pain among hospital staff varies between different countries(2). Health care providers team inside the operation rooms are frequently have to lift and transfer patients who may move suddenly and implement repetitive procedures with incorrect or poor body posture, which lead to cause low back pain(3). Low back pain has been described as one of the major occupational problems among health care workers, the nurses have the highest incidence (4).

Aim: This study aimed to determine the prevalence and risk factors for lower back pain amongst health care providers who are working in operation rooms at Mosul city hospitals, including nurses, surgeon, and anesthetist.
Objectives of the study:

1. To determine the prevalence of lower back pain among health care providers who are working in operation rooms.
2. To identify the factors that leading to increase of lower back pain.
3. To identify the natural and quality of this problem.

Methodology: Descriptive design (cross-sectional study) was conducted among (157) medical personnel (surgeons, nurses, anesthetists) were obtained from the operation rooms from four general hospitals at Mosul city (Al-Salam, AL-Jumhory, Alkansa, and Ibn-Sena Teaching Hospitals). Constructed questionnaire was dependent for this study, and validated by 7 experts, where as their opinions, suggestions and recommendations were depended to adopt and direct the questionnaire. Data collections were collected throughout two months, from the 30th of December 2017 to 1st of March 2018. This study was conducted on male and female persons who working in operation rooms. The questionnaires were redistributed by giving it to our subjects then we explain the aims of study for him and explain the questionnaires questions for him too, then leave questionnaires for three days at hospitals or more if it needed more time and collect it by hand when they finish. Also the researchers were used body mass index (BMI) measure in this study which consist of five categories (decrease weight less than 20, normal weight 20-25, increased weight 26-30, obesity 31-40, and risk obesity more than 40.

The Results

| Table (1) Demographical characteristics of the study subjects |
|-------------------|----------------|---------|
| Variable          | NO.     | %       |
| Age20-24          | 15      | 9.6     |
| 25-29             | 41      | 26.1    |
| 30-34             | 33      | 21      |
| 35-39             | 25      | 15.9    |
| 40 & more         | 43      | 27.4    |
| Total             | 157     | 100%    |

| Gender          | Male     | 111     | 70.7 |
|                | Female   | 46      | 29.3 |
|                | Total    | 157     | 100% |

| Marital status | Married  | 120     | 76.4 |
|                | Unmarried| 37      | 23.6 |
|                | Total    | 157     | 100% |

| Character of work | Nurse | 82 | 52.2 |
|                   | Surgeon| 20 | 12.7 |
|                   | Anesthetist | 55 | 35.1 |
|                   | Total   | 157| 100% |

| Existing of pain | Yes | 127 | 80.9 |
|                 | No  | 30  | 19.1 |

| Character of pain | Temporary | 93 | 73.2 |
|                   | Permanent | 34 | 26.8 |

| Intensity of pain | Mild | 40 | 31.5 |
|                  | Moderate | 70 | 55.1 |
|                  | Severe   | 17 | 13.4 |

| Relief strategy | by rest | 92 | 72.4 |
|                | by analgesia drugs | 35 | 27.6 |

Table (2) Prevalence of lower back pain and its characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing of pain</td>
<td>127</td>
<td>80.9</td>
</tr>
<tr>
<td>Not found</td>
<td>30</td>
<td>19.1</td>
</tr>
</tbody>
</table>

| Character of pain  | Temporary | 93 | 73.2 |
|                    | Permanent | 34 | 26.8 |

| Intensity of pain  | Mild | 40 | 31.5 |
|                    | Moderate | 70 | 55.1 |
|                    | Severe   | 17 | 13.4 |

| Relief strategy   | by rest | 92 | 72.4 |
|                   | by analgesia drugs | 35 | 27.6 |
Radiation of pain to the lower extremities

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>df</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiation of pain to Yes the lower extremities No</td>
<td>75</td>
<td>52</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Numbness of lower extremities Yes No</td>
<td>48</td>
<td>79</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stability of pain at night Yes No</td>
<td>48</td>
<td>79</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table (3) Relationship between age and suffering from lower back pain

<table>
<thead>
<tr>
<th>Age</th>
<th>Suffering lower back pain</th>
<th>Total</th>
<th>df</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-24</td>
<td>9</td>
<td>6</td>
<td>15</td>
<td>4</td>
</tr>
<tr>
<td>25-29</td>
<td>30</td>
<td>11</td>
<td>41</td>
<td></td>
</tr>
<tr>
<td>30-34</td>
<td>25</td>
<td>8</td>
<td>33</td>
<td></td>
</tr>
<tr>
<td>35-39</td>
<td>23</td>
<td>2</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>40 &amp; more</td>
<td>40</td>
<td>3</td>
<td>43</td>
<td></td>
</tr>
</tbody>
</table>

Chi-square test, df=4, significant at (p=0.01)

Table (4) Relationship between tenure and suffering from lower back pain

<table>
<thead>
<tr>
<th>Tenure</th>
<th>Suffering lower back pain</th>
<th>Total</th>
<th>df</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than (1) year</td>
<td>7</td>
<td>3</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>1-5</td>
<td>40</td>
<td>16</td>
<td>56</td>
<td></td>
</tr>
<tr>
<td>6-10</td>
<td>37</td>
<td>9</td>
<td>46</td>
<td></td>
</tr>
<tr>
<td>11-15</td>
<td>19</td>
<td>2</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>16 &amp; more</td>
<td>24</td>
<td>0</td>
<td>24</td>
<td></td>
</tr>
</tbody>
</table>

Chi-square test, df=4, significant at (p=0.02)

Table (5) Relationship between BMI and suffering from lower back pain

<table>
<thead>
<tr>
<th>Body mass index</th>
<th>Suffering lower back pain</th>
<th>Total</th>
<th>df</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>decrease weight</td>
<td>4</td>
<td>2</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Normal weight</td>
<td>60</td>
<td>21</td>
<td>81</td>
<td></td>
</tr>
<tr>
<td>increased weight</td>
<td>38</td>
<td>5</td>
<td>43</td>
<td></td>
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<tr>
<td>Obesity</td>
<td>24</td>
<td>2</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>risk obesity</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Chi-square test, df=4, non significant at (p=0.12)

Table (6) relationship between chronic diseases and suffering from lower back pain

<table>
<thead>
<tr>
<th>Chronic diseases</th>
<th>Suffering lower back pain</th>
<th>Total</th>
<th>df</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not found</td>
<td>108</td>
<td>30</td>
<td>138</td>
<td>3</td>
</tr>
<tr>
<td>D.M</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>H.T</td>
<td>7</td>
<td>0</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Arthritis</td>
<td>9</td>
<td>0</td>
<td>9</td>
<td></td>
</tr>
</tbody>
</table>

Chi-square test, df=3, non significant at (p=0.16)

Discussion

Lower back pain is a real problem that hinders the smooth running of the medical team in the operating rooms in any health care agency (5). Uncomfortable working positions because restriction of movement and privacy of space inside operation rooms and theatre (6).

The percent of lower back pain in our study was (80.9%), as in table 2. This percent come nearest to the study carried out by (1), which that show (78%) of respondents had experienced lower back pain among health care providers who are working inside theatre, alsowho demonstrate that (82.7%) of respondents had experienced lower back pain (7).

In our study there is increasing in percentage of incidence of lower back pain with advanced age, as in table 3. This fact come in agreement with a study conducted by which showed that more than 40% of operation theatre workers who suffered from lower back pain between age ranges of (35 -55) years.

Increase body mass index (BMI) leading to increase the probability of incidence of lower back pain among health care workers (8), but our study didn’t indicate any significant relationship between BMI and LBP because 79% of the study sample were around normal BMI (51.6% for normal weight and 27.4% for increased weight as in table 1.

The chronic diseases such as diabetes mellitus, arthritis and other musculoskeletal and joints problems consider risk factors or contributing factors to lower back pain, in our study not found significant relationship between chronic diseases and lower back pain because (87.9%) from the sample not suffering from chronic diseases. Return to table 1.
Increase the period or years of work inside intensive care units and operation theatre lead to increase chance of occurrence of lower back pain (9). Demonstrate in their study the workers experience more than 5 years recorded feeling low back pain; this fact comes in agreement with our study where there is significant relationship between duration of work and lower back pain. As in table 4.

**Conclusion**

Lower back pain is a terrible problem inside operation rooms; in addition the occurrence of lower back pain was increased with advanced age and with long period of years working inside operation rooms.

**Recommendations:** Some steps should be following to reduce lower back pain such as scheduling rest periods, and development of educational programs which enhance the ideal or proper use of body mechanics when lifting and transferring of patients and heavy objects.

**Ethical Clearance:** People identified as potential research participants because of their status as relatives or carers of patient’s research participants by virtue of their professional role in the university and departments.

**Source of Funding:** Self-Funding

**Conflict of Interests:** The authors declare there is no conflict interests.

**References**


Positive Deviance Against Malaria Events in Majene District

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\(^2\)Department of Agribusiness at the State Agricultural Polytechnic of Pangkajene Kepulauan, Pangkep

**Abstract**

Essentially behavioral factors are actions or activities of human beings themselves which result in an imbalance between agent, host and environment that affects human health status, including the incidence of malaria caused by one of the factors which is good human activity that can be observed directly or indirectly. So this study aims to determine the effect of positive deviance on malaria incidence in Majene District. This research was conducted in Manyamba Village, Majene Regency, West Sulawesi Province, July - September 2018. This study used a mixed-method research design. Quantitative data is used to explain the relationship between the variables of the study and the incidence of malaria and qualitative data is used to determine positive deviance behavior using the focus group discussion method. The data obtained will be processed using SPSS V.24. Based on the data obtained in the field there are several variables related to the incidence of malaria, namely positive deviance \(p = 0.039\), knowledge \(p = 0.018\) and work \(p = 0.035\). Multivariate analysis to see the effect on malaria, obtained results that the job variable has the strongest relationship to the incidence of malaria, with a value of \(p = 0.001\). The results of the data obtained from the FGD obtained that there were 4 positive deviance behaviors in the community of Manyamba Village, Tamerodo District, Majene District; plant the toga, keep the lead head fish, burn the egg rack and bring it to the paranormal. Positive deviance behavior in the community can be used to prevent the occurrence of malaria through the active role of health cadres by forming healthy communities in the community.

**Keywords**: malaria, positive deviance, work, knowledge

**Introduction**

Malaria is one of the diseases that causes the most suffering and death to date. Disease caused by the Protozoa of the Genus Plasmodium, which is transmitted through mosquito bites, attacks almost all regions or regions on the surface of the earth. This disease has also been detected since ancient times. Various efforts that have not been done by humans to overcome this disease both through Preventive and Curative actions\(^1\). Behavior is the biggest factor that leads to a person’s health. Health behavior is formed from individual characteristics such as knowledge, experience, attitudes and actions to interact with the environment. Another work factor that causes malaria transmission is the division of work shifts\(^2\). Malaria transmission can be associated with the most activity carried out by someone by considering where the person is doing daily activities. This is the basis for seeing the relationship between one’s work and the incidence of malaria. Of all respondents in all provinces in Indonesia who work in agriculture and fishermen by 18.5%. As many as 41% of respondents affected by malaria were people with jobs as fishermen and farmers\(^3\).

Knowledge factors are often associated with increased malaria incidence in several places. As was the case in Uganda, only 68% of people took their children to health facilities when they had a fever. Lack of knowledge about the behavior of clean and healthy people living by choosing an open source of water rather than a closed one\(^4\). Increased knowledge of malaria manifestations and controls is an important role in controlling malaria incidence\(^5\). Based on the background above, the researcher is interested in studying positive
deviance in Manyamba Village, Tamerodo District, Majene District, West Sulawesi.

### Materials and Method

This study uses a mixed-method research design. Quantitative data is used to explain the relationship between the variables of the study and the incidence of malaria and qualitative data is used to determine positive deviance behavior using the focus group discussion method. The population in this study were the people of Bussu Hamlet, Manyamba Village, Tammerodo District, Majene District, West Sulawesi. The sampling method for quantitative data uses Total Sampling with a total of 143 respondents. While the FGD participants were carried out by community leaders, religious leaders, health cadres and people in Bussu Hamlet. Data were analyzed using bivariate test with Chi-Square Test. Furthermore, multivariate test using Logistic Regression.

### Research Result

Based on table 1, it shows that the highest frequency is Positive Deviance as many as 114 Respondents (79.7%) and Positive Deviance is 29 respondents (20.3%) of the total respondents as many as 143 respondents (100%).

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive deviance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>114</td>
<td>79.7</td>
</tr>
<tr>
<td>No</td>
<td>29</td>
<td>20.3</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baby under 5 year</td>
<td>8</td>
<td>5.6</td>
</tr>
<tr>
<td>Children</td>
<td>29</td>
<td>20.3</td>
</tr>
<tr>
<td>Early Teenagers</td>
<td>32</td>
<td>22.4</td>
</tr>
<tr>
<td>Advance teenagers</td>
<td>19</td>
<td>13.3</td>
</tr>
<tr>
<td>Early adults</td>
<td>21</td>
<td>14.7</td>
</tr>
<tr>
<td>Advance adults</td>
<td>15</td>
<td>10.5</td>
</tr>
<tr>
<td>Early elder</td>
<td>9</td>
<td>6.3</td>
</tr>
<tr>
<td>Advance elder</td>
<td>6</td>
<td>4.2</td>
</tr>
<tr>
<td>Elderly</td>
<td>4</td>
<td>2.8</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>69</td>
<td>48.3</td>
</tr>
<tr>
<td>Female</td>
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<td>51.7</td>
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<td></td>
</tr>
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<td>44</td>
<td>30.8</td>
</tr>
<tr>
<td>Not graduate basic</td>
<td>29</td>
<td>20.3</td>
</tr>
<tr>
<td>Graduate basic</td>
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<td>35.7</td>
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<tr>
<td>Graduate junior school</td>
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<td>9.8</td>
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<tr>
<td>Occupation</td>
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<td></td>
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<tr>
<td>Risks</td>
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<td>37.1</td>
</tr>
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<td>Not risks</td>
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<td>62.9</td>
</tr>
<tr>
<td>Illness history</td>
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<td></td>
</tr>
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<td>Yes</td>
<td>41</td>
<td>28.7</td>
</tr>
<tr>
<td>No</td>
<td>102</td>
<td>71.3</td>
</tr>
<tr>
<td>Knowledge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enough</td>
<td>116</td>
<td>81.1</td>
</tr>
<tr>
<td>Less</td>
<td>27</td>
<td>18.9</td>
</tr>
<tr>
<td>Attitude</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enough</td>
<td>143</td>
<td>100</td>
</tr>
<tr>
<td>Less</td>
<td>49</td>
<td>34.3</td>
</tr>
<tr>
<td>Action</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enough</td>
<td>94</td>
<td>65.7</td>
</tr>
<tr>
<td>Less</td>
<td>49</td>
<td>34.3</td>
</tr>
<tr>
<td>Total</td>
<td>143</td>
<td>100</td>
</tr>
</tbody>
</table>

Furthermore, the highest age variable is the early adolescent age group as many as 32 Respondents (22.4%) then continued with the lowest age frequency, namely the elderly age group as many as 4 respondents (2.8%). Then the highest frequency based on sex was female gender as many as 74 respondents (51.7%) and the lowest was male gender as many as 69 respondents (48.3%) of a total of 143 respondents (100%).

The level of education in table 1 is known that. the highest level of education is never schooling as many as 44 respondents (30.8%) while based on the lowest level of education level is high school equivalent to 5 respondents (3.5%). For the highest respondent frequency job variable based on risky work as many as 53 respondents (37.1%) and the lowest frequency based on non-risky work as many as 90 respondents (62.9%). And the frequency of malaria occurrence based on the highest history of malaria incidence is that of non-malaria as many as 102 respondents (71.3%) while the lowest frequency of malaria incidence is positive malaria as many as 41 respondents (28.7%).

Based on the results of the FGD, 3 (three) out of 8 (eight) informants informed that burning an egg rack can repel mosquitoes to prevent mosquito bites. As quoted in the following FGD:

“Ma ‘baka I know, e tellu (burning egg racks)” (RS, 33 years) Meanwhile 1 (one) of 8 (eight) informants informed that planting lemongrass leaves can repel mosquitoes so that they avoid mosquito bites. As quoted in the following FGD:“If I plant Sarre leaves near my house”
There were 3 (three) out of 8 (eight) informants using mosquito nets to avoid mosquito bites during sleep. As quoted in the following FGD: “Installing mosquito nets with the usual burn is an egg rack” (JA, 27 years old) In addition, 1 (one) of 8 (eight) informants requested help from a seaman in the form of a spell so as not to contract Malaria.

Table 2. shows the results of cross tabulation between dependent variables and independent variables. Which is known that the positive deviance variable has a significant relationship with p = 0.039. Then other variables related to the incidence of malaria in Manyamba Village, Tammerodo Subdistrict, Majene Regency are knowledge and jobs with p value of 0.018 and 0.035 respectively.

<table>
<thead>
<tr>
<th></th>
<th>Malaria occurrence</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>Not</td>
</tr>
<tr>
<td>Positive deviance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not</td>
<td>13 (44.8%)</td>
<td>16 (55.2%)</td>
</tr>
<tr>
<td>Yes</td>
<td>28 (24.6%)</td>
<td>86 (75.4%)</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Productive</td>
<td>18 (28.1%)</td>
<td>46 (71.9%)</td>
</tr>
<tr>
<td>Productive</td>
<td>23 (29.1%)</td>
<td>56 (70.9%)</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>22 (31.9%)</td>
<td>47 (68.1%)</td>
</tr>
<tr>
<td>Female</td>
<td>19 (25.7%)</td>
<td>55 (74.3%)</td>
</tr>
<tr>
<td>Education level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>39 (28.3%)</td>
<td>99 (71.7%)</td>
</tr>
<tr>
<td>High</td>
<td>2 (40%)</td>
<td>3 (60%)</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risks</td>
<td>21 (39.6%)</td>
<td>32 (60.4%)</td>
</tr>
<tr>
<td>Not risks</td>
<td>20 (22.2%)</td>
<td>70 (77.8%)</td>
</tr>
<tr>
<td>Knowledge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less</td>
<td>13 (48.1%)</td>
<td>14 (51.9%)</td>
</tr>
<tr>
<td>Enough</td>
<td>28 (24.1%)</td>
<td>88 (75.9%)</td>
</tr>
<tr>
<td>Action</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less</td>
<td>28 (29.8%)</td>
<td>66 (70.2%)</td>
</tr>
<tr>
<td>Enough</td>
<td>13 (26.5%)</td>
<td>36 (73.5%)</td>
</tr>
<tr>
<td>Total</td>
<td>41 (28.7%)</td>
<td>102 (71.3%)</td>
</tr>
</tbody>
</table>

The data in table 3 shows the statistical test using logistic regression shows the smallest p value is a job with a value of p = 0.001.
Table 3. Regression logistic test results

<table>
<thead>
<tr>
<th>Variables in the Equation</th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>df</th>
<th>Sig.</th>
<th>Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive deviance</td>
<td>-.723</td>
<td>.624</td>
<td>1.342</td>
<td>1</td>
<td>.247</td>
<td>.485</td>
</tr>
<tr>
<td>Knowledge</td>
<td>-1.567</td>
<td>.669</td>
<td>5.495</td>
<td>1</td>
<td>.019</td>
<td>.209</td>
</tr>
<tr>
<td>Occupation</td>
<td>1.732</td>
<td>.498</td>
<td>12.086</td>
<td>1</td>
<td>.001</td>
<td>5.653</td>
</tr>
<tr>
<td>Constant</td>
<td>1.008</td>
<td>.713</td>
<td>1.995</td>
<td>1</td>
<td>.158</td>
<td>2.739</td>
</tr>
</tbody>
</table>

Which means that the job variable has the strongest relationship with malaria incidence in Manyamba Village, Tammerodo District, Majene District, South Sulawesi.

Discussion

Positive Deviance with Malaria

The location of the area in the mountains and the absence of a permanent road. Makes the area isolated and certainly makes it difficult for people to access daily needs, including mosquito repellent. To avoid mosquito bites, people use insect repellent. But when insect repellent was no longer available, the informant tried to find other alternatives, such as egg shelves. One end of the egg rack was burned to smoke. This smoke is then used by residents to repel mosquitoes. Although the smoke produced is quite thick and makes people around shortness of breath. Egg shelves are still chosen as an alternative mosquito repellent because they are easy to find and also practical.

In addition, there were informants who planted lemongrass. This lemongrass plant is seen on residents’ yard. Lemongrass planting is not preceded by the motive of preventing mosquito bites. But it is just a fulfillment of kitchen needs. Lemongrass leaves contain essential oils can repel mosquitoes. Lemongrass essential oil consists of cytral compounds, cytronella, geraniol, mirena, nerol, farnesol methyl heptenol and dipetana. Cytronella compounds have dehydration (desiscant) toxicity. The toxin is a contact poison that can cause death due to continuous fluid loss. Insects exposed to this poison will die from lack of fluids. This is what makes informants free from mosquitoes.

Informant beds are equipped with mosquito nets. This mosquito net is rarely released from the bed. So that every time you sleep, this mosquito net stays installed. The use of mosquito nets is an effective and safe way to avoid mosquito bites. When one family member suffers from malaria. The informant first took him to the shaman. This is because the distance from the place of residence to the health facility is quite far and the cost of transportation is high compared to the treatment in the seaman. The treatment of the shaman comes from supernatural powers. Shamans use white water as an intermediary medium. Water will be given a mantra or recitation of the Holy Qur’an according to the illness. The informant does not only ask for spells for healing. But also to prevent malaria transmission. The role of positive deviance behavior in the community of Manyamba Village, Tamerodo Subdistrict, Mejene Regency, West Sulawesi has a statistically significant relationship with the incidence of malaria, in line with research conducted in rural areas in the country of Senegal by Ndiaye et al reported that positive deviance increases found in the community can improve health in general. Positive deviance is a new strategy in an effort to improve health promotion and approach to the community. This was achieved when there was an extraordinary case of malaria in Thailand in 2014. Support for positive deviance was also found in research conducted in Cambodia, that positive deviance is one tool that can be used to control the incidence of malaria in an area by strengthening the community.

Knowledge with Malaria Events

Knowledge of the community has an important role in malaria transmission in an area. The level of knowledge of the community in the Manyamba Village is dominant in the category of sufficient malaria knowledge, although education in the community of manyamba is dominant in the category of low education. The results of this study
indicate that there is a significant relationship between people’s knowledge and the incidence of malaria.

Individual knowledge is one of the important factors to cut the chain of malaria transmission in each family, especially the knowledge possessed by women as a mother. Although the community’s knowledge of malaria is sufficient, there is still a need for a kind of community formation consisting of cadre cadres to provide more knowledge related to malaria in the community. In addition, knowledge about how to transmit malaria, people need to be educated about preventing mosquito bites that can cause malaria by using insecticide-treated mosquito nets.

Work with Malaria

The geographical condition found in the research location in the form of mountains is one of the places of vector breeding. In villages affected by extraordinary events there are rivers near residential areas that are breeding places for mosquitoes. With such geographical conditions, the livelihoods of the majority of the population are gardening and farming. This is also one of the causes of malaria because when they do the work of the plantation area, unconsciously mosquitoes carrying malaria attack. Suharmasto states there is a significant relationship between work with malaria incidence and people whose occupations are at risk of 2.82 times risk of developing malaria compared to people whose jobs are not at risk. Meanwhile, according to research by Aisy stated that there was no significant relationship between work and the incidence of malaria. Various activities or human work often result in changes in environment that benefit malaria transmission.

Conclusion

Positive deviance, work and knowledge are variables that have a significant relationship with the incidence of malaria. Work is a variable that has the strongest relationship with the incidence of malaria in Manyamba Village, Tammerodo District, Majene District, West Sulawesi. Positive deviance behavior in the community can be used to prevent community events through active role of health cadres by forming healthy communities in the community.

Conflict of Interest: None

Source of Funding: Authors

Ethical Clearance: Obtained from Faculty Ethical Committee

References


Genetic Identification of Aplocheilus Panchax from the Waters of West Papua Using Molecular Approach for Preventing the Spread of Malaria

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Abstract

Aplocheilus panchax domesticated as candidates of broodstock is genetically identified in order to be cultivated and restocked. This research is aimed at identifying the gene of Aplocheilus panchax from the waters of West Papua. Samples were collected from several locations. In Sorong only seven samples were obtained due to the decrease of population of A. panchax, because increase population of predator. The length of the total genomes of A. panchax which were isolated ranged 20 and 30 kb. Their amplicon length was approximately 400 bp. The quality of DNA was excellent with high level of brightness, brighter than the DNA bands in the DNA marker. Cyt b sequences from the samples of KT_MKW_01 with forward and reverse primers were aligned and manually proof read to ensure that DNA sequences corresponded to the peak of electropherogram. The results of BLAST sequence obtained from real sequences from Cyt b gene of A. panchax had 99% similarity with GenBank and alignment indicated that point of polymorphism was not found. All the sequences had exactly similar nucleotide sequences, that the amplified Cyt b gene was a greatly conserved gene and 34 samples were grouped into the same haplotype based on fragment of Cyt b gene.

Key words: Cyt b gene, Kepala timah (Aplocheilus panchax), malaria, molecular genetics and waters of West Papua.

Introduction

Papuagovernment encounters difficulties in protecting its natural wealth and most importantly human beings that inhabit the area. The inhabitants of Papua cannot be separated from a terrible bogeyman, i.e. malaria. Furthermore, malaria is the number one killer in Papua with the incidence of cases in 2012 that about 231 thousand people suffered from malaria with an incidence rate of 96 cases per 1000 births. In addition, Papua according to news daily Republika ROL Online1 has the highest Parasitical Annual Index (API) in Indonesia by more than 20 per 1000 population, which is far from the MDGs target of about one or less than one. This is also supported by high disparity value of API between regions, especially in eastern Indonesia by more than 10 per 1000 population. There are several challenges in controlling malaria including: limited access to health care, continuity of coverage, quality of (microscopic) diagnosis and case management, cross program and cross sector synergies and increased potential risk factors for malaria. This makes malaria control very difficult due to disease-transmitting vector, i.e. mosquitoes existing in nature and is not easy to deal with. In addition, environmental aspects facilitate the reproduction of mosquitoes and drugs lead to resistance2.

Understanding the geographical distribution of molecular within a species is paramount to any attempts to conserve major genetic lineages, if such variance exists in the wild4,5. Kepala timah Aplocheilus panchax Hamilton inhabits the waters of Papua in both freshwater
and brackish waters that can be used as a bio-indicator of pollution of any water body. *Aplocheilus panchax* has a habit of eating mosquito larvae in nature. This makes Kepala timah serving as a natural pest controller (biopesticide), that it has the ability to eat malaria mosquito larvae, a terrible bogeyman for most of the people who live in Papua.

A well-maintained and unique nature that is different from other Indonesian regions. This is not only due to the number of species, but also its genetic diversity. It is associated with the complex formation of the islands (biogeography) and the isolation of certain places, which lead to high speciation. In regard to the aforementioned problems and potential, this research attempts to identify the genetics of Kepala timah from West Papua waters which can be domesticated as a candidate superior parents to be cultivated and restocked to nature in order to assist the local government program in the form of policy to prevent malaria transmission in West Papua.

This research aims to identify molecular genetics of Kepala timah from West Papua waters (Manokwari, Sorong and Oransbari) that in the next research will be domesticated to support the restocking efforts to nature, in order to assist the local government in controlling malaria in West Papua. Meanwhile, this research is beneficial to obtain a genetic data of Kepala timah from West Papua waters, which has the advantage of feeding on mosquito larvae in controlling malaria transmission in West Papua.

**Materials and Method**

**Place and Time**

The research was conducted for eight months from January to August 2016. It attempted to obtain genetic data of Kepala timah (*Aplocheilus panchax*) from West Papua waters that feed on mosquito larvae and is resistant to adverse environmental conditions so that it is able prevent malaria transmission in Papua.

The research was conducted in the sub-laboratory of Genetics and Molecular, Faculty of Fisheries and Marine Sciences, University of Papua. It included sample collection, sample extraction, samples in PCR and data analysis of sequence results that previously the samples had been sent to obtain the data of the sequence results.
was Cytochrome b gene. Amplification aimed to copy genes existing in mtDNA. The amplification process was performed using PCR, namely Gold program (Saiki et al. 1988) in accordance with a modified protocol of standard gold (Lourie 2005). The amplification firstly made a mixture between 1 mL of sample extraction and 24 mL of master mix (MM) consisting of ddH2O, 10X PCR buffer (Gold), dNTPs, MgCl$_2$, primers and Taq enzyme. The amplification process was performed in the (PCR) Thermal Cycler machine and using Taq Gold DNA polymerase as an enzyme in denaturing conditions of 94°C for 10 minutes, annealing of 50°C for 30 seconds and chain elongation of 72°C for 10 minutes, as many as 38 cycles. Primers were designed using Geneious Software (Biomatter) with PCR product ≥400 base pairs (bp). Sequences were downloaded from GenBank (http://www.ncbi.nlm.nih.gov). Phylogeny tree was constructed using Neighbor Joining method (NJ) (MEGA 5.2) with 1000 replication.

Results and Discussion

Genetic analysis of *Aplocheilus panchax*

Genetic analysis of *Aplocheilus panchax* in this research aimed to identify genetic diversity of some populations of *Aplocheilus panchax* from of waters Manokwari District, South Manokwari District and Sorong Municipality in West Papua Province. Information of genetic diversity is very important in determining the origin of parents to be used. The higher the genetic diversity of a population is, the better the resilience of the population from the disease will be. The genetic analysis in this research was carried out through several stages, namely: a. Collection of tissue samples, b. Isolation of total genome, c. amplification CYT B gene, and d. sequencing of Cyt B Gene.

Collection of tissue samples

Samples of *Aplocheilus panchax* used in this research were collected from several locations in the province of West Papua as shown in Table 1. Ten samples were taken from each location to represent the population in the location. In Sorong, only seven samples were obtained because the population of *Aplocheilus panchax* was decreasing. The researcher believes that the population of *Channa striata*, *Trichogaster pectoralis* and *Oreochromis niloticus* in Sorong area was presumably the cause of the small number of *Aplocheilus panchax* obtained. All samples were preserved in 96% ethanol and stored in the collection of sub-Laboratory of Genetics and Molecular, Faculty of Fisheries and Marine Sciences, University of Papua. Photos of some of the collected samples were presented in Figure 1.

<table>
<thead>
<tr>
<th>Location sample</th>
<th>GPS Position</th>
<th>Sample id.</th>
<th>Total Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amban Pantai, Manokwari</td>
<td>S: 00°49'06.3&quot; E: 134°04'53.0&quot;</td>
<td>KT_ Mkw</td>
<td>10 Individuals</td>
</tr>
<tr>
<td>SP7 Masni, Manokwari</td>
<td>S: 00°48'00.0&quot; E: 133°43'51.6&quot;</td>
<td>KT_ Msi</td>
<td>10 Individuals</td>
</tr>
<tr>
<td>Oransbari, Manokwari</td>
<td>S: 00°19'48.8&quot; E: 134°13'15.5&quot;</td>
<td>KT_ Ob</td>
<td>10 Individuals</td>
</tr>
<tr>
<td>Sorong</td>
<td>S: 00°50'00.1&quot; E: 131°14'29.7&quot;</td>
<td>KT_ Sr</td>
<td>7 Individuals</td>
</tr>
</tbody>
</table>

Total Genomic DNA Isolation

Total genomes of *Aplocheilus panchax* samples in this research were isolated with a length of between 20-30 kb (Geneaid, 2013). The success of the genome isolation of was characterized by the appearance of DNA bands on agarose gel stained with ethidium bromide. The electrophoresis results of agarose gel from all samples are shown in Figure 1.
Genome of *A. panchax* from Manokwari (Amban Pantai)

Genome of *A. panchax* from Manokwari (Oransbari)

Genome of *A. panchax* from Manokwari (Masni)

Genome of *A. panchax* from Sorong

**Figure 1. Electrophoresis Results of *Aplocheilus panchax* Genomes from Manokwari District, South Manokwari District and Sorong Municipality, West Papua Province. Photo: Lutfi.**

In general, the quality of the genome obtained was very good, which could be seen from the presence of a thick band at the upper part of the gel and a thin smear band elongated at the lower part. This elongated smear band could be due to DNA which was cut during the process of genome isolation, or the result of the remains of short RNA molecules. The less good quality of the genome could be seen at samples from Manokwari (id: KT_Mkw_15 and KT_Mkw_17). In this sample, the DNA band that appeared was only a smear band from the middle to the lower part of the gel. However, this condition was still good enough to be used as a template in PCR to amplify Cyt B gene. This was because the target genes of Cyt B to be amplified using primers L14841 and H15149 (Kocher et al. 1989) only had a length of approximately 300 - 400 base pairs.

Cytochrome b (Cyt B) Gene Amplicon

Cytochrome b gene amplification was performed in vitro using polymerase chain reaction (PCR). The 1 kb DNA marker was used as a marker. The length of amplicon obtained had a size of approximately 400 bp. The quality of DNA was very good with high levels of brightness, brighter than the DNA bands in DNA marker which had a concentration of 70 ng/µL for the brightest band of DNA marker (Thermoscientific 2012). This means that the concentration of DNA amplicon was higher than 70 ng/µL. This concentration was sufficient to be used in the sequencing stage. The electrophoresis results of PCR products are shown in Figure 2.
Cytochromeb (Cyt B) Gene Sequence

Sequencing reaction (nucleotide sequencing) in vitro with Sanger’s dideoxy termination method using labeled nucleotide (Dideoxynucleotide triphosphates). Sequencing reactions was conducted by 1st Base of Singapore, through PT. Genetikas Sains. The sequencing results were electropherogram in AB1 file format that was sent via email. This file could be read using MEGA5 software. Each sample was sequenced using two primers, namely forward and reverse primers.

Cyt B sequences of KT_Mkw_01 samples with forward and reverse primers were aligned to be manually proof read in order to ensure that the DNA sequences and its peak of electropherogram had matched. Sequencing this sample has a very good quality. The proof reading process of these sequences was performed using MEGA5 software. Forward and reverse primers were aligned with the sequences and cut on the limit. The result of combination of the two sequences. The total length of nucleotides obtained was 358 bp.

In order to ensure that Cyt B sequences obtained were correct Cyt B sequences of Aplocheilus panchax, a comparison was performed with GenBank database (http://www.ncbi.nlm.nih.gov) by using BLAST (basic local alignment search tools). The results of BLAST. The results of BLAST by Satiamarga indicated that the sequences obtained were correct sequences of cyt B genes from Aplocheilus panchax with 99% similarity to sequences from GenBank with the access code AB373005.1.

Until September 2016, sequencing had been carried out for 37 samples from Manokwari Amban Pantai (10 samples) and Masni (10 samples); Oransbari (10 samples); and Sorong (7 samples). All samples had a very good quality of electropherogram, except 3 samples from Masni with the ID numbers (KT_Msi_12, KT_Msi_15, KT_Msi_18). The alignment to 34 samples was carried using clustalW contained in MEGA 5 software (Appendix 1). The results of the alignment did not indicate any point of polymorphism. All the sequences had the exact similarity of nucleotide sequences. This suggests that the amplified Cyt B gene was a very conserve gene (having a very low mutation rate). Therefore, the 34 samples could be grouped into the same haplotype based on Cyt B gene fragment in this research.
Conclusions

The results of the alignment do not show any point of polymorphism. All the sequences have the exact similarity of nucleotide sequences. This suggests that the amplified Cyt B gene is a very conserve gene (having a very low mutation rate).

34 samples can be grouped into the same haplotype based on Cyt B gene fragment.

This research suggests that genetic diversity analysis should be performed using RAPD (Random Amplification of Polymorphic DNA).

Conflict of Interest : None

Source of Funding : Incentive Research Insinas grant (RT-2016-0245), Ministry of research, technology and higher education of the Republic of Indonesia.

Ethical Clearance : Obtained from University of Papua

References

The Effect of National Health Care and Motivation of Maternity Mothers in Health Care Facilities in the Working Area of Bantilang Health Center East Luwu Regency in 2018

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¹Institute of Higher Health Education, Mega Buana Palopo. Indonesia

Abstract

Social Security Organizing Agency (BPJS) is organized through a social insurance mechanism and the BPJS membership is all Indonesian citizens without exception. Objective: To determine the effect of national health care and motivation of mothers giving birth in health care facilities in the work area of Bantilang Health Center East Luwu District in 2018 Method: This study used a cross sectional method. The population in this study were all obstetric patients at the time of the study. The sample in this study were some obstetric patients both from Maternity Mothers Care (KIA) and Family Planning (KB) Polyclinics and the delivery room (Inpatient) at the time of the ongoing study who were willing to become respondents using purposive sampling technique. Data collection using questionnaire research instruments and processed using SPSS program and distribution with distribution tables and bivariate analysis tables. Results: Univariate analysis looked for frequency distribution while bivariate analysis looked for the influence of each variable where National Health Insurance (JKN) variable (p = 0.000) and motivation (p = 0.003). Conclusion: There is an effect of national health care and motivation of mothers to give birth at health care facilities in the work area of Bantilang Health Center East Luwu District in 2018

Keywords: Maternity Mothers, Health Care Facilities, National Health Insurance and Motivation

Introduction

Health is the basic right of every person, all citizens have the right to receive health services, including the poor¹. In 2014, the government implemented a National Health Insurance (JKN) program organized by the Social Security Organizing Agency (BPJS)². This BPJS is expected to meet the needs of citizens for health services. Based on data from the East Luwu Health Service, the number of JKN participation in the District. In 2016, East Luwu was 1,722,111 people, while in 2017 there were 2,597.53 people. KIA annual report, namely coverage of assistance by health workers as many as 5,671 maternity mothers from the target target of 6,234 mothers giving birth.

Based on the PWS KIA report on the Bantilang Health Center in East Luwu Regency, the number of maternity mothers at home or non health facilities in 2015 was targeted for 119 maternity mothers where there were 108 maternity facilities at 11 maternity facilities and a target in 2016 as many as 131 women giving birth in health facilities as many as 115 mothers giving birth while non-health facilities are as many as 16 people and in 2017 the target of maternity mothers is 148 women giving birth in health facilities as many as 130 women giving birth while non-health facilities are 18 person. In a previous study conducted by Melina¹ that the results of analysis with the chi square test obtained a significance value of 0.000, because the significance value (p-value) was obtained at 0.000 smaller than 0.05 (p < 0.05), the statistics show that there is a relationship between the use of national health insurance and the achievement of coverage of target services for pregnant women at Banguntapan II Health Center, Bantul Regency in 2016. From the results of Zahruddin’s study, it was shown that half of the respondents in Jrangoan Community Health
Center considered that subjective norms were very instrumental in supporting the delivery community to health facilities. There are three aspects assessed in this regard, namely community support, husband support and parental support. Based on the description above, the researchers are interested in conducting research with the title “The Effect of National Health Insurance and Motivation of Maternity at Health Service Facilities in the Bantilang Community Health Center Working Area in East Luwu Regency in 2018”.

**Materials and Method**

**Research design**

This research is a quantitative research with analytical survey method using crossectional research design where the independent variable and dependent variable data are taken at the same time to identify factors related to JKN role on maternal motivation in health care facilities in Bantilang Health Center, East Luwu Regency in 2018.

**Location and Time of Research**

1. Research Sites: Research locations in Bantilang Health Center, East Luwu Regency.

**Population and Samples**

The population in this study were all women giving birth at the time of the study that took place with a population of 98 people. The sample in this study was that some women gave birth at the time of the study that were willing to be respondents with a total sample of 49 people. By using a purposive sampling technique. The results of this study are presented in the form of frequency distribution tables as follow.

**Results**

**Univariate Analysis**

**Maternity Facilities**

Based on maternal facilities at Bantilang Community Health Center in East Luwu Regency in 2018 was highest in health facilities as many as 44 people (89.8%) while the lowest was in non-health facilities with 5 (10.2%).

**National Health Insurance (JKN)**

<table>
<thead>
<tr>
<th>National Health Insurance</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>45</td>
<td>91.8</td>
</tr>
<tr>
<td>No</td>
<td>4</td>
<td>8.2</td>
</tr>
<tr>
<td>Total</td>
<td>49</td>
<td>100</td>
</tr>
</tbody>
</table>

Distribution based on national health insurance in the East Java Community Health Center in 2018 has the highest JKN of 45 people (91.8%) while the lowest in not having JKN with 4 (8.2%).

**Motivation**

<table>
<thead>
<tr>
<th>Motivation</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>44</td>
<td>89.8</td>
</tr>
<tr>
<td>Less</td>
<td>5</td>
<td>10.2</td>
</tr>
<tr>
<td>Total</td>
<td>49</td>
<td>100</td>
</tr>
</tbody>
</table>

Distribution based on maternal motivation in Bantilang Community Health Center in East Luwu Regency in 2018 was the highest in good motivation with 44 people (89.8%) while the lowest in motivation was 5 people (10.2%).

**Bivariate Analysis**

National health insurance
Table 4. Influence of JKN with Maternity in Health Facilities with in Bantilang East Luwu Regency in 2018.

<table>
<thead>
<tr>
<th>No</th>
<th>National Health Insurance</th>
<th>Maternity Health Facilities</th>
<th>Health Facility</th>
<th>Non Health Facility</th>
<th>Total</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>1</td>
<td>Yes</td>
<td>44</td>
<td>89.8</td>
<td></td>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td>2</td>
<td>No</td>
<td>0</td>
<td>0</td>
<td></td>
<td>4</td>
<td>100</td>
</tr>
</tbody>
</table>

Based on the results of statistical tests using SPSS version 20 with the chi-square statistical test, it can be seen that the chi-square values obtained are 000, which means <value of α, 05 which means Ha is accepted which means there is an influence of national health insurance with maternity at the service facility health in the working area of the Bantilang Community Health Center in East Luwu Regency in 2018.

Motivation

Table 5. Effects of Motivation with Maternity in Health Facilities with Bantilang Health Center East Luwu Regency in 2018.

<table>
<thead>
<tr>
<th>No</th>
<th>Motivation</th>
<th>Maternity Health Facilities</th>
<th>Health Facility</th>
<th>Non Health Facility</th>
<th>Total</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>1</td>
<td>Good</td>
<td>44</td>
<td>100</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>Less</td>
<td>0</td>
<td>0</td>
<td></td>
<td>5</td>
<td>10.0</td>
</tr>
</tbody>
</table>

Table shows the highest percentage with good motivation to choose maternity in health facilities as many as 44 people (100%) while the lowest percentage with less motivation by choosing labor in non-health care as much as 5 people (100%) of the total respondents as many as 49 people. The chi-square statistical test obtained are 000 which means <value α, 05 which means Ha is accepted which means there is an influence of motivation with maternity at health care facilities in the working area of Bantilang Community Health Center, East Luwu Regency in 2018.

Discussion

National Health Insurance

The results of this study indicate that JKN is a community need for national health insurance which is a necessity for basic and high levels. Basic level needs are needs that can be satisfied from the outside, for example physiological needs and the need for security. While high level needs are needs that can only be satisfied in the person concerned, for example the need for appreciation and self-actualization\(^{8,9}\). To certify the JKN program the role of all cross-sectors is needed to provide understanding and information to the public about the benefits of JKN so that the community can be motivated and can increase the coverage of universal and universal health services. The results of the above research indicate that the National Health Insurance (JKN) is part of the National Social Security System (SJSN). The National Social Security System is organized through a mandatory social health insurance mechanism based on Law No. 40 of 2004 concerning the National Social Security System. The aim is that all Indonesian citizens be protected in the insurance system, so that they can meet the basic needs of proper public health\(^{10-12}\). The results of the study are in line with the research conducted by Melina (2016). The results showed that pregnant women who used JKN whose achievement of coverage coverage for pregnant women reached 38 people (73.1%) and achieved the
target coverage of services for pregnant women as many as 14 people (26.9%).

Contingency coefficient values are $C = 0.502$ Thus it can be concluded that the closeness of the relationship of the contingency coefficient is moderate (0.40-0.599). The maintenance guarantee factor is one of the important factors for the community today where having a health care guarantee the community feels more protected if one day they are stricken with an illness because having health insurance they can be freed from medical expenses. Mothers who have not become BPJS members have reasons that different. The results showed that pregnant women were not yet members of the BPJS because they did not know how to take care of it, were in the process of being managed. Even though the Minister of Health of the Republic of Indonesia announced in 2019 the entire Indonesian community has been included as a member of the BPJS. One guarantee of maternity is the guarantee of childbirth. Collateral guarantee is a guarantee of funding for delivery services which includes prenatal care, delivery assistance, postpartum care, including postpartum family planning services and newborn services. In the process of implementing the National Health Insurance Program (JKN) to provide health protection in the form of health care benefits in order to meet basic health needs given to everyone who has paid contributions or fees paid by the government.

Motivation

Based on the results of statistical tests using SPSS version 20 with the chi-square statistical test it can be seen that the chi-square values obtained are 000 which means $<\text{value } \alpha, 05$ which means $H_0$ is accepted which means there is an influence of motivation with maternity at health care facilities in the working area of the Bantilang Community Health Center in East Luwu Regency in 2018. The research above shows that motivation is an internal drive that causes the person to carry out certain activities in order to achieve a goal. Expectations for Health facilities are health service facilities used for carry out individual health care efforts, both promotive, preventive, curative and rehabilitative organized by the Government, Regional Government and or Society. The results of this study are in line with the research by Zahruddin showing that half of the respondents in Jrangoan Health Center considered that subjective norms were very instrumental in supporting the delivery community to health facilities. Whereas based on the results of multiple linear regression tests, it was shown that the normative beliefs of giving birth to health facilities and the motivation to deliver to health facilities had a significant effect on subjective norms. Subjective norms are formed by two components, namely the normative belief in giving birth to health facilities and the motivation to deliver to a health facility. There are three aspects assessed in this regard, namely community support, husband support and parental support. The influence of motivation to health facilities is influenced by the most influential aspect in this case is the support of parents on the sub-variables of normative beliefs and community support in the sub-variables of labor motivation to health facilities. This result means that in deciding to implement or not deliver to a health facility, pregnant women and postpartum mothers are influenced by their social environment (significant others), namely the support of parents and support from the community or someone who becomes a preference. The absence of support from parents and the motivation of the community to give birth to health facilities causes the low desire of pregnant women to give birth to health facilities. The role of cross-sector in increasing motivation to Health Facilities in order to carry out individual health care efforts, both promotive, preventive, curative and rehabilitative organized by the Government, Regional Government, and or Community: First Level Health Facilities, hereinafter abbreviated as FKTP, are health facilities that carry out non-specialist personal health services for the purposes of observation, promotion, prevention, diagnosis, care, treatment, and/or other health services (BPJS, 2016). People as users of health services will provide an assessment that quality health services as a form that can meet the needs because it is organized by: 1) Courteous and polite, timely, responsive, 2) Able to cure illnesses, 3) Able to prevent the development or the spread of the disease suffered to other people or the disease gets worse. For health care providers linking quality health services with: 1) Equipment independence, 2) Work producer or protocol, 3) Professional freedom in carrying out every health service in accordance with the latest health technology and, 4) How is the outcome or outcome of health services implemented, 5) For funders of health services To be able to improve public health, there are many things that need attention. One of them which is considered to have a quite important role is to provide health services. What is meant by health
services is every effort that is held alone or jointly in 
an organization to maintain and improve health, prevent 
and cure diseases and restore the health of individuals, 
families, groups and / or communities. Requirements 
for good health services can at least be distinguished 
from 13 types, namely available, comprehensive 
(comprehensive, integrated), continuous, equitable, 
sustainable, appropriate, acceptable (acceptable), 
accessible (affordable), affordable (effective), effective 
(efficient), and quality.

Conclusion

1. There is an influence of national health insurance 
   with maternity at health service facilities in the working 
   area of Bantilang Community Health Center, East Luwu 
   Regency in 2018. Statistical test results using SPSS 
   version 20 with chi-square statistical test can be It is seen 
   that the chi-square value is obtained, 000, which means < value of α, 05 which means Ha is accepted. 2. There is 
   an influence of motivation with maternity at health care 
   facilities in the working area of Bantilang Community 
   Health Center, East Luwu Regency in 2018. The results 
   of statistical tests using SPSS version 20 with the chi-
   square statistical test can be seen that the chi-square 
   value is obtained which is 0,000 which means < value α, 
   05 which means Ha is accepted.

Conflict of Interest : None

Source of Funding : Institute of Higher Health 
Education, Mega Buana Palopo. Indonesia

Ethical Clearence : Obtained from Institute of 
Higher Health Education, Mega Buana Palopo.

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The Effect of Granisetron and Ondansetron on Hemodynamic During Cesarean Section Under Spinal Anesthesia

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Abstract

Spinal anesthesia is the most popular technique of anesthesia for Caesarean section (Cs) which is frequently associated with hypotension and bradycardia. Hypotension is harmful for maternal and fetal outcome. The Bezold–Jarisch reflex (BJR) is one of the mechanisms which explain the occurrence of hypotension after spinal anesthesia through serotonin-mediated vasodilatation. These receptors located peripherally as cardiac chemoreceptors on the cardiac vagal afferent and centrally in the chemoreceptor trigger zone. The aim of our study was to evaluate the effect 5-hydroxytryptamine 3 (5-HT3) receptor antagonists between Granisetron and Ondansetron on hemodynamic in parturients undergoing Cs with spinal anesthesia. Forty patients underwent Cs under spinal anesthesia randomly divided into two groups (20 parturients in each group). Group G received intravenous 0.03 mg/kg Granisetron 30 min before spinal anesthesia, group O received intravenous 0.1 mg/kg Ondansetron. Mean Arterial Blood Pressure (MABP), Heart Rate (HR), and vasopressor used were assessed. MABP changes was higher in group O compared to group G (p<0.05), although this result was not statistically significant (p>0.05). However, incidence of nausea and vomiting was significantly decreased in group G (p<0.05). Granisetron and Ondasetron have similar effect in prevent hemodynamic changes during Cs under spinal anesthesia.

Keywords: Granisetron, Ondansetron, hemodynamic, Caesarean section, spinal anesthesia.

Introduction

Spinal anesthesia is the most popular technique of anaesthesia for Cs, which is frequently associated with hypotension and bradycardia. Hypotension is harmful for maternal and fetal outcome. Hypotension resulted from the decrease in systemic vascular resistance and central venous pressure due to sympathetic block. Sudden bradycardia may occur from shift in cardiac autonomic balance toward the parasympathetic system.2,3

Ondansetron and Granisetron are selective 5-HT3 receptor antagonists. These receptors located peripherally as cardiac chemoreceptors on the cardiac vagal afferent and centrally in the chemoreceptor trigger zone. On the other hand, the BJR is one of the mechanisms which explain the development of hypotension after spinal anesthesia through serotonin-mediated vasodilatation. Stimulation of cardiac chemoreceptors in the heart due to decreased in venous return increases parasympathetic activity, while decreases the sympathetic activity resulting in hypotension and bradycardia.2,3 From systematic review and meta-analysis, Heesen et al. in 2016 suggested 5-HT3 receptor antagonist were effective in reducing the incidence of hypotension and bradycardia.1 The effect are only significant in patients undergoing Cs, therefore in this study, we evaluated the effect of Granisetron and Ondansetron on the hemodynamic and side effects following spinal anesthesia in women undergoing elective Cs.

Materials and Method

This study was conducted at Mother and Child Hospital in Makassar, Indonesia between February and March 2018. Institutional ethical committee approval
and informed written consent were obtained from all patients. Participants were evaluated one day before surgery by an anaesthesiologist. Obstetric patients with ASA Physical Status (PS) II, between 20 and 45 years old, and undergoing an elective CS were included. Patients who refused to participate, had any contraindications to spinal anesthesia, history of hypersensitivity to local anesthetic agent, bleeding disorder, hypertensive and cardiovascular disorders in pregnancy were excluded. For eligible patients, demographic information was collected and a physical examination was performed. Age, BMI, and ASA PS class were recorded and analyzed.

In the pre-anesthesia room, baseline value recorded, non-Invasive blood pressure (NIBP) and HR were recorded and a peripheral 18-Gauge i.v. cannula was inserted. Patients were randomly assigned to receive 0.1 mg/kg Ondansetron (group O) or 0.03 mg/kg Granisetron (group G) 30 min before spinal anesthesia, where each group consists of 20 parturients. All patients received i.v 50 mg Ranitidine and preloading with 10 mL/kg Ringer’s lactated solution given over 15 min. The spinal technique was performed at L3-4 or L4-5 with the patient in the left lateral decubitus position. The 10 mg 0.5% hyperbaric bupivacaine with adjuvant 25 mcg fentanyl was administered after confirmation of cerebrospinal fluid through a 25- or 26-Gauge Quincke spinal needle. Patients were immediately placed in the supine position with 15° left tilt. The second anesthesiologist was blinded to the study solution, measured hemodynamic parameters and recorded the presence of nausea and vomiting.

HR and MABP were recorded before spinal anesthesia and at 2-min intervals up to 15 min, followed by 30-min intervals until the end of surgery. Rescue i.v. bolus doses of 10 mg ephedrine were given if the parturient had hypotension (hypotension was defined as a decrease in SBP <90 mmHg or in MABP more than 20% from the baseline). Decrease in HR to less than 50 beat/min was treated with 0.5 mg atropine sulphate intravenous.

The Statistical Program SPSS (SPSS Inc., Chicago, Illinois, USA) for Windows, version 25, was used for data entry and analysis. Data were expressed as number and mean ± SD for quantitative variables. Categorical variables were analyzed using Chi-squared test or Fisher’s exact test. Numerical variables normally distributed were compared between groups by Student’s independent samples t-test with p<0.05 was statistically significant.

Results

Forty patients were recruited: 20 parturients in each group. No significant differences were observed in patients demographic (age, BMI, and ASA PS) between the two groups (p>0.05). The incidence of nausea and vomiting significantly reduced in group G (see Table 1).

MABP and HR were observed in the two groups. The difference in time of measurement in each group was observed. MABP changes was higher in group O compared to group G (p<0.05), although this result was not statistically significant (p>0.05) (see Figure 1). There was no difference of HR changes between the two groups (p>0.05) (see Figure 2).

| Table 1. Demographic details and side effect by each group |
|----------------------------------|-----------------|-----------------|-----------|
|                                  | Group G (n=20)  | Group O (n=20)  | p value   |
| Age (years)†                     | 28.95±4.45      | 28.55±6.32      | 0.818     |
| BMI (kg/m²)†                     | 25.38±2.24      | 25.88±2.74      | 0.532     |
| ASA PS‡                          | 20 (100)        | 20 (100)        | 1.000     |
| Nausea/Vomiting §                | 0(20)           | 5(20)           | 0.047*    |
| Vasopressor Use §                | 0               | 0               | -         |

Data presented in number of patient (n) or mean±SD. *,p<0.05, analyzed with Fisher’s exact test. †: analyzed with Student’s independent samples t-test, ‡: analyzed with Chi-square test. § : analyzed with Fisher’s exact test.
Discussion

Sympathetic blockade from spinal anesthesia decreases systemic vascular resistance and induces peripheral pooling of blood leading to hypotension. In response to hypovolaemia, stimulation of cardiac sensory receptors in the left ventricle induces the BJR and results in reflex bradycardia, vasodilation and hypotension. Chemoreceptors are activated in response to decreased blood volume by serotonin. Activation of 5-HT3 receptors, which are G protein coupled, ligand-gated fast-ion channels, results in increased efferent vagal nerve activity which frequently producing bradycardia. However, bradycardia occurs less frequently than hypotension following spinal anaesthesia.6,7,8

Ondansetron and Granisetron, although both of them from the same category and have same mechanism of action, may be due to the action of Ondansetron on mixed receptors and the high selectivity of Granisetron on 5-HT3 receptors, but it has minimal affinity for other 5-HT receptors, adrenergic, histaminic, dopaminergic, or opioid receptors.10,11

In the present study, two 5-HT3 antagonists, Ondasnetron and Granisetron, as they block the BJR and may successfully treat postspinal hypotension, were used prophylactically and given 30 min before spinal anesthesia. The important finding in this study is that, despite the reduction in MABP changes in Ondasetron group higher than Granisetron group, there were no statistically difference in MABP changes in the two groups.

Our findings is consistent with study by Mahmoud and Shaaban in 2017 showed that prophylactic intravenous 4 mg Ondansetron or 1 mg Granisetron compared to saline as placebo were significantly reduced the severity of hypotension induced by spinal anesthesia.6 In our study, we gave prophylactic 0.03 mg/kg Granisetron and 0.1 mg/kg Ondansetron 30 min before spinal anesthesia. It showed there were no difference in hemodynamic changes and there was no incidence vasopressor use in each group.

This study showed that Granisetron and Ondansetron have protective effect on hemodynamic response during Cs. Our results indicated that Ondansetron and Granisetron prevented the serotonin-induced BJR, suppressed venodilatation, augmented venous return to the heart and resulted in lesser reductions in MABP.10

Limitations of this study were small sample size, used one dose of each drugs only, and amount of blood loss was not recorded in this study, which may influence the hemodynamic profile of parturients. We recommend further studies with larger sample size and large doses of Granisetron and Ondansetron to evaluate the effect on hemodynamic.

Conclusion

Granisetron and Ondansetron has similar effect on preventing hemodynamic changes during Cs under spinal anesthesia.

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The Accessibility of Health Services for Multiethnic Community Towards Universal Health Coverage in Samarinda City: A Qualitative Study

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Introduction

Since January 1, 2019, Indonesia has entered the era of Universal Health Coverage (UHC) that is sustainable. This success is considered an innovation in the coverage of almost all communities to be able to access available health services. In some districts / cities, the membership of the National Health Insurance System (NHIS) does not cover 100 percent, such as Samarinda. This has an impact on the low universal coverage of NHIS, so that citizens experience obstacles to accessing the health services they need.

Methods: There are four focus group discussions (FGD), which are made according to large ethnic groups in Samarinda, namely the Banjar, Javanese, Bugis and Dayak ethnic groups. The discussion participants were almost all housewives, they were considered to have a high level of concern for their household health problems, and eight main informant interviews. Content analysis was used to explore the phenomena that emerged in this study.

Results: Findings show that approachability dimensions (distance traveled, travel time, and transportation costs), including health insurance coverage, are a problem for some multi-ethnic communities. Although there was no discrimination in vulnerable groups such as the elderly and pregnant women, it was revealed that other patients felt different treatment when receiving services. Available health facilities are considered adequate. However, the number of health workers (doctors and paramedics), is considered lacking. The low level of government attention and lack of socialization from the Social Security Agency of Health (SSAH) are considered as obstacles to achieving UHC in Samarinda City.

Conclusion: There are still obstacles to access for ethnic groups who are located far from the city center. Revealed the existence of ‘discrimination’ patients when using health care facilities.

Keywords: accessibility, multiethnic community, universal coverage, Samarinda city.

Introduction

The National Health Insurance System (NHIS) is a part of the National Social Security System (NSSS) which was implemented since 2014, using a mandatory social health insurance mechanism based on Law Number 40 of 2004. The law is concerning the NSSS with the aim of meeting the basic needs for decent public health, given to everyone who has paid contributions or fees paid by the government.1

NHIS management carried out by the Social Security Agency of Health (SSAH) based on Law Number 24 of 2011, aims to realize the implementation of guarantee, fulfillment of basic needs for a decent life for each participant and/or family members.2

Decentralization of government since 2001 has increasingly increased health system heterogeneity and worsening equity disparity.3 The UHC system in Indonesia initiated in 2014 focused on accommodating
diversity with flexible and adaptive implementation features and quick evidence-driven decisions based on changing needs. UHC is one way to reduce disparity in access to health services.\(^4\)

Since January 1, 2019, Indonesia has entered an ongoing era of UHC. This success is assessed as an innovation in the coverage of almost all communities to be able to access available health services.\(^3\) Some districts/cities in Indonesia, SSAH membership coverage has not reached 100 percent including Kota Samarinda.\(^5\) This has caused people experiencing difficulties in accessing health services that they need.

This study employed qualitative research on the accessibility of health services to multi-ethnic communities, in Samarinda City supporting UHC. This study aims to explore dimensions that affect the accessibility of multi-ethnic communities to support UHC and the achievement of Sustainable Development Goals (SDGs) 2030.\(^6\)

**Theoretical framework**

The theoretical concept of the five accessibility dimensions of Levesque, et al.\(^7\) was modified as a conceptual framework for this study. Access is defined as an opportunity to achieve and obtain appropriate health services in situations that are deemed necessary for care.\(^8\) Access is seen as a result of interactions between the characteristics of people, households, physical and social environment and characteristics of health systems, organizations and providers.\(^9\)

The concept of five dimensions of service accessibility includes Approachability; 2) Acceptability; 3) Availability and accommodation (Availability and accommodation); 4) Affordability; 5) Appropriateness.

**Conceptual definition used**

In this study, the concept of five dimensions of health service accessibility was modified to explore the dimensions of accessibility of health services to multi-ethnic communities in the city of Samarinda to utilize health facilities.

1) Approachability is the distance to get health services in the form of mileage, travel time, and travel costs (geographical access), including health insurance coverage.

2) Acceptability is that services provided do not conflict with customs, needs, beliefs, public trust, there is no discrimination in providing services, especially for vulnerable groups (not capable) and how people perceive service quality.

3) Availability and accommodation is that all types of health services needed by the community are not difficult, as well as their presence in the community at any time needed (availability of infrastructure, adequate health equipment, pharmaceuticals (medicines) and health human resources (doctors, midwives and nurses).

4) affordability is the financial capacity of the community to utilize health services (description of community work, socio-economic status and income picture).

5) Appropriateness is the need for health services with services provided in accordance with community demand; and community perceptions in accordance with services provided by providers (health care providers).

This dimension of accessibility allows individuals or households to plan, choose, utilize and feel satisfaction with the health services they obtain.

**Materials and Method**

**Selection of participants**

The selection of Focus Group Discussion (FGD) participants was purposive sampling with the following criteria; they have or are currently using health facilities; always be alert and responsive to maintaining the health of his family; influential in making decisions on the utilization of health facilities; and willing as a participant. Key informants are selected purposively based on their relevance to health service policies; community leaders, and traditional leaders.

The target population for this study was 4 ethnic communities (Banjar, Javanese, Bugis, and Dayak ethnic groups). The number of discussion participants was 8 people each group (n=32). Key informants were 4 people from service providers, and 4 people from community leaders and traditional leaders (n=8).

**Data collection and analysis**

Accessibility of Health Services in the Multi-Ethnic Community Towards UHC in Samarinda City was explored through 4 Focus Group Discussion
(FGD) groups and 8 key informant interviews. FGDs are conducted in open spaces and halls where communities usually gather. In-depth interviews were conducted at the office or at the key informant’s home. FGDs and in-depth interviews were conducted after obtaining informed consent from participants and key informants. Interviews and discussions focused on the 5 dimensions of accessibility of health services including: approachability, acceptability, availability and accommodation, affordability and appropriateness. Data analysis used content analysis to analyze the phenomena found in the study.

**Results**

Focus group discussions of 32 participants (n=32), as many as 30 people (93.75%) were women. Therefore, almost all participants were housewives. There were 8 key informants of which 4 key informants were heads of the community health center and 4 other key informants were community leaders and traditional leaders (n=8).

This study uses the accessibility model of Levesque et.al. which has been developed according to the context of local communities and the policies of the Indonesian government. There are 5 dimensions of accessibility including approachability, acceptability, availability and accommodation, affordability, and appropriateness.

**Approachability**

Accessibility of proximity includes distance, travel time, transportation costs and ownership status of health insurance.

Mileage to health care facilities, especially hospitals, each ethnicity is different depending on its geographical location, but can be accessed by public transportation or private vehicles, and motorbikes. For ethnic communities that are close to urban areas (Javanese, Banjar and Bugis), they are relatively not constrained by the distance. Unlike the Dayak ethnic group, having difficulty accessing health center and hospitals, it takes around 30 kilometers.

Travel time to health service facilities for ethnic communities domiciled around Samarinda city (Javanese, Banjar and Bugis ethnic group) between 6-18 minutes using a motorcycle or car. Whereas with the Dayak ethnic group, it took almost 1 hour to get to the hospital.

In focus discussions, participants argued that travel costs were perceived as an economic obstacle due to extra expenses, although these costs varied according to the distance traveled and transport facilities used. For the Banjar, Javanese and Bugis ethnic group, because they live around the center of Samarinda, the average cost is Rp. 10,000, up to Rp. 20,000, - one way. Unlike the Dayak ethnic group who have to spend around Rp. 50,000, one way.

Regarding the ownership status of NHIS, in 4 discussion groups it turned out the participants were very diverse. Those who have been included as NHIS participants, most feel happy to have used their cards to meet their medical needs. Unlike the participants who have not been included in NHIS membership, they feel the cost constraints if they want to use health services.

Regarding the ownership status of NHIS, in 4 discussion groups it turned out the participants were very diverse. Those who have been included as NHIS participants, most feel happy to have used their cards to meet their medical needs. Unlike the participants who have not been included in NHIS membership, they feel the cost constraints if they want to use health services.

On the other hand, the population of Samarinda City itself, the coverage of NHIS participation has not yet reached the Universal Health Coverage (UHC) target, still 81 percent.

**Acceptability**

Acceptance accessibility includes perceptions of service quality and discrimination in health services.

Public acceptance of the presence of modern health services is quite good. There are no significant obstacles to enjoying the medical needs of all ethnic group, both indigenous and immigrant ethnic group. Dayak ethnic group who still take good care of their culture and customs, have apparently relied on modern health services.

In the discussion it was revealed that participants were almost totally not familiar with the treatment system and care of their ancestors. Knowledge and traditional medicine systems are no longer an option, except occasionally using herbs such as betel leaves for the efficacy of reducing certain diseases. Even so, several cases of childbirth were handled by TBAs. Actions carried out by TBAs such as umbilical cord are
given powder, umbilical cord given coffee which finally festering.

**Availability and accommodation**

Some key informants from the service providers, stated that the condition of the infrastructure, the completeness of health equipment, the availability of medicines and the number of health workers (doctors and paramedics), were adequate. However, they admit that they still need an increase in the quantity and capacity of the availability of health facilities to be able to provide quality services.

**Affordability**

Accessibility of the users ability can be observed from the description of the work and income of the family head.

Job descriptions for the Javanese ethnic group are generally building coolies, Bugis ethnic group as fishermen and farmers, Dayak ethnic group as a farmers and Banjar ethnic group as farmers and traders.

The income picture of the multi-ethnic community is closely related to the type of work, so it is very varied, daily workers such as construction workers are around Rp. 75,000 / day or Rp. 180,000 per month. Fishermen can reach Rp. 100,000, - per day or Rp. 3,000,000, - while farmers are around Rp. 5,000,000 / month. Farmer’s income is around Rp. 3,000,000 per month. Those who work as traders earn an average of Rp. 4,000,000 per month.

** Appropriateness**

Accessibility in the form of suitability of demand with health services; and perceptions of services provided in accordance with health service providers.

The comments of several discussion participants stated that the service provided was good enough, hopefully this will continue. They do not doubt the professionalism of health workers who provide services. Meanwhile, several key informants said that they were in line with the operational standards of the minister of health regulations.

**Discussion**

Affordability of health care facilities for multi-ethnic communities in Samarinda City is closely related to the problems of distance, travel time, and transportation. This will effect the economic burden of the household, due to the costs that must be spent from their pockets to access the health services. The transportation costs comes from their daily expenses. This obstacle has an effect on the delay in achieving UHC. Potentially, health service needs are influenced by distribution, distance, and means of transportation.

This study revealed the complexity of managing and utilizing NHIS, among participants who were not the member of NHIS, they chose to pay for themselves because they did not want to be involved in the complexity due to uncertainty waiting for NHIS cards to arrive, and other administrative problems.

The emergence of ‘discriminatory’ treatment when receiving health services. This will cause patient discomfort. Participants for this study argued that every health problem should be treated equally. Experience in Cape Coast, Ghana showed that the main obstacles to subscribing to health insurance include; long queues and waiting times, and negative attitudes of service providers.

In East Kalimantan province alone, there have been 5 districts/cities won UHC awards. This is different from Samarinda city which has not yet reached the UHC target. Whereas the city government of Samarinda has improved the SSAH management counter facilities in each sub-district and sub-district, socialization of SSAH to all levels of society and every citizen who comes to the location must be informed, as well as door to door socialization. The ineffectiveness of SSAH outreach was also revealed in discussions that participants were still not covered by NHIS, there were also dropouts. The multi-ethnic approach model as carried out in this study can be used to help in socializing UHC achievements in Samarinda City.

One sensitive issue that emerged among discussion participants, i.e. the health service users still had to pay from their pocket when receiving the services, this would be an economic burden. Many patients purchased drugs in the private pharmacy because they were not available at the health facilities, especially for those who are not easy to have cash. The same case occurred in Addis Ababa when the beginning of the Economic Basic Health Insurance (EBHI) implemented. This condition shows that there are still obstacles to the use of health services.

This study emphasizes the need for intensive
socialization to foster positive perceptions of SSAH management. This is expected to increase the participation of NHIS, thus supporting the achievement of UHC in Samarinda City. Health center as the leading gate-keeper of health services is expected to optimize the Mobile Health Center as an effort to glue the imbalance of health services due to obstacles to geographical access especially to ethnic Dayak communities.

**Conclusion**

The accessibility of health services to multi-ethnic communities in Samarinda City was adequate. Although there was no discrimination in health services for vulnerable groups, other patients felt different treatments when receiving health services. The overall coverage of NHIS participation had not yet become a barrier to achieving UHC in Samarinda City.

**Conflict of Interest**: None

**Source of Funding**: Authors self

**Ethical Clearance**: Obtained from Public health faculty

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The Role of Estrogen and Progesterone Hormone Imbalance in Premenstrual Syndrome of Female Adolescent

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Abstract

**Background:** Teenagers with menstrual cycle still experience one or more symptoms of Premenstrual Syndrome (PMS). High estrogen levels and imbalance of estrogen and progesterone cause PMS symptoms.

**Research objective:** Identifying the role of estrogen and progesterone hormone imbalance on PMS in female adolescent.

**Research method:** using a non-experimental design, using a cross sectional approach with 40 samples.

**Conclusion:** The imbalance of the estrogen and progesterone hormones plays a role in the degree of premenstrual syndrome. The high imbalance of the hormones estrogen and progesterone will cause a low degree of premenstrual syndrome.

**Keywords:** estrogen, progesterone, premenstrual syndrome, female adolescent

**Introduction**

Menstruation is one sign of puberty in women. At present the average age of menstruation is getting earlier. The youngest age for menstruation is 8 years while the oldest age is 17 years. The better nutritional conditions accelerate the body’s readiness to start menstruation in girls. In addition, information about sex that is more easily obtained from various media today can also trigger the brain to immediately activate sexual hormones. So that when it reaches the age of 17 years old, a woman has not yet experienced menstruation, she must immediately see a doctor because it indicates a disruption in reproductive function¹.

The symptoms that arise before the menstrual period are expected to be a disruption to daily activities in adolescent girls during menstruation. According to Dickerson et al (2005), about 85% of young women who still get the menstrual cycle experience one or more symptoms of Premenstrual Syndrome (PMS)².

PMS or pre-menstrual syndrome is a condition where a number of symptoms occur just before menstruation, symptoms usually occur 7-10 days before menstruation and disappear when menstruation begins. These symptoms are physical and psychological disorders, physical complaints such as breast pain or swelling, flatulence or pain, headache, joint pain, back pain, nausea, vomiting, diarrhea or constipation, and the appearance of skin problems such as acne. Psychological problems include depression, sensitivity, irritability, sleep disorders, fatigue, weakness, and sometimes very rapid mood swings².

The prevalence of PMS is quite high, which occurs in around 70-90% of women of childbearing age and is more often found in women aged 20-40 years. Women who have given birth will be at higher risk of suffering from PMS. The exact cause of PMS is unknown³.

It is estimated that 13-19% of reproductive-age women experience PMS, 3-8% even experience premenstrual dysphoric disorder (PMDD)⁴. Ashraf (2014) even stated that the prevalence of STDs reached 48% and the highest prevalence was in Asia and the lowest in Europe⁵.

The results of a study conducted in Iran found that 98.2% of students aged 18-27 years experienced at least 1 mild or moderate degree of premenstrual syndrome. The overall evidence suggests that premenstrual syndrome is
a form of disorder commonly experienced by teenagers in Asia. Another study conducted by Locklear, 2010 found results that Justicia pectoralis Jacq. which has estrogenic, progestagenic and anti-inflammatory effects can be beneficial in menopausal women and PMS. Frank in Rimma stated that high estrogen levels and balance disorders of estrogen and progesterone cause PMS symptoms.

To get in-depth information about the role of estrogen and progesterone hormone imbalance with PMS, an assessment of estradiol, progesterone, and PMS degrees was carried out.

**Research purposes**

To identify the role of imbalance of estrogen and progesterone hormones with PMS in female adolescent.

**Research Method**

The design of this study uses a non-experimental design, with a cross sectional approach that is the observations are only conducted once according to the time determined by the researcher by looking at the relationship between the dependent and independent variables.

This research was conducted at STIK GIA Makassar and the Laboratory of Molecular Biology and Immunology at the Faculty of Medicine, Hasanuddin University.

The population in this study were female adolescent who experienced PMS (STIK GIA MAKASSAR students).

Sampling in this study using nonprobability sampling with purposive sampling technique that is sampling with certain considerations.

\[
\begin{align*}
\hat{n} &= \left(\frac{Z^2(1+4)}{r^2(1-4)}\right)^2 + 3 \\
&= \left(\frac{2.56}{0.51n[2.33]}\right)^2 + 3 \\
&= 36.6 + 3 \\
&= 39.6 \\
&= 40
\end{align*}
\]

The sample size in the study was obtained based on the sample formula for correlative analytical research, as follows:

Based on the calculations above, the sample size taken was 40 samples that were in accordance with the inclusion criteria.

**Inclusion criteria and exclusion criteria**

Inclusion criteria, namely:

1. Women of childbearing age who are in the luteal phase
2. Menstrual cycle 28-35 days

Exclusion Criteria, that are:

1. Using hormonal therapy
2. Alcoholic history
3. History of reproductive system disorders
4. Do not sign informed consent
5. Not cooperative
6. Not obese

**Research Materials and Tools**

1. Form of Food Frequency Questionnaire
2. Stationery
3. Spoit 10 cc
4. Blood sample
5. Commercial kit: DIAsource E2-EASIA
6. CYP17 gene primer, PCR System 7300 (Applied Biosystems, USA) with SYBR Green
Table 1. Characteristic Distribution of Young Women respondents.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-21</td>
<td>26</td>
<td>65</td>
</tr>
<tr>
<td>22-24</td>
<td>14</td>
<td>35</td>
</tr>
<tr>
<td><strong>Menstrual cycle</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28-30 days</td>
<td>21</td>
<td>52.5</td>
</tr>
<tr>
<td>31-35 days</td>
<td>19</td>
<td>47.5</td>
</tr>
<tr>
<td><strong>Menstrual period</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-5 days</td>
<td>24</td>
<td>60</td>
</tr>
<tr>
<td>6-7 days</td>
<td>16</td>
<td>40</td>
</tr>
<tr>
<td><strong>Body mass index</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>15</td>
<td>37.5</td>
</tr>
<tr>
<td>Moderate depletion</td>
<td>22</td>
<td>55.0</td>
</tr>
<tr>
<td>Severe depletion</td>
<td>3</td>
<td>7.5</td>
</tr>
<tr>
<td><strong>Estrogen rate</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td>High</td>
<td>30</td>
<td>75</td>
</tr>
<tr>
<td><strong>Progesterone level</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td>High</td>
<td>30</td>
<td>75</td>
</tr>
<tr>
<td><strong>Estrogen-Progesterone combination</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Estrogen, low progesterone</td>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td>Low Estrogen high progesterone</td>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td>High Estrogen and progesterone</td>
<td>20</td>
<td>50</td>
</tr>
<tr>
<td>Low Estrogen and progesterone</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>PMS level</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Severe PMS level</td>
<td>5</td>
<td>12.5</td>
</tr>
<tr>
<td>Moderate PMS level</td>
<td>28</td>
<td>70.0</td>
</tr>
<tr>
<td>Mild PMS level</td>
<td>7</td>
<td>17.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>40</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 1 shows that majority of respondents are in the age of 18-21 years old (26 respondents or 65%), and 22-24 years old (14 respondents or 35%). According to the menstrual cycle, respondents mostly have the 28-30 days cycle (21 respondents or 52.5%) and some have 31-35 (47.5%).

Based on the menstrual period, respondents mostly have 3-5 days (24 respondents or 60%) and some have 6-7 days (16 respondents or 40%). Based on the Body Mass Index, they mostly have moderate depletion (22, respondents or 55%), and minority of them have severe depletion (3 respondents or 7.5%).

Based on the characteristics of estrogen level, most of the respondents are on the higher category (30 people or 75%) and 10 of them are on lower category (25%). Based on the progesterone level, mostly they are on higher category (30 people or 75%) and 10 of them are on lower category (25%). Based on the estrogen-progesterone combination, mostly they have high level of estrogen and progesterone (20 people or 50%), 10 people have high estrogen and low progesterone (25%), the other 10 people have low estrogen and high progesterone, and no respondents has low estrogen and progesterone.
Table 2. The role of estrogen and progesterone hormones imbalance towards the level of premenstrual syndrome on female adolescent

<table>
<thead>
<tr>
<th>Imbalance of estrogen and progesterone hormones</th>
<th>PMS level</th>
<th></th>
<th></th>
<th></th>
<th>n</th>
<th>%</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Severe level of PMS</td>
<td>Moderate level of PMS</td>
<td>Mild level of PMS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High estrogen, low progesterone</td>
<td>2</td>
<td>20</td>
<td>7</td>
<td>70</td>
<td>1</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Low estrogen, high progesterone</td>
<td>2</td>
<td>20</td>
<td>8</td>
<td>80</td>
<td>0</td>
<td>0</td>
<td>10</td>
<td>10</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>High estrogen and progesterone</td>
<td>1</td>
<td>5</td>
<td>13</td>
<td>65</td>
<td>6</td>
<td>30</td>
<td>20</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low estrogen and progesterone</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

Based on table 2, the combination of high estrogen, low progesterone, the majority experienced moderate grade PMS (7 people or 70%). For the combination of low estrogen and high progesterone, the majority had moderate degrees of PMS (8 respondents (80%). The combination of high estrogen and progesterone, the majority experienced moderate degree of PMS (13 respondents or 65%). There were no respondents who had a combination of low estrogen and progesterone levels. The table also shows that there is a role for imbalance of estrogen and progesterone hormones with PMS degrees. The direction is negative and weak.

Discussion

The results of the research showed that there was the role of the imbalance of estrogen and progesterone hormones towards the degree of premenstrual syndrome. The higher the imbalance of estrogen and progesterone hormones, the lower the degree of PMS. Respondent who had high estrogen and progesterone levels was only one, with severe degree of PMS. This is due to the imbalance of the estrogen and progesterone hormones is not a single factor in PMS. Low calcium intake is one of the causes of PMS. From the data obtained, the respondents never consumed milk and spinach which are sources of calcium.

Meanwhile, respondents who had an imbalance of estrogen and progesterone (both high estrogen, low progesterone as well as low estrogen, high progesterone) have 2 respondents with severe PMS. This is partly due to low food intake (banana, papaya) which contains vitamin A which is a predisposition factor for PMS.

Conclusion

The imbalance of the estrogen and progesterone hormones plays a role in the degree of premenstrual syndrome. The high imbalance of the hormones estrogen and progesterone will cause a low degree of premenstrual syndrome.

Suggestion

Further research is needed regarding to the role of calcium, bananas, and papaya towards PMS.

Ethical Clearance: Taken from medical research ethics committee at the faculty of medicine, University of Hasanuddin, Makassar

Source of Funding: leading scholarship for Indonesian lecturers -domestic

There is no Conflict of Interest

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Factors that Influenced the Use of Family Planning (KB) in Padang Hulu District of Tebing Tinggi 2018

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Abstract

As developing country, Indonesia still has to struggle with various problem. One of the main problem faced by Indonesia today is the growing number of population. The purpose of this research is to analyse the factors that influence the male use of family planning in Padang Hulu sub-district, Tebing Tinggi 2018. This research is using analytical observational with case control study design. The sample of this study consisted of 60 cases group and 60 control group. The case group sample was the male family planning acceptor and the control group sample including the male non family planning. Based on multivariate results that age and support of wives are predicators of male family planning. It is suggested for health workers to improve the promotion of vasectomy services, through the provision of education, knowledge and the use of family planning vasectomy in the form of counselling and family approach concerning the importance of family planning vasectomy and for men family acceptor is expected to be role model to his peers so that the other men would participate in family planning, especially vasectomy.

Keywords: Use of Male Family Planning, Possible Factors, Strengthening Factors.

Introduction

Male participation rates in contraceptive use in Indonesia are still very low at only 2.1% family planning and they generally use condoms. The percentage is lower compared to other countries, such as Iran 12%, Tunisia 16%, Malaysia 9-11%, even the percentage in the United Stated reached up to 32%. Based on BKKBN 2012 the participation of male using contraception is only 1.3% consist of condom user (0.9%) and vasectomy (0.4%). Therefore the socialization of family planning programs among men should be improved¹,².

The ease and availability of service family planning facilities has a positive impact on the use of contraception. Men became less motivated to use contraception due to the low accessibility of information about family planning³. According to ⁴ the cause of husband’s less participation in family planning is the limitation of knowledge about reproductive health and paradigm associated with patriarchy in which the role of husband is greater than women. Based on the research showed that wife support associated with husband’s involvement in family planning (condom and vasectomy) in Bantul Regency. Male participation in the practice of modern family planning methods in Indonesia is influenced by socio-demography that includes knowledge, wife’s age, husband’s education, number of surviving children and attitudes toward family planning programs⁵⁻⁸.

Tebing Tinggi, is one of the city in North Sumatera which inhabited by 147,771 people with a total of 23,550 couples with reproductive age. Active family planning participants in 2013 reached up to 17,450 people which consist of 200 males using vasectomy (1.15%) and 610 males using condom (3.50%) at the group age of 30-45 years old. The largest coverage of family planning acceptors was found in Rambutan sub-district consist of 52 people (1.23%) from the total 5,578 reproductive couples. In Bajenis sub-district there were 49 people (1.23%) from the total 5,081 reproductive couples. In Bajenis sub-district there were 49 people (1.23%) from the total 5,081 reproductive couples. In Bajenis sub-district there were 49 people (1.23%) from the total 5,081 reproductive couples. In Bajenis sub-district there were 49 people (1.23%) from the total 5,081 reproductive couples.
Material and Method

This study is an analytic observational study with case control method. Analytical observational case control study is a design to determine the relationship between variables by comparing case group and control group based on their status\textsuperscript{10}. The sample were consisted of 60 control groups and 60 case groups. Data were analyzed using simplex logistic regression and multiple logistic regression test.

Univariate Analysis

Description of the respondents in the study showed that the most of respondents in the case group had entrepreneurial jobs it consist of cases of 38 people (63.3%). Based on the research, the Muslim respondents in the case group consist of 55 respondents (85%). And there were 58 Muslims (96.77%) in control group. The majority of respondent were Javanese consist of 28 people (46.7%) from case group and 35 people (53.8%) from control group. 47 people (78.3%) from case group had 1-2 children and in control group there were 52 respondents (86.7%) had (> 3) more 3 children’s. 48 respondents (80%) respondents in case group an 55 respondents (91,7%) in control group had income 1-2 million. 27 respondents (61,7%) wife in the case group were within in control group above 35 years. 43 respondents (71.7%) in control group were within the age group above 35 years (> 35). 32 of respondent (53.3%) from the case group and 40 respondents (66.7%) from control group had more than 12 years the length of marriage.

Bivariate Analysis

Simple Logistic Regression Test Results

The analysis results of simple logistic showed that there is a significant influence between age to male KB use. The results of analysis using simple logistic regression test showed that there is no significant influence between education on the use of family planning in men. The results of analysis using simple logistic regression test showed that there is no significant influence between knowledge on the use of family planning in men. The results of analysis using simple logistic regression test showed that there is no significant influence between the availability on the use of family planning in men.

The results of analysis using simple logistic regression test showed that there is no significant influence between the support of wife to the use of family planning. The results of analysis using simple logistic test showed that there is no significant influence between culture on male family usage.

Thus, based on bivariate analysis using simple logistic regression test, age variable and wife support have p value <0. 25 so it can be include in multivariate analysis model and conducted by multiple logistic regression test with “enter” method.

Multivariate Analysis Results

Based on the results of multiple logistic regression test showed that risk factors influencing the use of contraceptive in men in Padang Hulu sub-district of Tebing Tinggi after being adjusted with other variables were p = 0,034, OR = 2,384 95% CI (1,068-5,320), wife support p = 0,042 ; OR = 2,428 95% CI (1,033-5,708).

Results and Discussion

The Relationship Between Age and Contraceptive Use in Men

The result bivariate analysis shows that there is significant influence between age with the use of famili planning in men with p value = 0,014. The result of multivariate analysis also showed that age had significant effect on male KB use p = 0,034; OR = 2,384 95% CI 1,068-5,320. This means that men > 40 years old are 2.3 times more likely than men to use vasectomy contraception compared with men aged ≤ 40 years. Age can affects the one’s psychic, young age often cause tension, confusion, anxiety and fear that can affect one’s behavior\textsuperscript{11}. The results of this study is in line with the previous research that there is a spesific relationship between age and men’s participant in family planning\textsuperscript{12}. The results is also accordance with the research conducted by\textsuperscript{13} showing the significant relationship between respondent’s age and their participants in family planning.

The Relationship Between Education with The Contraceptive Use in Men

Based on the results of simple logistic regression, that there is no influence between education on contraceptive use in men. This is evidenced from the calculation of simple logistic regression test can be seen
that the value \( p = 0.999 \) which means greater than \( \alpha = 0.05 \), then \( H_0 \) accepted.

Conforming to Nurliana & Subiyatun\(^4\) states that there is no relationship between husband education with the use of contraceptives in the hamlet Tekik Bangunharjo Bangunkerto Turi Sleman, which proved the value with the value \( p = 0.185 \) (\( p > 0.05 \)). In contrast to research indicating that of 291 husbands in Sumber Agung Jetis Bantul, most husbands were educated at junior high school 150 (51.5%), and the least husband who had high education was 14 (0.5%). From the results of analysis it can be said most of the husband educated junior high. The results of this study revealed there is an influence between educational factors on the use of male contraceptive methods\(^5\).

Less educated people will be more likely to respond new ideas with emotion. Because the new things might be shock the people or change what they have done in the past. The level of education not only affects the willingness to use family planning, but also the selection of a method.

The Relationship Between Knowledge with The Contraceptive Use in Men

Based on the results of simple logistic regression test, that there is no influence between knowledge on contraceptive use in men. This is evidenced from the calculation of simple logistic regression test can be seen that the value \( p = 1,000 \) which means greater than \( \alpha = 0.05 \), then \( H_0 \) accepted.

Knowledge and attitude associated with husband’s participation in family planning, husbands’ knowledge about family planning can be influenced by geography location, the respondents live closer to the city has the better knowledge about family planning than that of respondents who live in the village, because the geography location close to the city can facilitate more information about family planning to society\(^6\).

The Relationship Between Knowledge with The Contraceptive Use in Men

Based on the results of simple logistic regression analysis, there is no influence between the availability of male family planning services to the use of contraception in men. This is revealed from the calculation of simple logistic regression test can be seen that the value \( p = 0.650 \) which means greater than \( \alpha = 0.05 \), then \( H_0 \) accepted.

This results of this study is contradict with previous research states, that factors that cause male family planning participation in various areas tend to be low are: First, information access is very limited. Men’s knowledge of contraception, such as type, side effects, effectiveness, mode of use, where to get contraceptives, benefits and others is still very low. Second, access to services is still limited\(^7\).

In accordance with the situation in the District of Padang Hulu Kota Tebing Tinggi, it was found that there was no relationship between the availability of male contraceptive services with the use of contraception in men. Although this study was not statistically significant but in terms of OR values, the availability of male family planning services has a tendency of 1.526 times to affect men in using contraception.

The Relationship Between Wife Support with Contraceptive Use in Men

Based on the results of simple logistic regression, there is a relationship between the wife support with the use of contraception in men. It is revealed from the result of simple logistic regression test with the value \( p = 0.017 \) which means smaller than \( \alpha = 0.05 \), then \( H_a \) is accepted.

The result of multivariate analysis was dominant influential factor which showed that wife support had significant effect on contraception use in men \( p = 0.042; \) OR = 2.428 95% CI 1.033-5.709 This means that men who get wife support 2.4 times more the estimate of men willing to use vasectomy contraception in men than men who do not have the support of the wife.

This is conforming to previous research stated, that the support of wife to the contraception use is a positive attribute of the wife to family planning, if couples have a positive attitude toward family planning then they tend to use contraception. Other research also stated that there is a relationship between the support of the wife and the participation of the husband in the family planning program\(^8\).

The Relationship Between Culture with Contraceptive Use in Men

Based on the results of simple logistic regression test, there is no influence between the culture on the use of contraception in men. This is revealed from the simple logistic regression test showed that the value \( p = 0.855 \)
which means greater than $\alpha = 0.05$, then $H_0$ is accepted.

A study states that, there is no socio-cultural relation on family planning men’s acceptor with men’s participation in family planning\(^\text{14}\). In some studies, cultural standards are identified as barriers to male involvement in participating family planning programs. All respondents believe that the reasons for involving men in family planning programs include that men play a dominant role in family decision-making. Another reason expressed by the majority of participants is that men are the head of the family and give much influence to women’s decisions\(^\text{20-22}\). Men often assume that family planning services are designed and provided for women, so men are embarrassed to join the family planning program.

In contrast to other research, which states that respondents who are positive social culture as much as 86% participate actively in the vasectomy program\(^\text{21}\). This is different from the situation in Padang Hulu Subdistrict, Tebing Tinggi in 2018, found that there is no connection between culture and contraceptive use in men. Although this study was not statistically significant but in terms of OR values, cultures had a tendency of 0.935 times to influence men in using contraception.

**Conclusion**

Based on the results of research on the use of factors that affect the use of male Family Planning in Padang Hulu District Tebing Tinggi in 2018, the conclusions are stated as follows:

There is an effect between age, education, knowledge, cultural, on the use of family planning, then the availability of male contraceptive service on male family planning use as well. However, There is an effect of wife support on the use of family planning Based on multivariate test results, the dominant variable affecting the use of male KB is the support of the wife

**Conflict of Interest:** None

**Ethical Clearance:** Taken from University of North Sumatera committee

**Source of Fund:** Self

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Efficacy of Topical Cream of Garlic Extract (Allium Sativum) on Wound Healing in Experimental Mice using Acute Wound Modeling: Determination of Expression of Tumor Necrotic Factor (TNF-α)

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Abstract

Garlic (Allium sativum) is one of the ethnomedicinal plants used by people in the tropical region. Its bulb is commonly utilized as traditional medicine for wound healing, particularly in the developing world. This study analyzed the efficacy of topical cream of garlic extract (Allium sativum) on the expression of tumor necrotic factor (TNF-α) and wound closure as the parameters of wound healing in the experimental mice using an acute wound modeling. The research design was a randomized post test control group design. The study was conducted at 4 laboratories, i.e., Biofarmaka Laboratory at the Center for Health Education Research at the Hasanuddin University for the preparation of topical cream of garlic bulb extract, Animal Laboratory of the Medicine Faculty of the Hasanuddin University for the care and treatment of the experimental mice, Histopathology Laboratory of the Research Center for Veterinary Sciences in Maros for the preparation of histopathological slides. A total of mice were 54 mice (Rattus novergicus) of wistar strain by making circular excision wound on dorsal with the diameter of 8 mm using punc byopsi. The experimental mice were divided into 3 groups that include the negative control group by treating 0.9% NaCl, the positive control group by treating 3% oxytetracycline and the treatment group by treating 10% topical cream of garlic extract. Wound tissues of mice were microscopically observed on day 3, day 7 and day 14 respectively. Results of the study proved that wound healing by using topical cream of garlic extract (Allium sativum) showed the highest effect in reducing the expression of tumor necrotic factor (TNF-α) and the lowest diameter of wound in the experimental mice compared to the control groups.

Keywords: Garlic, TNF-α, wound healing.

Introduction

In view of the modern concept, wound healing involves dynamic reciprocity between cytokines, cells, and the extracellular matrix during four overlapping phases¹. In cellular phase, wound healing process involves several types of cells working together to mount an inflammatory response, synthesize granulation tissue, and restore the epithelial layer. The second phase, the inflammatory phase, is characterized by the infiltration of inflammatory cells that secrete cytokines and growth factors, while assisting in the removal of apoptotic cells and debris. The third phase, the proliferative phase, involves the stage of tissue regeneration that is initiated in response to stimulatory factors initially produced during the inflammatory phase. Angiogenesis is central to wound healing and involves the growth of new capillary blood vessels². Finally, the remodeling phase encompasses the regression of capillaries, the reorganization of the extracellular matrix, and further
maturation of the tissue that ensures the structural and mechanical stability of the dermoepidermal junction.\(^3\)

Until 21st century, the prevalence and impact of wounds are likely to increase due to the growing epidemic of noncommunicable diseases and longer life expectancy. As indicated in a survey of the MedMarket Diligence in 2013, the estimated prevalence rates based on the wound categories worldwide in ascending order were surgical wounds (114,271 cases), traumatic wounds (1,627 cases), laceration wounds (20,645 cases), burn wounds (10,221 cases), chronic wounds (40,400 cases), carcinoma wounds (618 cases), melanoma wounds (103 cases), and skin cancer wounds (103 cases) consecutively.

In view of the national level in the developing world, the survey data derived from the National Basic Health Research\(^4\) reported that the proportions of types of wounds in Indonesia were dominated by bruised/chafed wounds (70.9%), and it was followed by sprained wounds (27.5%) and tear wounds (23.2%). Viewed in terms of gender, 70.6% wounds were observed in male and 71.2% wounds were found in female, whereas, 26.6% tear wounds were found in male and 17.8% were observed for female respectively.

Based on the problem background as stated above, this study aims to inquire about the efficacy of garlic extract (\textit{Allium sativum}) on wound healing in experimental mice using an acute wound modeling for developing this ethnomedicinal plant.

**Materials and Method**

**Location of the study**

This study was conducted at 4 laboratories, i.e., Biofarmaka Laboratory at the Research Health Center of the Hasanuddin University for the preparation of topical cream of garlic extract, Animal Laboratory of the Medicine Faculty of the Hasanuddin University for the care and treatment of the experimental mice, Histopathology Laboratory of the Center for Veterinary Sciences in Maros for the preparation of histopathological slides.

**Samples and animal care**

The mice were caged in groups with free access to laboratory pellets and tap water and maintained under standard conditions (12/12 h light-dark cycle, and ambient temperature 22 ± 1 °C). All animals used in this study were cared for and treated humanely according to the Principles of Laboratory Animal Care\(^5\). Ethical clearance for the treatment of the experimental animals were reviewed and approved by the Medicine Research Ethics Committee of the Medicine Faculty of the Hasanuddin University as stated in the Recommendation Letter of Research Ethics issued in the registration number: 2264/H4.8.4.5.31/PP36-KOMETIK/2015.

**Preparation of garlic extraction**

10% garlic extract was prepared in this study. Samples of garlic bulbs were chopped into small pieces, and then they were let stand for a while until dry. Afterward, dried bulbs were crushed by using a blender until formed refined garlic bulbs and they were then added with 70% ethanol solvent. Sonification was done to the mixture for 1 hour and it was then filtered. After the evaporation of the solvent, the extracted remaining materials were freeze-dried until formed the extract powder of garlic\(^6\).

**Preparation of topical cream**

Procedure for the preparation of topical cream referred to the study of Bergtorm & Strober\(^7\). The steps of topical cream procedure are described below.

**Weighing the following materials**

<table>
<thead>
<tr>
<th>Materials</th>
<th>Weight (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stearic acid</td>
<td>1.5</td>
</tr>
<tr>
<td>Cetyl alcohol</td>
<td>2</td>
</tr>
<tr>
<td>Stearyl alcohol</td>
<td>1.5</td>
</tr>
<tr>
<td>Glycerin</td>
<td>5</td>
</tr>
<tr>
<td>Propylene glycol</td>
<td>10</td>
</tr>
<tr>
<td>(\alpha)-Tokopherol</td>
<td>0.05</td>
</tr>
<tr>
<td>Metyl paraben</td>
<td>0.2</td>
</tr>
<tr>
<td>Propyl paraben</td>
<td>0.02</td>
</tr>
<tr>
<td>Novomer</td>
<td>1</td>
</tr>
<tr>
<td>Aquadest</td>
<td>Up to 100 gr</td>
</tr>
</tbody>
</table>

**Preparation of cream base**

The materials used to prepare cream base including stearic acid, cetyl alcohol, and stearyl alcohol as well as propyl paraben. These materials were weighed and then they were mixed and heated up to 70°C (oil phase). Glycerin, propylene glycol, MP, and water were heated up to 70°C (liquid phase).
Oil phase and liquid phase were mixed together and heated up to 70°C while stirring the mixture by using the homogenizer until the mixture achieved reduction of heat up to 40°C. The mixture was then added with the novomer and α-tokoferol until formed cream base.

Determination of tumor necrotizing factor-α (TNF-α)

Determination of tumor necrotizing factor-α (TNF-α) was conducted at the Center for Health Education Research at the Hasanuddin University.

Materials and Instruments for the determination of tumor necrotizing factor (TNF-α)

Materials and laboratory instruments used in this study including laboratory cloths, goggles, protective mask, gloves, micro pipette, Eppendorf, multichannel pipette, Bio-Rad, microplate reader 680, Bio-Rad, Maxi mix II, Thermolyne, Incubator, Memmert, Elisa Kit, human TNF-α (tumor necrosis factor alpha) ELISA kit, Elabscience, Pipet tip 10 µL, 100 µL, 1000 µL, distilled water (ddH₂O), reagent reservoir, test tubes of 1.5 mL, 15 mL and 50 mL.

Procedure of acute excision wound model

Each mouse was put into the anesthetizing box and it was anesthetized with ether solution with a dose of 0.5-1.0 cc by inhalation. After then, the dorsal area of each mouse was aseptically cleaned with hair removal cream (Veet). Subsequently, disinfection was done with 0.5% chlorhexidine in 70% alcohol. Acute injury was made with wound diameter of 0.8 cm (8 mm) by excision at the left and right bilateral areas of the dorsal.

Measurement of wound area

The wound area was measured by immediately placing a sheet of transparent paper over the wound and tracing its perimeter; the area of this impression was calculated using graph paper and a ruler in mm dimension. Observation of experimental mice after incision was conducted on day 4, 7 and 14 respectively.

Design of the study

This study was a purely experimental design by using randomized post test control group using mice of Wistar strain as the study samples. A total of samples were 54 mice divided into 3 experimental groups that include the negative control group, the positive control group and the treatment group. The negative control group was treated with 10% NaCl (placebo).

Statistical analysis

The experimental results were expressed as mean ± standard error, and analysis was done using SPSS version 20. Statistical correlations among three groups of mice were analyzed with Spearman’s correlation test. Statistically significant test was carried out by means of one-way analysis of variance (ANOVA) in which p < 0.05 was statistically considered significant.

Results

1. Expression of tumor necrotic factor (TNF-α)

Results of one-way Anova test in the negative control group showed that the expression of TNF-α showed statistically significant correlations on day 3 until day 14 (p: 0.058), whereas, the positive control group did not show statistically significant correlations in the 10% garlic topical cream group on day 3 until day 14 (p: 0.001) and day 7 until day 14 (p: 0.007). Results of Spearman’s correlation test showed that the expression of TNF-α was statistically significant correlations among all the mice groups, the negative control group (p : 0.048 and r : -0.682), the positive control group (p : 0.007 and r : -0.876) and the 10% garlic topical cream group (p : 0.002 and r : -0.779) respectively. Based on a two-way correlation, all experimental groups showed negative orientation of correlation. This means that the expression of TNF-α gradually reduced along with longer day in the process of wound healing. Spearman’s correlation test was highest in the positive group and the treatment group of garlic extract, whereas it was lowest in the negative control group.
2. Wound diameter

Results of one-way Anova test indicated that wound diameter in the negative control group showed statistically significant difference on day 3 until day 14 (p: 0.028) and day 3 until day 7 (p: 0.045). The positive control group showed statistically significant difference on day 3 until day 14 (p: 0.000) and day 7 until day 14 (p: 0.005) and day 3 until day 7 (p: 0.003) as well as in the 10% garlic topical cream group on day 3 until day 14 (p: 0.001) and day 7 until day 14 (p: 0.009). Results of Spearman’s correlation test in wound diameter showed statistically significant difference among the three groups that include the negative control group (p: 0.032 dan r: -0.506), the positive control group (p: 0.000 and r: -0.876) and the 10% garlic topical cream group (p: 0.000 and r : -0.779) based on the analysis of values of Spearman’s correlation test in which the highest value was observed in the positive control group and the lowest value was in the negative control group.
Table 1. Correlation between the expression of TNF-α and wound diameter.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Day 3, 7 and 14</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>p</td>
</tr>
<tr>
<td>TNF-α – Wound Diameter</td>
<td>0.737</td>
</tr>
<tr>
<td>Negative Control</td>
<td>0.062</td>
</tr>
<tr>
<td>Positive Control</td>
<td>0.004</td>
</tr>
<tr>
<td>10 % garlic topical cream</td>
<td>0.085</td>
</tr>
</tbody>
</table>

As shown in Table 1, results of correlation between the expression of TNF-α and fibroblast showed statistically significant correlation in the 10 % garlic topical cream group (TNF-α with wound diameter at p: 0.004).

Discussion

The effect of garlic topical cream on the expression of tumor necrotic factor (TNF-α)

Mean value of the expression of TNF-α for all the three groups showed the same pattern in which its expression decreased along with longer days on day 3, day 7 and day 14. This is in line with previous studies concerning the application of garlic ethanol topical cream that could accelerate wound healing process as antibacterial and anti-inflammatory reaction.

Inflammation is an initial reaction when the body is injured. This phase immediately occurs after injury and it may last up to 4-6 days. TNF-α is a sign of inflammation in the process of tissue restoration. Previous studies showed significant association between TNF-α and wound healing process. The decrease of TNF-α level indicates the inflammatory control and adequate process in wound healing. TNF-α stimulates synthesis of MMPs. High level of proteases in wounded areas lead to degradation of protein matrices and growth factor as the significant factors in wound healing process. In addition, TNF-α suppress tissue growth factor-β (TGF-β) in which TGF-β induces proliferation of myofibroblast to form essential proteins in reorganization of extracellular matrices such as α-smooth muscle actin (α-SMA), collagen type 1A, and fibronectin.

As reported in the study of Nagori et al.,10 wound infection is the barrier of wound healing. The most important organisms include Staphylococcus aureus, Streptococcus pyogenes, Corynebacterium sp, Escherichia coli and Pseudomonas aeruginosa. Garlic bulb is an anti-microbial agent. It has capability in inhibiting growth of microbes, including viruses, bacteria, protozoa, and fungi.

In a study conducted by Nidadavolu11, garlic ointment inhibits biofilm formation by bacterial pathogens from burn wounds. When thermal injury damages the skin, the physical barrier protecting underlying tissues from invading microorganisms is compromised and the host’s immune system becomes suppressed, facilitating colonization and infection of burn wounds with microorganisms. At a wounded area, bacteria often develop biofilms, which protect the bacteria from the immune response and enhance their resistance to antibiotics. Their study utilized the in-vitro wound biofilm model to examine the antibiofilm activity of garlic (Allium sativum).

The effect of garlic extract topical cream on the reduction of wound diameter

Mean value of wound diameter among the three groups showed similar pattern in which its expression decreased along with longer days on day 3, day 7 and day 14. Wound diameter was lowest on day 3 in the negative control group (3.8333 ± 1.16905) and was highest in the positive control group (5.3333 ± 1.03280), whereas, the highest diameter of wound was observed in the 10% garlic ethanol topical cream on day 7 (3.6667 ± 1.50555) and was lowest on day 14 (3.0 ± 063) in the 10% garlic ethanol topical cream (1.1667 ± 0.75277).

All previous studies as stated above are consistent with our study results concerning the efficacy of garlic extract (Allium sativum) on wound healing in experimental mice using an acute wound modeling for developing this ethnomedicinal plant.

Conclusions

Garlic (Allium sativum) extract topical cream with 10% concentration has better effect in wound healing compared to the control groups and showed the lowest level of tumor necrotic factor (TNF-α) and the lowest wound diameter compared to the control groups.

Ethical Clearance- Taken from Islam Makassar University committee

Source of Funding- Self
Conflict of Interest – Nil

References


Structural Intervention Problematic of Condom Usage in Makassar City, Sulawesi Selatan Indonesia

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Abstract

The issue of the larger risk of sexually transmitted infections (STIs) requires all stakeholders of health development to work together to reduce the risk of STIs. This research focuses on regulation problematic of condoms usage in Makassar city. It used qualitative research method. This research found that the problem of regulation was in determinants of lack of community leaders’ knowledge that have strong political influence so that there was hesitation among decision makers. As the result, the effectiveness of community protection programs against the high risk of unhealthy sex did not run as it should be. Practical condom usage programs should be backed up by strong regulations, They finally were only personal alertness both the level of sexually transmitted workers and their customers.

Keywords: Advocacy, STIs, Commercial Sex Workers

Introduction

The spread of sexually transmitted diseases (STIs) is a consequence of sexual behavior problem Sharma and Nam, Lack of awareness and knowledge of healthy sex, sexual intercourse before marriage, Muula, Patriarchal system by Cain D. et al, and social stigma of condom usage. Various Determinants show that the awareness of healthy sex is very complex. However, some researchers have not yet explained the influence of the determinants of political consequences for making regulation which can basically make healthy sex programs with condom usage in effective prostitution areas. Regulation that support the effectiveness of condom usage can protect society from the risk of transmission of sexually transmitted infections (STIs)

The Directorate General of P2P Ministry of Health of the Republic of Indonesia 2018 (2018: 139) stated that: There has been an increase of the new numbers of HIV cases in 2015 to 2017. There were 30,935 people infected with HIV in 2015 and there was an increase of 33,660 people in 2017. While there were 700 people in 2015 to 1,089 people in 2017 in South Sulawesi as sufferers. In 2017 AIDS cases amounted to 4,555 cases in Indonesia which can be specified as follows: causing of injection as many as 109 cases. AIDS cases amounted to 220 people and syringe cases were only 6 cases in South Sulawesi. This fact shows that the etiology of AIDS due to unhealthy sex is 4,445 for the national scale and 214 for South Sulawesi region. Etiology of unhealthy sex is awareness in using condoms.

This fact shows that etiology is due to a lack of awareness of condoms usage. Therefore, it is needed a preventive action to change the people’s mindset about healthy sex through the use of condoms, especially they work as commercial sex workers.

Materials and Method

The type of research used qualitative research to obtain information about government advocacy on condom usage in CSWs in preventing STIs cases in Makassar City. This research described the commercial sex workers’ level of understanding and behavior with other related parties. Data sources were not only from female sex workers (WPS) but also from government parties. Data were collected by conducting in-depth interviews.

Results and Discussion

The result of this research elaborated data from informants who were in the field of STIs prevention, several figures from agencies engaged in health sector and supported by government institutions as policy
makers both of executive and legislative. Whereas the commercial sex workers (CSWs) themselves are workers who serve a lot and having profession as sex workers.

The fact in the field indicated that the problem of condom usage was not only due to lack of knowledge and weak supervision from government but there were problems with policy interventions so that program accentuation was not running optimally. As a result, the quantity of cases of sexually transmitted infections was still worrying. As the results of the following interview:

*It is true what was said by the health office, that the report provided was a fact, and even the latest data showed that it had risen to 214 sufferers in addition to injecting drug cases or IDUs that were also incomplete using the right condom* "(AIA’s statement)

The AIA’s statement showed that the similarity of the etiology of STIs with data from the Directorate General of the P2P Ministry of Health in 2018 which confirmed these two determinants. Where from 214 cases, the etiology due to injecting drug cases was only the remaining 6 cases due to the problem of condom usage.

The facts above are strengthened by the testimony of informants who were engaged in community empowerment, especially public health. Informant Ail explained his activities to find solution to the problem of condom usage so that the risk of the spread of STIs did not increase. :

"If the system that we apply here, there was a program that carried out in the field with outrising systems or outreach in the immediate field, then outreach in some locations where we conduct monthly discussion activities” (to do interview with Ail)

The activities of non-government organizations (NGOs) showed that they fill in the actual space if it was implemented by government through regulations, so the problem of condom usage could be solved. They provided continuous assistance. Based on the results of the research we conducted that all provide assistance for HIV cases, because the program was done every day. Most of them worked with government institutions that directly deal with public health problems. dSw, as an informant, explained:

“Usually we are together with NGOs specifically for CSWs; we do have NGOs friends to collaborate with Community Health Centre ‘Puskesmas’ (dSw as informant).

The fact in the field indicated that health and medical interventions were the most commonly found with the aim of getting an overview of the incidence and prevalence of STIs and HIV / AIDS among certain communities while also observing patterns of trends and factors affecting the AIDS epidemic. In sex workers who are at risk for the program carried out by offering, if workers want to be tested it will be linked to a VCT clinic for testing. In particular the counselling process can be done after or post test to see if he is positively affected or not, counselling is still done. If it is found to be positive, the counselling is how he lives with PLWHA. This is as expressed by one NGO informant who has long worked as a companion for PLHIV in Kra AIDS South Sulawesi, Zla, that:

“If it was stated positive by the laboratory, he was said to have positive false and he was negative said negative, so he was directed to use condoms (Zla’s statement).

Based on the research conducted that has been carried out planning by partnering with the government by creating Pokja, with the aim of being based on the segmentation of potential areas of transmission. This segmentation is based on targets that were carried out previously even though there were new ones. The target of the working group (Pokja) is nightclubs, even though there is no prostitution, but there are behaviors that result in HIV / AIDS, as revealed by one of the informants from an NGO in the city of Makassar, that...... so we partnered with the government by creating a working group, our target is THM even though they did not say there was prostitution but there was risky behavior ...... (Zla’s statement).

But the structural intervention problematic is actually an additional obstacle to intervention that will make the condom usage program much more effective. There are problems of religious and anthropological conceptions found in the following information from informants:

*We did it, it was secretly not to be loose in public places, to avoid friction with cultural figures and religious leaders, so that if it is used only to get condoms,*
but if it really required, then there was a silent program (just silent). .......... (Zia’s Statement)

So there are religious and anthropological problems especially in social construction of condoms which causes entrusted politicians to make policies not to complete their duty. Fear of religious risk for condoms usage policy interventions is expressed by a legislator as follows:

“Actually, I really disagree with giving condoms, it’s called a solution to encourage people to commit adultery ...” (AdS’s Statement).

These non-technical issues cause structural intervention of policy making to solve the problem of condom usage un running optimally. The result is felt directly by them that actively promoting sexual health. There is no feeling of government support such as our interview with policy informants stated that ....... there is no regional regulations... “(AHi’s Statement).

Regarding condom usage, the government of Makassar city has not dared to provide a guarantee for the implementation of the policy. The reason cannot be, it is still constrained by the problem of the unpreparedness of the religious parties and people who still do not fully understand the condoms. As the result of our interview that:

“I didn’t want to talk about condoms, later NGOs. Did You know that what troubled condoms are”(AHI’s Statement)

The variety of obstacles cause of disparity between the appeal of the decision maker (government) and its implementation at the grassroots level (commercial sex workers). Based on the result of our interview with one of the CSW’s that:

“As long as I became a sex worker, I had never heard of it. The government came to tell us. We usually used it to avoid illness”(Era’s Statement).

Personally, sex workers had already known about unprotected sex or sexual intercourse without condoms usage. Regulations that are expected to provide legal guarantees for the provision of ‘ATM’ Condoms or Condom Vending Machine in nightclubs are not prepared. This means that awareness programs on condom usage are more emphasized in personal awareness. Warner L, Newman DR, Kamb ML, et al in The Society for Adolescent Health and Medicine\textsuperscript{17} stated

: “The effectiveness of condoms for prevention of non viral STIs, especially gonorrhea and Chlamydia, is well-documented. A multisite prospective study found no incident infections with consistent and correct condom use”.

In a personal perspective, awareness of sex workers has been formed. But there are problems structurally. The effort to eliminate misunderstanding about healthy sex programs, especially condom usage, it is still being carried out by the aim of community leaders. Dsw, that: “But we have worked together with AIDS Prevention Commission #KPA of City to provide understanding to the MUI, that condoms are not to justify protection, but it suppresses HIV/AIDS, there has been clear for that now” (Dsw’s statement)

The phenomenon above can be described in the flowchart of awareness of condom usage, according to Coombes et. Al (2017: 10)\textsuperscript{18} can be described as follows:

Looking at the fact of the research, the main problem of structural intervention was in absence of policies that are considered to accelerate the collective awareness of widespread condom usage. Policy makers still awkwardly maximize the program by intervening in a legal basis for the procurement of Condom Vending Machine or condoms ‘ATM’. The lack of maximum effort to make regulations has resulted in not being able to maximize funding to support every program both government and private sector or NGOs. In the end, market development condoms and market management condoms are not integrated.

**Conclusion**

The structural intervention problematic in this research is the reluctance or fear of policy makers to make regulations that are considered to maximize the effectiveness of condom usage and to cause widespread collective awareness of the importance of condoms. The determinant is misunderstanding of some community leaders both religiously and anthropologically.

**Ethical Clearance**- Taken from Mega Rezky University Committee

**Source of Funding**- Self

**Conflict of Interest** – None
References


Antenatal Care Documentation Information System Integrated with Web-based Government Employed Midwife Performance Index (Seindah Lutra)

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Abstract

Introduction: One of the reasons behind the difficulty to analyze Antenatal Care is the weakness of its documentation. To address this drawback, one of the methods is by designing an adopted antenatal documentation information system with web-based credit assessment for the midwives.

Method: Antenatal care documentation information system integrated with web-based government employed midwife performance index (Seindah Lutra) Design with System Development Life Cycle (SDLC) method. The prototype of Seindah Lutra is designed by using Php MyAdmin, MySQL data base and Apache web server.

The output is in the form antenatal patients database, midwives’ work shift recap, electronic antenatal documentation (subjective data, objective data, case analysis, management cases: physiologic, problematic physiology, pathology, pathology with accompanying illness, urgency) of with the recap of midwives’ credit point for performance index, valid and ready-to-use antenatal performance report and monthly antenatal report which is directly linked with the superior. The system validation of this research involves some experts in midwifery documentation, midwife’s credit rate for performance index, obstetrician and gineocologist, and information technology system. The system reliability test was conducted in a Community Health centers in Masamba sub-district, North Luwu district for a month using measuring test method. The system reliability test used the alpha cronbach with the score $r_{11} = 0.776$, the strong reliability of the coefficient.

Conclusion: Seindah Lutra created antenatal database which is complete and continuous, with prompt access and clear performance assessment for the midwives, precise and measured value for the policy maker to analyze in order to improve the quality of antenatal care to reduce the risk of stillbirths and pregnancy complications and give women a positive pregnancy experience

Keywords: Information System, Antenatal Documentation, Midwife performance index

Introduction

The documentation of antenatal assessment is still deemed as too weak that it is difficult to analyze for the improvement of antenatal care (1). The Antenatal Documentation at public clinics is still carried out manually (paper-based), resulting in data redundancy,
low data completion, reading difficulties, weak accessibility and inconsistency in the accuracy of the data information, time consuming risk screening, and inaccurate data analysis which caused slow pregnancy management (2,3).

Due to post-workshift exhaustion, lack of energy, unstandardized documentation, lack of format, the midwives’ demeanor and overlapping job caused the midwives’ inability to carry out the documentation well (4, 5). Despite this shortcoming, midwives had sufficient knowledge on midwifery documentation. However, implementing punishment to the midwives who failed to do the documentation process is suggested (6) to address said process’ poor practice because the accuracy of the documentation determines the service quality in assessing and evaluating the medical condition of the pregnancy and the next childbirth (7,8,9). Antenatal care documentation is also used to assess the performance of the midwives with the status of civil servant (10). It is still currently difficult for midwives to prove their credit point and the process could take a lot of time and may result in inaccurate value for performance index (11,12), thus the necessity to design an information system which is efficient in term of time, budget and energy to solve the documentation issues (2,3, 13-16).

By integrating midwifery documentation with credit point in an information system for government employed midwife performance index, a complete, comprehensive, and well-measured data base with quick and continuous access among the medical practitioners throughout the villages, local public clinics and policy makers will be created through monitoring and evaluation in order to improve the quality antenatal care.

Resources and Method

The antenatal care documentation information system integrated with web-based government employed midwife performance index (Seindah Lutra) design uses System Development Life Cycle (SDLC) method with the stages of problem identification, opportunity and direction analysis, determining the necessity analysis, designing recommended system, one-month system trial at the a Community Health centers in Masamba sub- district, district North Luwu. The system includes hardwares such as laptops with internet connection, as well as softwares such as browser, Apache web server, data base with MySQL, PHP MyAdmin as Graphic User Interface.

Result

Designing information system

SEINDAH LUTRA is a web-based information system designed as antenatal electronic documentation which usage includes assessing the performance of the midwives in the line of antenatal care.

1. Initial Menu Interface

The initial menu interface (Figure 2) shows the system logo which is the web address (www.bidannetd.unhas.ac.id), log-in with username and password, and menu option.
Midwives’ Workshift

Figure 2. Workshift Menu

This menu shows the workshift for the midwives who will input their attendance everytime they are on duty.

3. Antenatal Patients Data Base and Documentation

Figure 3. Antenatal Patients Data Base and Content of Antenatal Documentation
The patient database shows the medical record number of the patients who have done the antenatal check-up. This menu shows the Antenatal documentation which includes input questions for subjective data; objective data which includes the physical (head-to-toe) and laboratory check-up and will detect the check-up result if there are any abnormalities. Documentation analysis: this system provides assistance in analyzing 10 items of diagnosis enforcement. In the next check-up, midwives will choose the case in which the result is included (physiologic, problematic physiology, pathology, pathology with accompanying illness, urgency). Management: The menu shows the management based on the case chosen by the midwives, completed with informed consent menu dan referral letter. This electronic documentation is based on the flow of antenatal care and the authority of the midwife.

Antenatal Care Monthly Check-up and Performance Recap Daily and monthly per-patient credit point Report
The antenatal monthly report as shown in Figure 4 shows the recapitulation of antenatal check-up in Community Health centers of Masamba sub-district, Luwu Utara district. The items of the report includes the number of Antenatal visits with the type of physiologic case, problematic physiology, pathology, pathology with accompanying illness, urgency, contacs with a health provide access, Remidal contact on the second and third trimesters, body mass index (BMI) with classification, mean arteri pressure (MAP), Roll Over Test (ROT), number of patients with HIV/AIDS, malaria, anemia, sexually transmitted infections case, hepatitis, protein and sugar (+), Grievances information, education, communication, Informed Consent, medical delivery letter. This recap will be checked at the end of the month to show the result of antenatal check-up.

The system points out the details of the credit rate per patient which is showing the details of the credit rate per patient, per day, and per month based on cases rate and the position owned by the midwife. Each treatment and nurture given to the patients are counted by the system. At the end of the month, the midwife will print the recap of the credit rate as the proof of the working performance of antenatal care. This system proves that the midwife performance is tangible, clear, and measurable.

The system validation

The system validation of this research involves some experts in midwifery documentation, midwife’s credit rate for performance index, obstetritian and gineocologist, and information technology system.

Table 1. System validation

<table>
<thead>
<tr>
<th>NO</th>
<th>Designing points</th>
<th>note</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Login System</td>
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</tr>
<tr>
<td></td>
<td>the attendant’s workshift list</td>
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</tr>
<tr>
<td>3</td>
<td>The patients’ Data Based</td>
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<td>4</td>
<td>The Data of the pregnancy first contact</td>
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<td>5</td>
<td>The Data of the pregnancy revisititation</td>
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<tr>
<td>6</td>
<td>Subjective data documentation</td>
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</tr>
<tr>
<td>7</td>
<td>Objective data: physical dan laboratory check-up</td>
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</tr>
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<td>8</td>
<td>Analysis (10 reinforcement diagnosis) with cases types</td>
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</tr>
<tr>
<td>9</td>
<td>The implementation: Grievances information, education, communication, Informed Consent, medical delivery letter.</td>
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</tr>
<tr>
<td>10</td>
<td>The recap of the government employed midwife performance index Per patient, Per day dan Per month</td>
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</tr>
<tr>
<td>11</td>
<td>The recap of monthly antenatal report</td>
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</tr>
</tbody>
</table>

The system reliability

The system reliability test was conducted in a Community Health centers in Masamba sub-district, North Luwu district for a month using measuring test method. The system reliability test used the alpha cronbach with the score $r_{xx} = 0.776$, the strong reliability of the coefficient $(\pm 0.60 \text{ - } \pm 0.799)$

Conclusion and Suggestion

Antenatal care documentation information system integrated with web-based government employed midwife performance index (Seindah Lutra) is designed to: 1) produce the source of information about the complete health record data of the pregnant women quickly and continuously 2). Be used by the midwives and the policy makers to analyze the problems and make the decision in order to improve the quality of antenatal care to reduce the risk of stillbirths and pregnancy complications and give women a positive pregnancy experience 3). Evaluate and monitor antenatal care and the government employed midwife performance index
which is tangible, clear, and measurable.

It is highly suggested that antenatal care documentation information system integrated with web-based government employed midwife performance index (Seindah Lutra) should be tried in a broader area.

**Ethical Clearance:** Ethical clearance number: 1071 / H4.8.4.5.31 / PP36-KOMETIK / 2018 issued by the Health Research Committee Hasanuddin Makassar University

**Financial Resources:** Financial Resources are fully borne by the researcher

**Conflict of Interest:** There is not conflict of interest in the my research.

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Correlation of HbsAg, HBeAg and HBV DNA Viral Load in Chronic Hepatitis B Patients

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Abstract

Introduction: The high incidence of Hepatitis B infection worldwide causes this to be a universal problem. Diagnosis and monitoring of HBV infection therapy currently uses HBsAg, HBeAg, anti HBe, anti HBc and HBV Viral Load tests. Limitations of the tools and costs of HBV DNA Viral load test causes monitoring of patients with chronic HBV infection is difficult. This study aims to look at the correlation between HBsAg, HBeAg and HBV DNA Viral Load in patients with Chronic Hepatitis B.

Method: Chronic Hepatitis B patients who meet the criteria consisted of 232 samples. HBsAg, HBeAg, anti HBe, and HBV DNA Viral Load data were analyzed using the Spearmans Correlation Test and Chi Square Test. There is a significant correlation and relationship if the test p value is <0.05.

Results and Discussion: Correlation test results showed a significant positive correlation between HBsAg and HBeAg against HBV DNA, with a role of 28.8% and 60% respectively. There is a significant relationship between HBsAg and HBeAg with HBV DNA. The percentage of subjects with high HBV DNA was found to be higher in subjects with HBsAg and HBeAg who were also higher than in subjects with low HBsAg, HBeAg and anti HBe.

Conclusion and Suggestion: In this study, it is concluded that there is a significant positive correlation between HbsAg and HBeAg with HBV Viral Load. HBeAg has the greatest role in HBV DNA.

Keywords: Chronic Hepatitis B, HBsAg, HBeAg, HBV Viral Load.

Introduction

The Hepatitis B virus (HBV) is a universal health problem, estimated at 240 million people have been infected worldwide. The highest endemicity rates in countries with HBV carriers (East Asia, sub-Saharan Africa and the Amazon basin) are around 8%, then East European countries 2 to 8% and West European and North American countries < 2%.¹²

Basic Health Research Results in 2007 showed that clinical hepatitis was detected in all provinces in Indonesia with a prevalence of 0.6% (range: 0.2% - 1.9%). The prevalence of hepatitis in 2013 (1.2%) was twice as high as in 2007. Five provinces with the highest prevalence of hepatitis were East Nusa Tenggara, Papua, South Sulawesi, Central Sulawesi, and Maluku. The highest percentage of hepatitis B in the age group 45-49 years (11.92%), age >60 years (10.57%) and age 10-14 years (10.02%), then HBsAg positive in the male and female groups almost same (9.7% and 9.3%). This shows that 1 in 10 of Indonesia’s population has been infected with the Hepatitis B virus.³

Diagnosis of HBV infection now uses serological marker examination and HBV DNA Viral Load. Detection of Hepatitis B surface antigen (HBsAg), Hepatitis B envelope antigen (HBeAg) and anti Hepatitis B core (anti Hbc) is the initial foundation of diagnosis of chronic HBV infection, followed by HBV DNA Viral load examination for diagnosis and monitoring of therapy.⁴ HBV DNA Viral Load test is a very important marker for observing viral activity.⁴,⁵
Various studies show that the high number of viruses plays an important role in the emergence of complications of chronic hepatitis B. Low virus counts are associated with a lower risk of hepatocellular carcinoma when compared with a high number of viruses. The number of HBV DNA viruses varies depending on various factors, so repeated checks are needed for monitoring disease course and treatment. Limitations of the tools and costs of HBV DNA Viral load test causes monitoring of patients with chronic HBV infection is difficult. Clinicians need other tests / markers to estimate the number of HBV DNA viruses with a faster, easier and cheaper method than HBV DNA Viral Load testing.5

HBV serology markers are currently growing rapidly. The HBsAg level test is the basis for diagnosing HBV infection. The HBsAg level test correlates with the amount of cccDNA HBV in the liver so that it is considered a marker of infected cells. HBeAg level test is an active viral replication indicator. the high number of HBV DNA viruses in pregnant women has a significant correlation with HBeAg levels. Anti HBe is an antibody formed in HBeAg. The formation of anti-HBe is a marker of seroconversion and is associated with inactive HBV. 5,6

An easier and cheaper test to predict the number of HBV DNA viruses is very important for monitoring Chronic Hepatitis B. Research on HBsAg, HBeAg and anti HBe tests against HBV DNA Viral Load tests is still very lacking, especially in Makassar. This study was conducted to see the correlation between HBsAg, HBeAg, anti HBe and HBV DNA viral load levels in patients with Chronic Hepatitis B. This study aims to look at the correlation of HbsAg and BHeAg level against HBV DNA Viral Load in patients with chronic hepatitis in dr. Wahidin Sudirohusodo Hospital, Makassar.

**Materials and Method**

This study was a cross sectional study conducted at the Clinical Pathology Installation of dr. Wahidin Sudirohusodo Hospital Makassar and the Makassar Center for Health Laboratory. The study was conducted from January 2016 until the number of samples was sufficient.

The study sample was all adult patients with hepatitis B more than 6 months who were diagnosed as Chronic Hepatitis B Patients based on history, physical examination and laboratory results that showed HBsAg and anti-HBe reactive and normal SGPT levels (<45 IU / mL). Levels of HBsAg and HBeAg were examined using the Chemiluminescence Immunoassay (CLIA) method. HBV DNA Viral Load is examined using the realtime PCR method.

**Statistical Analysis**

Test data for HBsAg, HBeAg and anti HBe levels against HBV DNA Viral Load levels were tested using the Kolmogorov-Smirnov test for the normality of numerical data. Data distribution is not normal if the test p value is <0.05. The Spearmans Correlation test was used to assess the correlation of HBsAg, HbeAg and Anti HBe levels with HBV DNA Viral Load. There is a significant correlation if the test p value is <0.05. The role of each test on HBV DNA Viral load is obtained from the rank correlation coefficient multiplied by 100%. Chi Square Test, to assess the relationship of HBsAg, HbeAg and Anti HBe levels in the category of HBV DNA Viral Load. There is a significant relationship if the test p value is <0.05.

**Results and Discussion**

The study involved 273 patients, of whom 41 were excluded due to hemolysis samples or insufficient sample volume. A total of 232 chronic hepatitis B patients were analyzed, consisting of 123 patients (53%) and 195 patients (84%) in the age group of young adults (19-44 years), as seen in Table 1.

**Table 1. Characteristics of samples**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Number (n=232)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>121 (52%)</td>
</tr>
<tr>
<td>Female</td>
<td>111 (48%)</td>
</tr>
<tr>
<td>Age</td>
<td></td>
</tr>
<tr>
<td>19-44 years old</td>
<td>195 (84%)</td>
</tr>
<tr>
<td>45-59 years old</td>
<td>34 (15%)</td>
</tr>
<tr>
<td>≥ 60 years old</td>
<td>3 (1%)</td>
</tr>
</tbody>
</table>

Source : Primary Data

The results of the Ministry of Health’s Basic Health Research show that the incidence of positive HBsAg in men and women is almost the same, this was also found in this study, where men were 52% and women were 48%. This difference could be due to men’s lifestyles such as smoking, which can inhibit the response to the hepatitis B vaccine. The highest incidence is found in
the age group 19-44 years, this is probably due to the number of patients involved in this study were less than 40 years old. Chathuranga (2013) found that there was no significant difference between age and immune response to hepatitis B.8

Table 2. Correlation of Mean HBsAg, HBeAg, and Anti HBe against HBV Viral Load

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>Coefficient of Correlation (r)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>HBsAg Level Test</td>
<td>102.5 IU/mL</td>
<td>63.3</td>
<td>0.54</td>
<td>0.00</td>
</tr>
<tr>
<td>HBeAg Level Test</td>
<td>31 PEIU/mL</td>
<td>51</td>
<td>0.77</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Source : Primary Data

There was a positive correlation between HBsAg, HBeAg and anti HBe levels against HBV DNA Viral Load with p <0.00, wherein higher HBV Viral Load, the higher HBsAg, HBeAg and anti HBe levels. The correlation between HBV DNA and HBsAg is a strong correlation (r = 0.54) but with HBsAg role in HBV DNA Viral Load only 28.8% (Figure 1).

Figure 1. Correlation of HBsAg level and HBV DNA Viral Load

Gupta (2012) concludes that HBsAg correlates with HBV DNA in Chronic hepatitis B patients and can be used to predict the number of viruses in HBV DNA.9 Belopolskaya M in 2015 also found a correlation between HBsAg and HBV DNA levels in pregnant women, but HBsAg levels height does not always correlate with the high number of HBV DNA viruses.4 Zhu found that patients with high HBsAg levels also had high HBV DNA viral load.10

The role of HBeAg levels on HBV Viral Load DNA is greater than the role of HBsAg and anti HBe levels, which is 60.0% (Figure 2), while the role of anti HBe is only 47.7% (Figure 3). In this study also found a very strong correlation between HBeAg levels (r = 0.77) against HBV DNA Viral Load versus anti HBe which correlated strongly (r = 0.69)

Figure 2. Correlation of HBeAg and HBV DNA

Da Silva (2009) found a very strong correlation of HBeAg levels with HBV DNA Viral Load, a simultaneous decrease in HBV DNA Viral load and HBeAg levels after Lamivudin therapy, so that HBeAg levels in the initial week of therapy can be used as predictors of antiviral responses.11 HBeAg occur coincided with the production of DNA polymerase virus, therefore HBeAg showed more replication of the virus.4 Previous studies found a positive correlation between HBeAg and HBV DNA, 84.6% of patients with positive HBeAg had high HBV DNA viral load.12,13

Conclusion and Suggestion

This study concludes that there is a positive correlation between HBsAg and BHeAg level against HBV DNA Viral Load in patients with chronic hepatitis B. HBeAg level has the greatest role and strongest correlation to HBV DNA Viral load.

This study suggests the use of HBeAg level test to predict the number of HBV DNA either for diagnosis or monitoring the treatment of patients with chronic hepatitis B.

Ethical Clearance- Taken from Medical faculty ethical clearance committee

Source of Funding- Self
Conflict of Interest – None

References


Women Participation in Fast Food Control in Kendari City, Indonesia

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\textsuperscript{2}Institute of Tropical Disease, Airlangga University, Surabaya, Jawa Timur, Indonesia, 
\textsuperscript{3}Department of Environmental Health, Faculty of Public Health, Hasanuddin University, Makassar

Abstract

Background: Kendari City Health Government faced fast food trader issue which affected to public health status. The prevalence of diseases which were caused by food continued to increase. Community participation in fast food control was needed because of limited health workers in health centres. Therefore, this study aimed to indentify affectivity of women participation in fast food control to food traders in Kendari city, Southeast Sulawesi, Indonesia.

Materials and Method: This study applied Quacy Experiment with the one group pretest-posttest design. The study was conducted in 3 villages in Kendari City because they have many temporary food traders. The sample of temporary food traders ware 39 traders and 17 women. The hypothesis of this study is that community involving in control to the temporary food traders will be effective to improving the fast food processing which will affect to the quality of sold food. Data analysis used Linier Regression.

Results: women could control the fast food traders to increase food hygiene and sanitation. The distance of the cadre’s home to the fast food trader significantly influenced to the fast food processing which eventually affected to the quality of the sold food.

Conclusions: women can a representation of a civil society to control food for traders in Kendari effectively because they are closed with food traders.

Keywords: Women, Participation, Food, Disease

Introduction

Kendari city health government in Southeast Sulawesi Indonesia faced the unsanitary huge fast food sellers. This has contributed to increasing the number of communicable and non communicable diseases such as diarrhoea and hypertension in Kendari city. In 2015, there were about 63.28% of diarrhoea and about 14.83% of hypertension. Those were higher than other district such as in North Konawe (6.64%) and Wakatobi (15.87%) of the prevalence of diarrhoea\textsuperscript{1}. While the prevalence of hypertension were also higher compared to 7.15% of Bau-Bau city\textsuperscript{1}. The Health Department in Kendari City implement several strategies. The strategies include collaborated programs between the producers, governments, non-government organization and communities\textsuperscript{2}. However, community involvement was still unclear. While the number of unsecure fast food sellers continued to rise. Health department has involved cadres or community volunteers involve in the village comprehensive health services. However, cadre’s involvement in the fast food controller has never been done until now. Therefore, this study aimed to identify the model of cadres’ involvement in controlling to the fast food traders to reduce the foodborne diseases in Kendari city of Southeast Sulawesi Province.
Material and Method

a. Research Design

This quantitative method study used a quasi Experiment approach with The one-Group Pretest-posttest Design as described below.

<table>
<thead>
<tr>
<th>Pre-test</th>
<th>Treatment</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>0₁</td>
<td>X</td>
<td>0₂</td>
</tr>
</tbody>
</table>

Notes:
0₁ : Pre-test
X : treatment from communities as controller and educator
0₂ : Post-test

Figure-1. The Quacy-Experiment method with The One-Group Pretest-posttest Design

b. The Study Site and Time

This study was conducted in three villages in Kendari city of Southeast Sulawesi province Indonesia namely Andonohu, Rahandauna and Wundumbatu villages. This study was conducted from March to July 2018.

c. The Population and Samples

Population

All fast food traders were population in this study namely about 119 traders.

Sample and sampling technique

The samples of this study were 39 fast food traders who were selected with using the purposive sampling. The inclusive criteria of sample were active cadre available in the village and there many fast food traders.

d. Data collection

Data was collected through interview and observation. The interview was purposed to the fast food sellers and cadres in three villages. This study recruited 17 women a controller to the fast food traders.

e. Data analysis

Data was analysed into two ways, namely descriptive and inferential analysis. Descriptive analysis was to understanding percentage and distribution of each variable such as communities’ characteristic who involved in, the form, the mechanism of the fast food controlling. The inferential analysis was to analyse the relationship between the distance of cadre’s house to the fast food traders and the quality of the food hygiene and sanitation. The statistical analysis used linier Regression.

Results

a. Characteristic of women who involve in the fast food control

Women who were involved in this study were 17 people. All women aged 41.5 on the average and 7.3 of standard deviation. The majority of the age of cadres was between 40-44 years old (41.2%). There were only 5.9% of cadres who aged more than 50 years. 29.4% of them aged 35-39 years old and 11.8% of them aged 30-34 years old and 45-49 years old. Some of them passed from senior high school (52.9%), while they who passed from diploma/Bachelor/Post Graduate were 23.5%. Other cadres passed from Junior High School (17.6%) and 5.9% of Primary School. There were about 70.6% of cadres who did not have job. Another cadres work as traders (17.6%), teachers (5.9%) and civil servant (5.9%). 94.1% of cadres were married, while 1 cadre was widow. The majority of cadres have two children (41.2%), 23.5% have three and five children. 5.9% of cadres have one and four children. They have been a cadre more than 1 years. They have had many experiences to do social activities and trainings. Detail of the cadres who involved in controlling the fast food traders was presented in this table below.

Table-1. Women’s experiences in the social activities

b. The Relationship between the distance of women’s house to the fast food traders and the quality of food hygiene and sanitation

Women have various type when they controlled the food traders. Some of them used motor cycles (82.4%), while others were on food (17.6%). The duration of reaching the food traders were also verity as presented in the below table.
Table-2. The distance of Women’s house to the fast food traders

<table>
<thead>
<tr>
<th>Distance of Women’s House to the Fast Food Seller (meter)</th>
<th>Mean (±) 1 SD*</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 100</td>
<td>2 (11.8)</td>
</tr>
<tr>
<td>100 – 499</td>
<td>5 (29.4)</td>
</tr>
<tr>
<td>500 - 999</td>
<td>2 (11.8)</td>
</tr>
<tr>
<td>1000 – 1499</td>
<td>5 (29.4)</td>
</tr>
<tr>
<td>1500 – 1999</td>
<td>1 (5.9)</td>
</tr>
<tr>
<td>&gt; 2000</td>
<td>2 (11.8)</td>
</tr>
</tbody>
</table>

Duration of time to the food seller (minute): mean (±) 1 SD*

<table>
<thead>
<tr>
<th>Duration of Time to the Food Seller (Minute)</th>
<th>Mean (±) 1 SD*</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 4</td>
<td>4 (23.5)</td>
</tr>
<tr>
<td>5 – 9</td>
<td>8 (47.1)</td>
</tr>
<tr>
<td>10 – 14</td>
<td>3 (17.6)</td>
</tr>
<tr>
<td>15 – 19</td>
<td>1 (5.9)</td>
</tr>
<tr>
<td>20</td>
<td>1 (5.9)</td>
</tr>
</tbody>
</table>

SD* = Standard Deviation

This study found out there was significant association between the distance of women’s house to the fast food traders and the quality of food hygiene and sanitation as showed in table 3.

Table-3. The relationship between the distance of women’s house to the food traders with the quality of food hygiene and sanitation based

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>95% Confidence Interval for B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std.error</td>
<td>Beta</td>
</tr>
<tr>
<td>The Distance of cadre’s house (meter)</td>
<td>21.428</td>
<td>.616</td>
<td>.192</td>
</tr>
</tbody>
</table>

Discussion

This study found out that women or community health volunteers could control fast food traders because of many reasons. They have gotten training from Health Department and form Primary health care services, as showed about 9.2 times. They have become a volunteer more than 6 years. Therefore, they have had huge experiences, particularly in community engagement and Mobilization. They have also gotten their family’s support such as husband or parents. Family support is one of important factors of the individual behaviour besides the individual knowledge, belief and infrastructures. As presented above, the cadres passed from Senior High School (52.9%). Thus, they could synthesize health information which they got. Cadres with more higher educational level tends to have awareness about science and information. The several previous studies also found that cadres’ knowledge influenced to success in their social responsibility. Moreover, motivation is also the essential factor of successful for cadres. Motivation has significant relationship with
human basic needs. The human basic needs include physiological, safety, love, esteem and self-actualization needs. This is true that cadre’s involvement in the fast food control in this study because they want to get new experiences and self-actualization. This is based on Depth interview with cadres. Another thing, they hope to get an incentive from Primary Health Care Centre or from their village leader. Some of cadres (70.6%) do not have job. They are wives who do domestic chores only. If they got incentive such as a few money, there will be increasing their family income. Additional household income will give significantly impact for their children nutrition because they will increase their purchasing power for food. Increasing in the household income also can improve their household facilities such as water and latrine facilities. The housing condition also influence significantly to their under-five children’s nutrition status. Some of cadres have under-five years old children. Also, they can buy gasoline for their motor cycle because there are about 82.4% of them used motor cycle when they supervise the fast food sellers. This means that incentive includes in intrinsic factor which motivate the human to involve in the activity like involving in the fast food control. Other previous study also argued that cadre’s motivation was important factor for them to be active in the social activities in their village.

Other important factor why cadre were effective to involve in the fast food control is they have lots of free time. As above mentioned that there were about 70.6% of cadres were no job. Thus, they had lots of time to involve in the fast food control. This activity took about 6.7 minutes only. Even some of cadres (29.4%) who had a job, they still could use their free time to involve in this activity. The distance between the cadre’s home and the fast food seller is about 766 meters in average. Cadres have 3 children in the average. Therefore, they do not have heavy burden between their responsibility in their home and in this fast food control. As we known, the wives in this culture have responsibility to child rearing including the domestic chores.

Furthermore, cadre’s experiences in the previous activity could do the best approach and communication with the fast food traders. Thus, they could also give health promotion to the sellers during supervision. The cadres were about 41.5 years old in the average. They included in the adult people who changed their interest and responsibility towards socialist people. With the simple instrument of control the fast food quality, the cadres could show their ability to involve in the fast food control. The form includes several aspects such as about environment, the trader’s behaviour towards the food hygiene and sanitation. Thus, they could give health education for the food sellers during supervision. The number of assessment (0-10) of the quality of the food hygiene and sanitation is easier for the cadres. The number of 5 becomes the basic to determine the good or poor because this number was agreed as a middle number.

Conclusions

Women volunteer in the village who can help health worker to control the fast food traders because they have gotten lots of trainings and had huge experiences in the health promotion program. Therefore, they can influence the fast food traders to improve their food management. The process of controlling is simple and needs short time only.

Acknowledgement: I would like to thank to Ministry of Research, Technologi and Higher Education of Republic of Indonesia in financial support of this study. I am grateful to College of Mandala Waluya Health Sciences who give permission to take this study. My sincere goes to women volunteer and food traders in Kendari city for your participation.

Conflict of Interest: The authors have no conflict of interest associated with the material presented in this paper.

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Ethical Clearance- Taken from institution of Mandala Waluya Ethical committee

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Calculation of Potential Risks Assessment of Escherichia Coli and Total Coliform in Communities Well Water of Puty Village, Luwu Regency

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Abstract

This study aims to determine total coliform present in water and to determine the health risk to the people who consume water contaminated by bacteria. The research was a cross observational study with microbe risk analysis conducted in Puty Village of Bua District, Luwu Regency. The sample consisted of 15 drilling wells and 34 respondents who owned drilling wells selected using purposive sampling method. The data was analyzed using MRA method and Excel programs. The results of the research indicate that the average concentration of total coliform in drilling water among 15 samples is 130-160.000000 MPN / 100 ml water. Meanwhile, for E. coli the average concentration in water exceeds the standard of drinking water quality, i.e 23-24000 .000 cells/100 ml while the standard drinking water quality should be 0/100 ml water. The amount of risk for public who consume water contaminated by bacteria is in a high risk on average. The results of risk analysis indicate that the highest Probability of infection (P_inf/day) of Escherichia coli bacteria contamination in water among 15 samples is sample 5, i.e 2.40E-04. Probability of infection/year (P_inf/year) is 874E-2, while probability of illness (P_ill) is 1.28E+2. Therefore, this is in a high risk category which means that it is risky of a disease.

Keywords: Microbial Risk Analysis, Escherhicia coli, total coliform.

Introduction

Average water needs by Indonesia people is 60 liters per capita, include: 30 liters for bathing purposes, 15 liters for drinking purposes and the rest for other purposes¹. The presence of this group of bacteria used as an indicator of a product has been contaminated by fecal matter, namely bacteria residing with feces or feces. This is due to the natural habitat of these bacteria group is in the feces of humans and other warm-blooded animals.

Data by Riskesdas², the use of clean water that is most widely used for domestic purposes is protected dug wells amounted to 27.9% and boreholes or pump by 22.2%. Whereas, for the purposes of drinking water is the most widely used is protected dug wells amounted to 24.7% and boreholes or pump by 14%. These wells, if not addressed properly, has the potential to be contaminated with Escherichia coli.

Many risk factors are thought to cause diarrhea in Indonesia. One risk factor is often studied environmental factors including microbiological quality of water, the presence of pathogenic bacteria in the water, such as the bacterium Escherichia coli the most dominant risk. Factors contribute to diarrheal diseases are water, hygiene and sanitation (availability and ownership of
latrines, trash), the transmission through food, waste water and air².

A study of risk factors for the incidence of diarrhea by Natsir et al.,³ found that poor sanitation relationship with the incidence of diarrhea which gained frequency distribution of clean water a bad category of 199 (90.5%) of 220 respondents; Poor handling of waste by 171 (77.7%); bad excreta disposal facilities by 124 (56.4%). While the frequency distribution of bacteriological water quality examination showed that of 218 (99.1%) positive water samples E. coli. The World Health Organization (WHO)⁴ reported the disease caused by the bacterium Escherichia coli that hit Germany and 11 other countries in Europe up to now has reached 2,260 cases and resulted in the death of 22 people. Until June 5, 2011, Germany has reported the incidence of 1,536 cases of EHEC (Escherichia coli entorohemoragik) which is an increase of 108 cases from the previous day and resulted in the deaths of six people.

Assessment approach associated with the procedure MRA can assist the risk assessment to characterize the source of exposure, the causative agent associated with symptoms, and other factors that contribute to the emergence of disease MRA has become a method is growing rapidly that systematically combines available information on exposure and dose-response to produce estimates the burden of disease associated with exposure to pathogens⁵. MRA expressed great risk in the value P infection (P inf) or P illness (P ill). This study aims to determine the risk of contamination of Escherichia coli and total coliform in wells water to public health.

**Materials and Method**

Research Methods

This study used an observational study design with the approach of microbial risk analysis (MRA) to determine the health risk that would occur if infected by bacteria in the water.

Research Sites

This research was conducted in the village of Bua Puty districts during 2 months from May to June.

Population and Sample

The human population in this study are all people who consume water from well. For human sample in this study were 34 people who have dug well water samples was 15 samples. Sample is determined by purposive taken one time. Bacteria that become research object were Total coliform and Escherichia coli bacteria that present in water wells in the test laboratory. Sample Environmental health techniques for determining the amount of the concentration of bacteria in the water wells. Concentration results in analysis with Quantitative Approach Microbial Risk Assessment (QMRA) to determine how much the probability of Escherichia coli bacteria can cause infection (P infection) or disease (P illness) in the community.

**Data Collection**

Primary data obtained from the test results laboratories ie the number of E. coli and total coliforms in secondary Makassar. Data BTKL-PP obtained from recording data related to the community of Bua district office, health office and health center Luwu Bua about 10 highest diseases and the number of facilities 2014 clean water.

**Data analysis**

Data were analyzed using Analysis of Quantitative Microbial Risk Assessment (QMRA) which cover of Hazard Identification, Exposure Assessment, the analysis of dose response Risk characterization), and Risk Management. Presentation of data in tabular form accompanied by narration.

**Research Results**

Results showed that the number of E. coli and total coliform bacteria in wells water in the village Puty that used as sources of drinking water are not eligible for direct consumed. It present concentration of bacterium of Escherichia coli and total coliform. The result of temperature, and pH of the water wells test and analysis were also not meet requirement at all. The concentration of total coliform bacteria in water (Table 1) shows that water samples from 15 wells tested were not safe for consumption without treatment, the highest sample Total coliform at sample 5 with 160 million cells / 100 miles of water, and the lowest total coliform samples was at 130 cells / 100 miles of water at well number 15. In the sample (Table 2) shows the concentration of bacteria E.coli from 15 well water were tested all the samples showed no feasible and highest sample Escherichia coli bacteria
was on 5 sample that is 24 million cells / 100 miles of water and a sample of the bacteria Escherichia coli lowest 20 cells / 100 miles of water.

Table 1. Laboratory Test Results Total Pollution Total coliform in dug well water in Bua District, Luwu Regency in 2015

<table>
<thead>
<tr>
<th>Samples</th>
<th>Location</th>
<th>Total Coliform/100 ml</th>
<th>Maximum Allowance</th>
<th>Feasibility</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>RW 1</td>
<td>9200</td>
<td>Base of the regulation PERMENKES RI NO.416/MEN. KES/PER/IX/1990 50 for water air non pipe /IX/1990</td>
<td>Not Feasible</td>
<td>APHA 2005.9221 B</td>
</tr>
<tr>
<td>2</td>
<td>RW 1</td>
<td>5400</td>
<td>Not Feasible</td>
<td>Not Feasible</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>RW 1</td>
<td>230</td>
<td>Not Feasible</td>
<td>Not Feasible</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>RW 11</td>
<td>24,000,000</td>
<td>Not Feasible</td>
<td>Not Feasible</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>RW 11</td>
<td>160,000,000</td>
<td>Not Feasible</td>
<td>Not Feasible</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>RW III</td>
<td>1,600.000</td>
<td>Not Feasible</td>
<td>Not Feasible</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>RW III</td>
<td>3500</td>
<td>Not Feasible</td>
<td>Not Feasible</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>RW IV</td>
<td>1600</td>
<td>Not Feasible</td>
<td>Not Feasible</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>RW IV</td>
<td>220</td>
<td>Not Feasible</td>
<td>Not Feasible</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>RW V</td>
<td>470</td>
<td>Not Feasible</td>
<td>Not Feasible</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>RW V</td>
<td>54000</td>
<td>Not Feasible</td>
<td>Not Feasible</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>RW VI</td>
<td>9200</td>
<td>Not Feasible</td>
<td>Not Feasible</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>RW VI</td>
<td>5400</td>
<td>Not Feasible</td>
<td>Not Feasible</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>RW VII</td>
<td>1700</td>
<td>Not Feasible</td>
<td>Not Feasible</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>RW VII</td>
<td>130</td>
<td>Not Feasible</td>
<td>Not Feasible</td>
<td></td>
</tr>
</tbody>
</table>

Table 2 Laboratory Test Results Number of Escherichia coli Pollution in dug well water in Bua District, Luwu Regency in 2015

<table>
<thead>
<tr>
<th>Sample</th>
<th>Location</th>
<th>MPN E. Coly/100 ml</th>
<th>Maximum Allowance</th>
<th>Feasibility</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>RW 1</td>
<td>23</td>
<td>0 for drinking water</td>
<td>Not Feasible</td>
<td>APHA 2005.9221 F</td>
</tr>
<tr>
<td>2</td>
<td>RW 1</td>
<td>1700</td>
<td>Not Feasible</td>
<td>Not Feasible</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>RW 1</td>
<td>78</td>
<td>Not Feasible</td>
<td>Not Feasible</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>RW 11</td>
<td>23,000,000</td>
<td>Not Feasible</td>
<td>Not Feasible</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>RW 11</td>
<td>24,000,000</td>
<td>Not Feasible</td>
<td>Not Feasible</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>RW III</td>
<td>23000</td>
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<td>Not Feasible</td>
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</tr>
<tr>
<td>7</td>
<td>RW III</td>
<td>240</td>
<td>Not Feasible</td>
<td>Not Feasible</td>
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</tr>
<tr>
<td>8</td>
<td>RW IV</td>
<td>9200</td>
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<td></td>
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<tr>
<td>9</td>
<td>RW IV</td>
<td>20</td>
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</tr>
<tr>
<td>10</td>
<td>RW V</td>
<td>220</td>
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<tr>
<td>11</td>
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<td>250</td>
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<td>Not Feasible</td>
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<tr>
<td>12</td>
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<tr>
<td>13</td>
<td>RW VI</td>
<td>23</td>
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<td>Not Feasible</td>
<td></td>
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<tr>
<td>14</td>
<td>RW VII</td>
<td>45</td>
<td>Not Feasible</td>
<td>Not Feasible</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>RW VII</td>
<td>130</td>
<td>Not Feasible</td>
<td>Not Feasible</td>
<td></td>
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</tbody>
</table>
Table 3. Results of Quantitative Calculations Microbial Risk Assessment Source of Drinking Water in Puty Village, Bua District, Luwu District, 2015

<table>
<thead>
<tr>
<th>Sample</th>
<th>Bacteria in water $C_{b}$</th>
<th>Quality of Bacterial Concentration in Drinking Water ($C_{q}$)</th>
<th>Pathogen Exposure to Drinking Water (E)</th>
<th>Infection Probability Per Day ($P_{m}$)</th>
<th>Infection Probability Per year ($P_{inf,y}$)</th>
<th>Probability of Gastrointestinal Disease ($P_{ill}$)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>23</td>
<td>0.0023</td>
<td>0.0023</td>
<td>-2.30E-10</td>
<td>-8.39E-08</td>
<td>1.28E-05</td>
<td>High Risks</td>
</tr>
<tr>
<td>2</td>
<td>1700</td>
<td>0.17</td>
<td>0.17</td>
<td>-1.70E-08</td>
<td>6.20E-06</td>
<td>9.48E-04</td>
<td>High Risks</td>
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<tr>
<td>3</td>
<td>78</td>
<td>0.0078</td>
<td>0.0078</td>
<td>-3.37E-08</td>
<td>2.84E-07</td>
<td>4.35E-05</td>
<td>High Risks</td>
</tr>
<tr>
<td>4</td>
<td>23,000,000</td>
<td>2300</td>
<td>2300</td>
<td>2.30E-04</td>
<td>8.38E-02</td>
<td>1.28E+01</td>
<td>High Risks</td>
</tr>
<tr>
<td>5</td>
<td>24,000,000</td>
<td>2400</td>
<td>2400</td>
<td>2.40E-04</td>
<td>8.74E-02</td>
<td>1.34E+01</td>
<td>High Risks</td>
</tr>
<tr>
<td>6</td>
<td>23,000</td>
<td>2.3</td>
<td>2.3</td>
<td>2.30E-07</td>
<td>8.39E-05</td>
<td>1.28E-02</td>
<td>High Risks</td>
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<tr>
<td>7</td>
<td>240</td>
<td>0.024</td>
<td>0.024</td>
<td>2.40E-09</td>
<td>8.75E-07</td>
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<td>9200</td>
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<td>0.92</td>
<td>9.19E-08</td>
<td>3.35E-05</td>
<td>5.13E-03</td>
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</tr>
<tr>
<td>9</td>
<td>20</td>
<td>0.002</td>
<td>0.002</td>
<td>2.00E-10</td>
<td>7.29E-08</td>
<td>1.12E-05</td>
<td>High Risks</td>
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<tr>
<td>10</td>
<td>480</td>
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<td>0.022</td>
<td>2.20E-09</td>
<td>8.02E-07</td>
<td>1.23E-04</td>
<td>High Risks</td>
</tr>
<tr>
<td>11</td>
<td>220</td>
<td>0.025</td>
<td>0.025</td>
<td>2.50E-09</td>
<td>9.11E-07</td>
<td>1.39E-04</td>
<td>High Risks</td>
</tr>
<tr>
<td>12</td>
<td>250</td>
<td>0.04</td>
<td>0.04</td>
<td>4.00E-09</td>
<td>1.46E-06</td>
<td>1.90E-04</td>
<td>High Risks</td>
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<tr>
<td>13</td>
<td>400</td>
<td>0.0023</td>
<td>0.0023</td>
<td>2.30E-10</td>
<td>8.39E-08</td>
<td>1.09E-05</td>
<td>High Risks</td>
</tr>
<tr>
<td>15</td>
<td>45</td>
<td>0.013</td>
<td>0.013</td>
<td>1.30E-09</td>
<td>4.74E-07</td>
<td>7.39E-05</td>
<td>High Risks</td>
</tr>
</tbody>
</table>

Figure 1. Graph of State Temperature and pH of well water dug as a source of drinking water.

Figure 1 shows temperature and pH in the wells as a source of drinking water with an average of pH between 6.9 -9.2 while the normal limit of the pH is 6-8, meaning the highest pH value there is in the sample 14 are in RW 7 marks that it is on the water because the acid levels over the limit. Whereas highest pH in the sample 14 is 9.2 with the sampling time at 15:40 on the exposure limits with low pH 6.5 and the highest 9.0. pH or acidity pH ranges of drinking water 5-8. While the value of water quality standards 31.6 where temperature ever on the samples 2 to 15 and 30.9 on the sample 6, and 3 on the sample 5 is the maximum allowed 30.1 (BMA) water quality standards (26-29 °C).

Quantitative Microbial Risk Assessment on wells as a source of drinking water.

Quantitative calculation results in microbial risk analysis aims to determine the dose response of the
probability of infection and the risk characteristics of the population of the village society Puty. Table 3 shows the probability of infection per day based on \( P_{\text{inf. d}} = 1 - \left(1 + \frac{E}{\beta}\right)^{-\alpha} \) that people who consume water every day / 1 liter contaminated with bacteria E.coli then he will be infected with about 23954E-4 bacteria then categorized as high risk, while the probability of infection per year or infection due to consumption of water contaminated with bacteria during the year by the formula \( P_{\text{inf. d y}} = \frac{365}{1} \) was = 8.74327E-2 can be categorized high. And the probability for gastrointestinal disease or (\( P_{\text{ill}} \)) is \( P_{\text{inf. y x S x I}} = 13.3771209E^{-1} \) if the resulting percentage is the risk of clinical disease 50% the risk of disease is a high risk. Of the 15 samples of the lowest concentrations of the bacterium Escherichia coli is a sample 9 as 20/100 miles. For \( P_{\text{inf.d}} = 1 - \left(1 + \frac{E}{\beta}\right)^{-\alpha} \) 2.00E-10. For (\( P_{\text{inf.y}} \)) was 7.29E-10 while for (\( P_{\text{ill}} = P_{\text{inf. y x S x I}} = 1.12E^{-5} \)) Bahwa (\( P_{\text{inf.d y}} = 365 \) was 7,29E-10 can be categorized high. And the risk for probability of gastrointestinal disease or (\( P_{\text{ill}} \)) is \( P_{\text{inf. y x S x I}} = 13.3771209E^{-1} \) is a high risk. Of the 15 samples of water in the village Puty with test results analysis \( P_{\text{inf.y x S x I}} \) all smaller than 10-6 then all categorized as high risk.

**Discussion**

Results of the analysis of the content of total coliform bacteria in water samples dug research region ranged 130-160000000 MPN / 100 ml indicates that the water has been contaminated by human or animal feces that can cause gastrointestinal diseases. All samples were above the threshold of water quality standards are allowed to water intended for drinking water which should not be any bacteria that is 0/100 ml of water and for its designation as clean water \( \leq 50 \text{ MPN} / 100 \text{ ml} \). This study shows that the number concentration of E. Coly between 23-24,000,000 ranges coli cells / 100 ml water. In 100 ml drinking water should not be on the content of the bacterium Escherichia coli. The presence of E. coli in drinking water indicates poor water quality. Bacteria indicator bacteria E. coli are sanitation and also be pathogen that frequently causes various diseases.

In this study of the results of the risk analysis of the sample greatest risk is 12,82016452E-4 with a concentration of 23 million cells of E. coli / 100 ml of water is on the sample 4 and sample 5 is 13,3771209E-1 with concentration E. coli bacteria in the water 23 million cells / 100 ml of water. This is a relatively high risk even as the highest mortality burden in the future. The high concentration of bacteria in the water as probable with the results of measurements of water temperature past the normal limit water quality standard yaitu31,6 ie on the samples 2 to 15 and 30.9 on the sample 6, and to 3 on the sample 5 is the maximum allowed 30.1 (BMA) water quality standards (26-29°C but total coliforms are found under the maximum limit. It shows that the temperature conditions conducive to the growth of total coliforms. It is possible there are other factors such as levels of waste, as well as other things that cause could grow maximum of coliforms in the water.

Risk characteristics that (\( P_{\text{inf/day or Pill}} \)) ketch more than 10-6 is an example of the highest concentrations of bacteria are \( P_{\text{inf/year x S x I}} = 13.3771209E^{-1} \) is a high risk. Of the 15 water samples with assay results of analysis \( P_{\text{inf/y x S x I}} \) all smaller than 10-6 then all risks are categorized high. A study previously done by Kroli, shows that the level of risk is lower (1.36E-07 for fig. 1 and 1.45E-07) showed that cater to the health-based targets. Taking the average contamination in the distribution, the risk is much higher (5.26E-04 for 1998 and 2.92 E-04 for 1999). Gastrointestinal infections arising as a result of this attack Escherichia coli bacteria to the intestinal wall causing movement of the solution in large quantities and damage the membrane electrolyte balance in mucus. It can cause water absorption in the intestinal wall decreases and causes diarrhea.

**Conclusions**

Probability Risks of infection (\( P_{\text{inf/d}} \)) from Escherichia coli bacteria contamination in drinking water of 15 samples were highest in samples 5 was 2.40 E-4. Then, probability of infection / year (\( P_{\text{inf / year}} \)) 1.34E+1 or the probability of illness (\( P_{\text{ill}} \)) is the category in the high risks 1.34E+1.

**Ethical Clearance-** Taken from Faculty of Public Health committee

**Source of Funding-** Self

**Conflict of Interest – Nil**

**References**


4. WHO. Who Guidelines For Safe Recreational Water Environments, 2009; Volume 1, Coastal And Fresh Waters.


Proinflammation and Anti Inflammation in Contrast Induced Nephrophyathy Patient after Administration of Contras Media; Analysis of Interleukin 18 and Interleukin 37 Levels

Uleng Bahrun1*, Yuyun widaningsih1, Rahmawati Minhajat1, Andi Nilawati Usman4, Wira3

1Clinical Pathology Department, 2Clinical Pathology Department, 3Internal Medicine Department, Hasanudin University, Indonesia, 4Public Health Department, Mandala Waluya College, Indonesia

Abstract

Background/Objective: Contrast induced nephrophyathy is potential side effect of contrast administration. A good marker is required in order to synergize with the creatinine marker so that CIN can be handled more quickly. This study aimed to compare the levels of interleukin 18 as a marker of inflammation and interleukin 37 as an anti-inflammatory marker in patients with CIN after administration of contrast media.

Material and Method: It was as crossectional study, subject of study were were all affordable populations who underwent Percutaneus Coronary Intervention (PCI) at the Cardiac Installation Center of Wahidin Sudirohusodo Makassar (as many as 30 patients). Healthy people used as control of study (10 people) and also AKI patients (10 people).

Results: Data indicated that both Non CIN and CIN groups had statistically significant IL-18 increases but decrease IL-37 even unsignificantly Data after media contrast administration showed that IL-18 of the control group differed significantly with CIN and AKI groups and did not differ significantly with non-CIN groups. After media contrast administration also showed that the IL-37 of control group differed significantly with AKI groups only and did not differ significantly with non-CIN and CIN groups.

Conclusion: Proinflammation activity, marked by IL-18 increased significantly after contrast administration but anti-inflammatory, marked by IL-37 decrese even unsignificatnly.

Keywords: Contrast, Contrast Induced Nephrophyathy, IL-18, IL-37

Introduction

Contrast Induced nephrophyathy (CIN) is side effect of giving contrast media that has become one of the main causes of kidney failure and causes a critical condition in patients 1-3. It has been a major determinant of Acute Kidney injury (AKI) and its incident has varied time after contrast media delivery, there are fast only 2 days and there are up to 30 days4,5. Although a recent a meta-analysis study found that no significant difference between renal of patients given and those not given contrast many studies has indicated different result 6.

Marker of CIN traditionally still used increasing of creatinine serum within 24-48 hours after exposure but some studies have tried used inflammatory reponse as biomarker because delayed response of creatinine serum could reach 30 days and it was too late for patients to treat and prognostic will deteriorate 7. A good marker is required in order to synergize with the creatinine marker so that CIN can be handled more quickly even if the serum creatinine condition is still under normal conditions.

Pathophysiology of CIN-AKI is still being studied to gain a good understanding and consensus on prevention is not present yet 8. Inflammatory processes are involved in the CIN mechanism that occurs after the administration of contrast media, some studies use C-reactive protein (CRP) levels as an inflammatory marker and predictor 9-11. Proinflammation cytokine, interleukin 18 (IL-18) has been one of the early detection of AKI events, it can be detected at 24 hours and 48 hours after exposure.
Suppose as strong biomarker and moderate diagnostic IL-18 also has potential as a biomarker for CIN events \(^{12-14}\).

Before being used as a biomarker in CIN events, it must first be ascertained whether there is indeed a difference in IL-18 levels in CIN and non-CIN patients and should also be comparable to patients with AKI. Response to inflammation by antiinflammation cytokine should be considered to be biomarker together with proinflammation cytokine. One of the most infrequently studied but important anti-inflammatory cytokines is interleukin 37 (IL-37). Clinicians need an early biomarker of CIN diagnostic and also an appropriate decision regards inflammation.

Interleukin-18 stimulates infiltration and activation of T lymphocytes and Natural killer (NK) and interferon-production. Interleukin-18 is released into the urine 6 hours after the onset of a kidney injury \(^{15}\). Interleukin 37 (IL-37) is a family of IL-1 that has a close relationship as well as a natural inhibitor for Interleukin 18 (IL-18), this cytokine is also a suppressor for TNF-α that induces neutrophil activation \(^{16}\).

This study aimed to compare the levels of interleukin 18 as a marker of inflammation and interleukin 37 as an anti-inflammatory marker in patients with CIN after administration of contrast media. This study will also compare between IL-18 and IL-37 in patients with CIN and AKI patients.

**Materials and Method**

**Design and Subject**

It was as cross sectional study, subject of study were all affordable populations who underwent Percutaneous Coronary Intervention (PCI) at the Cardiac Installation Center of Dr. Wahidin Sudirohusodo Makassar and meet the inclusion criteria.

Inclusion criteria were serum creatinine levels were normal before contrast administration, adults aged 30 and above and willing to participate in research by signing Informed consent. Criteria of control were healthy young adults 20-40 years old who are not getting contrast and have no history or are not suffering from kidney disease and other illnesses based on serum history and serum creatinine. Subject was drop out when the patient’s condition worsened, patients refuse blood collection after 24-48 hours after contrast medium delivery. Patient categorized as CIN when a patient who after contrast has a serum creatinine increase of \( \geq 0.5 \) mg / dl or an increase of 25% from baseline within 24-48 hours.

The contrast agent in this study was a type of iodine contrast, nonionic with Low-Osmolar Contrast Media (LOCM) or Iso-Osmolar Contrast Media (IOCM) and injected into the patient’s body either through an artery or vein.

**Ethic**

Each action was conducted by the consent and knowledge of the patient who was sampled by the informed consent sheet and stated to fulfill the ethical requirements to be implemented from the Medical Research Ethics Committee of Hasanuddin University Medical Faculty. Ethical clearance has been accepted before study from Medical Research Ethics Committee of Hasanuddin University Medical Faculty (UH16080614).

**Procedures**

Procedure conducted was:

1. Record the identity of patients who meet the inclusion criteria and provide a full explanation of what will be done to them and if agreed they will fill out and sign the informed consent.

2. The subjects who met the inclusion criteria were taken venous blood sampling before and after contrast administration as many as 3 ml. The serum was obtained after the tube containing the blood was allowed to freeze for 30 minutes at room temperature and centrifuged for 20 minutes at a rate of 3000 rpm. Samples are stored at \(-80 \) °C until sufficient samples, at most 12 months, when the sample will be diluted at 25 °C before analysis.

3. Serum level of IL-18 and IL-37 examination was performed at the Biomolecular Laboratory and Immunology of the Faculty of Medicine, Hasanuddin University based on Human ELISA KIT Instruction.

**Statistics Analysis**

Data presented with table using mean, deviation standard (SD), mean difference and probability value
(p-value). Analysis of pre and post administration of contrast data used paired T-test and comparison of group used independent T-test for normal distribution data and Mann Whitney U for data have not normal distribution. Level of significance was 0.05.

**Results**

**Interleukin 18**

Data indicated that both Non CIN and CIN groups had statistically significant IL-18 increases (p-value=0.000), although the increase in the CIN group was much higher than in the non-CIN group (86.11 pg/ml versus 127.15 pg/ml) (Table 1).

**Table 1. Level of IL-18 before and after contrast administration**

<table>
<thead>
<tr>
<th>Group</th>
<th>Frequency (n)</th>
<th>IL-18 (pg/ml) level based on time administration of contrast Mean±SD</th>
<th>Mean difference</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Pre</td>
<td>Post</td>
<td></td>
</tr>
<tr>
<td>Non CIN</td>
<td>20</td>
<td>114.422±10.972</td>
<td>200.532±24.065</td>
<td>86.11</td>
</tr>
<tr>
<td>CIN</td>
<td>10</td>
<td>89.410±9.254</td>
<td>216.560±35.071</td>
<td>127.15</td>
</tr>
</tbody>
</table>

*Paired T-test

Data after media contrast administration showed that the control group differed significantly with CIN and AKI groups and did not differ significantly with non-CIN groups. Analysis of the differences between the groups showed that the largest difference in the control group was with the group experiencing CIN even higher when compared with patients with AKI but AKI and CIN group did not differ significant (Table 2).

**Table 2. Comparison Level of IL-18 between healthy and AKI subjects After Contrast Administration**

<table>
<thead>
<tr>
<th>Comparison of group</th>
<th>Frequency (n)</th>
<th>IL-18 (pg/ml) level Mean±SD</th>
<th>Mean difference</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control vs Non CIN</td>
<td>10</td>
<td>154.744±50.954</td>
<td>45.788</td>
<td>0.039*</td>
</tr>
<tr>
<td>CIN</td>
<td>10</td>
<td>216.560±35.071</td>
<td>61.816</td>
<td>0.015*</td>
</tr>
<tr>
<td>AKI</td>
<td>10</td>
<td>204.503±90.455</td>
<td>49.759</td>
<td>0.045*</td>
</tr>
</tbody>
</table>

| AKI vs Control      | 10            | 204.503±90.455              | 49.759         | 0.045*   |
| Non CIN vs AKI      | 20            | 200.532±24.065              | 3.971          | 0.967b   |
| CIN vs Control      | 10            | 154.744±50.954              | 49.759         | 0.045a   |
| Non CIN vs CIN      | 20            | 200.532±24.065              | 3.971          | 0.967b   |
| CIN vs AKI          | 10            | 216.560±35.071              | 12.057         | 0.701b   |

*Mann Whitney U test

*bIndependent T-test
The data show that both non-cin group and cin group had decreased levels of IL-37 although not statistically significant (table 3). Decreased levels of IL-37 group cin is higher than non-cin group (2.151 pg/ml versus 5.372 pg/ml).

**Interleukin 37**

**Table 3. Level of IL-37 before and after contrast administration**

<table>
<thead>
<tr>
<th>Group</th>
<th>Frequency (n)</th>
<th>IL-37 (pg/ml) level based on time administration of contrast Mean±SD</th>
<th>Mean difference</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Pre 85.152±25.837</td>
<td>83.001±34.841</td>
<td>-2.151</td>
</tr>
<tr>
<td>Non CIN</td>
<td></td>
<td>Post 83.001±34.841</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CIN</td>
<td>10</td>
<td>Pre 79.825±27.949</td>
<td>74.645±20.896</td>
<td>-5.372</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post 74.645±20.896</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Paired T-test

Data after media contrast administration showed that the IL-37 of control group differed significantly with AKI groups only and did not differ significantly with non-CIN and CIN groups. Analysis of the differences between the groups showed that the largest difference in the control group was with the group experiencing AKI and AKI group has significant difference with other group (Table 4).

**Table 4. Comparison Level of IL-37 between healthy and AKI subjects After Contrast Administration**

<table>
<thead>
<tr>
<th>Comparison of group</th>
<th>Frequency (n)</th>
<th>IL-18 (pg/ml) level Mean±SD</th>
<th>Mean difference</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control vs</td>
<td>10</td>
<td>85.243±35.003</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non CIN 20</td>
<td>20</td>
<td>83.001±34.841</td>
<td>2.242</td>
<td>0.930*</td>
</tr>
<tr>
<td>CIN 10</td>
<td></td>
<td>74.645±20.896</td>
<td>10.790</td>
<td>0.545*</td>
</tr>
<tr>
<td>AKI 10</td>
<td></td>
<td>240.366±145.463</td>
<td>155.123</td>
<td>0.000*</td>
</tr>
</tbody>
</table>

AKI vs

| Control 10          | 10            | 240.366±145.463             |                 |         |
| Non CIN 20          | 20            | 85.243±35.003               | 155.123         | 0.000*  |
| CIN 10              |               | 83.001±34.841               | 157.365         | 0.000*  |
|                     |               | 74.645±20.896               | 165.913         | 0.000*  |

*Mann Whitney U test

*Independent T-test

**Discussion**

An increase in inflammatory activity characterized by elevated pro inflammation cytokine interleukin 18 appears to suggest that inflammatory activity may be a predictor and at the same time as a diagnostic for CIN incidence for patients who get contrast administration. Although this still needs to be continued with further research because this study only provides basic data of significant differences.

The pathogenesis of CIN is very complex. Several previous studies have shown that inflammation is important in the prevention of renal impairment. Immune cells of both the natural immune system and the immune system include Dendritic Cells (DC), Natural Killer T
cells, T lymphocytes, B lymphocytes, neutrophils, and macrophages are known to participate in the early stages of injury. Thus, control of inflammation can reduce kidney damage significantly \textsuperscript{17,18}.

Inflammation is mediated by the adhesion of leukocytes to injured endothelial cells. There is increased escalation of leukocyte adhesion molecules such as ICAM-1, P-Selectin and E-Selectin in endothelial cells in response to injury. Increased chemoattractant factors such as fractalkine (CX3CL1) can be expressed when kidney injury occurs and promote macrophage infiltration. This leads to the activation of leukocytes, capillary obstruction and increased production of proinflammatory cytokines \textsuperscript{19,20}.

Data also showed that IL-37 level did not increase but decrease even not significantly. It is shown that contrast administration has high risk to develop be acute kidney injury. Immune response should increase IL-37 to prevent severe inflammation but it did not happen \textsuperscript{21,22}.

Study related IL-37 are still very rare, especially those associated with CIN, this study provide a basic data to develop. Increased proinflammatory cytokines, IL-18 and decreased anti-inflammatory cytokines, IL-37 have the potential to be predictors and diagnostics with further study.

**Conclusion**

Proinflammation activity, marked by IL-18 increased significantly after contrast administration but anti-inflammatory, marked by IL-37 decrease even insignificantly.

**Conflict of Interest :** None

**Source of Funding :** Self

**Ethical Clearance:** Obtained from Medical Faculty committee member

**References**


Influence of Teeth Brushing Behavior, Saliva Flow Rate, Salivary Hydration, Saliva Viscosity and Saliva PH on Risk of Caries Occurrence in Adolescents in Gianyar, Bali, Indonesia

(Research conducted at SMAN 1 Ubud-Gianyar District Bali)

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1Dental Hygienist Department-Polytechnic of Health-Ministry of Health - Denpasar-Indonesia

Abstract

Background: Objective: The purpose of this study was to determine the effect of brushing behavior, salivary flow rate, salivary hydration, salivary viscosity and saliva pH on the risk of caries occurrence in adolescents at SMAN 1 Ubud Gianyar. Method: This research is cross sectional study, with 235 samples selected by purposive random sampling. All samples were measured DMF-T, salivary flow rate and salivary hydration, followed by saliva collection 2 hours after eating last meal during the day for analysis of viscosity and salivary pH, followed by an assessment of toothbrushing skill with the guidance of toothbrushing rubric. The collected data were analyzed by chi-square statistic test. Result: there was a significant correlation between toothbrushing behavior with caries incidence rate with p = 0.00 (P≤0.05), whereas flow rate, hydration, viscosity and salivary pH did not significantly affect caries incidence rate with p≥0.05. Conclusion: Toothbrushing behavior significantly affects caries incidence rate when compared with physical and chemical properties of saliva.

keywords: tooth brushing behavior, saliva, caries, adolescent

Introduction

Dental caries occurs due to the interaction of the four factors of the host (teeth and saliva), microorganisms, substrate and time duration, which is the length of the interaction process between these factors.1 The process of caries occurrence begins with the fermentation of substrates containing carbohydrates by bacteria in plaque on tooth surfaces that can lower plaque pH below 5 within 1-3 minutes. The decrease in plaque pH of plaque will lead to demineralization on the surface of the enamel. The process of neutralization by saliva can increase salivary pH, and the process of remineralization takes place. Caries results from a larger demineralization process than remineralization.2

According to Rosenberg (2010), caries ranks second after the common cold.3 The caries experience varies considerably between countries, depending on behavioral factors, age, socio-economic circumstances and the pattern of life and diet of the community.4 Caries prevalence in developing countries tends to increase with increasing consumption of foods that contain lots of sticky processed sugar and inadequate coverage of dental services. Basic Health Research Results of (RISKESDAS) 2013 showed that there was an increase in dental caries prevalence from 2007 to 2013, and the highest increase at age 12 years was 13.7%. The prevalence of active caries in children aged 12 years reaches 43.4%.5

Adolescence is a period of transition from childhood to adulthood and in the process, there is development of physical, psychological and social maturity. According to Hurlock (2001), in general, adolescence is divided into three parts: the beginning of adolescence lasts from the age of 12-15 years, middle adolescence lasts from the age of 15-18 years and the end of adolescence begins from 18-21 years which is legal mature age. Adolescence is characterized by biological, cognitive and socio-emotional changes that influence self-care behaviors including keeping the teeth and mouth clean.

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Mobile: +6281999098894;
According to Notoatmodjo (2012), behavior is an activity or activity of a highly complex organism, among others: behavior in speaking, dressing, walking, perception, thought and emotion. Brushing behavior is one of the important and effective health behaviors for the maintenance of oral and dental health and prevents plaque buildup in teeth. According to Sihite (2011), tooth brushing behavior is influenced by several factors: brushing, brushing, brushing time and tools and ingredients to brush teeth. Notomatodjo in Sihite (2011), explains that the risk of caries and periodontal disease in society, one of which is the behavioral factor that is the attitude of neglecting tooth and mouth hygiene.

Saliva is also one of the factors that contribute to caries risk. Saliva is a secretory secretion of various glands in the oral cavity and plays an important role in maintaining balance in the oral cavity. Adequate salivary function, important in defense against caries attacks. Saliva contains certain organic and inorganic materials which, if excessive or decreased, can cause salivary imbalances. Saliva function is as a lubricant, buffer, cleanser, anti-solvent and anti-bacterial. Chemical composition, flow rate, viscosity, salivary hydration, acid-base properties (pH) and antibacterial properties of saliva are associated with the risk of caries occurrence in a person.

Caries risk is a person’s chances of having a carious lesion over a period of time. The risk of caries differs from person to person, and may even vary in the same individual, depending on how to maintain oral hygiene and the salivary buffer function. Assessment of caries risk in a person is necessary because caries can affect anyone regardless of age, gender, race or socioeconomic level. Caries can affect children, adolescents, adults and geriatrics. Information on caries risk assessment can be used as a strategy in planning the precautions.

High school students belong to adolescence which is in late adolescence, susceptible to dental caries because at this time biological, cognitive and socio-emotional changes that affect self-care behaviors include maintaining oral hygiene. The average age of high school students ranging from 15-19 years is the right age to measure the salivary flow rate.

Materials and Method

This research is cross sectional with survey design. The sample size is 235 students, selected by purposive random sampling. Intraoral examination was conducted first to measure DMF-T respondents and observed salivary flow rate and salivary hydration. The salivary collection was performed 2 hours after the last meal and conducted on the afternoon, conducting a salivary analysis including: salivary viscosity and salivary pH concluded with an assessment of tooth brushing skill with guidelines for tooth brushing rubric.

The collected data were then analyzed using bivariate analysis to find out the correlation between caries risk factor and caries incidence with chi-square statistic test.

Results

The results of analysis of tooth brushing time with caries experience score (DMF-T) can be seen in table 1 below:

<table>
<thead>
<tr>
<th>Tooth brushing time</th>
<th>Caries experience / DMF-T</th>
<th>total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High</td>
<td>%</td>
<td>Medium</td>
</tr>
<tr>
<td>Correct</td>
<td>2</td>
<td>2.13</td>
<td>6</td>
</tr>
<tr>
<td>Wrong</td>
<td>50</td>
<td>35.5</td>
<td>61</td>
</tr>
<tr>
<td>Total</td>
<td>52</td>
<td>22.1</td>
<td>67</td>
</tr>
</tbody>
</table>
The table above shows that 91.5% of respondents who brushed their teeth at the correct time has a low DMF-T score. While 35.5% of respondents who brush their teeth at the wrong time have high DMF-T numbers. The result of analysis with chi-square obtained value $P = 0.00 (<0.05)$ or there is significant correlation between tooth brushing time with caries experience.

The results of the relationship analysis of tooth brushing techniques with caries experience (DMF-T) are seen in Table 2 below:

Table 2: The Relationship between Tooth Brushing Technique with Experience of Caries (DMF-T) at Student of SMAN 1 Ubud Gianyar Regency 2017

<table>
<thead>
<tr>
<th>Tooth brushing technique</th>
<th>Caries experience / DMF-T</th>
<th>total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High</td>
<td>%</td>
<td>Medium</td>
</tr>
<tr>
<td>Correct</td>
<td>3</td>
<td>9.09</td>
<td>3</td>
</tr>
<tr>
<td>Wrong</td>
<td>49</td>
<td>24.3</td>
<td>64</td>
</tr>
<tr>
<td>Total</td>
<td>52</td>
<td>22.1</td>
<td>67</td>
</tr>
</tbody>
</table>

Table 2 above shows that of 235 respondents were examined, 33 people (14.04%) brushed their teeth with the correct technique and out of these, 81.8% had low caries category. Other 202 people (95.96%), brushing teeth with the wrong technique and from that amount, 49 people (24.3%) experienced caries with high category. The result of analysis with chi-square obtained value $P = 0.00 (<0.05)$ or there is significant relation between tooth brushing technique with caries experience.

The effect of salivary flow rate on DMF-T is shown in table 3 below:

Table 3: Effect of Saliva Flow Rate on Caries Experience (DMF-T) at Student of SMAN 1 Ubud, Gianyar Regency 2017

<table>
<thead>
<tr>
<th>Saliva flow rate</th>
<th>Caries experience / DMF-T</th>
<th>total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High</td>
<td>%</td>
<td>Medium</td>
</tr>
<tr>
<td>Low</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Normal</td>
<td>4</td>
<td>30.8</td>
<td>5</td>
</tr>
<tr>
<td>High</td>
<td>48</td>
<td>21.9</td>
<td>61</td>
</tr>
<tr>
<td>Total</td>
<td>52</td>
<td>22.1</td>
<td>67</td>
</tr>
</tbody>
</table>

Table 3 above shows that 219 samples (93.19%) have high salivary flow rates but have a high caries experience rate as well, compared with those with low salivary flow rates. The result of analysis with chi-square obtained p-value $= 0.602 (p> 0.05)$, which means there is no significant relationship between saliva flow rate with DMF-T number.

The effect of salivary hydration on DMF-T is shown in table 4 below:
Table 4: Effect of Saliva Hydration on Caries Experience (DMF-T) at students of SMAN 1 Ubud Gianyar Regency 2017

<table>
<thead>
<tr>
<th>Saliva hydration</th>
<th>Caries experience / DMF-T</th>
<th>total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td>Low</td>
<td>3</td>
<td>15</td>
<td>6</td>
</tr>
<tr>
<td>Normal</td>
<td>22</td>
<td>25</td>
<td>27</td>
</tr>
<tr>
<td>High</td>
<td>27</td>
<td>21.3</td>
<td>34</td>
</tr>
<tr>
<td>Total</td>
<td>52</td>
<td>22.1</td>
<td>67</td>
</tr>
</tbody>
</table>

Table 4 shows that most respondents had high salivary hydration. From 127 respondents who have high hydration, there are 27 respondents or 21.3% who have high caries. The chi-square test showed no significant relationship with p = 0.757 (p> 0.05) or no significant effect of salivary hydration with caries experience.

The result of saliva viscosity analysis on dental caries / DMF-T incidence is seen in table 5 below:

Table 5: Effect of Saliva Viscosity on Caries Experience (DMF-T) in students of SMAN 1 Ubud Gianyar Regency 2017

<table>
<thead>
<tr>
<th>Saliva viscosity</th>
<th>Caries experience / DMF-T</th>
<th>total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td>Very thick</td>
<td>9</td>
<td>25.7</td>
<td>8</td>
</tr>
<tr>
<td>Thick</td>
<td>40</td>
<td>23</td>
<td>51</td>
</tr>
<tr>
<td>Clear</td>
<td>3</td>
<td>11.5</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>52</td>
<td>22.1</td>
<td>67</td>
</tr>
</tbody>
</table>

Table 5 above shows that most of the respondents (74.04%) had viscosity saliva with thick category, but 47.7% of these had low caries experience. Results of chi-square analysis showed no significant relationship between salivary viscosity with caries experience with p = 0.757 (p> 0.05).

Saliva pH analysis result on dental caries incidence (DMF-T) is seen in table 6 below:

Table 6: Effect of Saliva PH on Caries Experience (DMF-T) at SMAN 1 Ubud Students Gianyar Regency 2017

<table>
<thead>
<tr>
<th>Saliva pH</th>
<th>Caries experience / DMF-T</th>
<th>total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High</td>
<td>Normal</td>
<td>%</td>
</tr>
<tr>
<td>Acidic</td>
<td>11</td>
<td>21.6</td>
<td>16</td>
</tr>
<tr>
<td>Normal</td>
<td>31</td>
<td>21.5</td>
<td>38</td>
</tr>
<tr>
<td>Alkaline</td>
<td>10</td>
<td>25</td>
<td>13</td>
</tr>
<tr>
<td>Total</td>
<td>52</td>
<td>22.1</td>
<td>67</td>
</tr>
</tbody>
</table>
Table 6 above shows that most respondents had normal and alkaline pH saliva. Of the 51 respondents (21.70%) who had an acidic pH of only 11 people (21.6%) and had high caries. The result of statistical analysis with chi-square showed that there was no significant relationship between salivary pH and caries experience with p = 0.839 (p> 0.05).

Discussion

The results showed that there is a significant correlation between tooth brushing behavior and DMF-T number in adolescent at SMA Negeri 1 Ubud with p = 0.00 (p <0.05), so tooth brushing behavior was a risk factor for caries occurrence. Brushing behavior is one of the most effective health behaviors for the maintenance of oral health because it prevents plaque buildup in teeth. Brushing teeth skillfully at the right time can prevent caries (Sihite, 2011). According to Princess, et al. (2010), tooth brushing is the act of cleaning the teeth and mouth of food scraps and debris that aims to prevent the occurrence of disease in the network hard and soft on the mouth.16

The results also showed that salivary flow rate, salivary hydration, salivary viscosity and salivary pH did not significantly affect the risk of caries occurrence in adolescents. Most students have a high salivary flow rate but have a high DMF-T number as well. Salivary hydration in most students is high but has a high DMF-T number as well. The saliva viscosity of most students is relatively thick, but has a low DMF-T. The saliva pH of most students is normal and has a low DMF-T number as well.

Saliva flow rate shows how much saliva is continuously secreted to protect and coat the oral cavity. Salivary flow rate at rest is 0.3 ml / min17. Zunt (2010), wrote that the average salivary flow of a normal person is 0.5-1.5 liters/day.18 When salivary flow is stimulated below 0.7ml / min, it can increase a person’s caries risk, but it also depends on other interacting factors.19 Salivary viscosity is the viscous viscosity that is closely related to the glycoprotein composition. If salivary viscosity is increased, it indicates that saliva in the saliva decreases, so saliva becomes thick, and the individual is at high risk for periodontal tissue disease.20 A person is said to be at high caries risk if it has a low salivary flow. Salivary deficiency can cause dry mouth, thus increasing the risk of caries occurrence. Multiple salivary secretions, dilute viscosity and normal salivary pH will facilitate control of dental and mouth disease.13

Saliva is not the only factor that contributes to the caries incidence rate, as other factors contribute to the risk of caries. The risk of caries is a person’s chances of having multiple carious lesions over a period in the future. The risk of caries in each person is different, not even permanent for life in the same person. Caries risk may change if the patient performs a caries prevention action either by himself or the dentist.11

Conclusion

Tooth Brushing behavior is significantly associated with caries experience in adolescents at SMA Negeri 1 Ubud, but Saliva flow rate, salivary hydration, salivary viscosity and salivary pH are not significantly related to caries experience in students, so it can be concluded that behaving correctly in tooth brushing will prevent caries.

Conflict of Interest : None

Ethical Clearance: Obtained from the University Committee and Respondent agreement

Source of Funding: Indonesian Ministry of Health

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Video Effect for the Prevention of Knowledge Increasing Stunting in State High School 1 Children in Topoyo Central Mamuju

Ismail Kamba1, Amran Razak2, Sirajuddin Saefuddin3, Sukri Palutturi4

1Department of Community Nutrition Mulawarman University, 2Department of Health Policy Administration Hasanuddin University, 3Department of Community Nutrition, University of Hasanuddin, 4Administration Department of Health Policy, University of Hasanuddin

Abstract

The purpose of this study was to find the influence of video compared to videos plus and increase knowledge for the prevention of stunting in the State high school students in Topoyo Central Mamuju. The research was conducted on February 1, 2018 until February 1, 2019. The research in State High School Topoyo Central Mamuju regency of West Sulawesi province. The population of this study were all male and female students at State High School Topoyo totaling 710 people. While the control sample by using a ratio of 1 : 1 the number of control samples as much as 171 respondents. So the total sample of 171 + 171 = 342 respondents. Knowledge changes from pre-test to post test after intervention by watching videos and video learning material plus 1000 HPK and prevention of stunting among children under five had an influence (the measurement result p = 0.000); then tested in the control group did nothing to influence the control group (p = 0.713 measurement results); and the use of video plus in learning there is no difference between the video and the video plus (the measurement result p = 0.640). It is recommended that society about the golden period of life known as the first 1,000 days of life needs to be established early to the students so that Central Mamuju Regency Health Office, needs to create a joint program with the school so that the students’ understanding as the nation becomes more qualified generation.

Keywords: Knowledge, Stunting, HPK, Pregnant woman

Introduction

Based on data from the Global Nutrition Report, Indonesia is on ranking top 15 from behind1-3. So that Indonesia is considered as the 15th worst in the world after Madagascar stunting2-4. Sequence worst stunting in the world the following are: Timor Leste amounted to 57.7 percent, Madagascar amounted to 49.2 percent, Guatemala amounted to 48.0 percent, Pakistan amounted to 45.0 percent, Lao People’s Democratic amounted to 43.8 percent, Republic Mozambique amounted to 43.1 percent, Nigeria amounted to 43.0 percent, Malawi amounting 42.4 percent, the Central African Republic by 40.7 percent, amounting to 40.4 percent of Ethiopia, Chad amounted to 38.7 percent, India by 38.7 percent, amounting to 38.5 percent of Mali and Indonesia is rate fifteen world with stands at 36.4 percent5.

One third of children stunted in the world is India, and children in rural areas worst affected6-8. The determinants of stunting among children in rural indigenous and odisha jharkhand, India, requires intervention and treatment9,10. The World Health Organization (WHO) reported that a total of 49.2% of children were chronically malnourished in Madagascar11, placing the country suffered the highest prevalence of stunting in the world. Short children as a result of chronic malnutrition, causing adverse consequences of short-term and long-term if not addressed at an early age6,9. Short-term risks are susceptible to various infectious diseases such as diarrhea and pneumonia due to a weakened immune system12. Toddlers with nothing short category stood at 52.0 percent. This means that there are approximately 48.0 percent of children under five in West Sulawesi who suffered stunting. It shows much higher than the national average there is difference in numbers about
10.2 percent compared to 37.2 pesen national stunting

Learning media is the messenger technology that can be used for learning purposes. So learning media is a tool that can be used for learning. The types of instructional media according to taxonomy Leshin, et al (in Arsyad, 2002: 79-101) are as follows: (a) human-based media is the medium used to transmit and communicate the role or information; (B) print-based media is most commonly known are textbooks, handbooks, workbooks or exercises, journals, magazines and loose sheets; (D) visual-based media (image) in this case plays a very important in the learning process in schools; (D) based audiovisual media combines the use of sound require additional work to produce it; (E) a computer-based media choose different functions in the field of education and training, the computer acts as a manager in the learning process, known as the Computer Managed Instruction (CMI). This research “The Effects of Increasing Knowledge Against the video for the prevention of stunting among children under five in State High School Topoyo in Central Mamuju.” This study used a quasi-experimental or quasi-experimental.

**Materials and Method**

The research design uses “Quasy-Experiment”, namely pre-test and post-test with control group design. The research was conducted at the date of February 1, 2018 until the date of April 1, 2019. The research in State High School Topoyo Central Mamuju regency of West Sulawesi province. The population of this study were all male and female students at State High School Topoyo Central Mamuju Regency, which amounted to 710 people. By using proportional random sampling. Total sample of 171 respondents totaled treatment and control sample as many as 171 respondents.

**Results and Discussion**

**Table 1. characteristics of Respondents**

<table>
<thead>
<tr>
<th>characteristics</th>
<th>Intervention group</th>
<th>Control group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Man</td>
<td>53</td>
<td>31.0</td>
</tr>
<tr>
<td>Woman</td>
<td>118</td>
<td>69.0</td>
</tr>
<tr>
<td>Total</td>
<td>171</td>
<td>100</td>
</tr>
<tr>
<td>Age (Years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16 years</td>
<td>12</td>
<td>7.0</td>
</tr>
<tr>
<td>17 years</td>
<td>113</td>
<td>66.1</td>
</tr>
<tr>
<td>18 years</td>
<td>46</td>
<td>26.9</td>
</tr>
<tr>
<td>Total</td>
<td>171</td>
<td>100</td>
</tr>
<tr>
<td>Education Parents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elementary School</td>
<td>89</td>
<td>52.0</td>
</tr>
<tr>
<td>Junior High School</td>
<td>36</td>
<td>21.1</td>
</tr>
<tr>
<td>Senior High School</td>
<td>34</td>
<td>19.9</td>
</tr>
<tr>
<td>PT</td>
<td>12</td>
<td>7.0</td>
</tr>
<tr>
<td>Total</td>
<td>171</td>
<td>100</td>
</tr>
<tr>
<td>Parents’ job</td>
<td></td>
<td></td>
</tr>
<tr>
<td>farmer</td>
<td>125</td>
<td>73.1</td>
</tr>
<tr>
<td>Government Employes</td>
<td>9</td>
<td>5.3</td>
</tr>
<tr>
<td>entrepreneur</td>
<td>37</td>
<td>21.6</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>
The table above shows that respondents aged 17 years more than other respondents as many as 113 respondents (66.1%). More female respondents than male respondents as many as 118 respondents (69.0%). Parental education more respondents completed primary school (primary school) other than as many as 89 respondents (52.0%). Respondents’ parents work more farmers than other jobs as many as 125 respondents (73.1%).

To determine the student’s absorption associated with this video presentation, first pre-test on two groups. The first group is called the group of cases and the second group is called a control group. The case group targeting State High School 1 Topoyo. The number of students as many as 710 people. By using the formula Slovin obtained a sample of 171 people. In applying these samples using the technique of proportional sampling conducted in 18 classes. Each member of a representative sample in each class taken at random, but still consider the representation of the sexes. At the time of randomization to enroll students who are elected to the sample in each class. Members of the sample is what will be the target of experimentation as follows: (a) first, follow the pre-test by answering a questionnaire distributed to each class in accordance with a list of predetermined sample; (B) second, watch video learning material 1000 HPK on the first day and watch the instructional video with 1000 HPK material accompanied by explanations of the teacher / instructor (in this experiment researchers who act as teachers / instructors) on the second day. Intervention / treatment on the first day done in four classes with each set schedule so as not to interfere with the learning process. Intervening on the second day was also performed on four classes to organize their own schedule; (C) third, following the post-test twice. Post the first test done after the intervention / treatment on the first day (watch the video) and the first post-test is also done post-intervention / treatment on the second day (watch video plus explanations of teachers / instructors). Post second test carried out on the fifth day post-intervention / treatment performed on each class based on the target that the research samples.

### Research Result

**Table 2. Student Knowledge Level Before and After Intervention in Central Mamuju Regency, West Sulawesi, 2018**

<table>
<thead>
<tr>
<th>Group</th>
<th>Knowledge</th>
<th>Pre Test Measurement results</th>
<th>Test Post Measurement results</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>intervention</td>
<td>Well</td>
<td>131</td>
<td>76.6</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>Less</td>
<td>40</td>
<td>23.4</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>171</td>
<td>100</td>
<td>171</td>
</tr>
<tr>
<td>Control</td>
<td>Well</td>
<td>128</td>
<td>74.9</td>
<td>37</td>
</tr>
<tr>
<td></td>
<td>Less</td>
<td>43</td>
<td>25.1</td>
<td>134</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>171</td>
<td>100</td>
<td>171</td>
</tr>
</tbody>
</table>

Table 2. showed that the intervention group Pre Test measurement results with both categories of 131 (76.6%) and the category is less by 40 (23.4%); while the measurement results of Post Test with both categories of 149 (87.1%) and the category is less by 22 (12.9%); while the value of p = 0.000, which means that there is the effect of the intervention to the respondent in improving knowledge in the prevention of stunting in State High School 1 Topoyo Central Mamuju regency of West Sulawesi province. The control group Pre Test measurement results with both categories of 128 (74.9%) and the category is less by 43 (25.1%); while the measurement results of Post Test with both categories by 37 (21.6%) and less category amounted
to 134 (78.4%); while the value of $p = 0.672$, which means that in the control group there was an increase of knowledge because no intervention on the students of Vocational High School 1 Topoyo Central Mamuju regency of West Sulawesi province.

Table 3. Knowledge Level Differences With Use of Video and Video Plus in State High School 1 Topoyo Central Mamuju Regency, West Sulawesi, 2018

<table>
<thead>
<tr>
<th>Group</th>
<th>Knowledge</th>
<th>Measurement results</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Video</td>
<td>Well</td>
<td>84</td>
<td>49.1</td>
</tr>
<tr>
<td></td>
<td>Less</td>
<td>87</td>
<td>50.9</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>171</td>
<td>100.0</td>
</tr>
<tr>
<td>Video Plus</td>
<td>Well</td>
<td>128</td>
<td>74.9</td>
</tr>
<tr>
<td></td>
<td>Less</td>
<td>43</td>
<td>25.1</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>171</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 3. shows that knowledge of respondents viewing through video with good category were 84 respondents (49.1%) and less category total of 87 (50.9%); knowledge of respondents viewing through video plus good category as many as 128 respondents (74.9%) and less category as many as 43 respondents (25.1%); whereas the results of the analysis of differences in the level of knowledge after watching the video and video plus is $p = 0.640$, which means there is no difference in the level of knowledge after watching the video and video plus or in other words.

Discussion

The first results, namely that there is a significant effect of pre-test to post-test in the treatment group. It is clear that knowledge is formed when there is the stimulus provided by the sources of knowledge. Stimulus will respond strongly in case of the sensory impression. Received knowledge will be stored in memory until the specified time will be released back into the raw knowledge to someone. The stronger the person’s knowledge of something, it is determined that a deep impression received by the human brain. Impression is also influenced by the experience of a person against such knowledge. So that a person’s level of knowledge to be better if it has a better experience on such knowledge. The experience in question is never gain the same knowledge repeatedly. For example, the provision of material on nutrition only incidentally do it, it will be different results if done systematically. In addition to the influence of the frequency of administration of knowledge, it is also influenced by the intensity or the power of knowledge. For example, knowledge of which is given sporadically, would be different if knowledge is only given spontaneously. By him, knowledge is not only determined at the time of its formation, but how to maintain the required knowledge, including elevation. also influenced by the intensity or the power of knowledge. For example, knowledge of which is given sporadically, would be different if knowledge is only given spontaneously. By him, knowledge is not only determined at the time of its formation, but how to maintain the required knowledge, including elevation.

The second result, that there was no significant effect of pre-test to post test in the control group, it is clear that knowledge of a person does not have restrictions on the sources from which it came. When the students of Vocational High School 1 Topoyo, not given the intervention or treatment that does not mean knowledge of the 1000 HPK is not owned, because the sources of knowledge can come from anywhere. Sources of knowledge at this time are manifold, ranging from the conventional sources of knowledge such as interpersonal communication, also with the involvement of the simplest medium to modern. Ranging from personal media to social media, such as media phones, mobile messaging to facebook, whatsapp (wa), and others. It’s just that being able to explore knowledge specifically requires a focus on specific learning. In addition, Vocational High School students do not really discuss matters relating to certain subjects (such as biology and the like).

The third result, it is known that there is no difference between the two methods use video and video plus, it is explained that the video plus does not mean there has a better ability for a process of confirmation given by the teacher or instructor. Only the confirmation process does not occur because students are more passive after watching the video. Supposedly after watching a process of confirmation or interactive porses. This confirmation
process in accordance with the theory of communication that requires a transformation in communication feedback or feedback so that doubts on the received knowledge, could confirmed back to the communicator or on a media source. In the communication process tersebesar doubt an obstacle to acceptance or adoption of a message in the form of knowledge.

The significant difference in the forms of such treatment. New knowledge is essentially formed from the existing knowledge is then used in a particular context. The process of formation of knowledge through shared experiences while interacting directly. For example one can know the knowledge about child care because he had been taking care of children. Formation of knowledge by transforming knowledge into explicit form. For example, concepts, drawings and written documents. An effective way to externalization is through dialogue. Formation of knowledge to manage existing knowledge from both inside and outside in the form of more complex and systematic.

Conclusions

Knowledge changes from pre-test to post test after intervention by watching videos and video learning material plus 1000 HPK and prevention of stunting among children under five had an influence (the measurement result p = 0.000);

Then tested in the control group did nothing to influence the control group (p = 0.713 measurement results);

Plus the use of video in learning there is no difference between the video and the video plus (the measurement result p = 0.640).

Ethical Clearance- Taken from Faculty of Public Health committee

Source of Funding- Self

Conflict of Interest – Nil

References

stunting syndrome in developing countries. Paediatrics and international child health, 34, 250-265.

Religious Character in Improving Primary Health Services Quality in South Sulawesi

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Abstract

Measurement of service quality with accreditation method is one of the tools to ensure the quality of service for community health centre, but from several models of quality improvement it is considered to have weaknesses because no one pays attention to religion, so that the model is not properly used in Indonesia. The aims of this study was to analyze the effect of religious character on the continuous improvement of the quality of primary health services in South Sulawesi. This research is a qualitative study with a case study approach. The data collection technique was carried out by Focus Group Discussion (FGD). The informants in this study were 10 people consisting of surveyors, religious leaders, community health centre heads, non-governmental organizations, lecturer and academics. Data analysis was done by content analysis method. The results of the study state that there were 10 religious characters that should be owned by health center officers, namely discipline, fair, honest, clean, trustworthy, good at communicating, patient, friendly, committed and wise. It is recommended to community health centre officers to apply this religious character so that service quality can be improved and sustainable.

Keywords: service quality, religious character, community health centre officers.

Introduction

The World Health Organization¹ expects all people in the world to get quality health services. For this reason, Indonesia has made efforts to provide quality and affordable health services. One of the quality recognition is the result of accreditation. Accreditation is a form of evaluation of the quality and feasibility of an institution carried out by an organization or accreditation body. Improving service quality as a concept according to Baldrige has dimensions, including: leadership, strategic planning, focus on patients served, measurement, analysis and knowledge of management, focus on human resources, management programs, and results obtained.²³

The Model for Understanding Success in Quality (MUSIQ) which was developed to improve the quality of health services has also yet conducted a study of consumer focus, implementation focus, access, patient safety, religious character, and innovation. Though this aspect is also very important influence on improving service quality.

Even though building religious character on each employee will certainly have a positive impact on the ability to act in providing services to patients. This has been proven through research that the quality of Islamic services has a positive and significant impact on customer satisfaction. In line with the CARTER Theory which was suggested by Othman and Owen (2001) that there is a strong relationship between compliance with Islamic law and consumer satisfaction.⁴⁶

Research conducted at 25 German hospitals to assess the relationship between accreditation status and patient satisfaction involving 3,000 patients using the
Picker questionnaire to assess the seven dimensions of patient satisfaction, found that there was no significant relationship between patient satisfaction and hospital accreditation status.  

Number of community health centre in Indonesia is 9,913 and there are 7,508 accredited community health centre. Based on data from 13 provinces in Indonesia for 3 years (2016-2018) that 45 community health centers had been evaluated for 3 days per health center using accreditation instruments that had been prepared and determined by the Indonesian Ministry of Health consisting of 9 chapters, 42 standards, 168 criteria and 776 rating elements. The results showed that there were 2.2% not accredited and 97.8% accredited. Basic accreditation status was 45.5%, middle accreditation status was 40.9%, primary accreditation status was 13.6% and there was no community health centre with plenary accreditation. This showed that the quality of health services in health centers is still very low.

Unsustainable quality improvement will have an impact on low patient satisfaction, lack of trust in health services, increased morbidity and mortality, increased maternal mortality, infant mortality, under-five mortality, decreased life expectancy, and low degree of public health. From these various problems, it is expected that there will be a concept for developing a model for the continuous improvement of primary health services that can be applied in health centers.

Materials and Method

This research is a qualitative study with a case study approach. The data collection technique carried out was by Focus Group Discussion (FGD). This research was conducted at the Grand Puri Perintis Hotel on April 9, 2019. Informants in this study were 10 people consisting of surveyors, religious leaders, community health centre heads, non-governmental organizations (NGOs), lecturer and academics. Data analysis was done by content analysis method.

Results

Informants involved in this study were ten informants consisting of two surveyors, 1 religious leader, 1 accreditation assistant, 1 head of community health centre, 2 people from NGOs, 1 lecturer and 2 academics. Specifically, characters based on religious values refer to the basic values contained in religion (Islam). From the results of the Focus Group Discussion (FGD), all informants agreed that religious character is important to be applied in the community health centre. The informant’s answer about the religious character that must be possessed by a community health centre officer has revealed several characters. The informant who stated that discipline was one of the religious characters that must be attached to the officers of the center, the quotations from the FGD were as follows:

“........ Well, I think between religious characters and disciplines characters is very similar, so how to develop a firm discipline based on the basics of religion so it will grows the sense of awareness...“

(Surveyor, 63 years)

“Well alluding to religious character, if we were in Makassar the religious character was actually what you mentioned, almost the same meaning as the disciplinary character that was said earlier .......... .. “

(Accreditation companion, 42 years)

In addition, some informants stated that taking fair action during the service process is also a reflection of religious character, as the following quote:

“...... ... So on, then each officer must provide safe services and also do not discriminate ethnic groups, religions, so health services are universal, so they cannot discriminate. Therefore an officer must be fair, regardless of the patient's background “

(NGO, 40 years old)

“ so on the fifth, everything is for the patient, so whatever happens to the patient, moreover service must provide justice, all layers of society come to the community health centre “

(Surveyor, 63 years old)

There are also informants who specifically argue that religious character refers to the basic values contained in the Islamic religion, namely the value that comes from the example of the Prophet in behaving daily, namely shiddiq (honest), amanah (trusted), tabligh (communicative) and fathanah (intelligent/wise), and all behavior always remembers Allah SWT. The following is the quote for the interview:
"... a quality is influenced by the leader, well, this leader, as mentioned by Mr. Adam, that the character is attached to the actor, but to the leader and besides the actor in its attached to the structure, this must be based on the prophetic character, the trust, siddiq and tabliq this, this is what should be a legalization when someone wants to be a leader, for this researcher I will give advice when the leader wants to be appointed as decision maker he should have this trait 

(Surveyor, 41 years)

"... Well this maybe, my advice also might be that religious characters could be brought to the nature of the prophet, trusteeship, siddiq and so forth 

(Lecturer, 52 years)

"... So that with his ears he heard there was Allah, with his eyes there there was Allah, with his hands Allah"

(Religious figure, 55 years)

Results of the FGD with several informants, there are those who say that maintaining cleanliness is also a religious because cleanliness is a part of faith, moreover hygiene has also been regulated in the accreditation of community health centre. The following are the results of the FGD with the informant:

“So hand washing is part of what is called, well-dressed, and it is regulated in the accreditation of the community health center that binding in a commitment, there is a culture of shame, also a part of faith, it is associated with religious it is already approached “

(surveyor, 41 years)

Patience in working especially in service is also included as one of the religious characters that should be owned by the officer. As quoted by the following FGD interview:

“after I thought about it, it seems like mmm... community health centre had two key words, namely patience and trust”

(Surveyor, 63 years old)

“This religious character is also inseparable from patience, this must be translated as patience, can the workload be handled by complaining, meaning not complaining, not giving up, high fighting spirit, now it must be measurable “

(Academician, 52 years old)

Other religious characters that should be owned by service officers in the community health centre discussed in the FGD are commitment and friendly attitude.

“The religious character of the officer must have a high commitment, there is a strong sense of empathy, that is the religious character that if there are sick people to be well served, this religious character must also be an example”

(Academician, 47 years old)

“... then the behavior approach, that is what we might know at this community health centre smile, greetings and regards”

(Lecturer, 52 years)

Discussion

Understanding character according to Maxwell is how far better than just words. According to Shihab, character is a set of experiences about education and history which then encourage abilities that exist within a person to be able to be a measuring tool or a human side to make it happen. The character of a person can be concluded that something found in individuals who personalities that are different from others in the form of attitudes, thoughts, and actions.

The results of the discussion of informants about religious characters agreed upon the indicators consisting of discipline, presenting God in his activities, fairness, patience, friendliness, commitment, tabligh (transparent/ communicative), fathanah (intelligent), amanah, and shiddiq (honest).

Discipline is the operative function of human resource management that is very important, because the better the level of discipline of the community health centre officers, the higher the work performance that can be achieved. Without good discipline it is difficult for the head of the community health centre to realize quality and optimal work results. The issue of work discipline continues to be sought for its upgrading and improvement. This is based on the assumption that with a high culture of discipline, it will improve the quality of work. Disruption of service to patients or the community will be a complaint so that people are not satisfied with
the services they receive, the dissatisfaction of patients or the community means the inability of community health centers to improve their quality continuously.

Presenting God in its activities means that every action of a health worker in providing health services to the community believes that God is witnessed everything done so that it can give service sincerely, work on the basis of worship, without any pressure / force in giving tasks. With the principle of presenting God in their activities, health workers at the health center will be able to provide health services as much as possible so that they can improve the quality of ongoing services.

According to informants, fair is a part of religious character, being fair in providing health services is an act that does not discriminate patients/society, does not discriminate men and women, does not discriminate services based on religion, ethnicity, race, and socio-economic status. Health services in the community health center do not apply to the queue system but apply to a triage system (prioritizing patients who are more serious and emergency) and priority patient systems (disability patients, the elderly, pregnant women and infants). The principle of fairness in providing health services will certainly be able to provide continuous upgrading and quality improvement.

Informants agreed that patience and friendliness is a must for health workers in providing health services to the community, although taking care patients/communities who are emotionally unstable and do not understand service procedures need extra patient in dealing with it. Facing these conditions, health workers should not be carried away with emotion on the behavior of patients / communities, instead they must remain calm and friendly to give explanation to patients / society.

Commitment to improve the quality of community health centre is an important factor in the delivery of services. Commitments in improving the quality of health services for community health centre must start from the head of the community health centre to all staff, because the commitment is actually an agreement to improve the quality of services to the community. Weak commitment in service will have an impact on not providing maximum service to the community. Not optimal community health centre services will be a public complaint.

Rasulullah’s exemplary values according to the informant must become the attitude and behavior of the community health centre staff, such as shiddiq (honest), trust (trustworthy), tabligh (communicative / transparent), fathanah (intelligent) must be the value of health services, community health centre officers must be honest in providing health services, being able to convey the health condition of the community properly, there are no corruption, collusion and nepotism officers in providing services, being honest with fellow community health centre officers, including not using community health centre facilities for personal gain.

Community health center officers must be trustworthy to do the work according to their main tasks, authority and responsibilities, carry out activities in accordance with the schedule, targets and places that have been determined, be responsible for all actions / services provided to the community, and if there is an error, dare to bear the risks. The nature of tabligh (transparent/communicative) is very important for a community health centre officer to provide services because they must be able to convey information accurately and clearly to the community and be able to motivate the community in achieving performance.

The nature of Fathanah (smart) is one of the characteristics that can be applied by community health centre officers in providing services such as being able to understand the needs and expectations of the community towards community health centre services, acting very carefully and in accordance with policies, guidelines / guidelines, terms of reference for activities and procedures, and being able to carry out analysis on the issue of continuous quality improvement.

Conclusions and Recommendations

Based on the results of the FGD conducted with ten informants, all informants agreed that important religious character was applied in the community health centre. The religious characters that should be owned by officers in the community health centre according to the informants are quite varied. The informant stated that religious character cannot be separated from the character of discipline, being honest is one of the religious characters that should be possessed by community health centre officers.

Patience in carrying out the workload according to the informant is very important to be included as
a religious character. Apart from being patient, high commitment, clean and friendly nature also become a character that can not be separated from religion. According to the informant, being friendly in services at the community health centre is considered an important point in efforts to improve the quality of the community health centre.

Informants agreed that religious characters cannot be separated from values derived from the example of the Prophet in behaving in daily life, namely shiddiq (honest), trust (trustworthy), tabligh (communicative) and fathanah (intelligent / wise).

It is recommended that each officer in the community health centre be able to apply religious character in providing services, so that the quality of service can be sustainable in accordance with what is expected, not limited to just accreditation assessment. In addition, the results of this study suggest that these characters are not only shown when in a service building, but can be applied in daily life including outside service time.

**Ethical Clearance**- Taken from Faculty of Public Health committee

**Source of Funding**- Self

**Conflict of Interest** – Nil

**References**


Analysis of the Expression Toll-Like Receptor 4 (TLR4) in Chronic Suppurative Otitis Media with and without Cholesteatoma

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Abstract

In recent years, the increasing incidence of chronic suppurative otitis media (CSOM) diseases worldwide is often associated with the role of TLR4 as a component of innate immunity. This study aimed to analyze the TLR4 levels in patients with chronic suppurative otitis media with and without cholesteatoma. This study was conducted using the cross-sectional technique on 30 patients divided into two groups. The first group is CSOM with cholesteatoma that consisted of 10 patients and the second group is CSOM without cholesteatoma that consisted of 20 patients. Each sample was examined for TLR4 levels and bacterial identification cultures in secretions and several samples were also examined for TLR4 levels in the middle ear mucosa. TLR4 levels were examined by the ELISA method.

The results showed that TLR4 levels in middle ear secretions and mucosa of CSOM patients with cholesteatoma were higher than chronic suppurative otitis media without cholesteatoma but there were no significant differences. TLR4 levels in mucosal samples are higher than secret samples but there are no significant differences. There were no significant differences in TLR4 levels in both secret and mucosal samples between groups of CSOM with cholesteatoma and CSOM without cholesteatoma. There were no significant differences in TLR4 levels between the secret and mucosal sample in both CSOM with and without cholesteatoma.

Key Words: Chronic Suppurative Otitis Media, Cholesteatoma, TLR4, Innate Immunity

Introduction

Otitis media (OM) is a middle ear infection associated with inflammation. This disease frequently afflicts humans and is the major cause of hearing loss worldwide. Substantial morbidity associated with OM is further exacerbated by the high frequency of recurrent infections leading to chronic suppurative otitis media (CSOM).¹ Chronic suppurative otitis media (CSOM) is a serious health care concern worldwide due to its substantial financial and non-financial burden.² Otitis media is the most common disease in children in the United States, with about 5 billion spent each year in direct and indirect costs.³ The World Health Organization (WHO) estimates that about 65-330 million people suffer from CSOM and that as many as 50% of these have some form of significant associated hearing loss and this disease results in reduced quality of life for patients.¹,⁴

Chronic suppurative otitis media is divided into chronic suppurative otitis media without cholesteatoma and with cholesteatoma. Both are distinguished by looking at the inflammatory process, the presence or absence of cholesteatoma and the location of the tympanic membrane perforation, and different management.⁵ The pathogenesis of otitis media is considered multifactorial, however, a bacterial infection is a major cause of acute and chronic otitis media.⁶,⁷ In a study conducted by Pancawati in 2016 in Makassar, it was found that the

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overall pattern of the pathogen that caused CSOM was gram-negative aerobic bacteria. The body’s immune response to microorganisms, including bacteria, consists of innate immunity and adaptive immunity. The innate immunity response acts as a non-specific first-line barrier to defense.4,9

Toll-like receptor (TLR) is a homologous protein in the cell membrane Antigen Presenting Cell (APC) that functions as a functional receptor that activates leukocytes to trigger innate immune responses or inflammatory responses to fight pathogens.10 TLR is an important mediator and the best innate immune receptor of the innate immune response.6,11,12 There are 11 types of TLRs have been identified from mammals and each response to a different class of pathogenic infections and is named TLR1-11.10 TLR4 mainly recognizes a large number of pathogens associated with PAMP that are specific to LPS (lipopolysaccharide) in gram-negative bacteria.13,14

Studies in humans have been carried out regarding the role of TLR in CSOM.15,16,17,18,19 Studies in animals have added in vivo evidence regarding the importance of TLR as innate immunity in OM resistance.16,18 The involvement of the innate immune system and TLRs in OM, as well on their relevance for new vaccination strategies and immunotherapies.20

Materials And Method

Patient selection

The research subjects were selected from two patient groups of CSOM: Group I consist of 10 patients CSOM with cholesteatoma and Group II consist of 20 patients CSOM without cholesteatoma. Each sample was examined for TLR4 levels and bacterial identification cultures in secretions. 5 of 10 patients from Group I and 10 of 20 patients from Group II was examined for TLR4 levels in middle ear mucosa. All patients are diagnosed based on history, physical examination and CT-Scan of temporal bone examination. Patients with acute suppurative otitis media, inactive chronic suppurative otitis media, congenital and primary acquired cholesteatoma, and patients with a history of other acute and chronic infectious diseases were not included as subjects in this study.

Middle ear secretion swab culture

Middle ear swab culture was performed for both sample groups. The external auditory canal was cleaned, and the middle ear discharge was collected using sterile cotton swabs than placed in a sterile tube and subjected to bacteriological examination.

Middle ear secretion collection

The external auditory canal was cleaned, and the middle ear discharge was collected using sterile cotton swabs than placed in an Eppendorf tube contains 1 ml phosphate buffer saline (PBS). The samples were stored in a freezer with a temperature of -20°C for further use in ELISA.

Middle ear mucosa collection

During each operation, the middle ear mucosa was exposed via tympanostomy anterior or posterior. The mucosae were collected using a microcurette and forceps than placed in an Eppendorf tube contains 1 ml phosphate buffer saline (PBS) than stored in a freezer with a temperature of -20°C for further use in ELISA.

ELISA

TLR4 protein levels were selectively tested by ELISA kits. The standard curve range of the ELISA kit is 0,05 ng/ml – 15 ng/ml and sensitivity are 0,027 ng/ml. Middle ear secretion and mucosae from the two groups were recollected. Middle ear secretion and mucosae homogenized in 0.5 ml of PBS. All samples were centrifuged for 5min at 13,000 g and the supernatant was tested in duplicate for TLR4 according to the manufacturer’s instruction.

Statistical Analysis

Data were analyzed using SPSS (Statistical Package for Social Sciences) version 24.0 for Windows. Samples were analyzed using independent T-test.

Results

Types and proportions of cultured pathogens

All of the samples were positive for bacteria. The most pathogen in CSOM without cholesteatoma are gram-negative bacteria, species Pseudomonas aeruginosa with 8 samples (40%), followed by gram-positive species Staphylococcus haemolyticus with 3
samples (15%). The most pathogen in CSOM with cholesteatoma are gram-negative bacteria, species *Pseudomonas aeruginosa* (Table 1).

### Table 1. Organisms are cultured from middle ear swabs.

<table>
<thead>
<tr>
<th>No</th>
<th>Bacteria</th>
<th>Gram (+) / (-)</th>
<th>Cholesteatoma (-)</th>
<th>Cholesteatoma (+)</th>
<th>n</th>
<th>%</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>Pseudomonas aeruginosa</em></td>
<td>Gram (-)</td>
<td>8</td>
<td>40</td>
<td>2</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Acinetobacter baumanii</td>
<td>Gram (-)</td>
<td>1</td>
<td>5</td>
<td>1</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Serratia marcescens</td>
<td>Gram (-)</td>
<td>1</td>
<td>5</td>
<td>0</td>
<td>0.0</td>
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<td></td>
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<tr>
<td>4</td>
<td>Serratia rubidae</td>
<td>Gram (-)</td>
<td>1</td>
<td>5</td>
<td>0</td>
<td>0.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Enterobacter cloacae</td>
<td>Gram (-)</td>
<td>0</td>
<td>0.0</td>
<td>1</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Providentia stuartii</td>
<td>Gram (-)</td>
<td>1</td>
<td>5</td>
<td>0</td>
<td>0.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Proteus mirabilis</td>
<td>Gram (-)</td>
<td>1</td>
<td>5</td>
<td>1</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Pantoea spp</td>
<td>Gram (-)</td>
<td>1</td>
<td>5</td>
<td>0</td>
<td>0.0</td>
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<td></td>
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<tr>
<td>9</td>
<td>Achromobacter xylosoxidans</td>
<td>Gram (-)</td>
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<td>5</td>
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<td>0.0</td>
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</tr>
<tr>
<td>10</td>
<td>Acinetobacter iwolfii</td>
<td>Gram (-)</td>
<td>0</td>
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<td></td>
<td></td>
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<tr>
<td>11</td>
<td>Staphylococcus haemolyticus</td>
<td>Gram (+)</td>
<td>3</td>
<td>15</td>
<td>1</td>
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<tr>
<td>12</td>
<td>Staphylococcus aureus</td>
<td>Gram (+)</td>
<td>0</td>
<td>0.0</td>
<td>1</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Staphylococcus warneri</td>
<td>Gram (+)</td>
<td>1</td>
<td>5</td>
<td>0</td>
<td>0.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Kocuria kritsinae</td>
<td>Gram (+)</td>
<td>1</td>
<td>5</td>
<td>1</td>
<td>10</td>
<td></td>
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</tr>
<tr>
<td>15</td>
<td>Kocuria varians</td>
<td>Gram (+)</td>
<td>0</td>
<td>0.0</td>
<td>1</td>
<td>10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total**              |   20            | 100.0            | 10                | 100.0             |

### TLR4 levels

In the secret samples with the independent T-test obtained p-value 0.460 (p > 0.05) that showed no significant difference. In the mucosal samples with the independent T-test obtained p value 0.114 (p > 0.05) that showed no significant difference (Table 2).

### Table 2. TLR4 levels between groups of CSOM with cholesteatoma and CSOM without cholesteatoma based on secretions and mucosal samples.

<table>
<thead>
<tr>
<th>CSOM</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secret</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With Cholesteatoma</td>
<td>10</td>
<td>3.7244</td>
<td>0.583</td>
<td>0.460</td>
</tr>
<tr>
<td>Without Cholesteatoma</td>
<td>20</td>
<td>3.4615</td>
<td>1.024</td>
<td></td>
</tr>
<tr>
<td>Mucosa</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With Cholesteatoma</td>
<td>5</td>
<td>4.1660</td>
<td>0.610</td>
<td>0.114</td>
</tr>
<tr>
<td>Without Cholesteatoma</td>
<td>10</td>
<td>3.7595</td>
<td>0.332</td>
<td></td>
</tr>
</tbody>
</table>

* Independent T-Test
TLR4 levels were also examined to compare TLR4 levels in secretions with TLR4 levels in the mucosa in each study group. In the group of CSOM with cholesteatoma with the independent T-test obtained p-value 0.196 (p > 0.05) that showed no significant difference. In the group of CSOM without cholesteatoma with the independent T-test obtained p-value 0.381 (p > 0.05) that showed no significant difference (Table 3).

**Table 3. TLR4 levels between secret samples with mucosal samples in CSOM with cholesteatoma and CSOM without cholesteatoma**

<table>
<thead>
<tr>
<th>Sample</th>
<th>n</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>With Cholesteatoma</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secret</td>
<td>10</td>
<td>3.7244</td>
<td>.58336</td>
<td>0.196</td>
</tr>
<tr>
<td>Mucosa</td>
<td>5</td>
<td>4.1666</td>
<td>.60976</td>
<td></td>
</tr>
<tr>
<td>Without Cholesteatoma</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secret</td>
<td>20</td>
<td>3.4615</td>
<td>1.02485</td>
<td>0.381</td>
</tr>
<tr>
<td>Mucosa</td>
<td>10</td>
<td>3.7595</td>
<td>.33240</td>
<td></td>
</tr>
</tbody>
</table>

* Independent T-Test

**Discussion**

In this study, the most pathogen in CSOM with and without cholesteatoma are gram-negative bacteria, species *Pseudomonas aeruginosa*. Pancawati in Makassar also received the most pathogen in CSOM without cholesteatoma are gram-negative bacteria but species *Proteus mirabilis* in CSOM with cholesteatoma. Harshika in India also obtained the dominant microbiological pathogen in CSOM is *Pseudomonas aeruginosa*.

*P. aeruginosa* is the main cause of CSOM disease in the tropics. *Pseudomonas* is more able to survive than other pathogens because it only requires minimal food and produces pyocyanin and bacteriocin which is its ability to carry out local infections in the form of necrotic activity by extracellular enzymes, which have characteristics such as epithelium damage, circulatory breakdown, and loss of tissue protection devitalizing organisms from normal defense mechanisms.

Toll-like Receptors (TLR) 1-10 plays a very crucial role in inducing and activating the natural immune system during an infection. Recent data have shown an important role for TLR in the inflammatory response to bacteria in the ear, and these receptors are particularly important during recovery from otitis media in mice.

Si (2014) on examining TLR4 levels using Real-Time - PCR and Western blot found low TLR4 mRNA levels and TLR4 protein levels in the middle ear mucosa of CSOM compared to normal middle ear mucosa. This is one proof of the involvement of TLR4 in the pathogenesis and recovery of CSOM.

Usually, TLR is expressed in immune cells, epithelial cells, and endothelium. The ligand is called Pathogen Associated Molecular Patterns (PAMP). The TLR bond and its ligand will cause signal transduction to release proinflammatory cytokines such as IL-1 and TNF-α. The most important histopathological features of cholesteatoma are the cholesteatoma matrix, immune cells, and stroma (stroma). The pathogenesis of cholesteatoma is still controversial. Excessive production of several cytokines such as IL-1α and IL-1β is found in the cholesteatoma epithelium and stroma. IL-6 is found in the stroma and intestines of cholesteatoma. These cytokines affect epithelial proliferation and bone resorption that occur in cholesteatoma. The discovery of these inflammatory mediators and the intercellular connecting molecule explain the immunologic aspects of the growth of cholesteatoma.

The results of this study generally obtained levels of TLR4 secret samples and mucosal samples in the CSOM group with cholesteatoma higher than TLR4 levels in CSOM without cholesteatoma but did not show a significant difference. Jesic et al. also found no significant difference in TLR4 expression between the granulation tissue of CSOM with cholesteatoma and CSOM patients without cholesteatoma on
TLR4 examination with histopathological and immunohistochemical examination techniques. Whereas Hirai et al.\textsuperscript{26} found higher TLR4 expression in middle ear mucosa CSOM with cholesteatoma than middle ear mucosa CSOM without cholesteatoma by immunohistochemical examination.

Higher TLR4 levels in CSOM with cholesteatoma caused by an infection process that occurs in CSOM with cholesteatoma is more severe than in CSOM without cholesteatoma. Cholesteatoma is a good medium for bacterial growth so that infection occurs. Infection can trigger a local immune response which results in the production of various inflammatory mediators and various cytokines. Inflammatory mediators and cytokines can stimulate keratinocytes of the cholesteatoma matrix to be hyperproliferative, destructive.\textsuperscript{27} In this study, TLR4 levels did not show a significant difference probably due to the lack of samples in this study.

The results of this study generally obtained levels of TLR4 in mucosal samples higher than TLR4 levels in meddled ear secret samples both on group CSOM with cholesteatoma and CSOM without cholesteatoma but did not show a significant difference. TLR4 levels in the secretions and mucosa which are almost the same and statistically do not show a significant difference in each sample group show that TLR4 levels can be measured using secret samples and mucosal samples.

Bacterial infections are the dominant factor in most cases of otitis media. The natural immune system of the mucosa (epithelial cells and other mucous cells) functions as a barrier and anti-infection. The natural immune system of the mucosa plays an anti-infectious role by recognizing Pathogen Associated Molecular Patterns (PAMP) through Pattern Recognition Receptors (PRR), such as Toll-like receptors (TLR). TLR activation mobilizes the innate immune response, including infiltration of inflammatory cells, production of inflammatory cytokines, and defense against bacterial infections.\textsuperscript{25}

**Conclusion**

TLR4 levels in secret and mucosal samples are higher in CSOM with cholesteatoma than in CSOM without cholesteatoma but there were no significant differences. TLR4 levels in mucosal samples are higher than secret samples but there were no significant differences in both group CSOM with and without cholesteatoma.

**Conflict of Interest:** The authors have no conflicts of interest to declare.

**Acknowledgments:** The authors very gratefully thank all chronic suppurative otitis media patients who were willing to be a respondent in this study.

**Ethical Clearance:** Taken from Biomedical Research Ethics Committee on Human Faculty of Medicine Hasanuddin University Makassar Indonesia (Register number : 1122 / H4.8.4.5.31 / PP36-KOMETIK / 2018).

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**References**


Intranatal Care Documentation Information System
Integrated With Web-Based Government Employed Midwife Performance Index (Seindah Paniai)

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Abstract

Introduction. Midwifery care documentation which is written in the forms of Subjective, Objective, Analysis, and Management development (SOAP) is not committed maximally which is caused by the double responsibility, unavailable format, tiredness, limited time, and repeatedly written data in the registering conventional book and it complicates the collecting of midwife’s credit numbers to increase their functional level.

This study aims to design an integrated information system of childbirth care documentation for the credit numbers of civil servant midwives (Seindah Paniai).

Method. The design of Seindah Paniai uses the System Development Life Cycle (SDLC) method. The Prototype of Seindah Paniai system is designed by using MySQL database and Apache web server.

Results. The design of Seindah Paniai system includes: login use, midwife care assignments, patient data, delivery (subjective data, objective data, case analysis, management of I-IV first-time delivery care, informed consent, latent phase observation sheets, partographs, internal reference forms), performance midwife and recapitulation of delivery data in one month. The constructive validity or the content of information system involves experts and intrinsic validity is done with black box testing, all test items are accepted. Reliability of information system uses a questionnaire (Likert) with retesting test and Alpha Chornbach methods (p = 0.832 > 0.05).

Conclusion. Seindah Paniai system documented Kala I-IV’s delivery care. Seindah Paniai displays the value of the midwife’s credit number according to the functional level. Seindah Paniai is valid and reliable to use. Seindah Paniai system needs to be completed with the interesting wall displays and the trials of service system to see the accepting.

Keywords: Information system, Delivery documentation, Midwife performance index.

Introduction

Midwifery documentation is the legal proof of recording and reporting the frame of thought which is used in the process of taking decision in accordance with their competence (1)
Midwifery documentation as a reflection of care models illustrates the problem solving methods which is carried out at each stage of midwifery care in systematic, precise, clear, accurate, concise, and clear manner (2). Documentation is carried out immediately and write it in the note forms on the progress of SOAP (Subjective, Objective, Analysis, Management) that can be a legal evidence for implementation of midwifery care (3).

Dike’s 2015 study on childbirth documentation obtained results: 80 (87%) respondents knew about documentation; 92 (100%) for continuity of care; 89.1% for law; 87% for quality care. But 71 (77.2%) respondents did not do documentation (4).

The role of technology in documenting midwifery in the form of recording and reporting to the Information system has been widely developed, such as SIK 5NG (5), Development of Information Systems for Maternal and Infant Health Services (6), PrasavGraf Android (7), e-Partograf (8) and PartoPen (9).

Information systems with digital partographs have been used as a means of detecting and clinical decision making in childbirth (10,11). But in its implementation, even though midwives have good knowledge about partographs, its use is still lack (12,13).

This case is caused by the lack of midwife motivation, physical and emotional fatigue. Therefore, the support and appreciation from supervisor are needed so that, the care can be well documented (14-16).

One of the appreciation terms for work performances and midwife services is promoting them for being Civil Servants (17). There has been the determination for the number of credit assignments for functional health officials (18) but the application of maternity care with SOAP documentation that refers to normal delivery care does not yet exist.

Preliminary studies about hospitalization in five Public Health Centers in Makassar City and two others in North Luwu Regency found that, the data of delivery was recorded in more than one register manually. The data and recording reports were stored in the form of ‘paper base’ which make it difficult for searching when the data is needed. On the other hand, it also requires much time for finding it which is caused by the buildup of data files. And when the recording data is incomplete, the data or archives cannot be shown. Documentation of giving birth in several places is only a delivery report without any care of providing documents. The unavailable of care documenting format is the reason of the incomplete data to the daily activities of the midwife. When completing the list of proposed credit numbers for an increase in the functional level, the midwife must reopen the stack of delivery care documenting files and manually calculate the credit score acquisition one by one.

MATERIALS AND METHODS

Materials and Methods

The design of Seindah Paniai uses the System Development Life Cycle (SDLC) method, which includes problem identification, need analysis, system design, implementation, and evaluation (19,20). The Prototype of Seindah Paniai system is designed by using MySQL database and Apache web server. The prototype simulation test was carried out for 1 month.

Data analysis

Information systems are validated constructively (involving experts), intrinsic with (black box testing) (21,22) and reliability with the retesting test by using Alpha Cronbach. And the process of collecting data use the SPSS version 24.

Results

Designing Information system

Software for building systems includes: MySQL with programming languages: html, java script, php, css for display; graphic User Interface / GUI for MySQL: phpMyadmin; application for text editor: Sublime Text Editor; File Treanser Protocol (FTP) application: FileZilla.

The results of Seindah Paniai Information designing system

a. Login and start page

Seindah Paniai system can be accessed by logging in the user name using the midwife employee’s number and personal password for each user.
The initial page with the slogan «Save and Health”. Before conducting documentation input, the midwife must input a guard assignment that is tailored to her condition, whether the duty is to keep the shift in place, on call, or to work in the affected area.

The data on registered patients is the biodata of spouse using the citizenship registered number and the patient’s medical record number as the identity key.

b. Delivery

Seindah Paniai system provides subjective data, objective data, analysis and management from the period of giving birth I-IV. The options are checked according to the patient’s condition. Subjective data includes patient complaints, menstrual history, the history of past and postpartum pregnancy, current pregnancy history, family disease, and psychosocial conditions. Objective data includes the whole body such obstetric examinations, internal examinations and investigations. Case analysis consists of physiological cases without problems, physiological problems, pathology, pathology with co-morbidities, and emergencies. Management is adjusted to analyze cases chosen by midwives.

Before the management is done, informed consent is inputted first. In the first stage of childbirth, there is a latent and partograph phase observation sheet to assess the progress of giving birth. In every delivering babies, the care is given by choosing and giving a check mark. If not available in the choice, the midwife can input the care in the column provided. The midwife cared for her according to authority, so that the output of the internal referral form was provided. At the step of IV, midwives completed their documentation in partograph and supervision two hours postpartum. Seindah Paniai system keeps all childbirth documentation in the patient’s medical record file. If data is needed, the medical record
c. Performance (performance index of civil servants midwives)

Government employed midwife performance index are obtained in accordance with midwives’ functional levels and analysis of cases handled, referring to Minister of Health Regulation number 551/2009 (17) and PerMenPAN 001/2008 (23). Seindah Paniai system displays the credit score obtained from each patient at each period of birth and the outgoing credit score in one month. Recapitulation of delivery service coverage data in one month is displayed at the end of the system.

The system of validities and reliabilities.

The Validities of Seindah Paniai system involves the experts (Doctor Specialists Obstetri Ginecology, team members of midwife’s documenting evaluators, the specialists of technology information and the counting of midwife performance index of South Sulawesi province).

The testing of constructive validities and content.

The Items and content which are validated constructively is the format data assessment of subjective, objective, analysis, management (SOAP), and the integrated item with SOAP performance index.

The testing of intrinsic.

The intrinsic validities of Seindah Paniai system use the black box testing. Black box testing examine the special function from application and the test of input and output is for the function without concerning to the process. There are some errors that can be identified such as: the lost and error function, the error between face, the error of data structure (database access) the error of initialization and performance in the end of program (24).

<table>
<thead>
<tr>
<th>No</th>
<th>Testing Class</th>
<th>Testing Items</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Login Use</td>
<td>Check registered user</td>
<td>Accepted</td>
</tr>
<tr>
<td>2</td>
<td>Guard duty</td>
<td>Date and duty guard</td>
<td>Accepted</td>
</tr>
<tr>
<td>3</td>
<td>Patient Data</td>
<td>New Data</td>
<td>Accepted</td>
</tr>
<tr>
<td>4</td>
<td>Delivery Period</td>
<td>Subjective data</td>
<td>Accepted Accepted Accepted Accepted</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Objective data</td>
<td>Accepted</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Analysis</td>
<td>Accepted</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Management</td>
<td>Accepted</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Latent Phase observation sheet</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Front sheet partograph</td>
<td>Accepted</td>
</tr>
</tbody>
</table>

Figure 3. The designing recapitulation of midwives performance
<table>
<thead>
<tr>
<th></th>
<th>Period</th>
<th>Subjective data</th>
<th>Objective data</th>
<th>Analysis</th>
<th>Management</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>II</td>
<td>Objective data</td>
<td>Objective data</td>
<td>Analysis</td>
<td></td>
<td>Accepted</td>
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<tr>
<td>6</td>
<td>Period III</td>
<td>Subjective data</td>
<td>Objective data</td>
<td>Analysis</td>
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<td>Accepted</td>
</tr>
<tr>
<td>7</td>
<td>Period IV</td>
<td>Subjective data</td>
<td>Objective data</td>
<td>Management</td>
<td>Back sheet partograph</td>
<td>Accepted</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>Informed Consent Sheet</td>
<td></td>
<td></td>
<td></td>
<td>Accepted</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>Internal Reference Sheet</td>
<td></td>
<td></td>
<td></td>
<td>Accepted</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>Performance</td>
<td>Integration of SOAP and midwife Credit Numbers from each patient</td>
<td></td>
<td></td>
<td>Accepted</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>Recapitulation of the acquisition of midwife's Credit Score in one month</td>
<td></td>
<td></td>
<td></td>
<td>Accepted</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td>Data Recap</td>
<td>Data Recap</td>
<td></td>
<td></td>
<td>Accepted</td>
</tr>
</tbody>
</table>

Table 1 shows that the output Seindah Paniai is in accordance with what is expected or received and it can fulfill the needs of user which is free from errors.

c. Reliability Test

The reliability testing of Seindah Paniai system uses a Likert questionnaire with 13 items of questions which include information system logins, guard duty, patient data, SOAP I-IV delivery, performance (SOAP integration and credit score acquisition according to midwife’s functional level) and data recapitulation. Questionnaires with 4 items of answers were tested by retesting test by using Cronbach Alpha (p = 0.832 > 0.05).

Conclusions and Recommendations

Information systems document the period I-IV delivery care. The information system displays the midwife credit score according to the functional level. Valid and reliable information system to be used.

Seindah Paniai system needs to be completed with the interesting wall displays and the trials of service system to see the accepting.

**Etical Clereance Number:** 1066 / H4.8.4.5.31 / PP36-KOMETIK / 2018 issued by the Health Research Commitee Hasanuddin Makassar University.

Source of Funding: Self

Conflict of Interest: None

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Analysis of Cotinine Levels in Urine as a Risk Factor of Otitis Media with Effusion in Children

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Abstract

Otitis media effusion (OME) is presence of fluids in the middle ear without any sign and acute inflammation symptoms with complete of tympanic membrane. This study aimed to analyse the cotinine level in urine as a risk factor of otitis media effusion in children.

This study is using the analyse observasional with case control design. Involving 52 childrens divided into 2 groups. First group consists of 22 patients with otitis media effusion. Second group consists of 30 childrens as controls. The diagnosis of otitis media effusion are determined by tympanometry examination and we found B type for the result. All subjects was checked the cotinine level in urine.

The result of this study show that mostly the cotinine levels in Otitis Media effusion (2.55) a little lower than controls (2.63), but the statistic not significant. This shows there’s not significant relation between cotinine level and otitis media effusion.

Keywords: otitis media effusion, cotinine level in urine, tympanometry.

Introduction

Otitis media effusion (OME) is presence of fluids in the middle ear without any sign and acute inflammation symptoms with complete of tympanic membrane. The presence of fluids in the middle ear can cause decrease function of tympanic membrane that make hearing loss1,2.

OME generally occurs as a short term disorder accompanying with respiratory infection in children, or as a chronic process. About 80% of children can have one episode of OME before 10 years old with mostly case occurring the range of 6 months until 4 years old and about 50% children sustain bilateral OME 1,3.

In 2007, WHO reported all prevalence 3.8% of non suppurative chronic of otitis media4. A cross sectional study in Saudi Arabia showed data on prevalence of OME in 1488 children 6-12 years old) are 7.5%5. Chen and friends in Taiwan reported the frequency of OME in 3013 children (3-6 years old) are 5.24 %6. Rizaldi in his study reported the prevalence of OME in the children 0-14 years old in East Jakarta are 1.3%7.

The etiology and pathogenesis of OME are multifactorial. The expose of cigarette’s smoke is one of the environment factors that cause OME that can cause irritation (toxic trauma) which is can damage the cilia, hyperplasia in the goblet cell, and hypersecretion in the mucus, and impaired function of mucociliary transport in Eustachian tube and middle ear8,9.

The American Academy of Otolrnyngology Head and Neck Surgey (AAO-HNS) officially said that the exposure of cigarette’s smoke can increase the risk of otitis media in children. According to Talaat et al, the effect of harm cigarette’s smoke not only for the active smoker but also risks to peoples around them, especially infants and children10.

Materials and Method

Study design

This study is using the analyses observational with case control design.
Place and Time

This study take place in ORL-HNS clinic at Wahidin Sudirohusodo Hospital and Hasanuddin University (Unhas) Hospital, research laboratory Hasanuddin University Hospital. Study started from November 2018 until March 2019.

Population and Sample

The population target are children between 0-18 years old who got the ORL-NHS treatment in Wahidin Sudirohusodo hospital and Unhas hospital. The selection population using children between 0-18 years old because WHO announce children until 18 years old have a big risk to get OME and highest prevalence of passive smoker in Indonesia (1).

Data Process

Analyze data using SPSS 2.2 version. Statistical analyze with descriptive statistic calculation and distribution of frequency and also Independent t-test statistical test, if the test result show significant statically. The test results are significant if the value is $p < 0.05$

Results

Case control study have been conducted in children between 0-18 years old. Total sample 52 children, 22 with OME (Case group), and 30 children without OME (control group).

Table 1. Descriptive statistic Ages and Cotinin level Statistic (n=52)

<table>
<thead>
<tr>
<th>Variabel</th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ages</td>
<td>2</td>
<td>16</td>
<td>9,19</td>
<td>2,10</td>
</tr>
<tr>
<td>Cotinin level</td>
<td>1,38</td>
<td>4,69</td>
<td>2,60</td>
<td>0,75</td>
</tr>
</tbody>
</table>

Table 2. Study variable category (n=52)

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>%</th>
<th>OR</th>
<th>95% CI</th>
</tr>
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<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>13</td>
<td>59</td>
<td>56,7</td>
<td>2,762</td>
</tr>
<tr>
<td>Female</td>
<td>9</td>
<td>41</td>
<td>33,3</td>
<td></td>
</tr>
<tr>
<td>Sleep Disorder (adenoids hypertrophy)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>5</td>
<td>22,7</td>
<td>23,3</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>17</td>
<td>77,3</td>
<td>76,7</td>
<td>3,826</td>
</tr>
<tr>
<td>Snoring (enlarge adenoids)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>8</td>
<td>36,4</td>
<td>20</td>
<td>1,522</td>
</tr>
<tr>
<td>No</td>
<td>14</td>
<td>63,6</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>Common Cold (upper respiratory tract infection)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>14</td>
<td>63,6</td>
<td>43,3</td>
<td>1,352</td>
</tr>
<tr>
<td>No</td>
<td>8</td>
<td>36,4</td>
<td>56,7</td>
<td></td>
</tr>
<tr>
<td>Active Smoker</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>No</td>
<td>22</td>
<td>100</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Member Of Family Smoking</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>20</td>
<td>91</td>
<td>43,3</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>2</td>
<td>9</td>
<td>56,7</td>
<td></td>
</tr>
</tbody>
</table>
Table 2. Study variable category (n=52)

<table>
<thead>
<tr>
<th>Number of Family Smoking</th>
<th>1 person</th>
<th>&gt;1</th>
<th>None</th>
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</thead>
<tbody>
<tr>
<td>Father</td>
<td>19</td>
<td>13</td>
<td>86,4</td>
</tr>
<tr>
<td></td>
<td>13</td>
<td>0</td>
<td>4,5</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>17</td>
<td>9,1</td>
</tr>
<tr>
<td></td>
<td>56,7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Who’s Smoke</th>
<th>Father</th>
<th>Others</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>19</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>13</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>9,1</td>
<td>4,5</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>56,7</td>
<td>43,3</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Smoking near child</th>
<th>Yes</th>
<th>No</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>20</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>8</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>90,9</td>
<td>26,7</td>
<td>56,6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Amount of cigarette stick</th>
<th>&gt;20 sticks</th>
<th>11-20 sticks</th>
<th>1-10 sticks</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>14</td>
<td>3</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>8</td>
<td>3</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>63,5</td>
<td>13,6</td>
<td>13,6</td>
<td>9,1</td>
</tr>
<tr>
<td></td>
<td>6,7</td>
<td>26,7</td>
<td>10</td>
<td>56,6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Place of Smoking</th>
<th>Inside the house</th>
<th>Outside house</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>20</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>7</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>90,9</td>
<td>23,3</td>
<td>56,6</td>
</tr>
</tbody>
</table>

Table 2, show mostly subjects are male with OME, 13 (59%) nor the control 17 (56,7%), odds ratio (OR) 2,762. Based on the results from the interviews using questioners, 5 with sleep disorder in OME group (22,7%), and group control in 7 (23,3%), OR 3,82, 8 subjects snoring (36,4%) who suffered OME and 6 (20%) in group control, OR 1,52. Common cold 14 (63,6) in OME and 13 (43,3) in control, OR 1,352. All subjects were passive smokers (100%) both those who suffered OME and controls, families smoke in 20 (91%) in OME patients and 13 (43,3%) in controls, the number of families who smoked 19 (86,4%) more than 1 person as many as 1 (4,9%) and the group control, most of whom were 13 (43,3%) smoker were 19 fathers ( 86,4%) in OME and 13 (43,3%) in controls, Smoking near childrens in 20 (90,9%) in OME and 5 (16,7%) in controls, the number of dominant cigarettes smoked >20 sticks in OME group are 14 (63,5%) and 2 in controls (6,&%), and smoking place in the house are 20 (90,9%) and 6 (20,1%) in group control.

Table 3. Mean cotinine level in Group

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Cotinin Level</th>
<th>%</th>
<th>Mean</th>
<th>SD</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>OME</td>
<td>22</td>
<td>Positive</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Negative</td>
<td>100</td>
<td>2,55</td>
<td>0,77</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>30</td>
<td>Positive</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Negative</td>
<td>100</td>
<td>2,63</td>
<td>0,75</td>
<td></td>
</tr>
</tbody>
</table>

P can not count because all subjects not cross the cut off level (>100ng/ml).
The mean results of type B tympanometry found (2.55) slightly lower than in type A (2.63), but not statistically significant with a value of p > 0.05. This shows that there is no significant relation between cotinine levels and tympanometry results.

### Discussion

The characteristics according gender in OME sample were obtained with ratio 59%:41% (table 2). Xenelis et al, 3:1. Rizaldi found that comparison between male and female in children range ages 0-14 years old is 1.5:7.11. As Restuty said correlating this study with the volume of mastoid cells in female tend to have a greater volume of mastoid cells than male, so OME is less common in women12.

In this study children with OME were highest ages range of 2 to 16 years old with mean of 9.2 years old (table 1). This is not related with some literature as Casselbrant and Mandel (2014) stating that the prevalence of OME is highest at the age of 6 months to 4 years old and this number will decline at the age of 6. This cause by the anatomy of Eustachian tube in infants and children under 7 years old is shorter and more horizontal and also the unperfect of immune system causes a higher risk of OME in children12.

From samples in table 2, it can be concluded that all samples were passive smoker and there’s no positive of cotinine level were found. This happens because subjective judgments do not always get reliable information, so that’s why the level of exposure can be influenced by the type of cigarette, the distance to the source of cigarette smoke, the length of exposure and the condition of ventilation at that time. Its useful for epidemiological study and intervention to control subsequent of exposure to cigarette smoke.13

We found the result of the OR in sleep disorder and snoring that cause the adenoid hypertrofi is 3.8 times and 1.5 times increase the risk of OME. Whereas for common cold that cause by ISPA, increase the risk of OME 1.3 times. In children, OME is generally arises as a short term disorder, with accompanying an upper respiratory tract infection. Several studies have been proven it, Zhang et all in their study, collecting 4 studies of URTI, obtained results that URTI means increasing the risk of Otitis Media. (OR,6.59;95% CL,3.13-13.89;P <0.0001), Children who have a history of URTI in the last 1 month, have chances 7 times to suffer OME, compared to children who do not have a history of URTI.123

This is supported by the literature which is said that URTI can cause inflammation and impair the fuction of eustachian tube, so that, it decreases the pressure in the middle ear, followed by the entry of bacteria and viruses into the ear, through the eustachian tube causes inflammation and effusion in the middle ear. In addition, the eustachian tube in children has not yet growing like an adult size, the eustachian tube in child is shorter and located more flat or horizontal, so that the secretions of nasopharynx can enter the middle ear easily. The imperfect of immune system of children causes children to be susceptible to get infection, such as upper respiratory tract infection, thereby facilitating the occurrence of Otitis Media.8

From table 4, the mean results of type B tympanometry were obtained (2.55) slightly lower than in type A (2.63), but not statistically significant with a value p >0.05. This shows there’s no relation between cotinine level and tympanometry results. In table 3 the mean cotinine level in OME (2.55) was slightly lower than controls (2.63), but not statistically significant. This shows that there is no relation between the cotinine level and OME.

Examination of cotinine level in urine, this study was carried out by the Enzym-linked immunosorbent Assay (ELISA) method, using a cut-off 100ng/ml referring to the Yeh et al study that was available in Indonesia. The result of this study, we found that there is no positive cotinine level or exceeded the cut off limit in case group or group controls. The result of this study not correlated with the theory which state that exposure to cigarette smoke.

<table>
<thead>
<tr>
<th>Tabel 4. Mean Cotinine Level from Tympanometry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
</tr>
<tr>
<td>------------------</td>
</tr>
<tr>
<td>OME (type B)</td>
</tr>
<tr>
<td>Control (type A)</td>
</tr>
</tbody>
</table>
smoke acts as a risk factor of OME which is believed to occur through the mechanism of irritation in Eustachian tube and middle ear that cause hyperplasia of goblet cell and damage the cilia can cause disappearance function of mucociliary transport.\textsuperscript{15}

Some study have different in setting the cut off rate of cotinine level in urine to assess a person’s smoking status between not being exposed to cigarette smoke (non smoker and being exposed (active/passive smoker). Moyer et al. conclude that the cut off 20 ng/ml for the boundary between non smoker and mild passive smoker used the HPLC tandem mass spectrometry method. Yeh and friends set a cut of 100 ng/ml to limit non smoking status and smokers (passive and active) using the lateral flow chromatographic immunoassay method.\textsuperscript{14,17,18}

According to Danch, to get an estimate of cut off the cotinine level in urine, its necessary to have a statistical distribution of cotinine level in urine for the local population so that’s persons smoking status can be distinguished. Cut-off number can be different among population in various regions of the world because of many influencing factor. Kwon et al. stated that cotinine metabolism from nicotine is associated with genetic polymorphism of cytochrome P450 (CYP) 2A6\textsuperscript{18-21}

There have been no studies in Indonesia determined the cut-off of a person’s smoking status, so the authors refer to the study of Yeh et al, who used a cut-off 100ng/ml using the lateral flow chromatographic immunoassay method that available in Indonesia. The cut-off number has a sensitivity of 92% and specificity of 91 \%.\textsuperscript{14} But according to Jung and Danch’s opinion, that the cut-off number will different between population in various regions, of course the cut off selection in this study that refers to the study of Yeh et all has limitations because held in another populations. So that method of analysis and determination of the cut-off in this study needs to be adjusted to the characteristic of the Indonesian peoples.

**Conclusion**

That can not be proven significantly, the cotinine levels in urine as a risk factor of OME. Upper respiratory tract infection and adenoid hypertrophy increase the risk factor of OME. OME is more common in male than female. Need a further study with an objective method of analysis the cotinine levels in urine using other techniques and large of samples size to obtain more accurate data. We need to set the cut-off number of value as a reference for cotinine levels in urine.

**Conflict of Interest:** Authors declare that there is no conflict of interest within this publication.

**Ethical Clearance:** Ethical clearance was made by Medical Faculty, Hasanuddin University, Makassar.

**Source Funding:** Source funding came from authors their selves.

**References**


Analysis of Plasma F2-Isoprostane Level After Administration of Vitamin C in Patients with Chronic Tonsillitis

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¹Department of Ear, Nose, Throat, Head-Neck Surgery, Medical Faculty, Hasanuddin University, Makassar, Indonesia

Abstract

Background: Chronic tonsillitis can cause oxidative stress in the body.

Objective: The study aims to analyse plasma F2-Isoprostane level in chronic tonsillitis patients with and without risk of Obstructive Sleep Apnea Syndrome (OSAS).

Materials and Method: The design of this study is a clinical trial with pre and posttest control group. Sampling was done in Wahidin Sudirohusodo Hospital and Kassi-kassi Health Center, Makassar. In this study, the sample size of each group was 20 samples, consisting of chronic tonsillitis patients with OSAS risk in the first group and chronic tonsillitis patients without the risk of OSAS in second group. Both groups were given 1x1000 mg tablet of vitamin C for 14 days.

Results: The results of this study showed that there was no significant decrease in plasma F2-Isoprostane level in patient with chronic tonsillitis with and without risk of OSAS after administration of vitamin C. There was no significant difference in decreased of plasma F2-Isoprostane level in patients with chronic tonsillitis at risk of OSAS after the administration of vitamin C especially in chronic tonsillitis patients without OSAS risk.

Conclusions: There was no significant decrease in plasma F2-Isoprostane level in patient with chronic tonsillitis with and without risk of OSAS after administration of vitamin C. There was no significant difference in decreased of plasma F2-Isoprostane level in patients with chronic tonsillitis at risk of OSAS after administration of vitamin C especially in chronic tonsillitis patients without OSAS risk.

Key Words: Chronic Tonsillitis, OSAS, F2-Isoprostane, Vitamin C

Introduction

Chronic tonsillitis is the most common disease of recurrent inflammation of the throat. Based on medical records of Laryngology and Pharyngology of ENT Head and Neck Department in 2010 at RSUP dr. M. Djamil Padang stated that there were 465 patients diagnosed with chronic tonsillitis from a total of 1110 patients visit at the sub-laryngeal polyclinic and 163 cases underwent tonsillectomy¹², meanwhile the number of the new patients diagnosed with chronic tonsillitis at Wahidin Sudirohusodo Hospital Makassar from January 2013 until July 2018 were 320 patients.³

A study conducted by Khan et al⁴ at Khyber Hospital, Pakistan in 2011-2012 regarding the distribution of ENT disease and found 8980 people suffering from chronic tonsillitis as much as 27.37%. In this study chronic tonsillitis was at the top of the incidence of other ENT diseases.⁴⁵ Another study conducted by Alfrida (2009)⁶ in Makassar found that chronic tonsillitis was also found in school age of 5-15 years (61.4%).
Chronic tonsillitis with or without adenoid hypertrophy is very common in childhood. Recurrent inflammation can cause sore throat, fever, dysphagia and malaise. Chronic tonsillitis is one of the most common causes of Obstructive Sleep Apnea Syndrome (OSAS) in children and lead to negative impact on sleep quality.\(^7\)

OSAS is the forced cessation of breathing during sleep for at least 10 seconds, with a decrease of oxygen in the blood due to blockage of the upper respiratory tract. This is characterized by the occurrence of hypopnea, where respiration decreases by more than 50% at least 5 times per hour. This metabolic change triggers oxidative stress and systemic inflammation which then causes the release of reactive oxygen species, antioxidant enzymes and inflammatory indicators.\(^8\)

The definitive diagnosis of OSAS is by polysomnography. In some countries, if polysomnography is not available, other parameters can be used such as Berlin questionnaire, Epworth Sleepiness Scale (ESS) as a parameter for OSA diagnosis.\(^9\)

In India a study was conducted to test the validity of Berlin questionnaire to identify patients at risk of developing OSA, this questionnaire was considered easier to use and more accurate. With this questionnaire people could be differ from high risk and low risk of OSA, and the internal reliability is acceptable because the answers of each questionnaire are assessed per category.\(^10\)

OSAS is characterized by the present of period of recurrent upper airway collapse which results in a hypoxic or reoxygenation cycle and causes an increase in oxygen species formation by oxidative stress. The oxygen free radicals formed will catalyze lipid peroxidation which will produce isoprostane. Carpagnano et al (2002)\(^11\) reported that isoprostane in peripheral blood and exhalation of condensate in OSAS patients has increased.

Free radicals are involved in various pathological conditions including chronic tonsillitis. Lipid peroxidation is the main indicator of free radicals related to the severity of cell membranes.\(^12\) Free radicals including Reactive Oxygen Species (ROS) and lipid peroxidation formed in chronic tonsillitis can increase, lead to cell damage and tissue injury. Plus, the free radicals can damage the leukocyte lipid membranes, hence permeability increases and reduces the function of leukocyte immunity. It can also damage DNA, thus reducing the synthesis and reproducibility of leukocytes. Human body will form antioxidants to prevent further cell damage. Low levels of antioxidants can cause frequent tonsillar infections.\(^13\)

The formation of free radicals will not cause damage or interfere the physiological processes of the body if the enzymatic protection system (the free radical scavenger) and non-enzymatic protection systems (antioxidants) are sufficient to inhibit the reaction of the free radical and can detoxify the formed free radicals. One of the non-enzymatic protection systems for free radicals is vitamin C. Vitamin C acts as an antioxidant by donating the hydrogen atoms to free radicals. A study conducted by Block et al. (2008)\(^14\) that dose of vitamin C was given 1000 mg per day for two months can reduce plasma F2-Isoprostane level in overweight smokers, passively exposed nonsmokers and healthy nonsmokers.\(^15\) Another study conducted by Moreno et al (2004)\(^16\), by giving the orange juice rich in vitamin C can reduce plasma F2-isoprostane level in healthy people on day 14\(^{th}\).

**Materials and Method**

**Patient selection**

The research subjects were selected from two groups of chronic tonsillitis: Group I consist of 20 patients chronic tonsillitis with OSAS risk and group II consist of 20 patients chronic tonsillitis without OSAS risk and both groups were given 1x1000mg of vitamin C for 14 days.

**Sampling procedures**

History taking and examination (otoscopy, anterior and posterior rhinoscopy, pharyngoscopy, indirect laryngoscopy) were conducted on the patients with the inclusion criteria as samples. The subject or patient’s family signed the informed consent form. The subjects filled out the Berlin questionnaire which evaluated the symptoms of OSA. Examination of plasma F2-Isoprostane level with the working principle:

**Taking Blood Samples**

Performed in the cubital median vein. Draw 3 cc of blood using a needle into a tube that already contains EDTA. Plasma separation and storage is carried out in the Molecular Biology Laboratory of Hasanuddin University Hospital Makassar.
Measurement of plasma F2-Isoprostane level was measured in the Molecular Biology laboratory of Hasanuddin University Hospital Makassar. Measurements were made according to the Enzyme-Linked Immunosorbent Assay (ELISA) method.

ELISA

F2-Isoprostane measurement were carried out according to the ELISA method.

Statistical analysis

All data is processed using SPSS version 22, then tested using the T-Test.

Results

From January 2nd 2019 to April 4th 2019, a study was conducted to analyze the plasma F2-Isoprostane level in patients with chronic tonsillitis after giving 1x1000 mg of vitamin C for 14 days. Chronic tonsillitis patients with inclusion criteria were given the Berlin questionnaire to assess the risks of OSAS, then their plasma F2-Isoprostane level were examined.

In this study there were 40 samples of chronic tonsillitis patients, 20 samples were chronic tonsillitis patients with risk of OSAS and 20 samples of patients with chronic tonsillitis without risk of OSAS and both groups were given 1x1000 mg vitamin C for 14 days.

Based on general and clinical characteristics in this study, the variables studied in the group of patients with chronic tonsillitis with and without OSAS risk who were given vitamin C therapy including gender, age, and tonsil size.

Table 1. Characteristics of samples based on gender, age, and tonsil size

<table>
<thead>
<tr>
<th>Sample Characteristics</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Man</td>
<td>16</td>
<td>40</td>
</tr>
<tr>
<td>Woman</td>
<td>24</td>
<td>60</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;20 years old</td>
<td>15</td>
<td>37.5</td>
</tr>
<tr>
<td>20-25 years</td>
<td>12</td>
<td>30</td>
</tr>
<tr>
<td>26-30 years</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>31-35 years old</td>
<td>3</td>
<td>7.5</td>
</tr>
</tbody>
</table>

Table 1 shows that most samples in this study were female which is 24 patients (60%). The most common age was <20 years which is 15 patients (37.5%). As for tonsil size category, 25 patients (62.5%) with T2-T2 and 15 patients (37.5%) with tonsil size T3-T3.

Table 2. Decreased F2-Isoprostane in chronic tonsillitis patients with OSAS risk

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>F2-Isoprostane before administration of Vit. C</td>
<td>106.92</td>
<td>40.21</td>
<td>0.064</td>
</tr>
<tr>
<td>F2-Isoprostane after administration of Vit. C</td>
<td>85.38</td>
<td>48.05</td>
<td></td>
</tr>
</tbody>
</table>

T-test

Table 2 shows a decrease in F2-Isoprotane level in patients with chronic tonsillitis at risk of OSAS after administration of vitamin C. The average level of F2-Isoprostane before administration of vitamin C was 106.92 with a standard deviation of 40.21, while the average F2-Isoprostane level after administration of vitamin C was 85.38 with a standard deviation of 48.05. Based on the T-test statistical test showed that there was no significant decrease in F2-Isoprostane level after the administration of vitamin C in patients with chronic tonsillitis with OSAS risk with a value of \( \rho = 0.064 (\rho = <0.05) \).

Table 3. Decreased F2-Isoprostane in patients with chronic tonsillitis without OSAS risk

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>F2-Isoprostane before administration of Vit. C</td>
<td>80.19</td>
<td>39.97</td>
<td>0.383</td>
</tr>
<tr>
<td>F2-Isoprostane after administration of Vit. C</td>
<td>71.37</td>
<td>34.22</td>
<td></td>
</tr>
</tbody>
</table>

T-test
Table 3 shows a decrease in F2-Isoprotane level in patients with chronic tonsillitis without OSAS risk after administration of vitamin C. The average level of F2-Isoprostane before administration of vitamin C was 80.19 with a standard deviation of 39.97, while the average F2-Isoprostane level after administration of vitamin C was 71.37 with a standard deviation of 34.22. Based on the T-test statistical test showed that there was no significant decrease in F2-Isoprostane level after administration of vitamin C in patients with chronic tonsillitis without OSAS risk with a value of $\rho$ value = 0.383 ($\rho < 0.05$).

Table 4. Comparison of decreases in F2-Isoprostane levels between chronic tonsillitis patients with and without OSAS risk.

<table>
<thead>
<tr>
<th>Decrease in F2-Isoprostane</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>With OSAS</td>
<td>21.54</td>
<td>48.92</td>
<td>0.751</td>
</tr>
<tr>
<td>Without OSAS</td>
<td>8.81</td>
<td>44.19</td>
<td></td>
</tr>
</tbody>
</table>

T-test

Table 4 shows a comparison of the decrease in F2-Isoprostane level between chronic tonsillitis patients with OSAS risk and without OSAS risk. The average decrease of F2-Isoprostane level in patients with chronic tonsillitis with OSAS risk is 21.54 with a standard deviation of 48.92, while the mean average of F2-Isoprostane decrease level in patients with chronic tonsillitis without OSAS risk was 8.81 with a standard deviation of 44.19. Based on the independent T-test statistical tests showed that there was no significant in comparison of the decrease in F2-Isoprostane levels between chronic tonsillitis patients with OSAS risk and without OSAS risk with a value of $\rho$ value = 0.751 ($\rho < 0.05$).

Discussion

This study were conducted on 40 chronic tonsillitis patients who came to the ENT Head and Neck polyclinic of Dr. Wahidin Sudirohusodo Hospital and Kassi-Kassi Health Center from January 2nd to April 4th 2019. To assess the prevalence of Obstructive Sleep Apnea Syndrome (OSAS), patients and their families were given Berlin questionnaires that has been translated into Indonesian. This questionnaire consists of three parts. The first part is about do they snore, how hard and how often they snore and if it disturbs others. The second part is about do they experience fatigue after sleep, how often they feel tired and have they fall asleep while driving. The third part includes the history of high blood pressure. Someone is assumed at risk of OSAS if they have at least two of the above criteria.

From 40 samples, venous blood sampling was carried out in 20 chronic tonsillitis patients with OSAS risk and 20 chronic tonsillitis patients without OSAS risk. Then the blood samples were sent to the laboratory of University Hasanuddin Hospital Makassar to examine plasma F2-Isoprostane level.

The results of this study found that the proportion of women (60%) is higher than men (40%) whom were diagnosed with chronic tonsillitis. This is corresponded with the study reported by Shalihat, et al. (2015) as chronic tonsillitis were most commonly affects female which is 84 people (56.4%). Teenagers are more concerned with their body shape and appearance so many of them will delay their eating schedule and reduce the portion of food they consume as for a perfect body posture. But this behavior will lead to malnutrition and weaken the body immunity which then vulnerable to infections and other health problems.

Out of the total number of 40 patients, maximum number of patients belonged to the age group of less than 20 years (37.5%). This is corresponded with the study conducted by Alfrida in Makassar (2009) at which the percentage of chronic tonsillitis patients at school age of 5-15 years were 61.4%. These children often consume unhealthy foods which contain a lot of preservatives, sweeteners and also cold drinks. These foods and drinks can cause irritation to the throat, which can lead to infection of the throat or tonsil. Besides, children who often suffer from upper respiratory tract infection or acute tonsillitis usually are not adequately treated.

The most tonsil size found was T2-T2 in 25 samples (62.5%). This is different from the study reported by Shalihat, et al. (2015) as mostly tonsillar size in patients with chronic tonsillitis is T3-T3. In chronic tonsillitis there is a persistent or recurrent infection occur, causing the tonsils to work harder to fight germs so that the tonsil become enlarged. Consequently, hyperplasia and fibrosis formation from the parenchymal connective tissue and lymphoid tissue results in tonsillar hypertrophy.

In this study, there was a decrease in plasma F2-Isoprostane level in patients with chronic tonsillitis
with OSAS risk after the administration of vitamin C for 14 days, which is from 106.92 to 85.38, but this is not statistically significant ($\rho$ value = 0.064). While in patients with chronic tonsillitis without OSAS risk there was also a decrease in plasma F2-Isoprostane levels after administration of vitamin C for 14 days, which is from 80.19 to 71.37, but not statistically significant ($\rho$ value = 0.383). Previous study by Alain (2011)\textsuperscript{18} has shown that isoprostane level was significantly higher in OSAS patients compared to healthy patients. Some mechanisms are responsible for increasing ROS and RNS production in OSAS, including recurrent hypoxia and reoxygenation cycle, increased of inflammatory response, sympathetic activity and ROS production.\textsuperscript{18} Recurrent hypoxia occurs in patients with OSAS. Hypoxia will decrease the oxygen supply to tissues and cells, thus disrupt the electron transport to the cell membrane. These result in electron leakage and lead to oxygen radicals formation that will trigger the occurrence of superoxide radicals ($O_2^-$). Superoxide radicals can damage cells and tissues.

Sleep apnea syndrome has been recognized as a very common public health problem (3-6% in adult population) with an increase of cardiovascular morbidity and mortality. The studies recognize the most common form in syndrome (80%), obstructive sleep apnea syndrome (OSAS), as 60-70% of patients are obese, about 68% is hypertensive patients, 63% of dyslipidemia, and 16% are diagnosed with type 2 diabetes or prediabetes.\textsuperscript{19}

OSAS consists of recurrent apnea episodes or hypopnea during sleep resulting in hypoxemia. The cycle change in arterial oxygen saturation can increase ROS production and disturb the balance between prooxidants and antioxidants. The recurrence episodes of apnea or hypopnea and the decreased of oxygen saturation in the blood can alter cell metabolism, such as ischemia or reperfusion. Thus, result in loss of cell compartment integrity. At this state, the iron released from lysosomes can cause or increase the production of free radicals. These abnormalities in cell then followed by mitochondrial damage, associated with a direct relationship of free radicals to the respiratory chain. Both of these situations result in the accumulation of ROS, namely superoxide radicals ($O_2^-$).

From this study there were differences in the decrease of F2-Isoprostane level between chronic tonsillitis patients with OSAS risk and without OSAS risk, but it is not statistically significant ($\rho$ value=0.751). The average decrease in F2-Isoprostane level in patients with chronic tonsillitis with OSAS risk is 21.54, whereas chronic tonsillitis patients without OSAS are 8.81. Based on the study reported by Soetjipto (2007)\textsuperscript{20}, airway obstruction can cause OSAS, from 79 samples of adults there were 64.56% with multi-location obstruction. The location that caused obstruction in most adults was nasal turbinates (76.4%), followed by oropharynx due to enlargement of tonsils (65.91%) and velopharynx caused by palatal abnormalities (64.81%). Besides that, obstructive hypoventilation is caused by the partial obstruction of the air flow which causes hypoventilation and hypoxia.\textsuperscript{21}

Oxidative stress has been involved in various diseases including cancer, cardiovascular disease, ischemia or reperfusion, aging, and chronic tonsillitis. Reactive oxygen species (ROS) including hydroxyl radicals, superoxide radicals, and hydrogen peroxide, which are produced by activated granulocytes, play an important role in many biochemical processes such as intracellular messages in cell differentiation, apoptosis, immunity, and defense against microorganisms. In contrast, the overproduction of these ROS, which occurs in inflammation process, produces oxidative stress. The main target of ROS is polysaturated fatty acids in cell membranes that cause lipid peroxidation and isoprostane formation, which can cause damage to cell structure and function.

There are many evidences show that ROS during chronic inflammatory process mediates the regulation of tonsillar pathophysiological functions. The inflammatory response is the first protective barrier against upper respiratory tract infections. Several recent studies have shown that inflammatory reactions are often closely related to the generation of free radicals. It has been shown that oxidative metabolism of peripheral blood granulocytes is altered in 30% of patients with tonsillar hypertrophy and in 75-90% of patients with recurrent tonsillitis.\textsuperscript{22}

OSAS is characterized by a recurring period of upper airway collapse and a hypoxic or reoxygenation cycle that causes an increase in oxygen species formation by oxidative stress. Oxygen free radicals formed will catalyze lipid peroxidation which will produce isoprostanes. Research conducted by Carpagnano, et al (2002)\textsuperscript{21} showed that isoprostane in the peripheral blood and condensate breaths from patients with OSAS...
were increased. Hypoxia is a condition of low oxygen concentration in cells or tissues that can threaten the life of cell, and it can result in cell injury which will cause an increase in ROS by mitochondria. Cells have a defense against attack from ROS, in the form of antioxidant enzymes, they act as inhibitors that can inhibit oxidation by reacting with reactive free radicals that will form non-reactive free radicals. In the body, free radicals cause lipid peroxidation processes which can produce isoprostane compounds.

Isoprostane is a prostaglandin-like compound formed in vivo through lipid peroxidation through unsaturated fatty acids. Isoprostane has several advantages over other oxidative stress biomarkers. One of the advantages of isoprostane is that chemically stable. Isoprostane has a different ring structure and has strong biological activity.

Vitamin C is one of the antioxidants that dissolves in water, has an effect as free radical scavenging and inhibiting the process lipid peroxidation. The study conducted by Block et al. (2008) that dose of vitamin C was given 1000 mg per day for two months can reduce plasma F2-Isoprostane level in overweight smokers, passively exposed nonsmokers and healthy nonsmokers. This difference in results may be due to a short duration of intervention, a lack of patient compliance with vitamin C, patients exposed to cigarette smoke even though as a secondhand smoke and other extrinsic factors which can increase levels of free radicals.

Vitamin C is an effective antioxidant and is called the first defense system. When ascorbate runs out, F2-Isoprostane will form in plasma which is exposed to aqueous peroxyl radicals, so that vitamin C can be used as an antioxidant against lipid peroxidation.

**Conclusion**

There was an insignificant decrease in plasma F2-isoprostane level in patients with chronic tonsillitis with and without risk of OSAS after administration of vitamin C and there was no significant difference in decreased of plasma F2-isoprostane level in patients with chronic tonsillitis at risk for OSAS after administration of vitamin C especially in chronic tonsillitis patients without OSAS risk.

**Conflict of Interest:** The author does not have a conflict of interest to express.

**Acknowledgments:** The author is very grateful to all patients who were willing to participate in this study.

**Ethical Clearance:** Biomedical Research on Human Ethics Committee, Faculty of Medicine, Hasanuddin University, Makassar, Indonesia (Register number: 72 / UN4.6.4.5.31 / PP36 / 2019).

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**References**


Comparison of Intraoperative Bleeding and Postoperative Pain of Tonsillectomy Using Method of Radiofrequency Dissection and Excision Dissection

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1 Department of Ear, Nose, throat, head-neck surgery, Faculty of Medicine, Hasanuddin University, Makassar

Abstract

Background: The operation of tonsillectomy in addition to the technique of simple tonsillectomy can also be done by the technique of bipolar radiofrequency that in research in 2007 in German universities found postoperative pain and Intraoperative bleeding is significantly lower with the use of bipolar radiofrequency compared with simple tonsillectomy. To date, there has been no research on the comparison of radiofrequency techniques and excision dissection in Indonesia, especially in Makassar.

Purpose: Find the best tonsillectomy technique based on the volume of bleeding and postoperative pain.

Research materials and methods: This research is done by the cross sectional of fourteen patients. The tonsillectomy procedure done by using radiofrequency dissection of 6 patients and with excision dissection of 8 patients, then measured the number of intraoperative bleeding and postoperative pain.

Results: This study showed that there was a decrease in the volume of intraoperative bleeding and a lighter pain in radiofrequency dissection compared to the excision dissection that was evaluated during the 6-hour post-operative. The 24-hour postoperative evaluation does not exhibit significant pain differences in both dissection techniques.

Conclusion: The use of radiofrequency techniques in tonsillectomy procedure is better than the excision dissection technique because it can reduce the volume of intraoperative bleeding as well as the lighter postoperative pain complained.

Keywords: chronic tonsillitis, radiofrequency, excision dissection

Introduction

Tonsillectomy is the most commonly performed procedure in the history of surgery and one of the oldest procedures that is still done since 1000 BAD and the frequency decreases drastically since the emergence of antibiotics. In 1985 in the United States, the incidence of tonsillectomy was 350,000 to 400,000 per year and in 2006, more than 530,000 operating procedures of tonsillectomy in children were carried out. In the last decade, the tonsillectomy is not only performed for recurrent tonsillitis, but also for a wider range of conditions including dietary difficulties, weight gain failure, overbite, tounge thrust, halitosis, snoring, and also Speech disorder. The American Academy of Otolaryngology-Head and Neck Surgery has issued an official recommendation which is an agreement of experts on the indication of the action of Tonsillectomy.

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Tonsillectomy can cause pain, bleeding and edema in the injured part, sore throat, difficulty swallowing, eating and drinking disorders, nausea and vomiting until it falls on a state of dehydration. It can decrease patient
satisfaction against the operation of Tonsilectomy. The results of previous retrospective studies received a secondary incidence of post-tonsillectomy reaching 10.1%, this is largely due to the release of mediators during pain that resulting an increased treatment duration.  

The use of radiofrequency is widely applied in the medical world. Previously researched use of radiofrequency in fat-attachment surgery on the palate, on thoracic surgery and joint operations, and also used for chemotherapy, some researchers also connect the use of radiofrequency in surgery Adenootonsillectomy in patients with cochlear implant implants with results of no influence that worsens due to the use of radiofrequency.

The study of Pfaar et al for treatment using bipolar radiofrequency compared with simple tonsilectomy was conducted at German University in 2007 with results on radiofrequency groups, found that Postoperative pain, difficulty swallowing and speaking, and intra-operative blood loss is significantly lower, and the operating duration is significantly shorter (all p< 0.05).

**Materials and Method**

**Patient Group Criteria**

The study consisted of 14 patients suffering from chronic tonsillitis undergoing tonsilectomy and divided into two groups. The first group, 6 patients of chronic tonsillitis, used a radiofrequency dissection and a second group of 8 patients with chronic tonsillitis, using excision dissection technique. Patients conducted anamnesis, physical examination, as well as fill in the approval of the operation procedure and conducted laboratory examination and thorax x-ray for the preparation of surgery. The postoperative patients was given the same analgesic paracetamol that is adjusted for the patient’s weight. Patients with persistent adenoid hypertrophy, lower respiratory tract infection, tonsil tumor, anatomical disorder of the head and neck area, suffering from systemic or metabolic diseases such as diabetes mellitus, hypertension, stroke, pulmonary tuberculosis, and blood disorders patients, are included in the exclusion criteria.

**Intra-operative bleeding measurement**

The bleeding measured in this study is an intra-operative bleeding measured based on the volume of the gauze weight mixed with blood reduced by the initial kassa weight of 0.4 grams, then calculated based on the calculation of blood density overall is 0.94x10^-9 in ml and added to the volume of blood in the suction tube that has been reduced by another fluid used to rinse.

**Measurement of postoperative pain**

Pain is calculated by using a visual analog scale (VAS) with the results obtained are the value of VAS more than 0 mm and less than 10 mm expressed no pain, mild pain is the value according to the VAS more than equal to 10 mm to 30 mm, moderate pain is values according to VAS 31 mm to 70 mm. Severe pain is the value according to VAS 71 mm to 90 mm, very severe pain is the value according to the VAS 91 mm to 100 mm. This pain measurement is measured during 6 hours post-operative and 24-hour post-operative.

**Results**

**Sample characteristics**

The gender of the sample is more male sex patients who are 8 people (57.14%) The most sample age is the age of < 20 years, which is 6 people (42.86%), for the category of tonsils size 6 people (42.86%) has a tonsils size of T2-T2 and 8 persons (57.14%) has a T3-T3 tonsils size.

**Table 1. Frequency Distribution**

<table>
<thead>
<tr>
<th>Sampel Characteristics</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>8</td>
<td>57,14</td>
</tr>
<tr>
<td>Female</td>
<td>6</td>
<td>42,86</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;20 year</td>
<td>6</td>
<td>42,86</td>
</tr>
<tr>
<td>20-35 year</td>
<td>5</td>
<td>35,72</td>
</tr>
<tr>
<td>&gt;35 year</td>
<td>3</td>
<td>21,42</td>
</tr>
<tr>
<td>Tonsil size</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1-T1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>T2-T2</td>
<td>6</td>
<td>42,86</td>
</tr>
<tr>
<td>T3-T3</td>
<td>8</td>
<td>57,14</td>
</tr>
</tbody>
</table>

Comparison of the volume intraoperative bleeding between an excision dissection and radiofrequency surgery
The mean value of the volume of bleeding in the excision dissection of the surgery is 75.625 ml with a standard deviation of 49.3672, while the average volume of bleeding in radiofrequency surgery is 7.612 with a standard deviation of 4.4058. According to statistical T-test shows that there is a comparison of the volume of significant bleeding between the patient’s excision dissection and radiofrequency with a value of \( \rho \text{value} = 0.000 \) (\( \rho = < 0.05 \)) (table 2).

Table 2. Volume of intraoperative bleeding

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>Deviation Standard</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excision dissection</td>
<td>75,625 ml</td>
<td>49.3672</td>
<td>0.000</td>
</tr>
<tr>
<td>Radiofrequency</td>
<td>7,612 ml</td>
<td>4.4058</td>
<td></td>
</tr>
</tbody>
</table>

Comparison of Pain 6 hours post-operative tonsillectomy patients surgical dissection of excision and radiofrequency.

Table 3 shows a comparison of 6-hour postoperative pain between excision dissection and radiofrequency, the average pain in excision dissection is 6.13 with a standard deviation of 0.64, while the average pain in radiofrequency dissection is 5.50 with standard Deviation 2.07. Based on the statistical T-Test showed that there was a significant pain ratio between excision dissection and radiofrequency dissection with a value of P\text{value} = 0.000 (\( \rho = < 0.05 \)).

Table 3. 6-hour post-operative pain ratio

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>Deviation Standard</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excision dissection</td>
<td>6.13</td>
<td>0.64</td>
<td>0.000</td>
</tr>
<tr>
<td>Radiofrequency</td>
<td>5.50</td>
<td>2.07</td>
<td></td>
</tr>
</tbody>
</table>

Comparison of 24-hour postoperative pain on tonsillectomy patients performed by excision dissection and radiofrequency.

In table 4 shows a comparative pain of the 24-hour postoperative tonsillectomy using excision dissection and dissection of radiofrequency, the average pain in an excision dissection is 3.38 with a standard deviation of 1.18, while the average pain in the Radiofrequency surgery is 4.17 with a standard deviation of 1.94. Based on the statistical T-Test showed that there was no significant comparison of pain between the patients with excision dissection and radiofrequency in the value of P\text{value} = 0.484 (\( \rho = < 0.05 \)).

Table 4. A comparison of 24-hour postoperative pain

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>Deviation Standard</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excision dissection</td>
<td>3.38</td>
<td>1.18</td>
<td>0.484</td>
</tr>
<tr>
<td>Radiofrequency</td>
<td>4.17</td>
<td>2.07</td>
<td></td>
</tr>
</tbody>
</table>

Decreased postoperative pain of tonsillectomy using radiofrequency and excision dissection.

In table 5 shows a comparative reduction in postoperative pain between excision dissection and radiofrequency dissection, the average pain decrease in excision dissection is 2.75 with a standard deviation of 1.03, while the average pain reduction in the dissection radiofrequency is 1.33 with a standard deviation of 2.06. Based on statistical T-test shows that there is a comparison of significant pain reduction between the patients of excision dissection and dissection of radiofrequency with a value of P\text{value} = 0.010 (\( \rho = < 0.05 \)).

Table 5. Comparison of postoperative pain reduction

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>Deviation Standard</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excision dissection</td>
<td>2.75</td>
<td>1.03</td>
<td>0.010</td>
</tr>
<tr>
<td>Radiofrequency</td>
<td>1.33</td>
<td>2.06</td>
<td></td>
</tr>
</tbody>
</table>

Discussion

In this study, it can be seen that most male gender samples were 8 people (57.14%), evidenced by the study results on the profile of tonsillitis patients in Sangla hospital, men are more often exposed to tonsillitis because men have lower immune system than women, where women Has an estrogen hormone that has functions as a reinforcement of humoral and cellular antibodies.
The most sample age is < 20 years, which is 6 people (42.86%), describing that children and adolescents have low body resistance so it is easy to get infected. Described also in some children followed by the enlargement of the adenoid gland. So that there can be an obstruction in respiratory system at bedtime is referred to as OSAS (Obstructive Sleep Apnea Syndrome). Obstruction of upper respiratory system that occurs at bedtime can cause hypoxia (lack of oxygen), this condition can decrease Immunological resistance that can lead to infection and frequency of pain can interfere with children’s growth and development, especially in childhood growth, so that the tonsillectomy needs to be done. Carneiro study in Brazil also reported improvement in quality of life in children who have had tonsillectomy. This occurs due to reduced sleep disorders caused by tonsil hypertrophy. The tonsillectomy also reduces the incidence of upper respiratory tract infections and reduce antibiotic use.

In this study there were 6 people with a tonsils size of T2-T2 (42.86%) and 8 people have a tonsils size of T3-T3 (57.14%), which means the largest tonsils size is found to be the size of T3 – T3. This result was in accordance with the cross sectional study in 812 patients who had tonsillectomy, there were 341 (42%) with a tonsils size of T3, as much as 308 (38%) T4 size, as much as 130 (16%) T2 size and as much as 33 (4%) ukuranT1. Until now there is no data that can explain about the differences between some of these studies. One of the tonsils enlargement factors is the infection in tonsils. The size of the tonsils is enlarged due to a parenchyma hyperplasia or fibrinoid degeneration with a crypts tonsils obstruction. Recurrent infections and blockages of the tonsils resulting in increased stasis of debris or antigen in the crypts, also occurring reduced integrity of the crypts epithelium so as to facilitate bacteria into tonsil parenchyma.

This study showed a comparison of the bleeding volume between excision dissection and radiofrequency surgery. The average volume of bleeding in an excision dissection is 75.625 ml with a standard deviation of 49.3672, while the average volume of bleeding in radiofrequency surgery is 7.612 with a standard deviation of 4.4058. Based on statistical T-test shows that there is a significant comparison of the bleeding volume between the patient’s excision dissection and radiofrequency with a value of Pvalue = 0.000 (ρ = < 0.05). The Volume of bleeding during surgery depends on the condition of the patient and its own operatoric factor. Bleeding may be more when there is excessive scarring or acute infections such as acute tonsillitis or peritonsilc abscesses. Bleeding that occurs due to capillary or small veins, ripped veins generally stop spontaneously or with tampons. If it still fails, the external carotid artery ligation can be performed. From reports of various libraries, the surgical techniques known as “hot” techniques (Electrokauter, radiofrequency, Koblas, etc.) can reduce morbidity and risk of postoperative bleeding.

Comparing the 6-hour postoperative pain between excision dissection and radiofrequency, the average pain in excision dissection is 6.13 with a standard deviation of 0.64, while the average pain in radiofrequency dissection is 5.50 with a standard deviation of 2.07. According to statistical T-test shows that there is a significant ratio of pain between the patient’s excision dissection and radiofrequency with a value of Pvalue = 0.000 (ρ = < 0.05) Whereas at 24 hours post operation, comparison of pain between dissection radiofrequency and excision dissection obtained the average pain in excision dissection is 3.38 with a standard deviation of 1.18, while the average pain in the dissection of radiofrequency is 4.17 with a standard deviation of 1.94. Based on statistical test T-test shows that there is no significant comparison of pain between the patient excision and dissection of radiofrequency with a value of Pvalue = 0.484 (ρ = < 0.05). Of these two different pain statements can be seen that each person’s pain threshold differs. For severe post-operative pain tonsillectomy depends on several factors, such as: patient’s health condition, operator skills, tonsillectomy technique, surgical complications and pain management.

Comparative postoperative pain reduction between excision dissection and radiofrequency dissection obtained an average decrease in pain in excision dissection is 2.75 with a standard deviation of 1.03, while the average reduction of pain in radiofrequency dissection is 1.33 with standard deviation 2.06. Based on T-test statistics, there is a significant comparison of the pain reduction between the patient’s excision dissection and the dissection of radiofrequency with a value of Pvalue = 0.010 (ρ = < 0.05). This suggests that in the excision dissection there is a noticeable change of pain reduction from the 6-hour post-operative to the 24-hour postoperative. The possibility of the use of the dissection dissection of many tissue damage occurs compared to the use of radiofrequency. This is in accordance with the literature says that pain caused by tissue damage as well
as increased release of the mediator that can generate pain impulses subsequent pain and finally causing muscle spasm \(^{16,20}\)

The frequent postoperative pain of tonsillectomy is difficult to prevent since the oropharyngeal region and fossa of the peri-tonsiller are pain-sensitive areas. Both are innervate by the trigeminal nerve (n. III) branches and the glossosfaringeus nerve (n. IX) which is highly sensitive to pain stimulation and connected to the somatic cortex in the cerebral. \(^{18,19}\)

Post-operative pain management of tonsillectomy is a special concern for both ENT-HN surgeon and anesthetic doctors. High incidence of pain or postoperative anxiety after tonsillectomy increase the risk of secondary bleeding of postoperative tonsilectomy. \(^{21}\)

To prevent these postoperative pain, it is necessary to know the mechanism for postoperative pain, the negative impact of pain, the effort to reduce postoperative pain and to choose rational analgetic to overcome the postoperative pain of tonsillectomy. \(^{12}\)

In research from Victor et al. 2018 the use of radiofrequency can reduce postoperative pain in comparison with other methods of operation. \(^{12}\)

**Conclusion**

The use of radiofrequency techniques in tonsillectomy is better than the excision dissection technique because it can reduce the volume of bleeding occurring as well as the pain complained more lighter.

Patients undergoing tonsillectomy using radiofrequency should be considered for analgesic use while those undergoing excision dissection should use analgesic for postoperative pain treatment.

**Conflict of Interest:** The authors have no conflicts of interest to declare.

**Acknowledgments:** The authors very gratefully thanks to all patients who were willing to be a respondent in this study.

**Ethical Clearance:** Taken from Biomedical Research Ethics Committee on Human Faculty of Medicine Hasanuddin University of Makassar, Indonesia (Register number :52 / UN4.6.4.5.31 / PP36/ 2019).

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Relationship between Inflammatory Response on Chronic Rhinosinusitis with Polyps and without Polyps Review for IL-8, Eosinophil and Neutrophil

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Abstract

Background: This study aimed to ascertain the association between inflammatory response in chronic rhinosinusitis with polyp and without polyp based on IL-8, eosinophil, and neutrophil observation.

Method: The study was conducted on 20 chronic rhinosinusitis patients with polyp and 20 chronic rhinosinusitis patients without polyp. Examination of IL-8 level was done by using ELISA method, while eosinophil and neutrophil cell examination was done by using nasal cytology.

Results: Of the 20 patients with chronic rhinosinusitis with polyps and 20 patients without polyps, IL-8 levels were significantly increased in patients with chronic rhinosinusitis without polyps. Meanwhile, in nasal cytology examination, eosinophil cells increased dominantly in chronic rhinosinusitis patients with polyps, while neutrophil cells increased dominantly in chronic rhinosinusitis patients without polyp (p<0.05).

Conclusion: There were difference of IL-8 level and eosinophil, neutrophil cells between chronic rhinosinusitis with polyp and without polyp.

Keywords: IL-8, eosinophil, neutrophil

Introduction

According to the 2012 European Position Paper on Rhinosinusitis and Nasal Polyps (EPOS), chronic rhinosinusitis (RSK) is an inflammation of the nasal mucosa and paranasal sinus which symptoms’ last for than 12 weeks, characterized by two or more symptoms, such as nasal congestion, obstruction, congestion or nasal discharge. This condition can be accompanied by facial pain spontaneously or appear when suppressed, and reduced ability to smell. Meanwhile, in endoscopic examination could find polyps or mucopurulent secretions from mediated meatus and edema in the meatus. Besides, Computed Tomography (CT) scan results are obtained mucosal changes in the ostiomeatal complex or paranasal sinuses.¹

Rhinosinusitis is an inflammatory disease of the nasal mucosa and paranasal sinuses. According to consensus of 2004, rhinosinusitis is classified chronologically into several categories; acute (up to 4 weeks), sub-acute (4 to 12 weeks), and chronic (more than 12 weeks). When it occurs on several sinuses, it is called multisinusitis and called pansinusitis if it occurs on all sinuses.²

The prevalence of chronic rhinosinusitis has also been reported in several areas in Indonesia. A study in Cipto Mangunkusumo Hospital’s Department of ENT’s Rinology Division found 69% of 435 patients had rhinosinusitis, while a study in Makassar which taken from three hospitals had prevalence 41.5% of all cases treated in rhinology sub-division.³,⁴

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Chronic rhinosinusitis can be classified into two subtypes namely chronic rhinosinusitis without polyps and rhinosinusitis with polyps. The two groups are different in inflammatory profile and remodeling process. Those differences can affect prognosis, asthma comorbidity, appropriate surgical procedures, relapse rates, and pharmacological management.

The main cause of chronic rhinosinusitis is obstruction of sinus ostium. Various factors, either local or systemic can cause inflammation or conditions that lead to obstruction of the sinus ostium, such as recurrent upper respiratory tract infections, allergies, irritant material exposure, anatomic disorders, and immune deficiency. Although some studies mentioned the role of eosinophils in the pathogenesis of chronic rhinosinusitis, especially in patients with a history of allergies, other studies also mentioned the effect of neutrophil recruitment into mucosal surfaces, especially in patients without a history of allergies.

Materials and Method

This study was conducted in otorhinolaryngology division of Hasanuddin University Hospital and Wahidin Sudirohusodo hospital during December 2018-March 2019. This study aimed to identify the difference of inflammatory responses (IL-8 levels, eosinophils, neutrophils) in patients with chronic rhinosinusitis with polyps and without polyps, and also observed the pathomechanism of the occurrence of polyps in chronic rhinosinusitis.

The sample is affordable population who met the study criteria. Samples were taken by using consecutive sampling method, which is all patients with chronic rhinosinusitis with polyps and without polyps who met the inclusion and exclusion criteria based on the order of the patients’ register. Inclusion criteria, based on European Position Paper criteria on Rhinosinusitis and Nasal Polyps (EPOS) 2012, were ages 18-70 years old, consent to take part in the research study and sign the Informed Consent, while the exclusion criteria including; have a history of severe systemic disease (kidney disease, liver disease, malignancy, autoimmune disease, heart disease). Nasal / paranasal sinus tumor, Has a history of previous sinus / nose surgery (Functional Endoscopic Sinus Surgery), Anatomic variations such as severe septal deviation, septal perforation, and synechiae, Atrophic Rhinitis Patients.

Samples were taken from the right and left inferior nasal concha surfaces of patients diagnosed with chronic rhinosinusitis with polyps or without polyps, and examined for IL-8 levels by using ELISA method. Meanwhile, Eosinophil and neutrophil cells were analyzed by using nasal cytology method under a microscope with a 100x objective and examined throughout the field of view were grouped into 6 grades:

1. Grade 0, inflammatory cells <10 per field of view
2. Grade 1, inflammatory cells 10-49 per field of view
3. Grade 2, inflammatory cells 50-149 per field of view
4. Grade 3, inflammatory cells 150-299 per field of view
5. Grade 4, inflammatory cells > 300 per field of view

Results

Table 1 shows that eosinophils cells in the polyp group mostly categorized 1 and 2 (80% and 10%) compared to category 0 (10%), while in the group without polyps, there are more categories 0 and 1 (80% and 20%), while category 2 does not exist at all, the results of chi square statistical test show a significant difference with p = 0.000 (p <0.05).

The mean of eosinophils counts per10 field of view in chronic rhinosinusitis with polyps was 297.95, while without polyps was 236.25. There were significant differences between the two groups with p = 0.000 (p <0.05). (table 2)

Table 3 shows category 0 and 1 of neutrophils in the polyp group is the same (50% and 50%), while in the group without polyps, neutrophils category 1 (75%) is more than category 0 and 2 (15% and 10%). The results of statistical tests showed a significant difference between the two groups with p = 0.046 (p <0.05).

mean of neutrophil level in polyp was 168.35 and without polyp were 245.45. there were significant differences between the groups with p = 0.041 (p <0.05). (table 4)

Based on the table 5, there are significant differences between IL-8 levels in chronic rhinosinusitis with polyps and without polyps with p = 0.004 (P <0.005)
Table 1. Distribution of eosinophil cells category in chronic rhinosinusitis with polyp and without polyp

<table>
<thead>
<tr>
<th>Rhinosinusitis</th>
<th>Eosinophil</th>
<th>Total</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Polyp</td>
<td>2 (10%)</td>
<td>16 (80%)</td>
<td>2 (10%)</td>
</tr>
<tr>
<td>Without polyp</td>
<td>16 (80%)</td>
<td>4 (20,0%)</td>
<td>0 (0%)</td>
</tr>
</tbody>
</table>

X^2 (chi square) test

Table 2. The difference of eosinophil cells between chronic rhinosinusitis with polyp and without polyp.

<table>
<thead>
<tr>
<th>Eosinophil</th>
<th>Polyp</th>
<th>Without Polyp</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>297.9500</td>
<td>236.2500</td>
<td></td>
</tr>
<tr>
<td>Median</td>
<td>320.00</td>
<td>215.00</td>
<td></td>
</tr>
<tr>
<td>Standard deviation</td>
<td>152.35</td>
<td>121.62</td>
<td></td>
</tr>
<tr>
<td>Minimum</td>
<td>86.00</td>
<td>78.00</td>
<td></td>
</tr>
<tr>
<td>Maximum</td>
<td>640.00</td>
<td>520.00</td>
<td></td>
</tr>
</tbody>
</table>

Mann whitney U test

Table 3. Distribution of neutrophil cells category in chronic rhinosinusitis with polyp and without polyp

<table>
<thead>
<tr>
<th>Rhinosinusitis</th>
<th>Neutrophil</th>
<th>Total</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Polyp</td>
<td>10 (50%)</td>
<td>10 (50%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Without polyp</td>
<td>3 (15%)</td>
<td>15 (75%)</td>
<td>2 (10%)</td>
</tr>
</tbody>
</table>

X^2 (Chi-square) Test

Table 4. The difference of neutrophil cells between chronic rhinosinusitis with polyp and without polyp

<table>
<thead>
<tr>
<th>Neutrophil</th>
<th>Polyp</th>
<th>Without Polyp</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>168.3500</td>
<td>245.4500</td>
<td></td>
</tr>
<tr>
<td>Median</td>
<td>141.500</td>
<td>215.00</td>
<td></td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>102.34</td>
<td>111.41</td>
<td></td>
</tr>
<tr>
<td>Minimum</td>
<td>56.00</td>
<td>120.00</td>
<td></td>
</tr>
<tr>
<td>Maximum</td>
<td>365.00</td>
<td>520.00</td>
<td></td>
</tr>
</tbody>
</table>

Uji Mann-whitney U
Table 5. IL-8 level of chronic rhinosinusitis with polyp and without polyp

<table>
<thead>
<tr>
<th>IL-8</th>
<th>Rhinosinusitis Polyp</th>
<th>Without Polyp</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>201.3391</td>
<td>279.1389</td>
</tr>
<tr>
<td></td>
<td>Median</td>
<td>189.85</td>
<td>282.00</td>
</tr>
<tr>
<td></td>
<td>Std. Deviasi</td>
<td>1310.80</td>
<td>38.68</td>
</tr>
<tr>
<td></td>
<td>Minimum</td>
<td>154.53</td>
<td>218.15</td>
</tr>
<tr>
<td></td>
<td>Maksimum</td>
<td>272.45</td>
<td>351.29</td>
</tr>
</tbody>
</table>

*T test

Discussion

The result of this study showed a significant difference between eosinophil counts in chronic rhinosinusitis with polyps and without polyp. It means that the role of eosinophils is very dominant in chronic rhinosinusitis with polyps. This is similar with previous studies. EPOS 2012 showed that chronic rhinosinusitis with polyps is an inflammation triggered by Th2 which caused infiltration of eosinophils in the blood to nasal mucosal tissue. High eosinophil levels in chronic rhinosinusitis with polyps lead to more severe disease associated with olfactory nerve dysfunction, more nasal obstruction and nasal secretions. Inflammation due to Th2 and eosinophils affects polyp formation through stromal tissue and pseudocystic edema, and also increase fibrin production due to activation of factor XIII-A which causes the process of remodeling nasal mucous tissue.

This study found a significant difference between neutrophil counts in chronic rhinosinusitis with polyps and without polyp. It means that the role of neutrophil is very dominant in chronic rhinosinusitis without polyps. This result is similar with a study conducted in Korea which stated that chronic rhinosinusitis without polyps is dominated by inflammation due to neutrophil-associated mediators and chemokines such as CXCL-2 and IL-8, which are associated with the severity of the disease. The Korean study also proves that the pathogenesis of chronic rhinosinusitis without polyps have two forms of inflammation regulated by Th1 and Th2, although the role of neutrophils remains dominant and is associated with disease progression. Chronic rhinosinusitis without polyps is dominated by neutrophils because the inflammatory type is a combination of Th1 and Th17. A previous study was also stated that the Asian race had the characteristics of chronic rhinosinusitis with polyps dominated by neutrophils, while Caucasian (European) race dominated by eosinophils.

IL-8 expression in the sinus mucosa increases in chronic rhinosinusitis especially without polyps because it is associated with its main activity in neutrophils and through stimulation by Th1. The results of Interleukin 8 (IL-8) are a chemokine produced in large quantities by epithelial cells in response to various stimulus including proinflammatory cytokines, bacteria, fungi, and viruses, and tend to be a kind of protein that activate neutrophils with two in vitro effects, chemotaxis and the release of enzyme granules. In allergic diseases, IL-8 is also chemoattractant in eosinophils, so it can be increased in rhinosinusitis with polyps due to Th2 effect that stimulates eosinophils. Normal values of IL-8 in adults based on a cohort study in Europe are 0.56 - 3.80 (18 - 39 years) and 0.56 - 7.52 (40 - 65 years), so in general, mean of IL-8 levels in the patients of this study was quite high from its normal range, which shows that IL-8 activity in chronic inflammatory processes such as CRS is very high.

Conclusion

This study concludes that eosinophil cells were higher in rhinosinusitis with polyps, while neutrophil cells were higher in rhinosinusitis without polyps. IL-8 level was significantly higher in rhinosinusitis without polyps.

References


The Women’s Pregnancy Intention in Makassar City, Indonesia

Apik Indarty Moedjiono1, Arifin Seweng1, Indra Fajarwati Ibnu1, Anwar Mallongi1

1Faculty of Public Health, Hasanuddin Universitas Hasanuddin, Makassar Indonesia

Abstract

Contraceptive use is one of the main ones, which suggests that serious efforts are needed to increase contraceptive use. Understanding comprehensively the issue of the intention of conceiving by referring to ecological theory, this study provides benefits in preventing unwanted pregnancies. This study aims to analyze determinant factors of pregnancy intention with a cross sectional study design. Subjects were 100 fertile women selected randomly in working area of Patingalloang and Panambungan Community Health Center, Makassar City in 2018. Determination of study sample was based on results of the screening for pregnancy intention in last pregnancy, women who take part in screening are divided into intended and unintended pregnancies. Data obtained through interviews using a structured questionnaire and analysis by logistic regression. Results showed that side effects, availability of methods and number of living children were found to be significantly associated with the pregnancy intention.

Keywords: pregnancy intention, theory of ecology, maternal health

Introduction

The increase in unintended pregnancies is marked by high case of unmet need for contraceptive. An estimated 225 million women in developing countries have unmet needs for modern contraception, of this number, 71% million do not use any method and rest use traditional methods1. Unmet need for contraceptive in Indonesia in 2017 which is 10.5%, this percentage has decreased slightly compared to 2012 which was 11.4%, and around 29% of contraceptive users stopped their methods in first 12 months of use2,3.

Unmet needs for contraceptive are defined as married women of reproductive age who do not use any contraceptive method but want to delay or limit the next pregnancy4. In ideal situations, all women who want to delay or limit their pregnancy will use contraception. But some women do not use contraception and are at risk of having unintended pregnancy. An unintended pregnancy occurs if a woman does not intend to get pregnant later or at any time in future. Mistimed pregnancies occur if a woman does not intend to get pregnant when pregnancy occurs, but intends to get pregnant at some time in the future. Subsequent division, unintended pregnancies include unwanted and mistimed. Intended pregnancy is a pregnancy that is desired when it occurs or faster5,6.

Based on the results of the PMA survey in Makassar, 2015, unmet need (25.4%) higher than the national level (14.4%)7. Based on the 2016 report, Patingalloang and Panambungan Community Health Center are two health centers with work areas serving coastal communities with a high birth rate8, thus the study of pregnant intentions is feasible for studied at women who use that facilities at the working area. This research then uses Ecological Theory to analyze determinant factors of the intention of pregnant women. Choice of ecological theory in determining determinant factors is very important to look at these factors holistically9, so that the study of specific pregnancy intentions in coastal communities will provide comprehensive information, that there are certain systems that shape women’s life experiences in form of their intention to conceive.

Materials and Method

This study uses a quantitative method with a cross...
sectional study design. This study looked at effects of side effects, susceptibility to pregnancy, role of the husband, value of the child, mechanism of promises, waiting times, availability of methods, provision of information, age of mother and number of children alive. This research was conducted in working area of Patingalloang and Panambungan Community Health Center. Study population was 100 fertile women. Determination of study sample based on results of screening the last pregnancy intention, women who were netted in the screening were divided into intended and unintended pregnancies. Samples will be selected from each group of pregnant intentions, with proportions equal to simple random sampling. Data will be obtained through interviews using a structured questionnaire. Data analysis will be carried out by logistic regression.

Results

Table 1. Characteristics of women dan husband in Makassar City, Indonesia

<table>
<thead>
<tr>
<th>Variables</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Year) Wife</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17-25</td>
<td>31</td>
<td>31</td>
</tr>
<tr>
<td>26-35</td>
<td>54</td>
<td>54</td>
</tr>
<tr>
<td>36-45</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Level of education (Wife)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Elementary</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Junior</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>High school</td>
<td>44</td>
<td>44</td>
</tr>
<tr>
<td>Higher education</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Level of education (Husband)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Elementary</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>Junior</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>High school</td>
<td>55</td>
<td>55</td>
</tr>
<tr>
<td>Higher education</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>Condition of woman</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pregnant</td>
<td>55</td>
<td>55</td>
</tr>
<tr>
<td>Not pregnant</td>
<td>45</td>
<td>45</td>
</tr>
<tr>
<td>Currently using contraceptive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>73</td>
<td>73</td>
</tr>
<tr>
<td>Yes</td>
<td>27</td>
<td>27</td>
</tr>
<tr>
<td>The last type of contraception used</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female sterilization</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Male sterilization</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>IUD</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Injection</td>
<td>74</td>
<td>74</td>
</tr>
<tr>
<td>Implant</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>Pill</td>
<td>6</td>
<td>6</td>
</tr>
</tbody>
</table>
Table 1. Characteristics of women dan husband in Makassar City, Indonesia

<table>
<thead>
<tr>
<th>Place to get contraceptive methods</th>
<th>8</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government hospital</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community Health Center (Puskesmas)</td>
<td>71</td>
<td>71</td>
</tr>
<tr>
<td>Auxiliary puskesmas</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Field officer of family planning (PLKB)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Health cadre</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Private hospital</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Private clinic</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Private practice midwife</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>Pharmacies / drug stores</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>The duration of stopping contraception (years)</th>
<th>25</th>
<th>25</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>1-5</td>
<td>45</td>
<td>45</td>
</tr>
<tr>
<td>6-10</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>≥10</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reasons for stopping contraception</th>
<th>46</th>
<th>46</th>
</tr>
</thead>
<tbody>
<tr>
<td>Want to have children</td>
<td>46</td>
<td>46</td>
</tr>
<tr>
<td>Side effects</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Distance</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Husband is rarely at home</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Husband’s desire</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Contraceptive failure</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pregnancy intention</th>
<th>50</th>
<th>50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intended</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Mistimed</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Unintended</td>
<td>41</td>
<td>41</td>
</tr>
</tbody>
</table>

Table 1 shows that wife’s age category is the most aged 26-35 years (54%). The highest husband age is in the age group 26-35 years (61%). The highest wife education is at the level of high school graduation / equivalent (44%). Husband’s education is highest at senior high school level / equivalent (55%). Women who have used and are not currently using contraception (73%). The most widely used type of contraception is injection (74%). Place to get the most contraception is at the puskesmas (71%). The length of termination of contraception is 1-5 years (45%). Reason for the women to stop using the highest contraception was because they wanted to have children (46%). Respondents who want pregnancy (50%).

Table 2. Factors associated with pregnancy intention among women in Makassar City, Indonesia

<table>
<thead>
<tr>
<th></th>
<th>Standard Error</th>
<th>p value</th>
<th>Odds Ratio</th>
<th>CI Lower Limit</th>
<th>CI Upper Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual Factor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Side effects</td>
<td>0,081</td>
<td>0,069</td>
<td>1,159</td>
<td>0,989</td>
<td>1,358</td>
</tr>
<tr>
<td>Susceptibility to pregnancy</td>
<td>0,197</td>
<td>0,262</td>
<td>1,248</td>
<td>0,848</td>
<td>1,837</td>
</tr>
<tr>
<td>Interpersonal factors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Role of the husband</td>
<td>0,119</td>
<td>0,777</td>
<td>0,967</td>
<td>0,766</td>
<td>1,221</td>
</tr>
<tr>
<td>Cultural Factors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Value of the child</td>
<td>0,162</td>
<td>0,177</td>
<td>1,244</td>
<td>0,906</td>
<td>1,709</td>
</tr>
</tbody>
</table>
Table 2 shows the multi-variable factors associated with pregnancy intention among women in Makassar City, Indonesia.

Susceptibility to pregnancy, role of the husband, value of the child, mechanism of promises, waiting times, provision of information, age of the mother are found as a factor that are not significantly related to pregnancy intention, while side effects, availability of methods was found to be a significantly related factor with alpha 10% toward the pregnancy intention, and number of children living with alpha 5%.

### Discussion

Injectable contraception and pills are contraceptives most often stopped because of side effects at 12 months of use in developing countries, the same thing was found in this study that 74% of women used injection contraception followed by other hormonal contraceptives namely implants and pills, reasons for stopping contraception 20% due to side effects (Table 1). Statistical tests showed that side effects had a significant effect on pregnancy intention at 10% significance (Table 2). Termination of contraception for reasons of side effects without being followed by use of contraception immediately which causes women to experience an unintended pregnancy is very important to anticipate, including in women who perceive side effects, information about contraception including about side effects obtained from fellow women not through health workers so that errors at occur in given and receipt of information. Misinformation can lead to non-compliance. Including the contraceptive use in a typical way and increase cases of contraceptive failure ultimately increasing the incidence of unwanted pregnancies.

The results of this study found that although the level of significance of method was alpha 10%, this variable needs to be an important concern (Table 2). The favorite method among women is the short-acting hormonal method but the continuity of the use of the method is hampered because it often runs out of stock. One indicator of service quality and can prevent termination of contraception is to provide various types of contraception, even preparing 1 additional method can anticipate discontinuation of contraception because the method preferred by women is not available. Improving the recording and reporting system that is integrated with various other health institutions by adopting a technology system will provide quick information about contraceptive supplies. This will also support institutions in their efforts to map and analyze institutions to increase the availability of contraception.

In addition to addressing the depleted stock instead of letting women go home from service without contraceptive protection or making referrals to other facilities, because women cannot go directly to the referral service, this is related to opportunities or personal constraints for women to access services. Efforts to provide comprehensive counseling on the types of contraception will be able to help women use contraception that has never been used or tried, because women choose contraception not because they have been used before but it can also be because only that method...
is women known. Counseling is an important component of service quality \(^\text{15}\) counseling can also be a solution in preventing cessation of contraception because of an error in perceiving contraception, therefore it can be said that termination of contraception is not caused by a woman’s fault but can occur because the information delivery system is not optimal, whether the service provider has given women’s rights to obtain contraceptive information. The thing that needs to be understood and anticipated is the possibility of counseling efforts that are not functioning properly, because the performance of officers in providing counseling is very dependent on the training and skills they have, so this can limit the methods they can offer\(^\text{18}\). In addition, if the institution is only based on waiting time as an indicator of quality service, certainly giving counseling is considered contrary to efforts to reduce patient waiting time\(^\text{19}\) including to set the mechanism for the next visit, can be anticipated with several solutions namely to encourage more women to come outside of rush hour, add staff and consultation rooms, to ask for the opinions of women the most preferred service hours\(^\text{20}\). Set the provider break time in turn, preparing social media-based consulting services.

The results of this study indicate that vulnerability does not have a significant relationship toward the pregnancy intention. Similar research results have been reported\(^\text{21}\) that vulnerability does not motivate women to use contraception, even though women perceive themselves to be fertile but women report having sex without contraception. One strategic effort in encouraging contraceptive use is through the involvement of husbands in maternal health services\(^\text{22}\). Indicator of the role of the husband in improving maternal health there are various kinds\(^\text{23, 24}\) husbands who are involved in the planning phase, discussing and reminding mothers to use contraception can prevent mothers from experiencing unwanted pregnancies through the use of contraception\(^\text{22}\). The results of this study indicate that the role of the husband does not significantly influence at pregnancy intention. In addition, even though the husband’s education was quite good, 55% said that he had graduated from high school but this was not enough to encourage the husband’s role. Researchers previously reported that the role of husbands is constrained by factors of cultural and traditional beliefs. Maternal health services are considered the domain of women, only women can be involved in maternal services so that this is the reason husbands do not have a maximum role in maternal health\(^\text{24}\).

These results indicate that value of child is not significant, but number of children born alive is significant (alpha 5%) toward pregnancy intention (Table 2). This shows that for some women control of fertility is needed after the target number of children has been reached. This shows that there are rational considerations for the number of children based on financial burdens and occasion to care for children. The consideration of the ideal number of children is also the result of social construction embedded in the traditional cultures and beliefs of some countries\(^\text{25}\). The magnitude of the influence of norms of society can influence decisions about the number of ideal children ultimately affecting the decision to use contraception. The results of this study imply that contraceptive services need to target women whose are have the number of children and a certain reproductive age. Synergizing with various parties because changes in attitude require a local culture approach and culture-based approach.

**Conclusion**

There is a need to reduce the desire to increase the number of children by synergizing various parties. The ideal number of children is formed because of cultural structure of society, and dealing with it requires collective change in social norms and attitudes of the community. In addition, the importance of increasing women’s awareness and understanding in interpreting side effects and increasing staff capacity to motivate women to use contraception. Addressing the issue of availability of contraception requires a variety of policies and systems that are strong in providing services so as to prevent depleted stocks.

**Conflict of Interest:** None

**Source of Funding:** Hasanuddin University

**Ethical Clearance:** Obtained from faculty committee and respondents agreement

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Analysis of VDR Gene Expression and its Relationship with Bacterial Load in Typhoid Fever Patients

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Abstract

In Indonesia, Typhoid must be taken seriously from various parties, because this disease is endemic and threatening public health. The vitamin D receptor gene (VDR) has been involved in modulation of susceptibility on inflammatory conditions including typhoid fever.

This study aimed at investigating VDR genes expression and its relationship with bacterial load in typhoid fever patients

This study used analytical survey design with cross-sectional approach, which focuses on Vitamin D Receptor (VDR) genes expression and its relationship with bacterial load in typhoid fever patients. The total sample was 55 sufferers. The statistical test used was Mann U Whitney with the confidence degree of 95% and value of α <0.05. All data were analyzed using the SPSS Version 21.0 program.

The results showed the weak VDR gene expression (47.3%) and the strong one (52.75%), bacterial load was in the average at 43,583,636.36 ± 75,649,400.29, and there was relationship between VDR gene expression with bacterial load (p <0.001), which is the bacterial load tendency is higher in patients with weak VDR gene expression than the strong one.

Strong VDR gene expression decreases bacterial load in cases of typhoid fever.

Keywords: VDR, bacterial load, typhoid fever

Introduction

Typhoid fever is a systemic infection caused by Salmonella typhi, usually through consumption of contaminated food or water. Acute illness is characterized by prolonged fever, headaches, nausea, loss of appetite, and constipation or sometimes diarrhea. Symptoms are often non-specific and clinically indistinguishable from other febrile illnesses. However, clinical severity varies and severe cases can cause serious complications or even death. The poor sanitation and lack of sterile drinking water make it worst¹,²,³.

Typhoid fever is a concerning public health problem in the world, especially in poor populations from developing countries. Globally, this disease is estimated lead to 220,000 deaths and 22 million cases per year, especially in school-age children or younger. Typhoid fever is one of the most common sources of bacteriological etiology in many developing countries. In these countries, the burden of disease is often
distributed heterogeneously in the worst hygiene and sanitation area.

In Indonesia, typhoid must be taken seriously from various parties, because this disease is endemic and threatening public health. The problem is increasingly complex with increasing carrier cases or relapse and resistance to the drugs used, obstructing treatment and prevention efforts. In 2008, typhoid morbidity in Indonesia was reported at 81.7 per 100,000 population, with distribution by age group 0.0 / 100,000 population (0–1 years), 148.7 / 100,000 population (2–4 years-old), 180.3 / 100,000 (5-15 years-old), and 51.2 / 100,000 (≥16 years-old). This figure shows that the highest number of carriers is 2-15 years-old group. The study of cases in major hospitals in Indonesia, indicate a trend increase in typhoid cases year by year with an average pain 500 / 100,000 population and deaths estimated at around 0.6–5%.

Typhoid is caused by the bacterium Salmonella. Salmonella infection in humans can be categorized into two types, caused by the low virulence serotype of Salmonella enterica which causes food poisoning, and caused by high virulence serotype of Salmonella enterica typhi (S. typhi), which lead to typhoid, and a group of serovars, known as S Paratyphi A, B and C, which causes Paratyphoid.

Blood cultures are generally used in laboratory diagnoses, but little information about the number of bacteria circulating in the blood or the distribution between plasma and phagocytic cells. Previous research found that in the bone marrow of 78 patients had an average of 4 times more bacteria. There was a significant negative correlation (p <0.05) between the number of bacteria and the age and length of fever before hospitalization. There was a significant positive correlation (p = 0.05) between bacterial count and temperature, period of decline fever after treatment, and multiple resistance from each bacterial isolate, even though there was a similar previous treatment history.

The vitamin D receptor gene (VDR) has been involved in modulation of susceptibility to inflammatory and autoimmune conditions. Vitamin D directly modulates T cell receptors (TCR). The action of vitamin D 1,25-dihydroxyvitamin D3 (1,25 (OH)₂D₃) hormone is mediated by the vitamin D receptor (VDR), the ligand activated transcription factor which control the gene expression. After activation of the ligand, VDR binds directly to the specific sequence located near the promoter and recruits a variety of coregulation complexes that perform the additional functions required to modify transcription output.

Previous research on 426 mild typhoid fever patients and 35 severe typhoid fever patients where all patients lived in geographically isolated villages in South Sulawesi, Central Sulawesi, Southeast Sulawesi, East Kalimantan and Papua islands which are endemic areas in Indonesia. It was found that there was no evidence for gene association of VDR polymorphisms with the severity of typhoid fever.

In this study, researchers will examine the gene expression of the Vitamin D Receptor (VDR) and its relationship with bacterial load in patients with typhoid fever.

### Material and Method

#### Design

This study is an analytical survey study with a cross sectional study to look at the expression of the Vitamin D receptor gene (VDR) and its relationship with bacterial load in patients with typhoid fever.

#### Sampling

The population in this study was the blood of patients with typhoid fever who were admitted to hospitals in Makassar (Wahidin Sudirohusodo Hospital, Pelamonia Hospital, Bhayangkara Hospital), Salewangan Hospital, Maros Regency, and Pangkep Regional Hospital in South Sulawesi. This study used purposive sampling technique with total sample as many as 55.

Inclusion criteria: patients with typhoid fever with the length of fever > 3 days above 37.5°C consecutively, dirty tongue and positive (+) widal and willing to take part in the study and sign the informed consent.

Exclusion criteria: patients with fever caused by other types of bacteria and have already received antibiotic treatment.

#### Examination of VDR and Bacteria load

Tools

The tools used in this study were: micro pipette P2
Materials

Blood samples infected with *S. typhi*, label paper, BD Bactec, Real Time Reagent PCR mRNA Gene VDR, L6, L2 Buffer, Ethanol 70%, Aceton and Tris EDTA.

Examination of VDR gene expression

Peripheral venous blood specimens from the study subjects were taken as much as 10 ml, inserted in the blood tube containing EDTA, and then DNA extraction and purification were carried out. The measurement of VDR gene mRNA expression was measured using real-time reverse transcriptase polymerase chain reaction (RT-PCR) (Aggergaard, et al., 2015). Strong: if the VDR value is ≥ the average value (10.24); Weak: if the VDR value < average value (10.24)

Bacterial load examination

Laboratory tests in the form of bacteria load by taking blood samples from veins aseptically and then performed blood sampling used Hemocytometry tool to determine the number of bacterial load to be reported per / mm³, then bacterial load is measured using colony count.

Data Analysis

The statistical test used was Mann U Whitney with a confidence degree of 95% and a value of α < 0.05. All data were analyzed using the SPSS Version 21.0 program (SPSS, Inc. Chicago, IL).

Result and Discussion

The average age of the respondents was 31.93 ± 10.075 years, more than half are male (50.9%), living in Pangkep (50.9%), high school / College (67.3%), and work as professionals (41.8%)

The expression of VDR gene was strong (52.73%) and the weak one (47.27%). The bacterial load was in average at 43,583,636.36 ± 75,649,400.29 (Table 1).

Bacterial load of respondents whose VDR gene expression was weak in average (41.94) and VDR gene expression was strong in average (15.50) where statistically there was a relationship between VDR gene expression and bacterial load (p < 0.001) with a tendency for bacterial load to be higher in patients whose expression of VDR gene is weak compared to patients whose VDR gene expression is strong. (Table 2).

Discussion

VDR gene expression

The results of this study found the weak VDR gene expression (47.27%) and the strong one (52.73%).

Vitamin D receptor (VDR) is the *ligand activated transcription factor* found almost in all cells and tissues in human body. The gene encoding the VDR is located on chromosome 12q13 (Figure 5), consisting of
11 axons, and more than 100 kilo base (kb) stretched genomic DNA.

**Bacterial Load**

The results of this study showed bacterial load average of 43,583,636.36 ± 75,649,400.29. Bacterial load is the number of bacteria measured in the compartments of objects and organisms. The bacterial amount of a material can be determined in various ways, depending on the material and type of microbes specified.

Germs can also replicate in macrophages. After the replication period, the bacteria are spread back into the circulatory system and cause secondary bacteremia while marking the end of the incubation period. Secondary bacteremia causes clinical symptoms such as fever, headache, and abdominal pain.

Relationship between VDR gene expression and bacterial load.

The statistical test results found that there was a relationship between VDR gene expression and bacterial load (p <0.001) with a higher bacterial load tendency in patients with weak VDR gene expression than the strong one.

VDR is very important in regulating intestinal homeostasis by preventing invasion of pathogenic bacteria, inhibiting inflammation, and maintaining cell integrity. Vitamin D directly modulates T cell receptors (TCR) expression. The action of vitamin D 1,25-dihydroxyvitamin D3 (1,25 (OH)2D3) hormone is mediated by the vitamin D receptor (VDR), the ligand activated transcription factor which control gene expression. After ligand is activated, VDR binds directly to the specific sequence located near the promoter and recruits a variety of co-regulation complexes that perform the additional functions needed to modify transcription output.

Vitamin D shown to reduce the expression of pro-inflammatory cytokines and have a regulating effect on autophagy and various immune cells including T cells, B cells, macrophages, dendritics cell, and epithelial cells. It has been reported that 1,25 (OH)2D3 suppresses the development of inflammatory bowel disease (IBD) in animal models. 1,25 (OH)2D3 deficiency has been reported in patients with IBD. Given the diverse immune function of vitamin D, the degree of deficiency may have important implications for the development and maintenance of intestinal homeostasis. Possible roles of vitamin D status and VDR signals in modulating the effects of intestinal microflora in other conditions such as asthma and obesity have been suggested.

Previous research showed that VDR - / - of the mice had increased bacterial clotting in the intestine. The microarray data found that VDR signals respond to *Salmonella* pathogens in intestinal colitis in vivo. Bacterial stimulation, both commensal and pathogenic, regulates VDR expression and location and negatively regulates bacterial-induced intestinal NF-κB activation. In general, *probiotic-induced* nuclear receptor signals are not well marked. The proliferation of VSL3 # is associated with nuclear receptor signals in the *IL10 - / - colitis* model. Nuclear receptors have been shown to negatively regulate NF-κB activity stimulated by bacteria in the intestinal epithelium. *Probiotic* treatments can increase VDR expression and activity of the host. Increased expression of VDR and increased mRNA cathelicidin in intestinal epithelial cell cultures when treated with *Lactobacillus plantarum* were seen. Monoassociated probiotic pig models for assessing *probiotic* effects on VDR expression in vivo and finding intestinal VDR increased significantly after *probiotic* colonization compared to germ-free pigs.

**Conclusion**

The strong VDR gene expression decreases bacterial load in cases of typhoid fever.

**Ethical Clearance:** Research permit is obtained from Ethics Commission FK UH Makassar (No. 609 / H4.8.4.5.31 / PP36-KOMETIK / 2018). After that, the researcher explained to the respondents about the objectives, benefits of the research, and procedures for collecting data. Researchers asked respondents to sign an informed consent as a form of consent to become respondents.

**Source of Funds:** Domestic Postgraduate Education Scholarship (BPPDN) and author’s personal funds, which are managed by the author.

**Conflict of Interest:** None.

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Abstract

**Background:** The optimal growth of school-age children depends on providing nutrition with good and correct quality and quantity. One way that can be done to determine the implementers of nutrition improvement is to determine or see the physical size, both in height and weight. A person’s physical size is closely related to nutritional status. Measurement of nutritional status in school children can be done by anthropometry. Based on WHO 2007 anthropometry standards for children aged 5-18 years, the nutritional status of children is determined based on the value of Z-score TB/U and BMI/U. Objective: The purpose of this study was to determine whether there were anthropometric differences in children entering primary school based on the index TB/U and BMI/U. Method: The type of research used is descriptive analytical research with cross sectional approach. The study population was 84 children who had just entered elementary school and this study used the Total Sampling Technique, where the number of samples was the same as the population of 84 school children. Results: The results of the study showed that there were no anthropometric differences in children entering primary school based on the TB/U and BMI/U index in urban and rural areas. Statistical analysis of TB/U using a non-parametric test shows the probability value (sig) > 0.05 (0.078 > 0.05). While the BMI/U is known the probability value (sig) > 0.05 (0.140 > 0.05). Energy and protein intake for urban and rural school children tends to be less. Nutritional deficiency is a factor associated with the nutritional status of school-age children. This is exacerbated by the high incidence of infections in children and most of the parents of disadvantaged people so that the purchasing power of food in households is low. Conclusion: There is no anthropometric difference in children enrolled in primary school based on the TB/U and BMI/U index in urban and rural areas.

**Keywords:** TB/U, BMI/U, School Children, City, Village.

Introduction

Protein is needed to build, maintain and repair body tissues. Protein also has an important role in growth. Children who have a high risk of stunting may have limited essential amino acids (such as tryptophan and lysine) in their food intake. Stunting in children, besides being caused by a deficiency of macro nutrients, is also associated with zinc (Zn) deficiency. Zinc (Zn) is an essential mineral that plays a role in the synthesis, secretion, and control of growth hormones (Growth Hormones). The low synthesis of growth hormones can inhibit linear growth and is thought to cause stunting conditions in infancy.

Zinc serum is one of the biomarkers that is often used to assess zinc status. The timing of serum zinc sampling, contamination of blood samples with other materials such as dust, and the use of non-metallic blood sample tubes is an issue of measuring serum zinc in the population. The relationship between serum zinc and growth is associated with zinc function increasing pituitary secretion as a raw material for growth hormone/ GH. Studies in Thailand show that low serum zinc levels tend to occur in short boys. In studies in rural China, which geographically contained low zinc in the soil, the prevalence of zinc deficiency was <25%. The study in Ethiopia showed no difference in serum zinc levels based on the severity of stunting. The results of several studies on the comparison of serum zinc levels according to the status index of height according to age in children are still inconsistent and studies that reveal serum zinc levels in children in coastal areas have not been widely used in Indonesia.

The International Zinc Nutrition Consultative Group (IZiNCG) estimates that more than 25% of the population...
in developing countries is at risk for zinc deficiency. The prevalence of moderate zinc deficiency of 5-30% occurs in children and adolescents. Insufficient zinc intake is a major cause of zinc deficiency in developing countries including Indonesia. The zinc content in vegetable, vegetable and fruit foods depends on the zinc content in the soil. The coastal area is one area where the zinc content in the soil is low. Quantitative data on zinc intake in school-age children in coastal areas of Indonesia has not been widely documented.  

In children in families with low income levels, inadequate zinc intake can occur because most of the intake comes from plant foods and consumes little animal food. The coastal area of Jayapura City, Papua is an area rich in fishery products. Fishery products are one of the foods that contain iron and zinc, however, consumption of food containing high and possibly higher because it is more affordable in terms of the economy. Another thing is evidenced by the still high rate of stunting of children under five in Jayapura City by 16.4%. It is suspected that school-age children on the coast are one group with a risk of insufficient zinc intake.

This study aims to describe the intake of protein, zinc and calcium and to know the differences in protein, zinc, and calcium intake with the incidence of stunting in elementary school children in the coastal area of Jayapura City.

**Materials and Method**

This research is an observational study with the research design used is case control. The research was carried out in selected elementary schools, namely Kotaraja Public Elementary School which is included in the administrative area of Jayapura City. Data collection is planned for June to August 2018. The population in this study were all elementary school children in the Jayapura City area. The sample inclusion criteria were elementary school students aged 9-12 years who were enrolled as students in Kotaraja Elementary School, while the subject exclusion criteria were school children suffering from mental disorders and physical disabilities. Calculation of sample size is calculated using the sample size formula for the control case study and the determination of the proportion of cases refers to the results of the Neldawati study, with α = 5%, β = 10%, p1 = 0.781, p2 = 0.5, the number of samples is 92 people, then the estimated lost of follow is 10% so the number of samples is 46 people. In this study using a case and control ratio of 1: 1 so that the number of samples was 46 cases and 46 controls or a total of 92 samples divided into schools with different areas of residence for students.

Primary data collected was height measured using microtoice with a precision level of 0.1 cm. Data on food consumption patterns including energy, protein, calcium, zinc and dietary intake were obtained by performing 1 x 24 hour food recall, food frequency data obtained through the Food Frequency Questionnaire. Data processing was carried out using the chi square test at a significance level of 95% (α = 0.05). Variables are bound to the incidence of stunting while the independent variables of this study are intake of protein, zinc and calcium.

**Research Results**

**Effects of Protein Intake on Stunting Events:**

Protein intake was obtained from the results of filling food form 1 x 24 hours which was then processed using nutrisurvey. Based on the research that has been done, the results of protein intake can be seen in the following table:

<table>
<thead>
<tr>
<th>Protein Intake</th>
<th>Stunting incidence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Stunting</td>
</tr>
<tr>
<td>Less</td>
<td>20</td>
</tr>
<tr>
<td>Enough</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td>29</td>
</tr>
</tbody>
</table>

p=0.035; OR = 3.148

Based on table 1 above, it can be seen that the proportion of stunting for low protein consumption habits is 20 children (69.0%) while only 9 children are high (31.0%). Normal children with low protein consumption habits as many as 12 children (41.4%), while the high as many as 17 children (58.6%). The results of statistical analysis using the chi-square test showed that, there was a significant relationship between protein consumption habits and the incidence of stunting (p = 0.035; OR = 3.148). Thus the protein consumption habits that have less risk are 3,148 times stunting compared to normal.

**Effect of Zinc Intake on Stunting Events:** Zinc intake was obtained from the results of filling 24-hour food recall forms for 1 day, the results of the recall were
processed using nutrisurvey which was then compared with the nutritional needs of school children. Based on the research that has been done, the results of zinc intake can be seen in the following table:

**Table 2. Effect of Zinc Intake on Stunting Children in SD InpresKotaraja Elementary School**

<table>
<thead>
<tr>
<th>Zinc Intake</th>
<th>Stunting incidence</th>
<th>Normal incidence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Less</td>
<td>18</td>
<td>75.9</td>
</tr>
<tr>
<td>Enough</td>
<td>11</td>
<td>24.1</td>
</tr>
<tr>
<td>Total</td>
<td>29</td>
<td>100</td>
</tr>
</tbody>
</table>

p=0.036; OR = 3.109

Table 2 above shows that the proportion of stunting for low energy consumption habits is 18 children (62.1%), while the high is 11 children (37.9%). Normal children with low energy consumption habits are 10 children (34.5%), while the high children are 19 children (65.5%). The results of statistical analysis using the chi-square test showed that there was a significant relationship between zinc intake and the incidence of stunting (p = 0.036; OR = 3.109). Thus zinc intake which is less risky is 3,109 times stunting compared to normal.

**Effects of Calcium Intake on Stunting Events:**

Table 3. Effect of Calcium Intake on Stunting Children in SD InpresKotaraja Elementary School.

<table>
<thead>
<tr>
<th>Calcium Intake</th>
<th>Stunting incidence</th>
<th>Normal incidence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Less</td>
<td>22</td>
<td>75.9</td>
</tr>
<tr>
<td>Enough</td>
<td>7</td>
<td>24.1</td>
</tr>
<tr>
<td>Total</td>
<td>29</td>
<td>100</td>
</tr>
</tbody>
</table>

p=0.002; OR = 5.971

Based on table 3 above it is known that the stunting proportion for low calcium consumption habits is 22 children (75.9%), while the high is only 7 children (24.1%). Normal children with low calcium intake as many as 10 children (34.5%), while the high as many as 19 children (65.5%). The results of statistical analysis using the chi-square test showed that, there was a significant relationship between calcium consumption habits and the incidence of stunting (p = 0.002; OR = 5.971). Thus calcium intake which has less risk of 5,971 times stunting compared with normal intake.

**Discussion**

Protein is needed to build, maintain, and repair body tissues. In addition, protein also plays an important role in growth. Protein is a nutrient needed by the body for growth, building body structures (muscles, skin and bones) and as a substitute for worn-out tissue. Based on the results of research by Sulistianingsih and Ari Madi Yanti in 2015 it was found that protein was associated with the incidence of p-value 0.002 stunting. This is in accordance with the study of the theory that the function of protein is as a builder substance. The entire cell layer consists of proteins that carry micronutrients. Protein functions in carrying out body regulation and the formation of new DNA for the body. Long-term protein deficiency will cause disruption of body regulation and growth hormone can be disrupted which can cause nutritional disorders such as stunting. The results of the chi square statistical test in Chastity research in 2017 also showed a positive relationship between protein intake and the incidence of stunting in adolescents with a value of p = 0.001 which means that there is a significant relationship between protein intake and the incidence of stunting.

The tight relationship between protein and growth causes a child who lacks protein intake to experience slower growth than children with sufficient protein intake (Bender, 2002) and in conditions that are worse in protein shortages over a long period of time can result in cessation of the growth process. Children’s protein needs include tissue maintenance, changes in body composition, and the formation of new tissues. Protein requirements for growth are estimated to range from 1-4 g/kg to additional body tissue.

The normal concentration of total calcium in plasma is 2.4-2.5 mM while the concentration of free calcium ions ranges from 1.25-1.3 mM. Effective calcium homeostasis is important in many biological processes, including bone metabolism, cell proliferation, blood coagulation, hormonal signaling transduction and neuromuscular function. Calcium balance is maintained by 3 main organs, namely: the gastrointestinal system, bones, and kidneys. Adequate calcium intake can help protect bones throughout our lives. In children and adolescents, adequate calcium intake can help produce higher bone mass. Partial loss of calcium daily through ekresi (urine and feces), sweat, and lungs when we breathe is normal, consuming enough calcium every day can restore lost calcium. Lack of calcium intake
in children will increase the risk of bone fracture in children, so that children cannot achieve optimal bone growth\textsuperscript{15-17}. During growth, demands for bone mineralization are very high, very low calcium intake can cause hypocalcemia, despite the secretion of the maximal parathyroid gland, which can result in low bone mineralization matrix and osteoblast dysfunction\textsuperscript{14}.

Calcium deficiency will affect linear growth if the calcium content in the bone is less than 50\% of the normal content. In infants, lack of calcium in the bones can cause rickets, whereas in children, lack of deposits can cause growth retardation\textsuperscript{18-19}. During growth, demands for bone mineralization are very high, very low calcium intake can cause hypocalcemia, despite the secretion of maximal parathyroid glands, which can result in low matrix mineralization of new bone deposits and osteoblast dysfunction. Calcium deficiency will affect linear growth if the calcium content in bone is less than 50\% of normal content. In infants, lack of calcium in the bones can cause rickets, whereas in children, lack of deposits can cause growth retardation\textsuperscript{19-21}.

**Source of Funding:** Self

**Conflict of Interest:** None

**Ethical Clearance:** Obtained from Faculty committee, Cendrawaiah University.

**Conclusions**

Protein, zinc, and calcium intake was significantly lower in stunting children than in non-stunting children of primary school age in Jayapura City. Stunting is a chronic nutrition problem that can be addressed in an early warning by monitoring nutritional status, especially height, at the posyandu so that it can be detected and given immediate intervention.

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Determinants of Exclusive Breastfeeding in 6 Months Old Infant in Jeneponto District

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Abstract

Background: The coverage of exclusive breastfeeding in Indonesia is still very low, especially in Jeneponto district. The purpose of this study was to determine the determinants of exclusive breastfeeding. METHOD: This study is a continuation of the main research, the design used is an experiment followed by a study cohort involving pregnant women and their babies then analyzed at the age of 6 months. 340 samples were randomly divided into 3 groups (Moringa leaves powder (MLP), Iron Folic Acid (IFA), Moringa leaves extract (MLE)) given to pregnant women (2nd trimester) and 1 month after delivery. Data analysis using logistic regression. RESULTS: The results showed that of 340 samples intervened (MLP 32.6%; IFA 35.9%; MLE 31.5%), as many as 42.9% of infants were exclusively breastfed and 57.1% of infants were not exclusively breastfed. The logistic regression test results showed that babies who received colostrum at birth were 3.185 times more likely for exclusive breastfeeding than those who did not get colostrum (AOR 3.185, CI 95% 1.324-7.659); mother’s work (AOR 1.923, CI 95% 1.044-3.540); family income (AOR 2.050, CI 95% 1.202-3.498); mother’s education (AOR 2.512, CI 95% 1.451-4.351), maternal knowledge (AOR 1.679, CI 95% 1.020-2.764) and birth weight has the possibility of exclusive breastfeeding compared to the comparison. CONCLUSION: The results showed that the determinants of exclusive breastfeeding in 0-6 months infants in Jeneponto District were giving colostrum, mother’s work, family income, mother’s education, and mother’s knowledge about the benefits of exclusive breastfeeding.

Keywords: Exclusive breastfeeding, mother’s knowledge, mother’s education, family income.

Introduction

The neonatal period is an important period for survival in infancy. Nutrition and breastfeeding are the things that are most needed in this period for the physical and mental development of babies. Breast milk, colostrum and prelacteal feeding are strongly influenced by knowledge, mother’s beliefs and socio-culture. UNICEF recommends breastfeeding should begin within half an hour after giving birth. Delays in breastfeeding can affect the quantity of milk produced. In addition, late stimulation can cause hypoglycemia, hypothermia and acidosis, especially for those at high risk such as low birth weight (LBW). Breast milk contains antibodies from mothers that help fight disease, protect babies from diarrhea and acute respiratory infections. Breastfeeding also stimulates the baby’s immune system and responds to vaccination. Continuing breastfeeding for more than six months, accompanied by nutritious foods that are sufficient, safe and appropriate, soft, and also help ensure good nutritional status and protect against disease. It is estimated that optimal breastfeeding of children under the age of two has the potential to prevent 1.4 million deaths in toddlers in developing countries each year¹,²,³

Globally, only 43% of six-month-old infants receive breast milk exclusively (UNICEF 2016). In low and middle income countries, more than 68 million children born this year are not exclusively breastfed. Most non-breastfeeding children exclusively consume water, milk, formula milk, or complementary foods other than breast milk, often causing infections in unsafe environments, only 45% of breastfed children within one hour after birth and only 46% continuing to breastfeed up to the age of two (UNICEF 2016). Exclusive breastfeeding and continued up to two years can accelerate body weight...
gain and body length in the first few months of life, based on globally reported data, 6.9 million children under five died in 2011, around 1 million could be saved simply as breastfeeding exclusive\textsuperscript{4,5,6}. Galactagogues are herbs that increase volume and facilitate the flow of milk. Several studies confirm the efficacy of galactogogue in helping nursing mothers. However, it is usually promoted and given 3 days after giving birth to induce lactation. Moringa leaves increase the effect of lactation as evidenced by a greater increase in maternal serum prolactin levels. Prolactin is the most important hormone in lactation initiation. Moringa leaf powder is an effective galactagogues to increase volume and facilitate ASI\textsuperscript{7}.

In Indonesia, the coverage of exclusive breastfeeding for infants aged 0-6 months is fluctuating. In 2007 only around 62.2\% and in 2008 it was 56.2\%. Meanwhile, based on the provincial health office report in Indonesia in 2018 for exclusive breastfeeding coverage of 37.7\%. The coverage of exclusive breastfeeding in South Sulawesi Province in 2009 to 2014 is still below the national standard. In 2014, the exclusive breastfeeding coverage was still 56.31\%. Jeneponto Regency in 2008-2012 showed exclusive breastfeeding coverage was far from the 80\% national standard. In fact, from the profile data of the South Sulawesi Provincial Health Office in 2012, Jeneponto district is the district with the lowest coverage of breastfeeding, which is around 20.57\%. Furthermore, in 2013 it showed an increase to 67.66\%\textsuperscript{8,9}.

**Method**

This research is a continuation of the main research. The research method used in this study was an experiment followed by a cohort involving pregnant women (second trimester) with their babies from birth to age 6 months. This study will be divided randomly into 3 groups, the first group is pregnant women who get *Moringa oleifera* flour, the second group is pregnant women who get Fe tablets and the third group is pregnant women who get extracts. The intervention will be given in the second trimester (pregnancy to 4 to 6 months) and followed by intervention after giving birth until their baby is 1 month old.

The population in this study was the number of pregnant women in 6 sub-districts located in Jeneponto Regency, South Sulawesi. Sub-district elections will be carried out based on an agreement with the Jeneponto Health Office with consideration of the performance of health workers in the Puskesmas, especially midwives and nutrition workers who oversee the sub-district so that this research can be carried out properly.

Samples were all mothers who participated in the previous study of 600 pregnant women but with various reasons several mothers had dropped out, so the number of samples participating in this study were mothers who had given birth and had babies aged 0-6 months as many as 340 babies.

Data that has been collected will be processed and analyzed using SPSS software. Before further statistical tests, all data processing variables will be presented in the form of averages, standard deviations, ranges and frequencies. Normality test is useful to determine whether the collected data is normally distributed or not, unpaired t test is used to compare differences between treatments in variables, logistic regression test is used to identify factors related to exclusive breastfeeding, bivariate analysis is used to select candidate variables that will included in multivariate regression.

This research was carried out after obtaining approval from the Ethics Commission of the Faculty of Public Health, Hasanuddin University number UH16090723. Before the implementation of measurements and interviews will be given an explanation of the actions to be taken for each respondent (Mother and baby). After the explanation, the respondents were asked for approval to participate in this study by signing an informed consent.

**Results**

The results of this study were carried out in 6 Districts of Jeneponto District. This research was conducted by interviewing respondents in the area.

**Table 1. Socio-demographic characteristic of respondents**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency (n)</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mother Age (n=340)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;26 year</td>
<td>134</td>
<td>39.4</td>
</tr>
<tr>
<td>≥26 year</td>
<td>206</td>
<td>60.6</td>
</tr>
<tr>
<td><strong>Gender of the child (n=340)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Man</td>
<td>177</td>
<td>52.1</td>
</tr>
<tr>
<td>Women</td>
<td>163</td>
<td>47.9</td>
</tr>
</tbody>
</table>
Based on Table 1 Socio-demographic characteristic of respondents based on mother’s age, it is known that the highest number of respondents was at the age of ≥26 years as much as 60.6% and the least at age <26 years as many as 39.4%. Based on the sex of the child, it is known that the highest number of respondents is male sex as much as 52.1% and women as much as 47.9%. Most maternal education at the low education level is as much as 67.6% and the level of higher education is 32.1%. For the work of mothers, it is known that more mothers do not work, namely as much as 81.5% and those who work as much as 18.5%. Family income in monthly is at most <2 million, 74.4% and 2 million as much as 25.6%.

Table 2. Distribution of characteristic related to breastfeeding in mother

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency (n)</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Childbirth Place (n = 340)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>House</td>
<td>41</td>
<td>12.1</td>
</tr>
<tr>
<td>Health facility</td>
<td>299</td>
<td>87.9</td>
</tr>
<tr>
<td>Childbirth Process (n = 340)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SecarSectio (SC)</td>
<td>21</td>
<td>6.2</td>
</tr>
<tr>
<td>Normal</td>
<td>319</td>
<td>93.8</td>
</tr>
</tbody>
</table>

| Birth Weight (n = 340)          |               |             |
| LBW (<2500gram)                 | 12            | 3.5         |
| Normal                          | 328           | 96.5        |

| Exclusive breastfeeding (n = 340) |               |             |
| Not                              | 146           | 42.9        |
| Yes                              | 194           | 57.1        |

| Pralacteal (n = 340)             |               |             |
| Not                              | 241           | 70.9        |
| Yes                              | 99            | 29.1        |

| Giving Colostrum (n = 340)       |               |             |
| Not                              | 26            | 7.6         |
| Yes                              | 314           | 92.4        |

| Mother’s knowledge about the benefits of breast milk (n = 340) |               |             |
| Do not know                                                   | 228           | 67.1        |
| Know                                                          | 112           | 32.9        |

| Number of children                                             |               |             |
| 1                                                             | 109           | 32.1        |
| >1                                                            | 231           | 67.9        |

Source: Primary data

Based on Table 2 Distribution of characteristic related to breastfeeding in mother based on place of birth, it is known that the highest number of respondents gave birth to health facilities as much as 87.9% and those at home as many as 12.1%. Based on the birth process, it is known that the highest number of respondents gave birth normally as much as 93.8% and sectio as much as 6.2%. For normal birth weight as much as 96.5% and LBW as much as 3.5% For breastfeeding patterns, it is known that more babies are exclusively breastfed as much as 57.1% and those without exclusive breastfeeding are 42.9%. Prelacteal is 70.9% and not prelacteal as much as 29.1%. For giving colostrum as much as 92.4% and those who did not get colostrum 7.6%. The knowledge of mothers about the benefits of breastfeeding is the most that is not years of benefits, namely as much as 67.1% and those who know as much as 32.9%. Whereas the number of children at most mothers who have more than 1 child is 67.9% and those who have 1 child are 32.1%.
Table 3. Factor Affecting Exclusive Breastfeeding: Results of Univariate and Multivariate Logistic Regression

<table>
<thead>
<tr>
<th>Socio Demographic Features</th>
<th>Practiced Exclusive Breastfeeding</th>
<th>OR Crude (95% CI)</th>
<th>OR Adjusted* (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Giving Colostrum</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>9</td>
<td>17</td>
<td>2.709 (1.171–6.266)</td>
</tr>
<tr>
<td>Not</td>
<td>185</td>
<td>129</td>
<td>1.0 (reference)</td>
</tr>
<tr>
<td>Mother’s Work</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not</td>
<td>163</td>
<td>114</td>
<td>1.476 (0.853-2.555)</td>
</tr>
<tr>
<td>Yes</td>
<td>31</td>
<td>32</td>
<td>1.0 (reference)</td>
</tr>
<tr>
<td>Family Income (IDR)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;2 million</td>
<td>152</td>
<td>101</td>
<td>1.612 (0.988-2.6322)</td>
</tr>
<tr>
<td>&gt; = 2 million</td>
<td>42</td>
<td>45</td>
<td>1.0 (reference)</td>
</tr>
<tr>
<td>Mother education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>73</td>
<td>37</td>
<td>1.777 (1.108-2.851)</td>
</tr>
<tr>
<td>Low</td>
<td>121</td>
<td>109</td>
<td>1.0 (reference)</td>
</tr>
<tr>
<td>Knowledge of the benefits of breastfeeding</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Know</td>
<td>73</td>
<td>39</td>
<td>1.655 (1.037-2.642)</td>
</tr>
<tr>
<td>Do not know</td>
<td>121</td>
<td>107</td>
<td>1.0 (reference)</td>
</tr>
<tr>
<td>Birth Weight</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>190</td>
<td>138</td>
<td>2.754 (0.813-0.9328)</td>
</tr>
<tr>
<td>Low Birth Weight</td>
<td>4</td>
<td>8</td>
<td>1.0 (reference)</td>
</tr>
</tbody>
</table>

*Each Factor adjusted for the others. Odds ratios from univariate and multiple generalized estimation equation logistic regression models, **Significant (CI 95% >1)

Identifying factors related to exclusive breastfeeding, bivariate analysis was performed to select candidate variables to be included in multivariate regression. The results of giving colostrum, work and mother’s education, family income, and mother’s knowledge of the benefits of breastfeeding for children associated with exclusive breastfeeding.

Multivariate logistic regression is used to identify predictor variables after controlling variable confounding. All variables <0.25 in bivariate analysis were included in the model namely Colostrum, Mother’s Work, Family income, Mother’s education, Mother’s knowledge, Birth weight.

The results can be seen in table 3. The mother who gave the child a collection, was 3.185 times more likely to give exclusive breastfeeding than those who did not give it (AOR 3.185, CI95% 1.324-7.659), as well as employment, income, education, knowledge of the benefits of ASI and birth weight, namely (AOR 1.923, CI95% 1.044-3.540); (AOR 2.050, CI95% 1.202-3.498); (AOR 2.512, CI95% 1.451-4.351); (AOR 1.679, CI95% 1.020-2.754); (AOR 3.205, CI95% 0.870-11.805) has the possibility of exclusive breastfeeding compared to the comparison.

Discussion

The results of the study on Aged 6 Months In JenepontoDistrict Determinants Of Exclusive Breastfeeding On Infants revealed that of 340 infants, about 57.1% of infants were exclusively breastfed and 42.9% were not exclusively breastfed. Based on the results of the logistic regression test, colostrum administration, mother’s work, family income, mother’s education level and mother’s level of knowledge about the benefits of breastfeeding.

In this study 92.4% of mothers gave colostrum and 7.6% who did not give colostrum. This is because when the baby is born, the mother does not directly have breast milk. About 67.1% of mothers who do not know the benefits of breastfeeding and only 32.9% of mothers who benefit from breastfeeding, even though mothers do not know the benefits of breastfeeding but mothers continue to give exclusive breastfeeding to their babies due to very low family income.
Breast milk is the best natural food a mother can give to a newborn child, besides its composition is suitable for the growth and development of a baby who changes according to the needs of the baby at all times. Breast milk also contains protective substances that can prevent various infectious diseases. Giving ASI also has an extraordinary emotional influence that affects the inner relationship of mother and child and the development of the child’s soul (Azwar, 2001). Research conducted by (Pujiati Abbas, 2011) that breast milk contains zinc minerals that have been proven effective for reducing pneumonia (pneumonia), diarrhea and other infectious diseases. Zinc can also reduce the duration and severity of ARI

In line with research conducted by (Namangboling et al., 2017) that exclusive breastfeeding can prevent the occurrence of diarrhea caused by infection in infants and can maintain the nutritional status of infants, because breast milk is the best food with complete nutrition and is very good for baby’s needs in its growth and development. The provision of ASI carried out exclusively can reduce the prevalence of the incidence of malnutrition in children. Breastfeeding promotion is considered as an intervention that aims to maintain nutritional status, individual health status, and can reduce mortality by 8% globally.

ASI provides all the energy and nutrients needed by babies during the first six months of life. Giving breast milk to the baby in the first hour of birth can accelerate the removal of the placenta, reduce postpartum bleeding and also accelerate recovery from the trauma of childbirth and can help the mother’s uterus to return to size before pregnancy. A data from developing countries showed that babies who did not get ASI were six times more likely to die from infectious diseases in the first two months of life

**Conclusion**

The results showed that the determinants of exclusive breastfeeding in 0-6 months infants in JenepontoDistrict were giving colostrum, mother’s work, family income, mother’s education, and mother’s knowledge about the benefits of exclusive breastfeeding

**Ethical Clearance:** Taken from University committee.

**Source of Funding:** Self

**Conflict of Interest:** Nil

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8. Riskesdas. Hasil UTAMA RISKESDAS 2018. 88


Analysis of Microplastic Content in Baronang Fish (Siganus sp) and Kakap Fish (Lutjanus sp) in the Coastal Area of Bangkala Subdistrict, Jeneponto Regency

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Abstract

Background: Micro plastic is a problem for the environment and public health measuring 0.3-5 mm.

Objective: To analyze the microplastic content of Baronang Fish and Snapper Fish in the Coastal of Bangkala Subdistrict.

Method: The method used is the analytical survey, laboratory approach with Minitab software 16. Fish samples were identified using FishBase. The obtained microscopy was calculated based on number and type, photographed with optilab, and measured by raster image software.

Results: The microplastic content of Snapper Fish is higher than that of Baronang Fish at each station. The microplastic content of Snapper Fish at Station 1 is 18 particles/fish while Baronang Fish is 14 particles/fish. The microplastic content of Snapper Fish at Station 2 is 18 particles/fish while Baronang Fish is 13 particles/fish. The microplastic content of Snapper at station 3 is ten particles/fish while Baronang Fish is six particles/fish. This happens because Snapper Fish has more prominent characteristics than Baronang Fish, including having faster growth, having excessive eating behavior, tolerant of turbidity and salinity and more actively moving. Based on these characteristics, the chances of microplastic entering the body of Snapper Fish through eating activities are greater than that of Baronang Fish. The largest type of microplastic fiber is found in the digestive tract of Snapper and Baronang Fish.

Conclusion: Baronang and Snapper Fish originated from Bangkala Subdistrict Beach, Jeneponto Regency containing microplastic. The microplastic content of Snapper Fish is greater than that of Baronang Fish.

Keywords: Microplastic, Baronang Fish, Snapper Fish.

Introduction

Waste is a problem for people throughout the world, both garbage originating from land and sea. Many years people do not care about marine pollution because of the large volume of seawater, and its ability to thin all types of foreign substances so that it almost not cause an impact at all. Therefore the sea is considered as waste dumps. However, this view began to gradually to change. This is due to, among other things, the waste is thrown into the sea increasingly the more time and in high concentration, so it happens environmental pollution on a local scale¹. If continuous disposal of waste into the sea, then feared there will be a global impact of marine pollution. One type the most common waste in the land and sea area is a plastic waste².

Marine litter (marine debris) can be defined as a solid,produced or processed by humans, directly or indirectly,accidentally or accidentally, thrown away or left in the environment sea³. Bellas J, et al⁴ estimate that 10%of all newly produced plastics will be discharged through the river and end at sea.
Plastics are synthetic polymer materials made through the process of polymerization. Everyday human life in this century is inseparable from plastic usage. Its nature is difficult to degrade in nature to make it the biggest waste contributor that causes damage to the balance of nature. The continued use of plastic increasing worldwide causes plastic waste to become an issue environment that is often discussed. Disposal of plastic waste to the environment can cause various environmental problems.

Eriksen M, et al. estimate that at least there are 250,000 tons of plastic waste that floats in the ocean. Plastic waste buried in the sea has the potential impact of chemical waste tends to increase with decreasing plastic particle size (microplastic). Microplastic is less sized plastic particles from 5 mm. Microplastic has the potential to have an impact more serious than plastic that has a larger size because it can be ingested by fish and plankton so that it can disrupt the chain system food in the water.

One plastic waste that can affect the food cycle at coastal and marine areas are microplastic. Microplastic is wrong one part of marine waste which when piled up in the waters will cause disruption of the food chain to fish. Research conducted by on the coast of China, the results obtained from 263 fish examined were 26 commercial fish species. 32.7% were identified as swallowing more than one type of microplastic. Of all the types of fish examined, 63.5% were benthic fish and 36.5% were pelagic fish. A total of 73 types of microplastic were identified, 48 (65.8%) were fibers and 25 (34.2%) fragmented, the rest were polymers (polypropylene, polyethylene, alkyd resin, rayon, polyester, nylon, and acrylic). Potentially threatening more serious microplastic than with large plastic materials as organisms inhabit lower tropics, like the plankton, have particles susceptible to the microplastic digestion process as consequently it can affect high levels of tropical organisms through the process bioaccumulation. Laboratory test results show that microplastic can be digested by marine organisms when one particle from microplastic can resemble food.

Microplastic pollution also occurs in Indonesia. Research conducted by Masanti YDin Semarang, the results obtained by Belanak Fish (Mugilcephalus) contain microplastic of 15 particles/fish. This is what inspires researchers to conduct microplastic research on Baronang (Siganus. Sp) and Snapper Fish (Lutjanus. Sp) around Bangkala Subdistrict, Jeneponto Regency because Jeneponto Regency is the largest fish producer in South Sulawesi. The purpose of this study was to determine the microplastic contents of Baronang (Siganus. Sp) and Snapper Fish (Lutjanus. Sp) in the vicinity of Bangkala Subdistrict Beach, Jeneponto Regency.

**Material and Method**

**Sampling:** The fish sample is put in a thermos of ice fish that has been filled with icestone. In addition, interviews were also conducted with local fishermen to find out the location of the arrest.

**Microplastic Identification in Fish:** All equipment is sterilized with acetone and distilled water. Sample fish identified using Fishbase. Fish is taken by the channel digestion from the base of the esophagus to the anus then the canal digestion soaked in 20% alcohol. Fish digestive tract crushed with a mixture of a solution of nitric acid (65%) and perchloric acid (68%) with a ratio of 4:1, so the channel comparison digestion and a mixture of solutions of nitric acid and perchloric acid are 1: 5. Soaking is carried out for 24 hours in an acidic room. Next, the suspension was boiled for 10 minutes and left for 30 minutes. The suspension is then diluted with distilled water 4 times dilution and filtered with a 0.5 mm filter. The pellet filter is then transferred to a petri dish, pierced with a hot needle to ensure that the pellet is microplastic, and observed by type (fiber, film, fragment, pellet) and colouring a stereo microscope. Next is the microplastic obtained is calculated the number of each type, photographed with optilab, and then measured by raster image software. The process is done as much astwo treatments in fish digestive tract samples and controls. Treatment of controls is carried out by following all procedures on fish but only use quads.

**Processing Data Analysis:** Data analysis used descriptive statistical analysis for knowing the number of microplastic between stations. Data analysis performed namely the laboratory approach using Minitab 16 software.

**Result and Discussion**

**Microplastic on the Fish Digestion:** Microplastic content found in the digestive tract of Baronang Fish (Siganus. Sp) and Snapper Fish (Lutjanus. Sp) found around the Beach Bangkala District, Jeneponto Regency.
Based on Picture 1. From the results of the study indicate that Snapper Fish (*Lutjanus. Sp*) contains more microplastic with an average of 18 particles/fish compared to Baronang (*Siganus. sp*) with average 14 particles/fish.

Based on Picture 2. From the results of the study indicate that Snapper Fish (*Lutjanus. Sp*) contains more microplastic with an average of 18 particles/fish compared to Baronang (*Siganus. sp*) with the average of 13 particles/fish.

Based on Picture 3. From the results of the study indicate that Snapper Fish (*Lutjanus. Sp*) contains more microplastic with an average of 10 particles/fish compared to Baronang (*Siganus. sp*) with average6 particles/fish.

The results of research from all stations show that Snapper Fish (*Lutjanus. Sp*) contains the most microplastic. This happened because snapper (*Lutjanus. sp*) has several characteristics more prominent than Baronang fish (*Siganus. sp*), among others, have relative growth faster and tends to have greater eating behavior (greedy). In addition, Snapper Fish (*Lutjanus sp*) is very tolerant of turbidity and salinity. Based on these characteristics, the potential or microplastic opportunities enter the body of Snapper Fish (*Lutjanussp*) through eating activities higher than grouper. The results of this study are in line with research conducted at Ancol Beach, Port Queen, and Labuan. The results obtained showed that Snapper fish (*Lutjanussp*).

Small microplastic size (≤ 5 mm) allows microplastic has high potential to be digested by various marine organisms. Fiber (filamentous), filament, and films are also found in fish mesopelagic with an average length of 2.2 mm. A new study on microplastics proves that at each stage of ontogenic Catfish (*Clariasbrachyurus* sp) in estuary waters in the south-west part of Atlantis, all of them contain microplastic. The microplastic ingested by fish or marine organisms will have an impact on marine organisms both physically and chemically. If ingested, microplastic can be passing through the intestine or can be maintained in the digestive tract.

Fiber is the most common type of microplastic on the digestive tract of Snapper Fish (*Lutjanussp*) and Baronang Fish (*Siganus. Sp*). This is in accordance with the research carried out by Lusher *et al.* (2013) who reported that the highest type of microplastic being in the digestive tract of fish is fiber (68.3%). If plastic particles accumulate in amounts of large intestines in small animals, will have the same effect as garbage large plastic and clogging the digestive system. Accumulation of garbage in the digestive tract can cause taste full fake. This causes the fish to experience a decrease in appetite eat. There are also concerns that if swallowed by organisms, small objects from plastic waste may facilitate chemical contaminant transportation. Microplastic found in marine biota such as fish, of course, make an impact if consumed by humans. Health effects that can arise are intestinal disorders and stomach (irritation). Chemicals contained in plastic can increase cancer cells growth.
Conclusion

Baronang fish (*Siganus. Sp*) and Snapper Fish (*Lutjanus sp.*) Originating at around Bangkala District Jeneponto Regency contains microplastic. Macroplastic in Snapper Fish (*Lutjanussp.*) More compared to Baronang Fish (*Siganus. sp.*) Microplastic content in Snapper Fish (*Lutjanus sp.*) at station 1 an average of 18 particles/fish, station 2 averages 18 particles/fish and station 3 averages 18 particles/fish.

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Ethical Clearance: Taken from University committee.

Source of Funding: Self

Conflict of Interest: Nil

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Factors Associated with the Appropriate Time of Complementary Feeding among Infants in Jeneponto Districts, South Sulawesi

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Abstract

Background: Nutritional problems in infants aged 6-11 months are strongly influenced by complementary feeding. The inaccuracy of time in complementary feeding to infant.

Aims: To examine the factors associated with the appropriate time of complementary feeding to infant in Jeneponto districts.

Method: This was a cross-sectional study. The sample were mothers who had infants aged 8 and 10 months with total 125 infants. Bivariate analysis using chi-square and multivariate logistic regression were conducted.

Results: The results of the bivariate analysis showed that frequency of following ANC (p = 0.045), birth weight status (p = 0.025) and mother occupation (p = 0.029) were independently associated with the appropriate time of complementary feeding. Based on multivariate analysis indicated that mothers who visited to ANC [AOR: 4.14 (95% CL: 1,576-10,885)], mothers who had normal birth weight status of infants (95% CI: 2.142-88,628)] and mother who consumed iron capsules [AOR 5.27 (95% CI: 1.72-16.06)] were found key factors the appropriate time of complementary.

Conclusions: The appropriate time of complementary feeding was significantly associated with maternal occupation, frequency of visiting ANC and birth weight status. The variable that most influences the appropriate time of complementary feeding was birth weight status.

Keywords: Complementary feeding, infant, determinant.

Introduction

Complementary feeding is defined as a process that starts when breast milk alone is no longer enough to meet a baby’s nutritional needs, and therefore other foods and fluids are needed, along with breast milk (1). Infants (ages 0-11 months) are a golden period as well as a critical period because at this time there is rapid growth and development which reaches a peak at the age of 24 months where nutritional deficiencies and diseases contribute globally to higher levels of malnutrition among children children under the age of five.

The problem of malnutrition causes four out of one hundred babies born each year to not survive more than five years, which are generally victims of diseases and conditions exacerbated by these nutritional problems; one in three toddlers has a growth disorder and almost one fifth of toddlers experience less weight.

The problem of malnutrition still a major problem in Indonesia. This is evidenced by the still finding cases of malnutrition in children in various regions. One factor that can affect nutritional status is intake. A person’s nutritional status is a picture of what he consumes. Children aged 6-24 months get nutritional adequacy from breast feeding and complementary feeding.

Child development will be disrupted if complementary feeding are not introduced at the age of 6.
months, or given in an improper way. Because at the age of 6 months, the baby’s needs for energy and nutrition begin to exceed what is provided by breastfeeding, and complementary feeding is needed to meet those needs.

Nationally, based on 2013 basic health research, national stunting prevalence reached 37.2% consisting of 18.0% very short children and 19.2% short children, increased from 2010 (35.6%) and 2007 (36, 8%)\(^4\).

Babies are very vulnerable during the transition period when complementary feeding begins. Ensuring their nutritional needs are met thus requires that complementary food be on time-meaning it is introduced when energy and nutrients are needed beyond what can be provided through exclusive breastfeeding and often\(^5\).

Provision of prolonged exclusive breastfeeding has the potential to cause a lack of energy and nutrition when the introduction of complementary food is incorrect or delayed. Meeting the nutritional needs of infants aged 6-12 months based on the intake of advanced breastfeeding on Demand and complementary feeding. Age of infants 6-12 months is the age that is susceptible to malnutrition due to the provision of complementary feeding which is not appropriate both time and composition. Inappropriate time is <6 months or <7 months, while the improper composition is lack or excess nutrients. Some complementary feeding babies lack fat intake and some excess carbohydrates derived from simple carbohydrates, the introduction of food taste in infants 6-12 months will determine the eating habits of these children\(^6\).

Introducing complementary feeding at an earlier risk of obesity at a higher economic level and delaying complementary feeding causes the supply of energy and protein and other micronutrients to be inadequate for babies\(^7\).

Other studies have shown that early feeding can increase the risk of eczema. However, there are few data that support the relationship between early solid feeding and other allergic conditions\(^8\). In addition, the initial introduction of solid foods can cause malnutrition results such as low iron stores by displacing rich energy and iron which is highly bioavailable in breast milk, and continues to increase the risk of diarrheal disease. The aims of this study was to look at factors associated with the timing of complementary feeding in infants in Jeneponto Districts.

### Materials and Method

This type of research is observational analytic with crossectional study design. The location of the study was carried out in the district with a population of 482 babies. The sample in this study were mothers who had babies aged 8 and 10 months as many as 125 children. The reason for choosing samples that were 8 and 10 months old was because that age was a transition of complementary feeding at texture and frequency. The sampling technique is accidental sampling. Data collection through interviews using a questionnaire. Data analysis using bivariate with chi-square and multivariate with logistic regression.

This research was carried out after obtaining approval from the Ethics Commission of the Faculty of Public Health, Hasanuddin University number UH16090723. Before the implementation of measurements and interviews will be given an explanation of the actions to be taken for each respondent (Mother and baby). After the explanation, the respondents were asked for approval to participate in this study by signing an informed consent.

### Results

| Table 1: Characteristics of Infant |
|-------------------------------|------|
| Variable                       | n (125) | % |
| Sex of infant                  |       |   |
| Boys                           | 68    | 54.4 |
| Girls                          | 57    | 45.6 |
| Maternal Age                   |       |   |
| <20                            | 25    | 20.0 |
| 20-24                          | 25    | 20.0 |
| 25-29                          | 33    | 26.4 |
| 30-34                          | 24    | 19.2 |
| ≥35                            | 18    | 14.4 |
| Intervensi                     |       |   |
| Moringa flour                  | 40    | 32.0 |
| Iron                           | 50    | 40.0 |
| Moringa extract                | 35    | 28.0 |
| Parities                       |       |   |
| One                            | 47    | 37.6 |
| Two                            | 49    | 39.2 |
| More than two                  | 29    | 23.2 |
| Maternal Occupation            |       |   |
| Housewife                      | 108   | 86.4 |
| Employed                       | 17    | 13.6 |
Table 1. The results of univariate analysis showed that the sex of boys was 54.4% and women were 45.6%, the maternal age ≥ 35 years was 14.4% and 25-29 years were 26.4%, intervention Moringa flour 32.0%, iron 40.0% Moringa extract 28.0%, second child 39.2% and children more than 2 by 23.2%, maternal occupation as a housewife by 86.4% and Employed by 13.6%, low maternal education level 72.0% and high by 28.0%, household income > 2 million at 72.8% and ≤ 2 million at 27.2%, frequency of ANC <4 times at 56.8% and ≥ 4 times at 43.2%, place of birth at home 5.6% and health services 94.4%, birth weight status the LBW is 6.4% and Normal is 93.6%, Post Natal care is 28.0% and not 72.0%.

Table 2. Relationship characteristics with Complementary Feeding

<table>
<thead>
<tr>
<th>Variable</th>
<th>Timely of Initiation Complementary Feeding N(%)</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;6 bulan</td>
<td>≥6 bulan</td>
</tr>
<tr>
<td>Intervensi</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moringa flour</td>
<td>17 (42.5)</td>
<td>23 (57.5)</td>
</tr>
<tr>
<td>Iron</td>
<td>12 (24.0)</td>
<td>38 (76.0)</td>
</tr>
<tr>
<td>Moringa extract</td>
<td>12 (34.4)</td>
<td>23 (65.7)</td>
</tr>
<tr>
<td>Parities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>One</td>
<td>18 (38.3)</td>
<td>29 (61.7)</td>
</tr>
<tr>
<td>Two</td>
<td>14 (28.6)</td>
<td>35 (71.4)</td>
</tr>
<tr>
<td>More than two</td>
<td>9 (13.0)</td>
<td>20 (33.6)</td>
</tr>
<tr>
<td>Maternal Occupation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Housewife</td>
<td>31 (28.7)</td>
<td>77 (71.3)</td>
</tr>
<tr>
<td>Employed</td>
<td>10 (58.8)</td>
<td>7 (41.2)</td>
</tr>
<tr>
<td>Maternal education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>26 (28.9)</td>
<td>64 (71.1)</td>
</tr>
<tr>
<td>High</td>
<td>15 (42.9)</td>
<td>20 (57.1)</td>
</tr>
<tr>
<td>Household Income</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 2 million</td>
<td>27 (19.7)</td>
<td>64 (70.3)</td>
</tr>
<tr>
<td>≥ 2 million</td>
<td>14 (41.2)</td>
<td>20 (58.8)</td>
</tr>
<tr>
<td>Number of ANC follow up</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;4 times</td>
<td>29 (40.8)</td>
<td>42 (59.2)</td>
</tr>
<tr>
<td>≥ 4 times</td>
<td>12 (22.2)</td>
<td>42 (77.8)</td>
</tr>
<tr>
<td>Place of delivery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Home</td>
<td>3 (42.9)</td>
<td>4 (57.1)</td>
</tr>
<tr>
<td>Health Institution</td>
<td>38 (32.2)</td>
<td>80 (67.8)</td>
</tr>
<tr>
<td>Birth weight Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BBLR</td>
<td>6 (75.0)</td>
<td>2 (25.0)</td>
</tr>
<tr>
<td>Normal</td>
<td>35 (29.9)</td>
<td>82 (70.1)</td>
</tr>
<tr>
<td>Post Natal Care</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>9 (25.7)</td>
<td>26 (74.3)</td>
</tr>
<tr>
<td>No</td>
<td>32 (35.6)</td>
<td>58 (64.4)</td>
</tr>
</tbody>
</table>

Table 2. The results of bivariate analysis showed that the factors of the sex of the baby (p = 1.000), maternal ages (p = 0.165), intervention group (p = 0.174), the sequence of children (p = 0.582), maternal education (p = 0.200), household income (p = 0.315), place of delivery (p = 0.856) and post natal care (p = 0.401) with the time of complementary feeding were not related. The maternal occupation (p = 0.029), Frequency of following ANC (p = 0.045), BBL status (p = 0.025) with the time of complementary feeding was related.
Table 3. Factor Affecting complementary Feeding practice among children 6-12 months

<table>
<thead>
<tr>
<th>Socio Demographic Features</th>
<th>OR Crude (95% CI)</th>
<th>OR Adjusted* (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;20</td>
<td>1.0 (reference)</td>
<td>1.0 (reference)</td>
</tr>
<tr>
<td>20-24</td>
<td>1.23 (0.34-4.37)</td>
<td>0.96 (0.225-4.163)</td>
</tr>
<tr>
<td>25-29</td>
<td>0.52 (0.17-1.60)</td>
<td>0.41 (0.114-1.490)</td>
</tr>
<tr>
<td>30-34</td>
<td>0.46 (0.14-1.50)</td>
<td>0.27 (0.066-1.116)</td>
</tr>
<tr>
<td>&gt;=35</td>
<td>1.94 (0.42-8.85)</td>
<td>2.18 (0.372-12.771)</td>
</tr>
<tr>
<td>Maternal Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>1.0 (reference)</td>
<td>1.0 (reference)</td>
</tr>
<tr>
<td>High</td>
<td>0.54 (0.24-1.21)</td>
<td>0.36 (0.136-0.989)</td>
</tr>
<tr>
<td>ANC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 4 times</td>
<td>1.0 (reference)</td>
<td>1.0 (reference)</td>
</tr>
<tr>
<td>&gt;=4 times</td>
<td>2.41 (1.08-5.36)*</td>
<td>4.14 (1.576-10.885)*</td>
</tr>
<tr>
<td>Birth weight Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BBLR</td>
<td>1.0 (reference)</td>
<td>1.0 (reference)</td>
</tr>
<tr>
<td>Normal</td>
<td>7.02(1.35-36.54)*</td>
<td>13.77 (2.142-88.628)*</td>
</tr>
<tr>
<td>Intervensi</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moringa flour</td>
<td>1.0 (reference)</td>
<td>1.0 (reference)</td>
</tr>
<tr>
<td>Iron</td>
<td>2.34(0.95-5.77)</td>
<td>5.27 (1.72-16.06)*</td>
</tr>
<tr>
<td>Moringa leaf extract</td>
<td>1.41(0.55-3.62)</td>
<td>1.98 (0.65-6.00)</td>
</tr>
</tbody>
</table>

Table 3. The results of multivariate analysis showed that the possibility of giving complementary feeding correctly to mothers who during pregnancy were ANC visits ≤4 times higher than ANC> 4 times [AOR: 4.14 (95% CI: 1,576-10,885)], possible complementary feeding in infants born with normal weight is higher than babies born with low body weight [AOR: 13.77 (95% CI: 2.142-88,628)] and the possibility of giving complementary feeding correctly to mothers given capsules iron is higher than those given Moringa flour [AOR 5.27 (95% CI: 1.72-16.06)].

Discussion

This study found that the frequency of participating in ANC was a determining factor in the time to introduce complementary feeding. Pregnant women who follow ANC> = 4 times may introduce complementary feeding correctly compared to pregnant women who participate in ANC <4 times this is because visits that are more frequent to health services make it possible to obtain information from health workers about the importance of providing complementary feeding properly time to baby. This study is consistent with studies conducted in Ethiopia that children whose mothers have antenatal care visits (ANC) are more likely to introduce complementary feeding on time than children whose mothers have never had antenatal care services when they are pregnant.

BBL status is a determining factor in the time to introduce MP-ASI. Normal-born babies are more likely to introducecomplementary feeding in a timely manner than babies born with a weight below normal (<2500). Babies born normally are faster growth and development because exclusive breastfeeding is not problematic compared to those below normal birth weight so it is possible to delay of complementary feeding earlier. Whereas babies born under normal have problems at birth due to having to be hospitalized so they part with their mothers. This causes low exclusive breast feeding and is replaced by formula milk. This study is consistent with the results of a study in Brazil showing that the relationship between types of breastfeeding and difficulties in providing complementary food, especially in food rejection, as well as an increased chance of formula-fed infants having difficulty serving complementary meals compared to other types of breastfeeding. In addition, they also need prolonged hospitalization, contributing to low milk production or even disrupting mother-baby bonds that might reduce the possibility of forming a full breastfeeding pattern.

Tablet fe consumption during pregnancy is a determining factor in the time to introduce complementary feeding. Babies born to mothers who consume Fe tablets during pregnancy may introduce complementary feeding in a timely manner compared to babies born to mothers who consume Moringa flour capsules and Moringa extract. Supplements given to pregnant women in order to prevent anemia. Prevention of anemia during pregnancy will prevent low birth weight, this is consistent with other studies that say that the treatment of anemia in pregnant women must be done because it has an impact on fetal growth and development such as low birth weight (LBW) and this will have an impact on later growth and development. If the baby is born normally, the growth and development is in accordance with his age so that the time of introduction of complementary feeding can be appropriate.

Conclusion

This study showed that the timing of the introduction of complementary feeding was significantly associated with ANC visits at the time of pregnancy, consumption of Fe tablets during pregnancy and birth weight. The
more pregnant women go to health services, the more exposed they are to information about the importance of introducing MP-ASI to babies. For the next researcher, it is expected to look deeply into the reasons for the mother not introducing MP-ASI on time by using a qualitative research design.

**Acknowledgement:** The author would like to thank all the respondents for their willingness to participate in this research. Likewise, University of Malaya Malaysia has provided an opportunity for writers to present this research in the form of posters. And thank you also to Hasanuddin University where the writer is studying and the Indonesian Muslim University where the writer works.

**Ethical Clearance:** Taken from Hasanuddin University committee.

**Source of Funding:** Self

**Conflict of Interest:** Nil

**Reference**

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Analysis of Risk Factors Maternal Mortality in Sinjai District

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Abstract

The maternal mortality rate is the number of maternal deaths during pregnancy, labor and childbirth. Maternal mortality is an important problem because it causes the state to lose a number of productive forces, increasing child morbidity and mortality. This study aims to determine the risk factors for maternal mortality. The research used was analytic observational with a case control study design with a sample size of 120 people consisting of 30 case groups and 90 control groups with a ratio of 1: 3. Data analysis used bivariate analysis with Odds Ratio and multivariate analysis with multiple logistic regression. The results found there are three variables which are risk factors for maternal mortality, namely late referral (OR = 4.620, 95% CI = 1.513-14.113), history of maternal disease (OR = 3.028, 95% CI = 1.095-8.669), and obstetric complications (OR = 3.081, 95% CI = 1.161-7.896). While antenatal examination, family planning history, parity and distance of pregnancy are not risk factors for maternal mortality. Health workers are advised to strengthen the referral network system, conduct early detection of risk factors and manage obstetric complications.

Keywords: Maternal Mortality, Obstetric Complications, Maternal Disease History Antenatal Examination, Family Planning History.

Introduction

Globally in 2015 around 830 women died every day and in Indonesia 38 women were due to complications during pregnancy or childbirth. Based on the Intercental Population Survey (SUPAS 2015) the Maternal Mortality Rate (MMR) is 305 per 100,000 live births. Total maternal deaths were 14,640, reported 4,999 mothers and those not reported 9,641 maternal deaths. The agenda for reducing the MMR’s Sustainable Development Goals (SDGs) globally by 2030 is 70 per 100,000 live births and Indonesia targets MMR in 2024 to be 232 per 100,000 live births¹.

Nearly 20% of maternal deaths occur before delivery, 82% occur after labor or abortion, 46% occur within 24 hours of delivery and 69% occur within seven days after delivery. Most reported maternal deaths occur in health facilities. The highest maternal mortality sites were 77% in hospitals, 15.6% at home, 4.1% occurred in trips to hospitals/health facilities, 2.5% in other health facilities and 0.8%².

The World Health Organization (WHO) in developing countries in some countries have high AKI such as Sub-Saharan Africa 179,000, South Asia 69,000, and Southeast Asia 16,000. The maternal mortality rate in Southeast Asian countries is ranked first by Laos, namely 357 per 100.00 Births, Vietnam 49 per 100,000 live births, Thailand 26 per 100,000 live births, Brunei 27 per 100,000 live births, Malaysia 24 per 100,000 live births and Singapore have a maternal mortality rate of 7 per 100,000 births.

The Maternal Mortality Rate in Indonesia still reaches 305 per 100,000 live births, this figure places Indonesia as the country with the second highest mortality rate in Southeast Asia. It is still very far compared to neighboring Malaysia and Singapore. Based on data from the South Sulawesi Health Office in 2015 the number of maternal deaths was 149 cases, in 2016 there were 156 cases and the number of maternal deaths in 2017 reached 115 cases. South Sulawesi Province is included in the top 10 list of provinces contributing to maternal mortality in Indonesia in 2017. Sinjai District ranks the second highest in MMR in South Sulawesi province. Based on the health profile of Sinjai district, Maternal Mortality Rate in 2016 was 293 (12 cases) per 100,000 live births, decreased in 2017. Namely the
MMR reported 148 (6 cases) per 100,000 KH, the target of the 2017 Strategic Plan is 113 per 100.00 KH. In 2018 the MMR was 297 per 100,000 KH (12 cases), the target of the Strategic Plan 2018 was 113 cases per 100,000 Births.

Cases of maternal deaths due to pregnancy, childbirth, and childbirth in Sinjai District are generally caused by bleeding, hypertension, pre-eclampsia, eclampsia, infection, abortion, anemia, nutritional status and others. Most deaths occur within seven days after saline or the puerperium. Some studies show maternal mortality is influenced by factors related to maternal factors, reproductive status factors, factors related to obstetric complications, factors related to health services, socio-economic factors and socio-cultural factors.

**Materials and Method**

**Location and Design of Research:** This research was conducted in the working area of the Sinjai District Health Office. This type of research is observational analytic with case control design.

**Population and Samples:** The population in this study were all pregnant women, maternal and postpartum mothers at 13 (thirteen) Puskesmas from 16 (Sixteen) Puskesmas located in the Sinjai District Health Office area for the period 2016 to 2018. Samples were 120 mothers in which groups cases are all maternal deaths (maternal mortality, maternal mortality and postpartum maternal mortality) and the control group are all pregnant women and mothers giving birth in the Puskesmas area where there are cases of maternal deaths, with a case sample ratio: control is 1: 3, so Minimum sample amount is 30:90. The withdrawal of case and control samples was done by selecting samples randomly from all mothers who gave birth in the area of the Sinjai District Health Office.

**Method of collecting data:** This study uses secondary data obtained from the Sinjai District Health Office. Data collected from 13 (thirteen) Puskesmas in Sinjai District for 2016 to 2018 are: Balangnipa Health Center, Island IX Health Center, Bulupoddo Health Center, Samataring Health Center, Kampala Health Center, Samaenre Health Center, Aska Health Center, Mannanti Health Center, Lappadata Health Center, Manimpahi Health Center, Manipi Community Health Center, Central Lembang and Puskesmas Biji Nangka.

**Data analysis:** Data on general characteristics of respondents, independent variables and dependent variables were processed using SPSS. To determine the risk factors for maternal mortality in pregnant, childbirth and postpartum mothers in Sinjai District, data analysis was used using univariate analysis, and multivariate analysis with multiple logistic regression.

**Results**

Table 1 shows the comparison of the proportion of age between cases and controls, the age category with the lowest presentation at age > 35 years where the case group and controls presented the same number (43.3%). Comparing the proportion of education levels between cases and controls, the education level with the lowest presentation was at the low education level where the control group was higher (60.0%) than the case group (50.0%). Comparison of the proportion of employment status between cases and controls, the lowest status of work with presentations was for mothers who worked where the case group was higher (16.7%) than the control group (15.6%).

Table 1. Distribution of general characteristics of mothers in Sinjai District 2016-2018

<table>
<thead>
<tr>
<th>Variable</th>
<th>Case</th>
<th>Control</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-35</td>
<td>17</td>
<td>51</td>
<td>68</td>
</tr>
<tr>
<td>&gt;35</td>
<td>13</td>
<td>39</td>
<td>52</td>
</tr>
<tr>
<td><strong>Level of education</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>15</td>
<td>54</td>
<td>69</td>
</tr>
<tr>
<td>High</td>
<td>15</td>
<td>36</td>
<td>51</td>
</tr>
<tr>
<td><strong>Job status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work</td>
<td>5</td>
<td>14</td>
<td>19</td>
</tr>
<tr>
<td>Does not work</td>
<td>25</td>
<td>76</td>
<td>101</td>
</tr>
</tbody>
</table>

Table 2. Shows that variables including risk factors, which are thought to influence the occurrence of maternal deaths in Sinjai District, show: the results of multiple logistic regression tests, which are assessed through significance (Sig.) and “B” coefficients, and Exp (B) shows that there are three independent variables entered into the test simultaneously, the significance values are described as follows:
Table 2. Multivariate analysis of risk factors for maternal mortality in Sinjai District 2016-2018

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>Wald</th>
<th>Df</th>
<th>Sig.</th>
<th>Exp</th>
<th>95.0% C.I for EXP(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Late Referral</td>
<td>1.350</td>
<td>7,217</td>
<td>1</td>
<td>0.007</td>
<td>4,620</td>
<td>1,513 - 14,113</td>
</tr>
<tr>
<td>Disease History</td>
<td>1.108</td>
<td>5,133</td>
<td>1</td>
<td>0.023</td>
<td>3,028</td>
<td>1,095 - 8,669</td>
</tr>
<tr>
<td>Obstetrics Complications</td>
<td>1.125</td>
<td>4,454</td>
<td>1</td>
<td>0.033</td>
<td>3,081</td>
<td>1,161 - 7,896</td>
</tr>
</tbody>
</table>

Referral delay, with B value = 1.350, p = 0.007, with the risk being assessed through Exp (B) = 4,620, this value implies that late referrals have a significant influence (p = 0.007) on the incidence of maternal mortality with a 4,620 risk times greater than mothers who are not late to be referred.

Disease history, with a value of B = 1.108, p = 0.023, with the risk being assessed through Exp (B) = 3.028, this value implies that the history of the disease has a significant influence (p = 0.023) on the incidence of maternal mortality with a large risk 3,028 times greater than mothers who did not have a history of disease.

Obstetric complications, with a value of B = 1.125, p = 0.033, with the risk being assessed through Exp (B) = 3.081, this value implies that obstetric complications have a significant influence (p = 0.033) on the incidence of maternal deaths with a large risk 3,081 times greater than mothers who did not experience obstetric complications.

Discussion

In this study showed a significant result that the delay in referral, provided a risk of 4,620 greater for the occurrence of maternal deaths. The results of this study are in line with the research of Aeni (2013) that the delay in referral was proven to be significantly related to maternal mortality (OR = 10; p value = 0.013, 95% CI = 1.34-74.5). Factors of delay are especially late in making decisions to refer to and delay in reaching a referral place related to maternal death. This happens because the mother’s unwillingness to go to a health facility immediately and considers the signs of complications that are common in pregnancy, while other family members do not know the signs of emergency in obstetric complications. In general, this occurs in mothers with parity> 1 because they feel experienced in a previous pregnancy.

The results of the study were also in line with Atjo’s study, which was one of the causes of maternal deaths due to the delay in deciding to refer to a hospital, meaning that the delay from arriving to the hospital until medical treatment became one of the causes of maternal and childbirth deaths and numbers maternal mortality (Maternal Mortality Rate) is the ratio of the number of maternal deaths to 100,000 live births, this figure is an important indicator in efforts to achieve better quality of health services for pregnant and childbirth mothers in the city of Palu. When viewed from the Odds Ratio (OR), the delay in medical treatment also has the highest OR (30,447) compared to the others.

Other infectious diseases that are still the main problem of public health are Tuberculosis (TB). In pregnant women. In pregnant women TB can worsen maternal health and nutritional status, and affect fetal growth and development and the risk of contracting the baby.3

Research results in line with the research conducted by Jayanti, et al5 indicate that there is an influence between history of illness on maternal mortality. Mothers with a history of illness increased the risk of maternal death by about 9 times greater than those of women without a history of disease (OR = 8.9 95% CI; 2.76-28.71).

Godefay et al6 study of risk factors for maternal mortality in Tigray Ethiopia states that a history of maternal disease affects maternal mortality where mothers with a history of disease have a risk of 5.58 times compared to mothers with no history of disease.

In this study obtained the most existing history of disease data in the case group that is equal to 56.7%. The types of diseases found include chronic diseases such as cardiac hypertension asthma and infectious diseases such as TB, syphilis and nutritional problems, namely SEZ. Based on data on causes of maternal mortality, it was found that there were 2 (two) maternal deaths due to TB disease, 2 maternal deaths due to diagnosed heart disease and other maternal deaths due to eclampsia caused by hypertension in the mother before pregnancy.
A history of maternal disease is a disease that has been suffered by the mother before the last pregnancy based on the results of an antenatal examination and the results of laboratory tests. With a mother who has a history of chronic diseases that can interfere with the mother’s pregnancy journey or aggravate the problem of her pregnancy.

The results of this study indicate a significant risk of a history of maternal disease against maternal mortality. The history of maternal disease is a disease that has been suffered by the mother before the last pregnancy based on the results of an antenatal examination and the results of laboratory tests. With a mother who has a history of chronic diseases that can interfere with the mother’s pregnancy journey or aggravate the problem of her pregnancy.

The results of this study are in line with Suriani’s research, in this study showed that there was a significant relationship between the history of the disease and the incidence of maternal mortality. The statistical test results show that mothers with a history of risky diseases have 15 times the chance to experience a maternal death event. This is because the history of the disease during pregnancy cannot be avoided by pregnant women because the history occurs before pregnancy and affects later in pregnancy.

Factors that contribute to maternal mortality are direct causes of maternal death, namely factors associated with complications of pregnancy, childbirth, and childbirth such as bleeding, infection, hypertension in pregnancy (HDK) preeclampsia/eclampsia, congestion and abortion. Maternal mortality caused by obstetric complications In 2017, hypertension was 33.07%, obstetric bleeding 27.03%, other obstetric complications 12.04%, infections in pregnancy 6.06% and 4.81% due to other causes.

Obstetric complications such as hypertension in pregnancy are a major trigger for the occurrence of pre-eclampsia and eclampsia in pregnant, maternity and postpartum mothers. As many as 10% of pregnancy problems in the world are caused by hypertensive disorders including pregnancies with hypertension and pre-eclampsia.

The results of this study indicate that obstetric complications are significant risk factors for maternal mortality. This research is in line with the risk factor research conducted in Gowa South Sulawesi by using a case control study design by looking at the effect of health status consisting of pregnancy complications stating that women with high risk health status were found with (OR = 9.750) having 10 times more risk large maternal mortality compared to mothers who have low risk health status.

The yego et al. study of risk factors for maternal mortality in tertiary hospitals in Kenya stated that a history of complications affected maternal mortality with a value (OR 9.0, 95% CI 4.2-19.3), in which mothers with complications such as eclampsia has a risk of dying as much as 9 times higher than women who do not have a history of obstetric complications.

Researches found that the main cause of obstetric bleeding complications was uterine atony, placental retention, mothers with a history of previous bleeding, Pre eclampsia, labor induction and macromelia (large infants).

In this study 76.7% of obstetric complications occurred in the case group. The complications that occur are as a direct result of pregnancy, and the types of obstetric complications that occur are anemia, hypertension, congestion, bleeding Pre eclampsia/ eclampsia, infection, Early Rupture of the membranes (KPD) and Hyperemesis Gravidarum. Some cases of complications were detected when the mother performed an ANC examination but no collaboration was conducted for laboratory examinations and even some cases were not referred to for treatment. For example, mothers who have hypertension are detected by a midwife in the village but no further treatment is done. Likewise, the handling is done by referring to the Hospital, but when the mother goes home, no monitoring is carried out, even the mother is never visited, so the mother experiences severe complications.

Conclusions

Based on the results of research and discussion with reference to the formulation of the problem and the research hypothesis, conclusions can be drawn, namely the delay in referral, obstetric history and complications (Complications of Pregnancy, Childbirth and Postpartum) are significant risk factors for the incidence of maternal deaths in Sinjai District.

Ethical Clearance: aken from Faculty of Public Health, Hasanuddin University committee.

Source of Funding: Self

Conflict of Interest: Nil
References


The Influence of Family on He Use of Child Birth Facilities in Muna Indonesia: A Cross Sectioal Study

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Abstract

Background: Until now, maternal mortality is very high. Every day, around 830 women die from preventable causes related to pregnancy and childbirth. Most occur in developing countries and related to the ability of low family resources. The research objective is to determine the effect of family factors on the use of childbirth facilities.

Method: The study design used a cross sectional study, starting September 2016 to February 2017. Samples were 730 baby mothers, spread in 22 health center areas in Muna Regency. Sampling in proportion to simple random sampling.

Results: Most respondents preferred to give birth at home 473 people (64.8%). The family component that is significantly related to the place of delivery is communication with husband OR = 2.23, family structure OR = 2.89, community support OR = 2.76. Husband’s occupation, marital status, access and wealth do not show a significant relationship with the place of delivery. Further analysis by multivariate, variables significantly related were husband communication (Adjusted Odds Ratio (AOR): 1.61 [1.02-2.53]), family structure (AOR: 2.56 [1.82-3.59]), and community support (AOR: 2.17 [1.09-4.32]).

Conclusion: Communication with the husband, family structure, and community support have a significant relationship with the choice of place of delivery while the husband’s work variables, marital status, access and wealth are not related.

Keywords: Family, facilities, childbirth.

Introduction

One factor in maternal and infant mortality is home delivery2. Most maternal deaths arise from unpredictable complications. Therefore the role of trained health workers is important for the safety of mothers and babies during childbirth3. Women do not get services in health facilities due to lack of trained health workers and family support factors4. The role of the family context that influences reproductive health service decisions such as delivery in health facilities and trained delivery attendants has received serious attention especially in Asia and Africa5. The family factor is a feature of social organization related to marital status, partner communication, access, community support, poverty, which is bound by a norm and trust in the community influences the decision to use health services6. The state of maternal health in Indonesia is still far from expectations, marked by the high mortality rate, which is still showing 305/100,000 KH in 2015, while the MDGs target 102/100,000 KH7 and even the medium-term development plan for 2019, Indonesia targets 306 per 100,000 KH8. Hard work must be done to achieve the targets set for sustainable health development (SDGs) of less than 70 per 100,000 KH in 20309. Southeast Sulawesi Province also has a high maternal mortality of 312/100,000 KH with an increasing number of maternal deaths10. To support these efforts, the government of the Republic of Indonesia since 1989, began a safe motherhood movement with a village midwife program that succeeded in increasing the proportion of births
Claims of delivery by the puskesmas for maternal conditions on delivery at a health care facility\textsuperscript{8}. To enhance the role of the family, in 2010, an active alert village program was declared, where husbands, families and communities are expected to be active in order to better recognize danger signs and complications of pregnancy and increase births by trained personnel in health facilities\textsuperscript{12,13}. The family factor is very important that determines the decision of the mother to choose the place of delivery as some previous studies in Asia and Africa\textsuperscript{14}, but researchers want to see the other side that is different in the region of Indonesia, especially the eastern part., marital status, communication with husband, family structure, access to facilities, community support and wealth with decisions on where to deliver in Muna Regency

**Materials and Method**

The study design used a cross sectional study, starting September 2016 to February 2017. The sample was 730 infants from 2,222 populations spread across 22 health centers in Muna Regency. Sampling in proportion to simple random sampling. Data analysis consisted of univariate, bivariate by classifying variables into two categories of husband’s work; (not working; if you do not have a permanent job and work; have a permanent job), Marital status (Not married; if you do not have a marriage certificate or divorced and Married; have a marriage certificate) communication with husband (no; no discussion; There is if there is discussion with the husband), family structure (no; no influence and no; there is influence) access to facilitation (difficult; very difficult or difficult and not difficult; easy or very easy), community support (not support; not support or very unsupportive and supportive; supportive or very supportive), wealth based on total asset scores in Quintil (low; Q1 to Q2 and high; Q3 to Q5) and further analysis by multivariate.

**Results**

**Characteristics of Respondents:** The number who participated until the end of the study was 730 mothers who had children aged 0-1 years. The description of research results can be seen in the following table 1.

<table>
<thead>
<tr>
<th>Variabel</th>
<th>Delivery in Home (%)</th>
<th>Delivery in health facility (%)</th>
<th>Total N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delivery places</td>
<td>473 (64.8)</td>
<td>257 (35.2)</td>
<td>730 (100)</td>
</tr>
<tr>
<td><strong>Husband job</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not work</td>
<td>66 (14)</td>
<td>40 (15.6)</td>
<td>106 (14.5)</td>
</tr>
<tr>
<td>Labor</td>
<td>86 (18.2)</td>
<td>29 (11.3)</td>
<td>115 (15.8)</td>
</tr>
<tr>
<td>Farmer</td>
<td>132 (27.9)</td>
<td>26 (10.1)</td>
<td>158 (21.6)</td>
</tr>
<tr>
<td>Fishery</td>
<td>20 (4.2)</td>
<td>8 (3.1)</td>
<td>28 (3.8)</td>
</tr>
<tr>
<td>Business</td>
<td>43 (9.1)</td>
<td>18 (7.0)</td>
<td>61 (8.4)</td>
</tr>
<tr>
<td>Private staff</td>
<td>25 (5.3)</td>
<td>34 (13.2)</td>
<td>59 (8.1)</td>
</tr>
<tr>
<td>PNS/TNI/POLRI</td>
<td>17 (3.6)</td>
<td>35 (13.6)</td>
<td>52 (7.1)</td>
</tr>
<tr>
<td>Other, Honorer</td>
<td>84 (17.8)</td>
<td>67 (26.1)</td>
<td>151 (20.7)</td>
</tr>
<tr>
<td><strong>Marital status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not marriage</td>
<td>1 (2)</td>
<td>1 (4)</td>
<td>2 (3.0)</td>
</tr>
<tr>
<td>Marriage</td>
<td>472 (99.8)</td>
<td>256 (99.6)</td>
<td>728 (99.7)</td>
</tr>
<tr>
<td><strong>Husband communication</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>111 (23.5)</td>
<td>31 (12.1)</td>
<td>142 (19.5)</td>
</tr>
<tr>
<td>Yes</td>
<td>362 (76.5)</td>
<td>226 (87.9)</td>
<td>558 (80.5)</td>
</tr>
<tr>
<td><strong>Family Struktur</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self willing</td>
<td>241 (51)</td>
<td>68 (26.5)</td>
<td>309 (42.3)</td>
</tr>
<tr>
<td>Husband</td>
<td>162 (34.2)</td>
<td>107 (41.6)</td>
<td>269 (36.8)</td>
</tr>
<tr>
<td>Parent</td>
<td>55 (11.6)</td>
<td>52 (20.2)</td>
<td>107 (14.7)</td>
</tr>
<tr>
<td>Father in low</td>
<td>50 (12.1)</td>
<td>8 (31)</td>
<td>18 (2.5)</td>
</tr>
<tr>
<td>Community leader</td>
<td>1 (2)</td>
<td>0 (0)</td>
<td>1 (0.1)</td>
</tr>
<tr>
<td>Friend/neighbor</td>
<td>1 (2)</td>
<td>2 (8)</td>
<td>3 (0.4)</td>
</tr>
<tr>
<td>Health staff</td>
<td>3 (6)</td>
<td>20 (7.8)</td>
<td>23 (3.2)</td>
</tr>
</tbody>
</table>

Table 1. Characteristics of family components by place of delivery in Muna District in 2017
Based on marital status, generally the marital status is 728 people (99.7%). Based on the family structure, most decisions are determined by the mother’s own will of 309 people (42.3%). Access to childbirth facilities is generally easy namely 583 people (79.9%). Based on community support, generally it supports 527 people (72.2%). Wealth status, most are in the range of Q4 (rich) ie 332 people (45.5%)

Family factors related to the place of delivery: To see the relationship between family components related to the choice of place of delivery (Table 2), a bivariate and multivariate analysis was performed. The results of the bivariate analysis showed that the husband’s work, marital status, access to labor facilities and wealth did not have a significant relationship with the place of birth (p> 0.05). Communication with husband has a significant relationship (p <0.05) OR = 2.23. This shows that mothers who do not communicate with their husbands regarding planning helpers and delivery places have 2.23 times the chance to give birth at home compared with those who communicate. The family structure has a significant relationship (p <0.05) OR = 2.89. This shows that the absence of the role of family structure towards pregnant women has a potential 2.89 times that mothers will give birth at home compared to those who have a role. Community support also has a significant relationship (p <0.05) OR = 2.76. This shows that mothers who do not have the support of the community have 2.76 times the opportunity to give birth at home compared to those who have the support of the community. Next we conducted a multivariate analysis. The test results using logistic regression analysis with back ward elimination method. The results show that women who do not communicate with their husbands regarding birth planning (Adjusted Odds Ratio (AOR): 2.61 [1.02-2.53]) are more likely to give birth at home than those who communicate with their husbands. In the absence of the role of family structure in pregnant women (AOR: 2.56 [1.82-3.59]), it is 2.56 times more likely to give birth at home compared to mothers whose families have influence. The lack of community support for pregnant women (AOR: 2.19 [1.57-3.06]) has the potential of 2.19 times mothers giving birth at home.

Table 2. Family factors related to the place of delivery in Muna District in 2017

<table>
<thead>
<tr>
<th>Variable</th>
<th>Bivariable Analysis</th>
<th>Multivariable analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unadjusted odds ratio (OR) 95% CI</td>
<td>ρ</td>
</tr>
<tr>
<td>Husband job</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not work</td>
<td>Ref.</td>
<td>0.555</td>
</tr>
<tr>
<td>Work</td>
<td>0.88 (0.58-1.35)</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Access to facility</th>
<th>Delivery in Home (%)</th>
<th>Delivery in health facility (%)</th>
<th>Total N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very difficult</td>
<td>11 (2.2)</td>
<td>6 (2.3)</td>
<td>17 (2.3)</td>
</tr>
<tr>
<td>Difficult</td>
<td>18 (3.8)</td>
<td>13 (5.1)</td>
<td>31 (4.2)</td>
</tr>
<tr>
<td>Easy</td>
<td>338 (82)</td>
<td>195 (75.9)</td>
<td>583 (79.9)</td>
</tr>
<tr>
<td>Very easy</td>
<td>56 (11.8)</td>
<td>43 (16.7)</td>
<td>99 (13.6)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Community support</th>
<th>Delivery in Home (%)</th>
<th>Delivery in health facility (%)</th>
<th>Total N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very support</td>
<td>89 (18.8)</td>
<td>51 (19.8)</td>
<td>140 (19.2)</td>
</tr>
<tr>
<td>support</td>
<td>332 (70.2)</td>
<td>195 (75.9)</td>
<td>527 (72.2)</td>
</tr>
<tr>
<td>Not support</td>
<td>51 (10.8)</td>
<td>11 (4.3)</td>
<td>62 (8.5)</td>
</tr>
<tr>
<td>Very not support</td>
<td>1 (2)</td>
<td>0 (0)</td>
<td>1 (0.1)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Wealthy</th>
<th>Delivery in Home (%)</th>
<th>Delivery in health facility (%)</th>
<th>Total N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>13 (2.7)</td>
<td>5 (1.9)</td>
<td>18 (2.5)</td>
</tr>
<tr>
<td>Q2</td>
<td>71 (15)</td>
<td>28 (10.9)</td>
<td>99 (13.6)</td>
</tr>
<tr>
<td>Q3</td>
<td>162 (34.2)</td>
<td>82 (31.9)</td>
<td>244 (33.4)</td>
</tr>
<tr>
<td>Q4</td>
<td>213 (45)</td>
<td>119 (46.3)</td>
<td>332 (45.5)</td>
</tr>
<tr>
<td>Q5</td>
<td>14 (3)</td>
<td>23 (8.9)</td>
<td>99 (5.1)</td>
</tr>
</tbody>
</table>
### Variable	| Bivariable Analysis | Multivariable analysis |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unadjusted odds ratio (OR) 95% CI</td>
<td>Adjusted odds ratio (OR) 95% CI</td>
</tr>
<tr>
<td><strong>Marital status</strong></td>
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<td></td>
</tr>
<tr>
<td>Not marriage</td>
<td>Ref.</td>
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</tr>
<tr>
<td>Marriage</td>
<td>0.54 (0.03-8.71)</td>
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</tr>
<tr>
<td><strong>Husband communication</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>Ref.</td>
<td>*0.000</td>
</tr>
<tr>
<td>Yes</td>
<td>2.23 (1.45-3.44)</td>
<td>Ref.</td>
</tr>
<tr>
<td></td>
<td>1.61 (1.02-2.53)</td>
<td>*0.040</td>
</tr>
<tr>
<td><strong>Family structure</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>Ref.</td>
<td>*0.000</td>
</tr>
<tr>
<td>Yes</td>
<td>2.89 (2.07-4.02)</td>
<td>Ref.</td>
</tr>
<tr>
<td></td>
<td>2.56 (1.82-3.59)</td>
<td>*0.000</td>
</tr>
<tr>
<td><strong>Access to facility</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Difficult</td>
<td>Ref.</td>
<td>0.511</td>
</tr>
<tr>
<td>Not Difficult</td>
<td>0.82 (0.45-1.49)</td>
<td></td>
</tr>
<tr>
<td><strong>Community support</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not support</td>
<td>Ref.</td>
<td>*0.003</td>
</tr>
<tr>
<td>support</td>
<td>2.76 (1.14-5.39)</td>
<td>Ref.</td>
</tr>
<tr>
<td></td>
<td>2.17 (1.09-4.32)</td>
<td>*0.027</td>
</tr>
<tr>
<td><strong>Wealthy</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>Ref.</td>
<td>0.085</td>
</tr>
<tr>
<td>Hihg</td>
<td>1.47 (0.95-2.26)</td>
<td></td>
</tr>
</tbody>
</table>

* signifikan

### Discussion

Our study aims to look at the determinants of the influence of family factors on the use of health facilities as a place of delivery. WHO recommends that safe deliveries should be performed in a health facility16, but in this study only 35% were found. This figure is still far below the coverage of Southeast Sulawesi 61.7% even nationally 83.7%7. Most of the respondents’ husbands work as farmers and laborers. The husband’s work is very important in terms of improving the family’s economy which can determine the ability to give birth in a health facility17, 18. In this study it was found that mothers with farmer husbands, laborers or unemployed have limited abilities so that labor tends to be done at home. If they want to go to the puskesmas or hospital, they depend more on the cost of childbirth on the poor health insurance (Askeskin), assistance from parents or in-laws19.

The importance of communication with the husband appears in this research. Planning a helper and place of delivery if done earlier will make the husband have the responsibility in preparing funding for delivery. A similar previous study, found the importance of communication with a partner during pregnancy to be able to prepare for labor by trained staff at a facility20-22.

The influence of family structure largely determines labor in a home or health facility. In this study it was found that there were no strong interventions from families regarding the place of delivery, giving the opportunity for pregnant women to give birth 2.89 times at home. More worrying is the culture of giving birth at home by midwives and traditional healers may have the support of the family23-25. Distance and economy are the reasons for not using facilities as in previous studies26, but this study is different because access to facilities is quite easy and the level of wealth is quite high. This evidence of family support for giving birth at home is very strong11.

As social beings we need the support of other people or the community around us in life, including support
when giving birth. Support from the surrounding community comes from neighbors, relatives, or other relatives\(^27\). In this study it was found that pregnant women who did not get community support had 2.7 times the chance of giving birth at home. Therefore community support is very important in encouraging pregnant women to use health facilities as a place of delivery. Such community support may be in the form of financial assistance, thoughts, health service information or moral support that encourages pregnant women to give birth in a health facility\(^28-31\)

Conclusion

The results showed the husband’s communication factors, family structure, and community support had a significant relationship with the choice of place of delivery while the husband’s work, marital status, access to facilities and wealth were not related.

Ethical clearance-Taken from Faculty of Public Health ethical committee

Source of Funding: Self

Conflict of Interest: Nil

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Accessibility of Availability of Public Health Services Dayak Tribe in Samarinda “Qualitative Study”

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Abstract

In Indonesia, health services are still a problem both in terms of financing, quality, and public access. The purpose of this study is to analyze the availability of public health services in the Dayak tribes. Informants in this study are indigenous Dayaks Society, the Society who were and had experienced/illness, Dayak Customary Chief, Head of health center and health workers. Analysis of the data in this study using thematic analysis. The primary data obtained from direct observation and in-depth interviews and focus group discussion (FGD), while the secondary data obtained from the study documents. Based on this research, accessibility of public health services in the Dayak based on an interview to the informant still has limited Human Resources (HR), infrastructure, medical equipment and pharmaceuticals (drugs). Advice to the city administration should have to provide health care facilities that can be accessed 24 hours as “Homecare Health Center” mainly Dayak and other communities who live on the outskirts of the city of Samarinda. There needs to increase the number of health workers, especially doctors and surveillance personnel.

Keywords: Aksesibilitas, Layanan Kesehatan, Dayak.

Introduction

Health workers there were more concentrated in urban areas, it is possible urban health centers are economically better and very promising in very remote health centers appeal. Remote areas and rural disadvantage, not only because it has fewer health care facilities, but also the difficulty associated with health sector workers¹. Access is not only distance, but also the availability of resources, namely the means (Tumanggor 2010)², infrastructure, and human resources and budgeting³-⁵.

Households knowledge about the existence of the practice of a midwife or maternity hospitals nationwide was 66.3 percent, the highest in Bali (85.2%) and lowest in Papua (9.9%). Knowledge of the existence of integrated health service post as much as 65.2 percent, the highest in West Java (78.2%) and lowest in Bengkulu (26.0%). Proportion of Households using various modes of transportation motorcycle to the government hospital in 53.6 percent of urban and 46.5 percent rural. To use public transport in urban areas 28.0 percent and 35.5 percent rural. While using more than one mode of transport in urban areas while in rural areas 8.5 percent 11.4 percent.

Samarinda city is one of the most multi-ethnic settled because the number of immigrants from other regions and indigenous people who are looking for work in the city of Samarinda, thus requiring attention related to public access to health services remains low and is not covered, the number of health workers are still lacking, time and distance to health care is still a problem. Past research has studied some of the dimensions of accessibility, but research is mostly done using quantitative Method and yet many researchers who studied qualitatively. Among some of the existing research dimension, the dimension of accessibility proposed consists of the accessibility factor approachability, acceptability, availability and accommodation, affordability and appropriateness has not been widely used as a reference in the accessibility of health services research⁶-⁸. Based on several research studies, theories about the accessibility of health services, the researchers were interested in examining the accessibility of the availability of health services for the Dayak people in the city of Samarinda.
**Materials and Method**

In this study, researchers used a qualitative research method with case study approach is a study that aims to describe and understand and explain how the accessibility of health services availability Dayak community in Samarinda. The research was conducted in the city of Samarinda which are urban areas wulayah Kalimantan Dayak tribal communities. The election procedure informants in this study is using purposive procedure. The informant in this research that indigenous Dayaks Society, the Society that are and have experienced/illness, Dayak Customary Chief, Head of health center and health professionals. Analysis of the data in this study using thematic analysis, The data collection was obtained by conducting interviews with informants.

**Results**

Factors Availability and Accomodation all kinds of health services needed by the people is not difficult, as well as its presence in the community at any time that it takes the form of infrastructure, equipment adequate health, pharmaceuticals (drugs) and health human resources (doctors, midwives and nurses).

**Infrastructure:** Infrastructure for health services provided in the city of Samarinda felt was sufficient. Health infrastructure as befits a provincial capital in other places, there are many choices for accessing and utilizing health facilities especially the government and private Hospitals.

One of the key informants, addressing conditions of health care infrastructure in the city of Samarinda, as follows.

“Infrastructure in general is sufficient, in the sense of being rich, the infrastructure of the ingredients may need additional kinds of things, such as parking and all kinds” (DK)

This is confirmed also by other informants:

“the building is good, sir” (DI2, 58 Th)

**Medical tools:** Medical equipment is something that people felt inadequate, because there are still some requirements with appropriate equipment for quality health care. It is revealed from the following disclosure of some key informants:

“Praise be to God, it is enough because we are not hospitalized, it is not treated like that” (DK)

“So thank God, if that at least we have fulfilled” (JM)

“Primary health care problem in Pampang is sometimes there is no blood check equipment, cholesterol check tools and other checks” (DI2, 58 Th)

**Pharmacy:** Procurement and availability of drugs, especially in the health center, was considered good enough as explained by key informant described below:

“Use it as possible. Alhamdulillah, right now the health center has already had a pharmacist, let alone want to accreditation, the goal must be that it must be complete”(DK)

“There was once, and it happened indeed in the pharmaceutical warehouse is empty. But whatstisname that there are drugs that his choice another term is no other choice he did the same, but could not really empty consumables same” (“JM)

“Then there is the doctor or the spouse who is checking this pain, right, right, there is always no medicine, you just have to come back home who has a fever, sir, how come you come to the doctor, uh, to the health center again tomorrow is closed again. So what should I do, the puskesmas is 24 hours, sir. Now that drug is often not there sir. The area here is including the city area, near samarinda”(DI1, 60 Th)

“Only the medicine at the health center for the illness that was not so severe, the severe illness was immediately referred to, which I saw there was no blood and cholesterol check”

“So if I, I am my disease because I am old, I am 72, my prostate disease must go to a public hospital, so this month I went to the public hospital to take prostate medication, no medicine this month. So if at the puskesmas why should I go to the hospital to take medicine, why don’t the medicine go to the health center so that it is also close to mine, also the cost from Pampang is 50 Kepuskesmas can also be sent if they do, but it is also difficult every month I get there this month there is no medicine. So they told me to wait for the drug this month but I haven’t left But thankfully because I have no problems with urinary problems, it’s a disorder if the prostate is a genuine parent. I also had surgery for stone kidney stones yesterday, if the service at that time is ok, the service is only because of the reason we postpone the long delay until 1 month wait, many women say
we suffer from us too long we wait, suffer the cost of suffering pain ha ha ha ha” (DI2, 58 Th).

**Human Resources:** Human Resources for Health is required to create an appropriate health services and qualified patient needs.

“Iyah Internship, every year right we can be an additional 5, 5 so so very helpful at both the field and what it later so. But his own doctor if power is actually also “(DK).

The existence of human resources for health in the city of Samarinda, especially PHC is recognized, a key informant had provided, as stated below.

“The doctors we are actually hospitalized we had 3, under 4 we have 7 but e just now just one doctor mutase to Jogja follows husband, one doctor again pulled out due to be Acting head of the health centers in lempake that here one doctor learning tasks in Unhas also, So under the 2 remaining above 2 to 4, dentist 1 “(JM)

“Because we hear complaints so even if we are not allowed stay where where but complaints that we need to hear this society procession. Moreover, they go for treatment was not often come for treatment to the clinic there was no doctor there is also no cure “(DI1, 60 Th).

“if I sir, if here we want to go to health services, there should be a midwife or a spouse. there is no midwife because we as housewives want complaints from women as well, we have to have the midwife only if we are ... if we consult the womb pain difference, the midwife knows we feel free we feel we want to “(DI7, 50 Th)

**Discussion**

Factors Accessibility all kinds of health services needed by the people is not difficult, as well as its presence in the community at any time that it takes the form of availability of facilities and infrastructure, equipment adequate health, pharmaceuticals (drugs) and the source human resources (HR) factors accessibility Availability (Availability and Accomodation) all kinds of health services needed by the people is not difficult, as well as its presence in the community at any time that it takes the form of infrastructure, equipment adequate health, pharmaceuticals (drugs) and the source health human resources (doctors, midwives and nurses).

**Infrastructure:** Infrastructure for health services provided in the city of Samarinda felt was sufficient. Health infrastructure as befits a provincial capital in other places, there are many choices for accessing and utilizing health facilities especially the government and private hospital. Currently, the city of Samarinda at least have had the health facilities (infrastructure), such as the hospital as much as 17 government and private hospitals, 24 health centers with various levels of stratification continues level to meet the standards and quality of health services measured.

Although health service infrastructure rated adequate, but the following few key informants suggested still the need to improve infrastructure in order to meet the standards of quality healthThere is a desire to rehabilitate the building, especially at the primary care level to plan their special space to care for the elderly, their meeting place/meetings broader staff and meet the standards supported boardroom meeting facilities.

With the potential power of health service infrastructure, especially 24 health centers scattered throughout the districts, and villages, health centers in the city of Samarinda can initiate emergency services 24 hours, gradually based on the medical needs of emergency in the district area (based kominitas such ethnic Dayak tribes and rural communities Samarinda city). To support the 24-hour service for emergency conditions needed some cars faster health care (home care). This car is equipped with a small body supporting health facilities for those suffering from heart disease and more importantly equipped with telemedicine.

**Medical tools:** Medical equipment is perceived all health care-related partners (providers and users/patients) are still inadequate. This was revealed by some health care providers who say certain types of equipment not available, the patient is required in the examination.

For example, dental care unit facilities, can already kindling revocation of all kinds, the term in accordance with service standards. When referring to the Minister of Health, especially the basic examination (not hospitalization), the equipment available is deemed to have complied.

Based on the recognition of some participants in the discussion (FGD) from the Dayak tribe, they say if standard hospital equipment such as hospitals Abdel Wahab Syahrane (Hospital AWS) and RS Abdul Muis and other hospitals (private hospitals) in Samarinda city, judged complete and adequate.
Pharmaceuticals (Drugs): Pharmaceuticals (Drugs) are available both in auxiliary health center and health centers have never experienced problems in terms of both supply and availability. Drugs that are needed by the community can be obtained easily, especially in auxiliary health center. Demand for drugs from auxiliary health center conducted every month, adjusted for the needs of island communities. For drug distribution auxiliary health center parties should come to the clinic to take the demand for drugs by using the services in every single month which coincides with the monthly health center workshop.

Human Resources (HR) Health: Not only in Indonesia, the physical availability of health services begins with the service, but the distribution of services and medical personnel are not uniform across Australia. The concentration of medical practitioners, for example, the highest in large cities (392 medical practitioners equivalent full per 100,000 population), and significantly lower in the remoteness of the other, with outdoor areas that have the lowest rates (206 medical equivalent of a full time practitioners per 100,000 population).

The problem of inadequate staff and lack of health care services reverberate throughout the interview. “There is no chemist, no doctor, no other services, so everything is pretty limited at this stage”. Some reportedly in need of services including X-rays, a defibrillator, a local surgery, kidney dialysis services. Issues of health human resources is still a problem that needs to be resolved. Interesting facts discovered why health care workers who are in the area of the island is always deficient because when the life of a health worker has been prosperous, so they decided to leave the place where he works, and chose to live and serve in place better and have better access anyway.

Ethical Clearance: Taken from favultu of public health ethical committee

Source of Funding: Self

Conflict of Interest: Nil

Conclusion

Based on the description above, it can be concluded that the availability of Dayak community health services is inadequate, this is based on the availability of facilities and infrastructure in health facilities which are considered inadequate, such as infrastructure, medical equipment, pharmaceuticals and unmet health human resources. needs of health care facilities.

References


Role of Genetic Polymorphisms of Angiotensin Converting Enzyme to Cardiovascular Endurance in Men Ages 13-14 Years After Fartlek Training for 3 Months

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¹Faculty of Medicine, Universitas Hasanuddin, ²Faculty of Science, Universitas Negeri Makassar, Indonesia

Abstract

Physical ability is influenced by two factors, namely environmental and genetic factors. Environmental factors that influence are exercise intensity, nutritional intake, and age. Another factor that is not less important in influencing cardiovascular endurance is genetic factors. One of gene variation that is considered to determine the athlete’s potential is the variation in the ACE gene symbolized by I and D. The ACE gene insertion/deletion polymorphism (I/D) has an important relationship with cardiovascular fitness with genotype II which shows a lower level of cardiorespiratory fitness with VO₂max than the Non II genotype (ID and DD). The purpose of this study was to assess how the role of the ACE gene in male cardiovascular endurance aged 13-14 years. This study provides a three-month fartlek training program and conducts cardiovascular endurance tests before and after taking a three-month fartlek training program. In group II genotype subjects showed the results of increased cardiovascular endurance compared to the Non II genotype subject group. Research can conclude a strong relationship between the variation of the angiotensin converting enzyme gene II genotype against male cardiovascular age 13-14 years.

Keywords: ACE gene, cardiovascular endurance, fartlek training.

Introduction

Efforts to improve sports performance cannot be separated from physical conditions, because the physical condition supports when practicing or competing to show the best performance by displaying techniques and tactics effectively and efficiently. Good physical condition is one of the absolute requirements to achieve optimal performance. Sports training strategies focus on athletes’ interests and achievements. Genetic potential of individuals must be considered to get high achieving athletes, because with the appropriate genetic variation there is a greater chance of producing accomplished athletes than athletes who have inappropriate genetic variations if they receive the same training intervention and motivation. This research concentrates on finding the right genetic profile to contribute to sports performance. One of the main objectives of this research is to help trainers to identify and guide individuals with genetic potential to become elite athletes.

ACE gene is an important factor that needs to be considered. The results of this study prove that human physical performance is influenced by genetic profiles¹. Allele I was found to have a beneficial effect on higher maximum oxygen uptake values. Characteristic distribution of genotypes was found, where allele II was more common in individuals doing aerobic exercise and DD alleles in individuals who were disciplined in anaerobic exercise². The role of ACE gene polymorphism with cardiovascular response with irregular resistance training in women. The subject of DD alleles is greater in post-exercise hypotension, While the allele I showed a greater increase in heart rate after endurance training³ the integration of several genes added to environmental factors, identification of talents and prescription of training programs that maximize the athlete’s individual potential based on genetic variable characteristic, will be able to make a revolution in sports science. polymorphism gene ACE II which states higher ACE activity has a correlation with the ability for sports that require endurance, while DD polymorphisms and higher ACE activity are related to sprint ability⁴. Variations
in the Angiotensin Converting Enzyme gene which were interacted with resistance showed differences in changes in endurance results, namely genotype II which was better than the variation of DD genotype, with an average increase of 11.57ml/kg/minute, while the DD genotype decreases by an average of-8ml/kg/minute.

There is an individual variability characterized in response to endurance training, and some research results suggest that this part of the variation is genetically regulated. In addition, the results show that genetic variation. The ACE gene can affect blood pressure response to exercise, although more research is needed to confirm this finding.

Research results of Myerson S, et al. showed a linear tendency to increase the frequency of allele I with running distance. The allele I ACE gene is associated with improved endurance performance. In addition, the insertion/deletion (I/D) type polymorphism of the ACE gene also influences the process of performance in the heart as the results of the study. Aziza, L., et al. which states that the insertion/deletion (I/D) type polymorphism of the ACE gene affects ACE concentration in the blood and affects blood pressure. Blood pressure changes are affected by changes in angiotensin II, aldosterone or active vaso substances.

This relatively new approach needs to be considered by sports institutions in determining the right strategies to foster the seeds of young athletes to improve sports performance. So, research can be utilized by considering the variation of the genotype II of the ACE gene in the search for potential talent for Indonesian endurance athletes. If the genetic information of prospective young athletes obtained earlier, is expected to have a significant influence on the effectiveness of sports training in general.

**Research Method**

This type of research is a retrospective cohort study using a cross-sectional design or approach to describe the correlation between factors and effects. Research in October 2018 January 2019 in South Sulawesi. The population in this study were SMP N 3 Sungguminasa students with a age range of 13-14 years, amounting to 78 people to be the number of samples in this study but those who completed until the end of the study were 59 samples. Data were analyzed using SPSS version 24. The results are displayed in the form of narratives and tables.

**Measurement Procedure:** The 12-minute run test designed by Cooper is a field test that is relatively easy and inexpensive, because it requires enough running track or can also use public roads and time measuring devices (watch or stopwatch). The cooper test (running 12 minute) is used to determine endurance. The implementation of the 12-minute run test requires a rather complicated procedure, in which participants are required to stop when the 12-minute time has been exceeded, then they need to give a sign where the stop is, to immediately measure the distance the result is taken. If there are many test participants, it needs carefulness to measure it. The distance reached is then confirmed in the physical fitness category table to determine the fitness status of the sample. The test categories are distinguished by sex and age group. In the implementation the 12-minute run test requires a running track even though it can be carried out on the streets.

**Test implementation**

1. Beginning attitude
2. Participants stand behind the start line
3. Movement:
   a. In the “READY” command, the participants took a stand, ready to run
   b. On the “YES” command the participants ran as much as possible until the time showed 12 minutes
   c. After reaching 12 minutes the stopwatch is turned off and the runners are told to stop at their respective places
   d. What is measured is how many meters can be taken while running for 12 minutes. If it stops it is considered a failure
   e. Record of results

The distance taken during a 12-minute run is recorded in meters, as a result of the test takers.

**Ways To Calculate Cooper’s VO\textsubscript{2max} test**

\[
\text{VO}_{2\text{max}} (\text{ml/kg/mnt}) = \frac{(\text{Distance (Meter)} - 504,9)}{44,73}
\]

Results obtained from the above calculations. After that, classify according to the fitness category table based on the Cooper test.
Result and Discussion

This study was conducted from October 2018 to January 2019. Selection of respondents by age category and sex at SMPN3 Sungguminasa Gowa Regency by ages 13 to 14 years old. In this study involved 59 male sex students. Characteristics of research subjects include age, weight, and height.

Table 1: General characteristics of research subjects

<table>
<thead>
<tr>
<th>No.</th>
<th>Variable</th>
<th>Means± SD</th>
<th>Min-max</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Age</td>
<td>13,02 + 0,13</td>
<td>13-14</td>
<td>0,000</td>
</tr>
<tr>
<td>2</td>
<td>Weight</td>
<td>37,07 + 8,073</td>
<td>25-64</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Height</td>
<td>144,51 + 6,654</td>
<td>129-159</td>
<td></td>
</tr>
</tbody>
</table>

Source: Primary Data, 2018

Table 1 above present information on average age of sample 13,02 years old with a range of 13 to 14 years old, average weight of 37,07 kg with a range of a minimum weight of 25 kg and a maximum weight of 64 kg, the average height of 144,51 cm with the range of 129-159 cm.

Table 2. Characteristics of the subject gene variation

<table>
<thead>
<tr>
<th>Gene Variation</th>
<th>Before</th>
<th>After</th>
<th>Change</th>
<th>P*</th>
<th>P**</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean±SD</td>
<td>Mean±SD</td>
<td>Mean±SD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>27,6±4,5</td>
<td>32,5±3,8</td>
<td>4,9±0,7</td>
<td>0,000</td>
<td>0,000</td>
</tr>
<tr>
<td>Non II</td>
<td>29,2±4,9</td>
<td>31,8±4,8</td>
<td>2,6±0,1</td>
<td>0,000</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>28,5±4,8</td>
<td>32,1±4,4</td>
<td>3,6±1,8</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2 provides information on the gene variations angiotensin-converting enzyme found among the sample population. There are two variations group of the ACE gene in which samples with a variation within the variations in Non II genotype have a greater number than II genotype from 59 samples in this study.

Table 3. Cooper Test Results before the fartlek training program

<table>
<thead>
<tr>
<th>No.</th>
<th>Gene Variation</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>II</td>
<td>25</td>
<td>42,4</td>
</tr>
<tr>
<td>2</td>
<td>Non II</td>
<td>34</td>
<td>57,6</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>59</td>
<td>100</td>
</tr>
</tbody>
</table>

*Paired T test **Independent T test

Based on Table 3 above it can be seen that the effect of fartlek training for 3 months showed an increase in cardiovascular endurance (VO2max) significantly p < 0.001 by (4.9 ± 0.7) ml/kg/min, from (27.6 ± 4.5) ml/kg/min to (32.5 ± 3.8) ml/kg/min in the genotype II group. Whereas the Non II genotype showed a significant increase in VO2max p <0.001 by (2.6 ± 0.1) ml/kg/min, from (29.2 ± 4.9) ml/kg/min to (31.8 ± 4.8) ml/kg/min. Furthermore, the fitness test category can be seen in table 4.

Table 4. Fitness Test Category (VO2max) for Men (value in ml/kg/min)

<table>
<thead>
<tr>
<th>Age</th>
<th>Bad</th>
<th>Lower average</th>
<th>Average</th>
<th>Above average</th>
<th>Excellent</th>
<th>Superior</th>
</tr>
</thead>
<tbody>
<tr>
<td>13-19</td>
<td>&lt; 35.0</td>
<td>35.0-39.9</td>
<td>40.5-45.1</td>
<td>45.2-50.9</td>
<td>51.0-55.9</td>
<td>&gt; 55.9</td>
</tr>
<tr>
<td>20-29</td>
<td>&lt; 33.0</td>
<td>33.0-39.0</td>
<td>39.9-43.3</td>
<td>43.9-48.7</td>
<td>49.3-52.5</td>
<td>&gt; 52.6</td>
</tr>
<tr>
<td>30-39</td>
<td>&lt; 31.5</td>
<td>31.5-38.4</td>
<td>38.5-41.8</td>
<td>42.4-47.4</td>
<td>48.0-51.4</td>
<td>&gt; 51.6</td>
</tr>
</tbody>
</table>

The increase in VO2max due to the effect of fartlek training for 3 months on subjects in the II genotype and Non II genotype groups showed an increase in cardiovascular endurance (VO2max) significantly p <0.001, however the increase did not change the category of fitness level which was still in the “Bad” category, if adjusted to the table above categories.

Statistical test results obtained significance value of 0.000 (P <0.005), so it was concluded that there was a difference in Test cooper on the first measurement with the second measurement score.

To see a comparison of the increase in cardiovascular endurance (VO2max) in both groups of II genotypes and Non II genotypes ACE genes after taking 3 months of fartlek training.
Conclusion

In this study, the distribution of 59 participants who were students aged 13 to 14 years at SMP N 3 Sungguminasa, Gowa Regency obtained II genotype 57.6% and Non II genotype 42.6%.

Based on the results of the variation of the angiotensin converting enzyme gene that was interacted with changes in cardiovascular endurance showed male subjects aged 13-14 years who took fartlek training for 3 months with the ACE gene, that group II genotypes had a greater increase than the Non II genotype group either through approach to distance when running for 12 minutes or the ability of VO2max. However, the increase in cardiovascular endurance of subjects in both genotypes II and Non II subjects did not change in the fitness category.

Conflict of Interest: None

Source of Funding: Self

Ethical Clearance: From the University Hasanuddin committee.

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The Expression of miR-21 and miR-29c in Blood Plasma of Nasopharyngeal Carcinoma Patient Post-Chemoradiotherapy

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Abstract

Background and Objective: Radiotherapy and chemotherapy are main therapy for tumor. Nasopharyngeal carcinoma (NPC) is a malignant tumor which come from nasopharyngeal epithelial cells (a squamous cell carcinoma). MicroRNAs (miRNAs) are non-coding RNAs, acting as post-transcription regulators in the target gene. MiRNAs have an important role in the pathogenesis of NPC, they may act as tumor suppressor genes or as oncogenes and their regulation is related to the prognosis of the disease and the outcome of therapy in the target gene. This study aims to determine the effects of chemoradiotherapy on miR-21 and miR-29c in blood plasma of nasopharyngeal carcinoma patient.

Materials and Method: Prospective cohort was used as a research design. The study was conducted in Wahidin Sudirohusodo Hospital Makassar in February-November 2017. Plasma of blood collected after chemoradiotherapy will be isolated, then synthesized into c-DNA and calculated the quantitative amount with qRT-PCR.

Result: There were 16 samples consisting of 9 NPC plasma post chemoradiotherapy and 7 plasma NPC post radiotherapy. From the plasma we detected miR-21 and miR-29c. The expression of miR-21 in post chemoradiotherapy decreased compared to pre-therapy, in contrast, the expression of miR-29c in postchemoradiotherapy increased compared with pre-therapy. The expressionsof miR-21 and miR-29c in post radiotherapy decreased compared to pre-therapy. The expression of miR-21 in post chemoradiotherapy decreased compared to post radiotherapy, in contrast, the expression of miR-29c in post chemoradiotherapy increased compared with post radiotherapy.

Conclusion: We found essential differentiation between mRNA-29c expression before and after radiotherapy at nasopharyngeal carcinoma patient, so it can consider as predictive factor for therapy responses.

Keywords: Nasopharyngeal carcinoma, miRNA, miR-21, miR-29c, chemoradiotherapy, radiotherapy, qRT-PCR.

Background

MicroRNA is an endogenous RNA non-protein-coding molecule with size of (18-25nt), its primary function is to decrease transcription and/or protein content in its target.⁹ MicroRNAs (miRNAs) have been shown to play a role in the clinical and biological behavior of human cancer cells, including NPC. In NPC, miRNA plays an important role in the pathogenesis of NPC as tumor and oncogene suppressor genes and its regulation is related to disease prognosis and therapy outcomes.⁹ The first known miRNA characteristic in NPC is miR-29c (Sengupta et al). It was also found that miR-29c serves as tumor suppressive, enhances migration and invasion of NPC cells through regulation of extracellular dimeric components.²¹ While the study by Zhang et al showed that the decrease of miR-29c occurred in increased resistance to apy and platinum-based chemotherapy through regulation of antiapoptotic Mcl-1 and Bcl-2. Like other miRNAs, miR-29c can work through multiple ways to suppress proliferation, survival, and motility of NPC cells.²⁷
Among all types of miRNA, miR-21 is a key oncogene, since it was found in many cancers and contributes to multiple malignant processes such as increasing proliferation of NPC cells, suppressing apoptosis, tumor growth in MCF-7 cells and decreasing invasion and metastasis in MDA-MB-231.15

Nasopharyngeal carcinoma (NPC) is a malignant tumor which comes from nasopharyngeal epithelial cells (a squamous cell carcinoma (SCC), a multifactorial genetic disease with endemic characters. An estimation of 87,000 new cases of nasopharynx appear each year.1-2 of NPC is primarily found in men of reproductive age (the ratio of male and female patients is 2.18:1) and 60% of patients between the ages of 25 and 60. The highest incidence rate in the world is found in the province of Southeast China with 40 to 50 cases of nasopharyngeal cancer among 100,000 inhabitants. In Indonesia, nasopharyngeal carcinoma is ranked 4th after breast cancer, cervical cancer, and lung cancer with an incidence of about 4.7 per 100,000 population (GLOBOCAN 2012). Most patients who come for treatment are already in an advanced stage, resulting in poor treatment outcome and prognosis. In Dadi hospital and Dr. Wahidin Sudirohusodo hospital during the 10-year period (1990-1999) found 274 cases (47.98%) of NPC from malignant head and neck tumors in the ratio between male and female of 2.6:1 From Nasopharyngeal carcinoma profile data at Dr. Wahidin Sudirohusodo hospital Makassar, South Sulawesi province from January 2004 to June 2007 NPC has constituted 33% of malignancy in the ears, nose, and throat, (2000-2009) found 362 cases (57.28%) of malignant head and neck tumors6,7

Despite improvements in chemoradiotherapy, the prognosis of NPC remains poor with a 5-year survival rate of less than 60%. The main cause of treatment failure and metastasis is the occurrence of resistance to radioactive substances and antitumor drugs.27

Based on these backgrounds, this research was conducted to determine the effects of chemoradiotherapy on the expression of miR-21 and miR-29c in blood plasma of patients with nasopharyngeal carcinoma.

This study has no conflict of interest. Source of Funding: are independent.

Materials and Method

Location and Time of the Research: The study was conducted at ENT Head & Neck Dr. Wahidin Sudirohusodo hospital the period of February-November 2017.

Design and Variable Research: This study is a prospective cohort study. Independent variables (chemoradiotherapy and radiotherapy), intermediate variables (nasopharyngeal carcinoma), dependent variables (miR-21 and miR-29c expression) and external variables (EBV infection, lifestyle, and genetic).

Population and Sample: Thetestypopulationwas NPC patients of stage I, II, III, IV who had not been treated, cametothe Polyclinic of ENT Head & Neck Dr. Wahidin Sudirohusodo hospital, thenmonitored during therapy (chemoradiotherapy) during February-November 2017. The sample is the entire population that meets the research criteria.

Research Ethics: Any action is made on the consent of the patients/the parent(s) of the patients through the informed consent sheet and fulfilled the ethical requirements to be implemented from the Commission on Biomedical Research Ethics in Human Faculty of Medicine Hasanuddin University. Recomendation number: 921/H4.8.4.5.31/PP36-KOMETIK/2017

Method of collecting data: Sampling was done by consecutive sampling, all patients with nasopharyngeal carcinoma that has not been treated, either by chemotherapy / radiotherapy / chemoradiotherapy that meets the inclusion criteria.

The inclusion criteria were NPC patients (all stages) who had been diagnosed based on histopathologic examination, aged> 15 years, no malignancy found in other organs, no history of hemostatic disorders, NPC patients with chemotherapy regimens Cisplatin + Paclitaxel, and are willing to be research samples.

The exclusion criteria are NPC patients who have received chemotherapy, radiotherapy, or chemoradiotherapy.

The dropout criteria were lysis blood samples, the patients who died before the chemoradiotherapy protocol was completed, the change the chemotherapy regimen (Carboplatin/Docetaxel).
Group 1: Blood plasma samples after treatment (neoadjuvant chemoradiotherapy), regimens of cisplatin and paclitaxel, followed by radiotherapy.

Group 2: Blood plasma samples after radiotherapy only.

The both groups received the same treatment process, as (± 2-5ml of blood plasma) is taken and inserted into the tube which has been given EDTA 10%. After that it is centrifuged at 3000 rpm for 10 minutes. Plasma is taken and stored in the-80°C refrigerator and labeled. Then the isolation of RNA is done with the plasma samples using miRCURY RNA Isolation Kit-BiofluidExiqon (Cat No.300112, Exiqon), then synthesized into cDNA using the Universal cDNA Synthesis Kit II (Cat No. 203301, Exiqon). Then the quantitative quantity is measured by qRT-PCR (Bio-radinc, C1000). The tool used is Exilent SYBR Green Master Mix 2.5mL (Exiqon, Denmark), Primer set miRCURY LNA has-miR-21-5p (Cat No. 204230) with primary sequence, has-miR-29c-3p (Cat No. 204729) with primary sequence and has-miR-16-5p as reference genes (Cat No. 2057020) with primary sequence.

**Statistic analysis:** The statistical analysis used CFX Manager 96 Software (version 3.0 for windows, Bio-Rad Laboratories Inc, California). The steps were data entry, select tools, Exiqon PCR wizard. Select CFX 96, enter data file containing panel layout. Entry fail data of each sample ct. Set the interpolate calibrator, internal control, sheet validation and normalization with gene reference. The data was stored in control panel software. The analysis was done by T-test, heat map and descriptive statistic.

**Results**

Results Analysis of miR-29c and 21 expression in patients with nasopharyngeal carcinoma

There are 3 graphs generated from PCR quantification performed using BIORAD and analyzed using CFX 96 Manager software: graph amplification, melt curve and melt peak. Each chart has been distinguished based on the three target colors red = miR-21, blue = miR-29c and green is the reference gene of miR-16.

**Amplification Curve:**

![Amplification Curve](image)

Figure 1 shows the amplification results of all samples in RFU (Relative Fluorescence Unit). The result of fluorescence captured in each quantification cycle is translated into curve form. The more left or the earlier fluorescence is captured, indicating a higher level of miRNA expression.
a. Melt Curve

Figure 2 shows a melt curve, where the higher the temperature, the sample will be denatured and the captured fluorescence will end. This curve shows the total reaction that occurs, so we can know that the sample preparation is good enough.

b. The melt curve peak

Figure 3 is a graph that can be used to view the sensitivity and specificity of amplification targets. In this study, total reaction of each reaction has peak.
The value of the cycle of quantification (cq) obtained is:

<table>
<thead>
<tr>
<th>Sample Code</th>
<th>Pre therapy</th>
<th>Chemo-radiotherapy</th>
<th>Radiotherapy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cq-miR-21</td>
<td>Cq-miR-29c</td>
<td>Cq-miR-16</td>
</tr>
<tr>
<td>1</td>
<td>28.2</td>
<td>32.4</td>
<td>27.8</td>
</tr>
<tr>
<td>2</td>
<td>26.53</td>
<td>30.96</td>
<td>25.78</td>
</tr>
<tr>
<td>3</td>
<td>30.18</td>
<td>33.12</td>
<td>29.05</td>
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<tr>
<td>4</td>
<td>30.34</td>
<td>31.34</td>
<td>27.96</td>
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<tr>
<td>5</td>
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<td>24.75</td>
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<td>26.09</td>
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<td>7</td>
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<td>29.86</td>
<td>27.47</td>
</tr>
<tr>
<td>8</td>
<td>26.52</td>
<td>30.08</td>
<td>25.8</td>
</tr>
<tr>
<td>9</td>
<td>26.46</td>
<td>27.25</td>
<td>23.72</td>
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<tr>
<td>10</td>
<td>25.84</td>
<td>31.46</td>
<td>24.57</td>
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<tr>
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<td>28.23</td>
<td>24.98</td>
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<td>25.83</td>
<td>29.42</td>
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<td>28.64</td>
<td>24.7</td>
</tr>
<tr>
<td>14</td>
<td>29.75</td>
<td>34.19</td>
<td>24.69</td>
</tr>
<tr>
<td>15</td>
<td>23.58</td>
<td>27.56</td>
<td>24.682</td>
</tr>
<tr>
<td>16</td>
<td>32</td>
<td>33.72</td>
<td>24.678</td>
</tr>
</tbody>
</table>

Some of the results that have been obtained are:

a. The results of quantification of miR 21 and miR-29c expression in NPC patient samples who were given chemoradiotherapy and regimens compared with untreated samples.

<table>
<thead>
<tr>
<th>Variabel</th>
<th>Post Chemoradiotherapy (n=9)</th>
<th>Pre therapy(n=9)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Median (Min-Max)</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>miRNA-21 expression</td>
<td>25,90 (24,21-29,57)</td>
<td>26,28</td>
<td>3,05</td>
</tr>
<tr>
<td>miRNA-29c expression</td>
<td>31,13 (25,58-36,69)</td>
<td>32,10</td>
<td>3,71</td>
</tr>
</tbody>
</table>

Data present in mean and deviation standard. p>0,05 considered not significant differentiation, with Dependent Sample T-test.

b. The results of quantification of miR 21 and miR-29c expression in NPC patient samples who were given radiotherapy compared with untreated samples.

<table>
<thead>
<tr>
<th>Variabel</th>
<th>Post Radiotherapy (n=7)</th>
<th>Pre Therapy (n=7)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Median (Min-Max)</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>miRNA-21 expression</td>
<td>27,33 (22,58-32,08)</td>
<td>26,89</td>
<td>3,71</td>
</tr>
<tr>
<td>miRNA-29c expression</td>
<td>32,02 (29,94-38,22)</td>
<td>32,03</td>
<td>3,10</td>
</tr>
</tbody>
</table>

Data present in mean and Deviation Standard. p<0,05 at miRNA-29c expression considered significant, while p>0,05 at miRNA-21 expression considered not significant, with Dependent Sample T-test.

The results of quantification of miR 21 and miR-29c expression in NPC patient samples who were given chemoradiotherapy and regimens compared with given radiotherapy samples.


<table>
<thead>
<tr>
<th>Variabel</th>
<th>Post Chemoradiotherapy (n=9)</th>
<th>Post Radiotherapy (n=7)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Median (Min-Max)</td>
<td>Mean SD</td>
<td>Median (Min-Max)</td>
</tr>
<tr>
<td>miRNA-21 expression</td>
<td>25,90 (24,21-29,57)</td>
<td>26,28 3,05</td>
<td>27,33 (22,58-32,08)</td>
</tr>
<tr>
<td>miRNA-29c expression</td>
<td>31,13 (25,58-36,69)</td>
<td>32,10 3,71</td>
<td>32,02 (29,94-38,22)</td>
</tr>
</tbody>
</table>

Data present in mean and Deviation Standard. p>0,05 considered not significant, with Independent Sample T-test.

**Discussion**

This study collected 27 samples of venous blood of NPC patients. However, of all the samples collected there were only 16 plasma samples consisting of 9 samples of post chemoradiotherapy and 7 post radiotherapy samples which can be continued up to qPCR examination for technical reasons. Initially, DNA isolation and DNA synthesis were done at the hospital of Hasanuddin University Hospital. Samples in the form of cDNA were then sent to the molecular biology laboratory of Gajah Mada University for qPCR examination. We found increased of miR-21 expression from 5 NPC post chemoradiotherapy samples, this caused by unresponsive to therapy and biogenetical mutation. This study also found decreased of miR-29c expression in 1 sample of NPC post radiotherapy, this caused by unresponsive to therapy and biogenetical mutation, so we need further examination to see dedaiser mutation.

**Conclusions and Recommendations**

Based on our study we conclude that the expression of miR-21 in patients with nasopharyngeal carcinoma who have been treated with chemoradiotherapy is lower compared with patients who have not received therapy. In this study, it can also be concluded that the expression of miR-21 in patients with nasopharyngeal carcinoma who have been treated with radiotherapy is also lower compared with patients who have not been treated with therapy. Whereas the comparison between miR-21 expression in patients with post-therapy nasopharyngeal carcinoma with chemoradiotherapy was higher when compared with post-therapy with radiotherapy alone. But the expression of miR-29c post-chemoradiotherapy therapy obtained the opposite result to the expression miR-21.

**Conflict of Interest:** None

**Source of Funding:** Self

**Ethical Clearance:** Obtained from Hasanuddin University ethical committee.

**References**

5. Iliopoulos D., jaeger H.A., Hirsch M.L, Bulyk K. STAT3 activation of miRNA-21 and miR-181b-1, via PTEN and CYLD, are part of the epigenetic swich linking inflammation to cancer. Mol Cell 2010. ; (4) 39: 493-506


Audiometric Profile of Fishermen Using Motor Boat in Barombong Village, Makassar

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¹Department of Otorhinolaryngology Head and Neck Surgery, Medical Faculty, Hasanuddin University, Indonesia

Abstract

Objective: To analyze the audiometric profile of Indonesian fishermen in the village of Barombong as well as determine the prevalence and degree of hearing loss and its related factors.

Method: This was an observational, cross-sectional study of adult full-time fishermen recruited from the village of Barombong in the city of Makassar within the province of South Sulawesi who were part of a voluntary screening for hearing loss. All pure tone audiometry tests were conducted by a single, experienced audiologist using the same pre-calibrated Interacoustics AD226 Diagnostic Audiometer. Noise intensity of the participant’s working environment was sampled by a single audiologist using the same pre-calibrated Extech 407732 sound level meter for a duration of 30 minutes.

Results: The mean age of the study group was 43.93±8.10 years with 95% confidence interval of 26.65-34.04 years, the mean working period was 19.45±3.95 years with 95% confidence interval of 11.48-15.31 years. The mean noise intensity the participants were exposed to was 101.7±2.342dB with 95% confidence interval of 98.9-101.7dB. There was a statistically significant (P<0.05) positive relationship between the age of participants and degree of hearing loss with r-value of 0.6467. Degree of hearing loss was also significantly related (P<0.05) to the working period of participants with r-value of 0.6203. There was also a significant (P<0.05) positive correlation between degree of hearing loss and noise intensity the participants were exposed to with r-value of 0.2482.

Conclusion: Our study showed that a significant majority of fishermen working in the Barombong village experienced hearing loss. Significant decline in hearing threshold was observed and was significantly related to age, working period and noise intensity the participants were exposed to. Hence, there is a great need to raise awareness regarding the dangers of noise-induced hearing loss among fishermen and the need for preventive measures to be put in place to prevent hearing loss and therefore a declining quality of life for the fishermen.

Keywords: Noise-induced hearing loss, sensorineural hearing loss, occupational hearing loss.

Introduction

South Sulawesi has a strategic geographical position with a long coastline of 1,937 km² and large fishing grounds that extend beyond the Makassar Strait to the Flores Sea and Bone Bay, with as many as 199,216 fishermen. In the coastal city of Makassar, yearly catch produced up to 18,000 tons while marine fisheries production reached 12,731 tons per year. Earlier surveys of the fishing population places the number of fishermen to be around 11,497 with 4934 units of fishing gear¹³.

The village of Barombong in Makassar city is predominantly occupied by fishermen. Fishermen work almost every day with frequent sea trips using a motor boat as their means of water transport in order to fish. However, most fishermen are unaware that exposure to noise from the machine of their fishing boats is an insidious cause of hearing loss.

Most fishermen whom experience damage to their hearing is due to noise-induced hearing loss (NIHL). Noise-induced hearing loss (NIHL) is damage to hearing that is caused by prolonged exposure to loud noise, usually ten years or more. Noise is defined as the
mixture of various pure tone sounds with differing frequencies. Noise with intensity of 85 dB or more can cause damage to the Corti hearing receptors in the inner ear. The Corti’s organ sound receptors are often damaged at frequencies of 3000-6000 Hz frequency and most heavily affected at the 4000 Hz frequency. This is classified as sensorineural hearing loss that typically affects both ears to similar degrees.

Pure tone audiometry (PTA) is a tool commonly used to assess the type of hearing loss and hearing threshold to those who experience hearing problems. Furthermore, PTA can help evaluate the degree of hearing loss and is useful in screening for hearing problems. Pure tone sound means the sound produced only has one frequency, expressed in the number of vibrations per second. Audiometric examination requires a sound proof room, and audiologist and a cooperative patient.

Preliminary survey of fishermen in Barombong village in Makassar city revealed that fishermen are exposed to motorboats that generate noise of high intensity for long hours. This working condition has a great potential to cause hearing loss among fishermen that can significantly reduce their quality of life with time. Furthermore, most fishermen do not use protective equipment to minimize noise exposure and have been working for more than 10 years for more than 8 hours per day. Thus, our study aims to provide a closer look at the audiometric profile of Indonesian fishermen in Barombong, determine the prevalence and degree of hearing loss and its related factors as well as establish the need for preventive measures against noise-induced hearing loss.

Materials and Method

This study is an observational, cross-sectional analysis conducted between 21st December to 30th December 2018 performed according to the tenets of the Declaration of Helsinki and approved by the institutional review boards of Wahidin Sudirohusodo Hospital.

Subjects: Participants were full-time fishermen recruited from the village of Barombong in the city of Makassar within the province of South Sulawesi and consisted of adults over the age of 21 working in the village of Barombong who were part of a voluntary screening for hearing loss. Exclusion criteria included past history of ear infections, past history of trauma to the ear and past history of ear surgery.

Sound Level Measurement: Noise intensity of the participant’s working environment was sampled by a single audiologist using the same pre-calibrated Extech 407732 sound level meter for a duration of 30 minutes.

Pure Tone Audiometry: All pure tone audiometry tests were conducted by a single, experienced audiologist using the same pre-calibrated Interacoustics AD226 Diagnostic Audiometer. Participants were required to avoid exposure to noise for at least 12 hours prior to audiometry test. All tests were performed with participants in a soundproof booth that met ambient noise level standards at multiple frequencies.

Classification of Noise-induced Hearing Loss: Hearing loss was defined as the mean of hearing threshold at 1000, 2000, 3000 and 4000 Hz that is more than 25 dB in either ear. The degree of hearing ability was classified as normal (≥25 dB), mild (26 to 40 dB), moderate (41 to 55 dB), moderately severe (56 to 70 dB), severe (71 to 90 dB) and profound (>90 dB) hearing loss.

Statistical Analysis: The acquired data was analyzed using a commercial analytical software program (GraphPad Prism 8.0, San Diego, CA, USA). Descriptive statistics were obtained based on survey results. Spearman correlation analyses were conducted to determine the correlation value (r) of age, length of working period, noise intensity of working environment and hearing threshold in regards to degree of hearing loss. Degree of hearing loss were represented numerically as 0 for normal, 1 for mild, 2 for moderate, 3 for moderately severe, 4 for severe and 5 for profound hearing loss. A P-value of <0.05 indicated that the variables considered was statistically significant.

Results

Pure tone audiometric of 40 fishermen were included for analysis in this study. All of the participants were male. As summarized in Table 1, 18 out of 40 (45%) participants were between the age of 30 to 40, 13 out of 40 (32.5%) participants were between the age of 41 to 50 and 9 out of 40 (22.5%) participants were over the age of 51. 4 out of 40 (10%) participants worked as fishermen for 5 to 10 years, 2 out of 40 (5%) participants worked for 11-15 years, 20 out of 40 (50%) worked for 16 to 20 years while 14 out of 40 (35%) of participants worked for more than 21 years as full-time fishermen.
Table 1: Characteristics of participants

<table>
<thead>
<tr>
<th></th>
<th>Number of people (n)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>40</td>
<td>100</td>
</tr>
<tr>
<td>Age (years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30-40</td>
<td>18</td>
<td>45</td>
</tr>
<tr>
<td>41-50</td>
<td>13</td>
<td>32.5</td>
</tr>
<tr>
<td>≥ 51</td>
<td>9</td>
<td>22.5</td>
</tr>
<tr>
<td>Working period</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5-10</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>11-15</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>16-20</td>
<td>20</td>
<td>50</td>
</tr>
<tr>
<td>≥ 21</td>
<td>14</td>
<td>35</td>
</tr>
</tbody>
</table>

The mean age of the study group was 43.93±8.10 years with 95% confidence interval of 26.65-34.04 years, the mean working period was 19.45±3.95 years with 95% confidence interval of 11.48-15.31 years. The mean noise intensity the participants were exposed to was 101.7±2.342dB with 95% confidence interval of 98.9-101.7dB.

Table 2: Mean and 95% CI of Age, Working Period and Noise Intensity

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean ± SD</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>43.93±8.10</td>
<td>26.65-34.04</td>
</tr>
<tr>
<td>Working Period</td>
<td>19.45±3.95</td>
<td>11.48-15.31</td>
</tr>
<tr>
<td>Noise Intensity</td>
<td>101.7±2.342</td>
<td>98.9-101.7</td>
</tr>
</tbody>
</table>

Prevalence and degree of hearing loss were analyzed in 80 ears from 40 participants. Only 2 out of 80 (2.50%) ears showed normal hearing, while 78 out of 80 (97.50%) ears showed hearing loss. 42 out of 80 (52.50%) ears showed mild hearing loss, 35 out of 80 (43.75%) ears showed moderate hearing loss while 1 out of 80 (1.25%) ears showed moderately severe hearing loss. No severe or profound hearing loss was observed.

Table 3: Prevalence of Hearing Loss

<table>
<thead>
<tr>
<th>Prevalence of Hearing Loss</th>
<th>Number (n)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0: Normal</td>
<td>2</td>
<td>2.50</td>
</tr>
<tr>
<td>1: Mild</td>
<td>42</td>
<td>52.50</td>
</tr>
<tr>
<td>2: Moderate</td>
<td>35</td>
<td>43.75</td>
</tr>
<tr>
<td>3: Moderately severe</td>
<td>1</td>
<td>1.25</td>
</tr>
<tr>
<td>4: Severe</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5: Profound</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Spearman correlation analysis showed that there was a statistically significant (P<0.05) positive relationship between the age of participants and degree of hearing loss with r-value of 0.6467 as shown in Figure 1. Degree of hearing loss was also significantly related (P<0.05) to the working period of participants with r-value of 0.6203 as shown in Figure 2. There was also a significant (P<0.05) positive correlation between degree of hearing loss and noise intensity the participants were exposed to with r-value of 0.2482 as shown in Figure 3.
Discussion

Most participants in this study have been working for more than 15 years as full-time fishermen while being exposed to noise of loud intensity from motor boats with an average of 101.7 dB. Furthermore, the fishermen surveyed had little awareness about NIHL and its implications. None of the participants exercised any noise-proofing measures. Such long-term exposure to high noise levels cause fishermen to be at high risk for occupational NIHL.

Our study revealed that a significant majority (97.50%) of fishermen experienced noise-induced hearing loss although they had no habits that exposed them to loud noise and had no previous medical condition of the ear. Hence it can be deduced that hearing impairment experienced by the fishermen was due to occupational NIHL. Most fishermen experienced mild to moderate HI, with percentages of 52.50% and 43.75% respectively, while 1.25% presented with moderately severe HI loss. No HI was found in 2.50% of that surveyed which could be explained by shorter working period (5-10 years) and younger age (30-40 years) of the participant.

Studies on occupational NIHL have generally shown that the higher the intensity of noise exposure received by the workers, the higher the risk of such workers have hearing loss. It has been proven that the fishermen in our study experienced hearing loss due to exposure to noise over threshold value, and the degree of hearing loss is has positive correlations with factors such as age, working period and therefore period of exposure to noise, as well as the level of noise intensity stemming from the motor boat. Anies et al found that the risk of HI was not significant although participants were exposed to noise level ≤ 75 dB for more than 8 hours per day. Even at the level of exposure to 80 dB, there could be no increase in the risk of HI, but when noise level is between 85-89 dB HI is significant after 5 years of work, with 1% showing significant HI, 3% after 10 years and 5% after 15 years. When exposed to noise level of 90-94 dB, 4% experienced HI after 5 years, 10% after 10 years and 14% after 15 years. When the noise level was above 95 dB HI increased to 7% after 5 years, 17% after 10 years and 24% after 15 years6-9.

The difference in hearing threshold values in both ears of the participants are likely to be influenced by the position and type of activities carried out at the time on the boat. Working position of the participants that are closer to the machines that is the main source of noise in the boat affects the hearing threshold of participants. For example, participants who steer the boat adjacent to the diesel motor engine would have higher hearing threshold than those who work further away from the engine. Participants who steer from the left and those who steer from the right of the engine would also experience different hearing threshold between both ears. This is also supported by study of NIHL among Gulf Coast fishermen, whom showed different levels of hearing loss that is significantly influenced by their position on commercial fishing boats, with fishermen working at the engine rooms having greater severity of HI than those working out of the engine rooms.

There is a need to implement and provide easy access to hearing protection devices (HPDs) among fishermen to prevent progression of NIHL. Most resist wearing HPDs with a misconception that the use of HPDs will interfere with daily verbal communication and sensitivity to warning sound signals. However, studies have shown that HPDs in a noisy environment does not affect quality of communication or perception in those with normal hearing. However, when HI is significant, quality of hearing is reduced drastically and cause greater problems in communication and perception of sound.

Hearing loss prevention programs should also be put in place to assess noise levels in the working environment, regulation of noise levels and audiometric monitoring of hearing loss. Education and the implementation of prevention Method at primary healthcare institutions should become an important part of preventive healthcare especially among fishermen who make up a large part of the working population in Indonesia.

Limitations: There were several limitations to our study as it was performed in a single fishing village. Hence, findings of this study may not be representative of the larger Indonesian population. Furthermore, as a cross-sectional study, further longitudinal study is needed to better shed light to the process of chronic exposure that causes progression of noise-induced hearing loss in fishermen.

Conclusion

Our study showed that a significant majority of fishermen working in the Barombong village experienced hearing loss. Significant decline in hearing threshold was observed and was significantly related to age, working period and noise intensity from motor
boats the participants were exposed to. Hence, there is a great need to raise awareness regarding the dangers of noise-induced hearing loss among fishermen and the need for preventive measures to be put in place to prevent hearing loss and therefore a declining quality of life among fishermen.

Acknowledgements: The researchers would like to thank all people who have helped them in the research process.

Ethical clearance: Taken from university Hasanudd in ethical committee

Source of Funding: Self

Conflict of Interest: Nil

References


Implementation of Partnership between Midwives and Traditional Birth Attendants Inkotabaru District

Anggita Sari¹, Adriana Palimbo¹,², Angga Irawan¹, Sukamto², Isda Herlina⁴

¹Lecturer of Sari Mulia University, Banjarmasin, Indonesia, ²South Kalimantan Provincial Health Office, Banjarmasin, ³Student Doctoral of Public Health, Hasanuddin University, Makassar, Indonesia, ⁴Public Health Center of Berangas, Kotabaru

Abstract

Background: Maternal and infant mortality ratio, in the Kota Baru high enough, one of them because of labor that much by the Traditional Birth Attendants (TBA). Midwives offer fewer deliveries and coverage has not reached the 95% target and fewer midwives than TBA.

Objectives: This study aims to know the implementation of the partnership program between midwives and traditional birth attendants in Kotabaru District.

Method: This study use da qualitative approach to the design of case studies, with purposive sampling technique. The number of the main informant as much as 3 people and informant triangulation 6 people. This research was conducted for 1 month consists of content analysis and data processing.

Results: The results show human resources are still lacking, inadequate facilities and funding partnership that is often paid late. Midwives and TBA is not made a written agreement, and over the role of the TBA will not be in accordance with there gulations. The support from the village head and community leader that there is no information and the number of TBA partnering is still less.

Conclusion: Our findings conclude the importance of cross-program coordination and involvement in the District Health Office and across sectors at the District Government level. This participation is urgently needed from local stakeholders playing a major role in the successful implementation of maternal and child health programs.

Keywords: Midwives; traditional birth attendants; implementation of partnerships.

Introduction

Traditional Birth Attendant’s (TBAs), "dukan beranak" in Indonesia, has been around for a long time, and are still practicing labor and childbirth, where most deliveries occur at home and are not assisted by skill birth attendant such as midwives. This situation increases the risk of death for the mother and her baby.¹ TBA is a trusted employee in the family and community in all matters relating to women’s reproductive problems and their work is obtained from generation to generation.² Indonesia, which has a variety of tribes, customs, and cultures in the community, they are considered capable of providing emotional comfort and security to mothers during pregnancy check-ups, assisting mothers and caring for their mothers and babies after birth for up to 40 days. TBA’s knowledge of pregnancy and birth is so lacking that if complications arise they are unable to overcome them even realize it.³ However, in addition to providing technical assistance, TBA also practices unsafe abortion and contraception at high risk and threatening the life of the pregnant woman.⁴

Family TBA is someone who has been appointed by a large family to attend a birth in that family. Trained TBAs are family TBAs who have received short training courses through the modern health care sector to improve their skills.⁵⁻⁶ So, starting in 2007, the government initiated a partnership program by village midwives and traditional birth attendants aimed at reducing maternal and child mortality and morbidity.⁷ This statement reveals that the higher the number of
deliveries assisted by TBA, the more high risk that will potentially endanger the safety of the mother and baby. This is because the traditional birth attendants do not have enough ability and knowledge to handle obstetric complications and emergencies (EMOC) that occur during and after labor.

Then, between midwives and doulas, they offer physical, emotional, and ongoing support while simultaneously encouraging patient autonomy. However, disagreements between them also occur from the Middlemiss study in the UK, differences in the role of doulas and midwives and identify potential for conflict if the role of doulas is misunderstood. Some experts have identified antagonistic attitudes towards doulas that create challenges for midwives and lead to inter-professional conflicts in the dynamics between midwives and doulas. In Canada, this misconception, midwives and nurses fear that doulas will take over their roles and “grass” jobs.

Death that occurs in a hospital is a referral for labor handled by TBA. Furthermore, in some cases TBAs called on midwives when their mother’s condition was severe. At this time, there are 329 TBAs in Kotabaru District. Their presence is spread in 21 sub-districts. Meanwhile, only 220 midwives served. The coverage of childbirth assistance by health workers is 68.2% which has not increased and has not reached target 95% from 2014 to 2017. Based on this problem, this research is intended to know the implementation of the partnership program between midwives and traditional birth attendants in Kotabaru District.

**Materials and Method**

The study design uses an explorative qualitative approach. A total of 9 participants consisted of 3 village midwives and 6 triangulation informants. This study was conducted at the Berangas Public Health Center in Kotabaru District, South Kalimantan Province. The selection of research locations was taken through considerations, among others: First, coverage of delivery assistance by health workers in the last 3 years had not met the District target of 95%. Second, there have the highest number of traditional birth attendants from the number of midwives. And, third, their has an ongoing partnership program indicator.

Data collection uses in-depth interviews, and semi-structured interview guides. Processing data with content analysis. The aspects studied include the system of implementing partnerships, namely 1) Human Resources, funding, facilities, and data collection and mapping of traditional birth attendants; 2) Fostering of traditional birth attendants; Written Agreement for Midwives and TBA; and the role of TBA; and 3) Support of Village Heads and Community Leaders.

**Results**

**Characteristics of Participants**

<table>
<thead>
<tr>
<th>No</th>
<th>Code Informant</th>
<th>Age</th>
<th>Sex of Gender</th>
<th>Education Background</th>
<th>Work Status</th>
<th>Period of Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Informant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>IU 1</td>
<td>28</td>
<td>Female</td>
<td>Midwifery Diploma</td>
<td>Midwife of Berangas</td>
<td>Six years</td>
</tr>
<tr>
<td>2</td>
<td>IU 2</td>
<td>28</td>
<td>Female</td>
<td>Midwifery Diploma</td>
<td>Midwife of Sungai Limau</td>
<td>Three years</td>
</tr>
<tr>
<td>3</td>
<td>IU 3</td>
<td>29</td>
<td>Female</td>
<td>Midwifery Diploma</td>
<td>Midwife of BatuTunau</td>
<td>Seven years</td>
</tr>
<tr>
<td>Triangulation Informant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>BK</td>
<td>39</td>
<td>Female</td>
<td>Midwifery Diploma</td>
<td>Coordinating Midwife</td>
<td>21 years</td>
</tr>
<tr>
<td>2</td>
<td>DB</td>
<td>55</td>
<td>Female</td>
<td>No school</td>
<td>TBA Partnered</td>
<td>Five years</td>
</tr>
<tr>
<td>3</td>
<td>DT</td>
<td>70</td>
<td>Female</td>
<td>Primary School</td>
<td>TBA Not Partnered</td>
<td>30 years</td>
</tr>
<tr>
<td>4</td>
<td>TM</td>
<td>47</td>
<td>Male</td>
<td>High School</td>
<td>Community Leader</td>
<td>20 years in village</td>
</tr>
<tr>
<td>5</td>
<td>KD</td>
<td>49</td>
<td>Male</td>
<td>High School</td>
<td>Village Head</td>
<td>Three years</td>
</tr>
<tr>
<td>6</td>
<td>M</td>
<td>29</td>
<td>Female</td>
<td>Primary School</td>
<td>Mothers is served by Midwives and TBA</td>
<td>Second Labor</td>
</tr>
</tbody>
</table>

Sources: Health Office Report, 2017
Analysis of Results

Human Resources: Thirteen midwives were obtained: 1 coordinating midwife and 12 other midwives serving in the village and in the puskesmas who were also double the task of fostering villages that did not have a midwife. From the interviews, information was obtained that 1 midwife served 2 to 3 villages a time, because other villages that did not have midwives to cover all villages in their work area.

“.Serving three villages, meaning one village has three regions: Rampa Kapis, Batu Tunau and the Coal Mining Company.” (IU2) “Each place only has a few empty villages” (IU1, IU 3)

Interview for six triangulation informants, we obtained a statement that three midwives were still not living in the village but were willing to come at any time if needed.

“.do not live in the village every day, if called they are willing” (KD, M) “there is no residence in Berangas village, but if anyone wants to give birth, they are ready to come” (BK)

Half of the midwives, residing in districts and villages, have areas with a geographical area that vary by a distance of 25-30 km.

“I live in urban areas for about 30 minutes from Berangas Village because my children go to school in there” (IU3) “.back and forth to the village, but don’t stay overnight” (BK, M)

Midwives as MNH service providers and partners in implementing partnerships still lack adequate capacity. In terms of management, there are still two villages that do not have midwives. They also caseload to serve other programs. Type of inpatient health centers located in isolated areas.

Facilities and Infrastructure: Access and difficult terrain is also an obstacle. It must be taken on foot. Medical equipment is very unnoticed, so they add unsafe ingredients to the baby’s umbilical cord.

Funding Source: Specific funds for partnerships do not exist. Companion funds come from Health Operational Assistance (BOK). The funds according to them are insufficient because they are considered too little. Disbursement of funds is not routine every month but has to wait a long time.

Written Agreement for Midwives and TBA:
Information from two people revealed never made a written agreement. Only an oral request to call the midwife if there is something

“.nothing. we just talked.” (IU1, IU2)

Even they do not know the information about the partnership. The coordinating midwife stated that the agreement had not been made, it was still in the planning stage and had not been implemented.

“.up to now has not been implemented, because many other health programs take precedence” (BK)

TBA will call the midwife, if the baby has been born and delivery has been completed just to cut the baby’s umbilical cord.

“.because I am not allowed to cut the umbilical cord with a knife and concoctions” (DB)

Fostering of TBAs: Fostering shamans only through refreshing once a year and not all of them are invited. Midwives provide guidance on useful knowledge.

“Guidance and refreshing shamans have been carried out ..This year is only once, this year just once” (BK, TM)

Different from the 3 other triangulate informants who claimed to have never known and were never invited to refreshing the shaman.

“.never really meetings, try to be invited to meetings” (DB, DT, KD)

The Role of TBAs: Only one midwife informant who collaborated and applied the transfer of roles with TBAs.

“.if at my place, TBA tells me that pregnant women will give birth.. we usually join together to help until parturition “ (IU1) “they usually massage, make herbal concoctions, and midwives care.” (IU2)

Other different information TBAs are not partners, refuse cooperation and complete change of role. Only ever accidentally help together give birth.

“.Ever..she only held the abdomen, if part of the birth ..of course midwife”(IU3)”.Postpartum mothers still visited by midwives.” (BK, DB, M)
Midwives and TBA seem to compete and look less harmonious. “...they (midwives) hold mother’s full ...if her signs of birth appear, you call me, I better go home” (DT)

it can be concluded that TBA not partnered still does not work together so that their role is still helping birth and the baby independently.

Support of Village Heads and Community Leaders: Real support was provided from the village head and community leaders, but information about the partnership program was not yet optimal. During this time they made requests to give birth with midwives at the health center.

Discussions

Human Resources: Resources hold an important influence in the implementation of health care systems, especially partnerships. Resources include implementing personnel, infrastructure, service facilities, and funding. Midwives are competent health workers who are stationed and should reside 24 hours in the work area of the puskesmas. One of the factors that caused the community to choose to be assisted by a dukun is the distance between the community’s house and the dukun in the adjacent village and the TBA is always 24 hours. While many of the midwives reside in areas farthest from the reach of the community.

Facilities and Infrastructure: Geographical conditions make it difficult to call midwives so that pregnant women choose TBA who are domiciled around their homes. To be able to realize the partnership, childbirth must be assisted by midwives, the government must be able to facilitate adequate health facilities and ensure the availability of quality midwives in each village and easy access to services.

Funding Source: The availability of a budget plan for the Birth Waiting Home which is a temporary residence for pregnant women who will give birth until the postpartum period including their babies and their companions (husband/family/cadre).

Written Agreement for Midwives and TBA: A written agreement between the midwife and the dukun is made together, in accordance with the implementation manual which contains information on the mechanism of reference for pregnant women, the referral mechanism for labor cases, the mechanism for distributing labor costs and the schedule for regular meetings. In line with the results of research by Rochmayanti the partnership did not go according to expectations and targets despite having a memorandum of agreement between them.

Fostering of TBAs: TBAs are also not equipped with knowledge of detection of danger signs in pregnant women, maternity, postpartum and newborn babies as well as ways of referring midwifery. In terms of benefits, some TBAs want to follow the call so that they don’t help their own deliveries anymore. But the appeal is not optimal so that they are still many who help deliveries unsafe.

The Role of TBAs: In the period of childbirth: remind the family to prepare transportation to the midwife, prepare safe delivery facilities such as clean water and clean cloth, and accompany the mother when giving birth. Some things in the puerperal period are: making home visits and motivating mothers to use contraception after giving birth, and motivating referrals if needed and reporting to midwives if the prospective acceptor wants to use contraception.

Support of Village Heads and Community Leaders: The support of community leaders is needed in collaboration between midwives and TBAs. This support includes socialization and direction through village meetings, mediation between midwives and TBAs and helps influence other parties such as posyandu cadres, village officials, and TBAs to take an active role in the partnership. Some other village heads did not yet know information about the program.

Conclusions

Some obstacles in implementing the partnership program are midwives and TBAs on the utilization of SBA and strengthening the role of each available resource. Funding management from Jamkesmas, DAK and other fund allocations needs to be maximized so that the community realizes that safe delivery with midwives and in health facilities is accompanied by TBAs, not obstacles or concerns from families and communities. Training of skilled TBAs needs to be considered as a refresher in the skills of their childbirth practices under the supervision of the District Health Office, the priority of areas that are difficult to reach.

Conflict of Interest: None

Ethical Clearance: Obtained from university committee.

Source of Funding: Author him self
References


Risk Factors and Criminogenic Needs of Indonesian Inmates

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Abstract

This research was the initial stage of the main research. It aimed to get the constructs about risk factors and criminogenic needs of adult individuals committing crimes in the field, people of North Sumatera using Qualitative approach through Grounded Theory. Six hundred and nine participants were involved with a variety of respondents based on criminals (inmates) and not criminal such as the general public and significant persons who were considered to have had a lot of contacts and understood the reasons for adult individuals committing crimes. In general public and inmate respondents, the interview method was used to collect data about risk factors for committing a crime resulting in imprisonment and criminogenic needs that can be used as a solution to overcome recidivist. While the significant persons, the focus group discussion was used to obtain the field data. The results found eight factors: economic, social, personality, family, educational, prohibited substance, spiritual or religious, and criminal justice system.

Keywords: Adult inmates, criminogenic needs, construct, grounded theory, risk factors.

Introduction

In Indonesia, risk assessment and needs assessment for inmates began to take effect with the issuance of Regulation of the Minister of Law and Human Rights of the Republic of Indonesia No.12 of 2013 concerning risk assessment and needs assessment for inmates and correctional clients. This assessment was introduced in 2012 through collaboration between the departments of the New South Wales State prison and the Indonesian Directorate of Corrections. The instrument used to predict the level of risk and needs was Aksesmen Risiko Residivisme Indonesia (RR-I) which was an adaptation of the Level of Service Inventory-Revised¹.

Widyadarma² conducted a risk and needs assessment study on six inmates who would be released using a qualitative approach based on Risiko Residivisme Indonesia (RR-I) assessment. The category of crimes they have committed is related to economic motives. Other research on risk assessment and needs assessment was conducted by Sulfin and Hendiarto³. Using the LSI-R instrument, they assessed 100 inmates in Klas I Cipinang Prison. The results showed that drug/alcoholic beverages abuse and emotional/personality problems, that were significantly related to criminal records. Other factors such as the history of crime, education/work, finance, and family had no significant relationship with the crime of the research subject³.

Risk assessment and needs assessments studies conducted in Indonesia, as far as researcher known, still use instruments from western countries. There were no risk and criminogenic needs assessment instruments of inmates that refer to the risk principle and criminogenic needs principle based on the characteristics of Indonesian adult inmates (Indonesian version) which have good psychometric qualities. The purpose of this study is to identify precisely and deeply what factors are behind an adult prisoner in North Sumatera to commit a crime. The factors obtained will later be used as a predictor of an inmate committing repeated crimes.

Research Method

This study used a qualitative approach through the exploration of constructs about the risk factors and the criminogenic needs of inmates. The method of analyzing data through Grounded Theory was used as a strategy to explore the phenomena that want to be studied by exploring new concepts or theories from field data. The interview method was used in the data collection process. Respondents in this study were divided into three groups, namely 500 general public, 102 inmates, and seven informants who were considered to understand the problem of criminal acts consisting of two religious leaders, one lawyer, one prosecutor, one police officer, one prison officer and one law faculty lecturer with criminology specialization. All respondents were asked
to answer the open questions put forward, namely, “in your opinion, what are the reasons behind someone committing a crime or crimes that causes them to go to jail”? The data obtained in this interview process were then analyzed using coding techniques.

**Data Analysis Method:** The initial stage of the coding process was open coding, the second stage is axial coding, and the final stage, the selective coding. This stage was also called the determination of the main factor of the research.

**Results and Discussion**

**Respondents’ demographics background:** Respondents who participated in this study were 609 people, having diverse demographic backgrounds with the aim of obtaining more comprehensive data. Demographic descriptions based on gender, marital status, ethnicity, age, employment status, and final education are presented in Table 1.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Categories</th>
<th>F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Female</td>
<td>251</td>
<td>41.2</td>
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<td></td>
<td>Male</td>
<td>358</td>
<td>58.8</td>
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<td></td>
<td>Total</td>
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<td>100.0</td>
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<tr>
<td>Marital Status</td>
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<td>35.5</td>
</tr>
<tr>
<td></td>
<td>Married</td>
<td>369</td>
<td>60.6</td>
</tr>
<tr>
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<td>Divorced</td>
<td>24</td>
<td>3.9</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>609</td>
<td>100.0</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>Not Providing Information</td>
<td>26</td>
<td>4.3</td>
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<td></td>
<td>Batak</td>
<td>362</td>
<td>59.4</td>
</tr>
<tr>
<td></td>
<td>Javanese</td>
<td>105</td>
<td>17.2</td>
</tr>
<tr>
<td></td>
<td>Padang</td>
<td>26</td>
<td>4.3</td>
</tr>
<tr>
<td></td>
<td>Nias</td>
<td>15</td>
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<tr>
<td></td>
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<td></td>
<td>Melayu</td>
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<td>Tionghoa</td>
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<tr>
<td></td>
<td>Betawi</td>
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<tr>
<td></td>
<td>Bugis</td>
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<td>0.3</td>
</tr>
<tr>
<td></td>
<td>Tamil</td>
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<td>0.2</td>
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<tr>
<td></td>
<td>Buton</td>
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<td>0.2</td>
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<td>Sasak</td>
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</tr>
<tr>
<td></td>
<td>Dayak</td>
<td>1</td>
<td>0.2</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>609</td>
<td>100.0</td>
</tr>
</tbody>
</table>

The majority of respondents involved in this study were male (58.8%), and more than 50% (369) of the total respondents had married status. Respondents had an ethnic background that varied greatly with the majority of Batak and Javanese tribes which is around 59.4% (362) and 17.2% (105), around 4.3% did not provide information about ethnic groups. Based on age, more than 85.7% of respondents came from early adulthood and middle adulthood age groups, about 3.4% were not willing to provide information about age. The educational background of the respondents also varied from not completing elementary school to doctoral level. The majority of respondents have a senior high school (38.9%) and a Bachelor (36.5%) education level. Viewed from the status of employment, most respondents work as private employees (31.2%) and entrepreneurs (23.6%).

**Criminal background:** The results of the field data text unit in the form of keywords related to the background of someone committing a crime shows in table 2.
Table 2: The factors and indicator of someone committing a crime.

<table>
<thead>
<tr>
<th>Factors</th>
<th>Indicator</th>
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</thead>
<tbody>
<tr>
<td>Economic</td>
<td>Unemployment</td>
</tr>
<tr>
<td></td>
<td>Financial problems</td>
</tr>
<tr>
<td>Social</td>
<td>Residence</td>
</tr>
<tr>
<td></td>
<td>Media influence</td>
</tr>
<tr>
<td></td>
<td>Social environment</td>
</tr>
<tr>
<td></td>
<td>Chance</td>
</tr>
<tr>
<td>Personality</td>
<td>Anti-social</td>
</tr>
<tr>
<td></td>
<td>Self control</td>
</tr>
<tr>
<td></td>
<td>Psychological problems</td>
</tr>
<tr>
<td>Forbidden Substances</td>
<td>Drugs</td>
</tr>
<tr>
<td></td>
<td>Liquor</td>
</tr>
<tr>
<td>Family</td>
<td>Not harmonious family</td>
</tr>
<tr>
<td></td>
<td>Parenting</td>
</tr>
<tr>
<td></td>
<td>History of family members involved in crime</td>
</tr>
<tr>
<td>Spiritual or Religion</td>
<td>Not afraid of God</td>
</tr>
<tr>
<td></td>
<td>Lack of religious knowledge</td>
</tr>
<tr>
<td></td>
<td>Lack of gratitude</td>
</tr>
<tr>
<td>Education</td>
<td>Low education level</td>
</tr>
<tr>
<td></td>
<td>Lack of knowledge about criminal behavior</td>
</tr>
<tr>
<td>Judicial System</td>
<td>Law enforcement is weak</td>
</tr>
</tbody>
</table>

Discussion

Lumenta, Kekenusa, & Hatidja\(^5\) showed that the total population and unemployment had a direct effect on crime, while the number of industries and poverty had an indirect effect on crime; unemployment was a factor that had the greatest direct positive effect on crime, followed by educational and moral factors factors with a direct influence with\(^6\). The type of crime committed by the community, namely theft, embezzlement, fraud, and persecution, had a background of poverty\(^7,8\).

The effect of impressions and exposure to information from the media on criminal behavior could explain by the Modeling or Vicarious Learning theory proposed by Albert Bandura\(^9\). Based on the explanation of this theory, criminal behavior could occur by observing or being exposed to information both in the form of fiction and non-fiction from media shows. More than 1,000 studies aimed at seeing the effects of violent television and film shows over the past 40 years have produced a consistent conclusion that violent shows would increase aggression, social anxiety, and also negative perspectives on reality in the world\(^10,11\). Living in an environment that was predominantly poor was vulnerable to directing someone to act aggressively\(^12\), detained for violent behavior\(^13\) and committing a recurrent crime (recidivism)\(^14\). Furthermore, Damm & Dustmann\(^15\) added that a child who was raised in an environment with a high crime rate was also predicted to commit a crime during the next development period. The influence of the living environment on the occurrence of criminal acts can be seen from the presence or absence of norms and collective efficacy which will act as a defense against criminal acts\(^16,17\).

Liquor also greatly affects a person’s thinking power which in turn could cause people to commit criminal acts. The forms of crime that often occurred due to the influence of alcohol are murder, persecution, and rape\(^18\), theft, hijacking\(^19\). The results of a survey conducted by the BadanNarkotikaNasional (National Narcotics Agency)\(^20\) in 2016, 18 provinces in Indonesia found that certain types of drugs could lead to excessive aggressive behavior on users and often resulted in behavior or acts of violence. Some even commit criminal acts such as stealing and selling drugs. In addition, in the effort to get drugs, users commit fraud and sell themselves.

Some descriptions of the personality of criminals were relatively high intellectual abilities, difficulties in controlling the inner drive, easily suspicious, acting without thinking and unstable emotions\(^21\). Listwan, Piquero, & Van Voorhis\(^22\) then attempts to explain the relationship of personality to criminal behavior. In subsequent studies, he also stated that the type of neurotic and aggressive personality directed a person to commit repeated acts of crime (recidivism). In addition to personality types, other factors that were expected to direct a person to commit a crime were psychological problem or disorder\(^23\).

Adult individuals received their first education from their families during childhood. Tangkudung\(^24\) conducted a study on the role of family communication in preventing juvenile delinquency. Seventy-nine teenagers aged 13-18 years were respondents of this study. By looking at the intensity of communication, attention, and children’s needs, the results of the study found that parent communication with children was at a very good level, so it could prevent teenagers from committing illegal acts.

In addition to social norms or customary norms, religion was one of the rules that could control individuals in behaving in society. Wahyuni\(^25\) conducted qualitative research to see the role of religious education.
in preventing deviant behavior. Research respondents were principals, teachers, and fourth-grade students. The results showed that the implementation of teaching practices such as prayer, *juz' Amma* reading, and spiritual giving are effective enough to prevent deviant behavior in elementary school students. Other research on the role of Islamic religious education in family and society was examined by Nasution. The results of the study concluded that the application of religious education (tauhid, aqidah, worship, morality, and sharia) in the family in adolescents could shape them in actual behavior.

Research showed that low education could become an individual background in committing a crime. The influence of age, education, income, and number of family dependents towards thievery crime rate in prisoners was the study of Maulana. 66 inmates who were committed thievery crimes in Lapas Klas 1 Kedungpane in Semarang City were the respondents of the study. The results of multiple regression analysis showed that of the four independent variables, namely age, education, income and number of family dependents, only the age variable that was not significant. Educational variables had a negative and significant influence, the income variable had a negative and significant effect, the number of family dependents had a positive and significant relationship while the age variable had a significant negative effect.

An elements of law enforcement such as police, prosecutors, judges, and even prison officials had recently been in the spotlight of the Indonesian people. Police who act without conscience (misusing the power they had) were often found, it was uncommon for prosecutors to extort and amend cases just to get material benefits, court decisions that are often not accepted by the public. Such conditions were exacerbated by the behavior of law enforcement officers who were less praiseworthy and carried out actions that tarnish themselves and their own institutions. The bribery case that occurred in the Supreme Court was one sign that law enforcement in Indonesia was indeed faced with a big problem.

**Conclusion**

The findings in the field showed eight factors namely economic, social, personality, alcohol and prohibited substances, family, spiritual or religious, education and the criminal justice system that was behind an adult individual committing a crime and imprisoned for his actions.

**Conflict of Interest:** Nil

**Ethical Clearance:** Research Institute of Sumatera Utara University and the Faculty of Public Health University of Sumatera Utara.

**Funding:** Grant of the Directorate of Research and Community Service. General of Strengthening Research and Development Ministry of Research, Technology and Higher Education 2018.

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Vitamin D Receptor Gene Polymorphism Fok 1 and Vitamin D (25-OH)D Status in Type 2 Diabetes Mellitus Patients with Pulmonary Tuberculosis

Wahiduddin1,2, Agung Pranoto3,4, Sudjarwo5, Ni Made Mertaniasih6

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Abstract

Vitamin D plays a role in supporting macrophage activation via vitamin D receptor. Polymorphism of Fok1, vitamin D receptor gene, can show the different level of susceptibility to pulmonary tuberculosis (PTB). This research aimed to analyze the comparison of polymorphisms of the Fok1 region of the vitamin D receptor (VDR) gene and vitamin D status in patients with type 2 diabetes mellitus (T2DM) with PTB. A descriptive comparative study of adult T2DM patients seeking treatment at the endocrine clinic, internal medicine clinic, and pulmonary clinic in two government hospitals in the city of Surabaya. The result showed that F allele frequency (63.3%), f allele (36.7%), FF genotype variation (40.0%), Ff (46.7%) and ff (13.3%) in T2DM group with PTB while in T2DM group without PTB obtained frequency of F allele (54.8%), f allele (45.2%), variation of FF genotype (33.3%), Ff (46.7%) and ff (20.0%). Polymorphism in T2DM group with PTB (60.0%) and DMT2 group without PTB (66.7%). Plasma vitamin D levels were found median (IQR) 20.26 (0.78) ng/ml in the T2DM group with PTB and 20.18 (1.25) ng/ml in the T2DM group without PTB. There were no differences in polymorphism in the frequency of F and f alleles, FF genotype variations, Ff, ff in the Fok1 region of the VDR gene, and the average vitamin D level between T2DM patients with and without PTB. Further research is needed on the linkages and gene interactions encoding macrophage activation proteins.

Keywords: Fok1 region polymorphism, vitamin D level, type 2 diabetes mellitus, pulmonary tuberculosis, PCR-RFLP, DNA Sequencing.

Introduction

Diabetes mellitus (DM) is one of the factors that influence the pathogenesis of tuberculosis (TB) in immunocompromised conditions. The condition of DM is a decrease in the patient’s immune response, which in turn can facilitate the occurrence of infection by Mycobacterium tuberculosis can develop into TB disease1. DM is one of the main risk factors with a three times greater relative risk of TB, reported in 22 countries with a high prevalence of TB including Indonesia2. Populations with DM have a three times higher risk of experiencing TB compared to populations without DM. About 15% of TB cases are globally associated with DM, most people with DM accompanied by undiagnosed TB or late diagnosis3. Reports from research in several countries said the prevalence of DM among TB patients was found to be 1.9% to 35%, while the prevalence of TB among DM patients was found to be 1.7% to 36%4,5. It is estimated that more than a quarter of people with DM have latent TB infections, studies in Mexico found prevalence of 51.3% and in Singapore 28.2%6,7.

Single Nucleotide Polymorphisms (SNPs) in the VDR gene show different levels of vulnerability and resistance in different subjects and populations. One of the SNPs associated with TB is polymorphism in the VDR gene which is located in exon two, which is a transition to T to C (ATG to ACG). There are two potential translation initiation sites in exons that can be
identified by the Fok1 endonuclease restriction enzyme, the individual with the C allele (called F) initiating translation on the second ATG codon and the absence of three-NH2 terminal amino acids from the overall length of vitamin D receptor proteins. Individuals with T alleles (indicated by f) initiate translation of the first ATG codon and synthesize the entire length of the vitamin D receptor protein (full-length with 427 amino acids).8,9

This research aimed to elucidate the polymorphism of VDR gene and vitamin D concentration in T2DM patients with PTB in Surabaya city, Indonesia.

Materials and Method

Research with a descriptive comparative study on subjects from endocrine polyclinic outpatients, internal medicine clinics and pulmonary disease clinics in two government hospitals in Surabaya City was conducted in October 2017 to January 2018, samples consisted of 45 patients each of T2DM with and without PTB.

PCR-RFLP test and DNA, DNA isolation on cell pellets was carried out as directed in QIAamp® DNA mini and Blood Mini Kit (Qiagen, cat. no. 51104). Amplification of DNA isolation results for VDR gene with Fok1 primer with forward sequences 5'AGC TGG CCC TGG CTCT3 TGA CAC ' and reversed 5 'GAA ATG ACA TGC TTC TTCT3' to produce DNA products at the target 267 bp. The PCR conditions for all reactions were 35 cycles for denaturation of 95°C for 1 minute, annealing 57°C for 30 seconds, and extension at 72°C for 30 seconds. Electrophoresis was performed with 3% agarose gel in 0.5 x TAE solution and ethidium bromide. RFLP product description in the form of T allele (f) in the form of fragments measuring 69 bp and 198 bp as well as nonpolimorphic images C (F) allele consisting of one fragment, 267 bp and heterozygous Ff gives a description of the three fragments 267 bp, 198 bp and 69 bp. Furthermore, DNA sequencing was examined to confirm the results of cutting on the VDR gene using a reverse primer.

Vitamin D examination using an ELISA from DBC Diagnostic Biochem. Vitamin D calculation uses a 4-parameter immunoassay. In this study vitamin D levels were said to be deficienced if found (<20 ng/ml), insufficiency (20-30 ng/ml) and sufficiency (> 30 ng/ml).10

Results

Averaged age sampel 51.91 years ± 7.93 years, with proportion > 50 years (62.2%) in T2DM with PTB, whereas T2DM group without PTB average age was 55.78 ± 7.36 years, with proportion > 50 years (77.8%), the greater proportion was female, (53.3% and 88.9%). From laboratory measurements and examinations, T2DM group with PTB had lower BMI, SBP, and DBP, whereas average FBG, 2hPBG, and HbA1c were higher than T2DM group without PTB (Table 1).

Table 1: Demographic and clinical characteristics of subjects

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>With Pulmonary TB Mean ± SD or n (%)</th>
<th>Without Pulmonary TB Mean ± SD or n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Year)</td>
<td>51.91 ± 7.93</td>
<td>55.78 ± 7.36</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>21 (46.7%)</td>
<td>5 (11.1%)</td>
</tr>
<tr>
<td>Female</td>
<td>24 (53.3%)</td>
<td>40 (88.9%)</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>22.39 ± 3.71</td>
<td>26.13 ± 3.99</td>
</tr>
<tr>
<td>SBP (mmHg)</td>
<td>129.56 ± 18.39</td>
<td>139.80 ± 18.94</td>
</tr>
<tr>
<td>DBP (mmHg)</td>
<td>74.78 ± 11.44</td>
<td>78.64 ± 13.43</td>
</tr>
<tr>
<td>FBG (mg/dl)</td>
<td>202.11 ± 78.68</td>
<td>175.29 ± 61.38</td>
</tr>
<tr>
<td>2hPBG (mg/dl)</td>
<td>283.20 ± 107.2</td>
<td>208.22 ± 75.61</td>
</tr>
<tr>
<td>HbA1c (%)</td>
<td>11.2 ± 2.61</td>
<td>9.34 ± 2.22</td>
</tr>
</tbody>
</table>

BMI : body mass index, SBP: systolic blood pressure, DBP: diastolic blood pressure, FBG: fasting blood glucose, 2h PBG: 2 hours postprandial blood glucose, HbA1c: hemoglobin A1c, T2DM: type 2 diabetes mellitus, TB: tuberculosis

The results of PCR-RFLP using Fok1 restriction enzymes show that there is a band intersection in variations genotypes FF, Ff, and ff genotypes

Figure 1, ELISA plasma vitamin D examination showed median (IQR) of vitamin D levels in T2DM group with PTB higher than T2DM without PTB (20.26 (0.78) ng/ml vs. 20.18 (1.25) ng/ml).
Discussion

Polymorphism is a variation of DNA sequences that give rise to genetic diversity in a pool gene. The amino acid sequence in proteins was determined by information contained in genes compiled by DNA. Genes that have different sequences was considered polymorphic has neutral effect on biological functions, but some conditions can cause disturbance of biological functions. This changes in arrangement DNA that encodes proteins. So that genetic polymorphism was different form of same allele in the population. “Normal” alleles was referred to as wild type alleles, while their variants called polymorphic or mutant alleles. Polymorphism was different from mutations because frequency of occurrence higher than repetitive mutations. As per provisions, the polymorphic locus was occupied by at least two alleles, each frequency of occurrence of more than 1%. Alleles whose frequency of occurrence less than 1% was repeated mutations.

The results of this research found that no difference in genotype variation of Fok1 polymorphism VDR gene in T2DM patients with or without PTB. In India (2013), 110 active PTB patients who reported proportion of Fok1 genotypes as follows FF (46.36%), Ff (41.82%), ff (11.82%). The results of this study stated that there were no differences in genotype variation between patients and controls. The frequency of FF genotypes from the Fok1 polymorphism VDR is higher than the mutant type. Also in line with Fok1 polymorphism research of pulmonary TB patients in Egypt reported FF genotypes (30.0%), Ff (50.0%) and ff (20.0%). As well as a study in Iran of TB patients reported the proportion of Fok1 genotypes each FF (52.4%), Ff (39.3%) and ff (8.3%). These results also reported no difference between genotype variations between cases of PTB with controls.

Research in North Sumatra Indonesia of PTB patients reported the proportion of FF genotypes (35.5%), Ff (55.3%) and ff (9.2%), these results indicate there was no association between Fok1 genotype variation and the incidence of PTB (p = 0.311).

Different results were found in Fok1 polymorphism of T2DM patients in Morocco, stated FF genotype 49.43%, Ff (45.45%) and genotype ff (5.11%) The results of the study found an association between genotype ff and T2DM risk (p-value=0.018). Similarly, research in Santiago de Chile of T2DM patients and without diabetes received each proportion of FF genotype variation (17.3% vs 22.0%) Ff (62.3% vs 47.0%) and ff genotype (20.2% vs 30.8%). The results of the study found the risk of T2DM especially in the F allele genotypes Ff and FF (p-value = 0.0361).

Some studies on vitamin D status of T2DM patients showed varied results, among others, studies in Morocco received an average vitamin D level of 26.07 ± 13.03 ng/ml with normal vitamin D status of 31.0%, insufficiency of 29.0% and those with deficiency as much as 40%.
Vitamin D levels showed a significant difference between T2DM patients and controls (p-value<0.001). Study in China of T2DM patients reported a proportion of 20.14% of vitamin D 25 (OH) D deficiency, 62.27% of insufficiency and 17.59% of normal. Study in Santiago de Chile of T2DM patients received vitamin D deficiency (<20 ng/ml) based on variations in genotype namely FF genotype (16.6%), Ff (59.0%) and ff (24.4%).

Fok1 polymorphism research of T2DM patients and vitamin D status in Morocco results of vitamin D measurements based on the variation of genotype obtained FF (28.18 ± 12.72 ng/ml), Ff genotype (28.61 ± 12.82 ng/ml), and ff genotype (25.83 ± 17.49 ng/ml) with p values in the comparison of FF vs Ff genotypes (p = 0.774) and FF vs ff (p = 0.083). These results indicate there was no relations between vitamin D levels and Fok1 genotype. Research in Tanzania reported a low vitamin D status (<75 nmol/l) reaching 50.0% with an average age of 43.5 years and an average BMI of 20.5 kg/m² when compared with DM patients with low vitamin D status, only 29.7% with an average age of 43.5 years and an average BMI of 28.5 kg/m², no correlation between low vitamin D status between the two groups (p-value = 0.22).

There are differences in the prevalence of vitamin D status in various regions has different risk factors. Vitamin D deficiency is influenced by various factors such as lifestyle, genetics, traditions, and activities so that further research, multifactorial, and multigenes interrelation needed and macrophage activation interactions in the incidence of T2DM comorbid TB.

Conclusion and Suggestion

From this study there were no differences in the frequency of F and f alleles and FF genotype variations, Ff, on Fok1 regional polymorphism in the VDR gene between T2DM with or without PTB, and there was no difference in vitamin D level status with PTB in T2DM patients. Further research is needed on the relationship and interaction of genes encoding macrophage activation proteins.

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Conflict of Interest: None

Ethical Clearance: This study has obtained ethical feasibility information No. 533/Panke.KKE/IX/2017 from the Ethics Committee of the RSUD Dr. Soetomo Surabaya.


References


An Overview of Socio-Cultural Factors on the Utilization of Antenatal Care Services in Bajonese Pomalaa, Southeast Sulawesi

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Abstract

Maternal and infant mortality rate is one indicator of health status in one region. These can be seen from the low utilization of antenatal care (ANC) service which influenced by socio-cultural aspect. This study aims to obtain in-depth information about the influence of socio-cultural aspects on the utilization of antenatal care services in Bajonese Pomalaa.

This was a qualitative research with ethnographic approach. Six informants were interviewed. Data were obtained through observation, in-depth interviews and documentation.

Results shows that community are more prioritizing shaman to do their pregnancy check. They consider that shaman has certain rituals and more experienced than health workers. This causes a psychological impact where they feel more secure with their pregnancy after they were check by shaman.

The low coverage of ANC services is due to the fact that community is more entrusted their pregnancy check by shaman than health workers. It is suggested that health workers can develop partnership with shaman on assisting the community especially women during pregnancy and labor.

Keywords: Antenatal Care, Shaman, social, culture, Bajonese.

Introduction

Maternal and Child Health is one indicators that can be used to measures health status and prosperity of a country. Maternal Mortality Rate (MMR) and infant mortality (IMR) are two things that can be used as parameters to measure the success of health services in a region. Data from Health Ministry in 2015 shows that Maternal Mortality Rate (MMR) is 305 per 100,000 live births, while for Infant Mortality Rate (IMR) in 2016 is 25,5 per 1,000 live births. This data is still far from the target of Sustainable Developments Goals (SDGs) which is 70 per 100,000 live births for Maternal Mortality Rate (MMR) and 12 per 1,000 live birth Infant Mortality (IMR) by 2030¹,².

The high level of MMR and IMR in Indonesia is caused by the low utilization of maternal health service facilities. Socio-cultural conditions in each region also contribute, where there are still many areas where people still go to shamans to check their pregnancy and use shaman as a helper on delivering their child, especially in remote areas. This reality shows that there is linkages between socio-cultural and health aspect, where culture can form habits and responses toward health behavior and occurance of disease in society³,⁴. This phenomenon also happens in the Bajo tribe in Coastal Area of Hakatutobu Village Pomalaa District Southeast Sulawesi.

Bajonese people still adheres to their culture and traditions due to maternal health seeking behavior, where society are tend to have more trust in shaman in doing their pregnancy check and giving help in delivering their child³. They believe that shaman has been possessed by their ancestral spirits which is called MboJanggo. Bajonese people assume that the shaman can solve their health problems through mantras which they believe can help smooth their pregnancy and delivery process⁵.
Based on this background, this research was conducted to find out how socio-cultural factors as a determinant factor in the utilization of maternal health services in Bajo Tribe, Pomalaa District. This research aims to obtain in-depth information related to socio-cultural aspects in the utilization of maternal health services in Bajo Tribe, Pomalaa District.

Materials and Method

This research was conducted in Hakatutobu Village, Pomalaa District, South East Sulawesi. This was a qualitative research with ethnographic approach as a procedure to describe, analyze, and interpret elements of a cultural group such as behavioral pattern, belief, and language that develops from time to time.

Information was obtained through observation, in-depth interviews and documentation. Observations were made by observing and make some notes about how Bajonese people behave towards utilization of maternal health care services during pregnancy and childbirth. In-depth interviews were conducted to obtain in-depth information about socio-cultural aspects, traditions and beliefs of Bajonese people related to pregnancy and childbirth matters. Documentation was carried by collecting data, recording and reviewing every information that are considered to be important and associated with this research.

This research involves six informants which consist of four common informants, which are pregnant women, maternity women and postpartum mother, midwives as key informants and shaman as supporting informants.

Results and Discussion

Based on the indepth-interviewed and observation, it shows that in Bajonese society shamans are society’s first priority when they want to do health checks related to pregnancy and to handle their delivery process. Bajonese considered that shaman has more experience than health workers (midwife), they also feel more comfortable interacting with shaman because they think that shaman is more familiar and all ritual that performed is not conflicted with customs that they believe.

The ritual that performed by shamans for pregnant women is called “mabbetang” which intend to provide safety during pregnancy for mother and their child. Although this ritual is perform only by giving spells on the thread and then tied to the wrist of pregnant woman, but it contains very deep meaning because they believe that it can protect them from evil spirit during their pregnancy. This ritual is performed by shaman at pregnant women’s first visit. Bajonese people believe that this ritual can keep them away from the dangers and evil spirits that can harm their pregnancy. That is the reason why pregnant women will directly come to shaman as soon as they know that they are pregnant.

From all informant statements it can be concluded that socio-cultural factors have an enormous contribution to the low utilization of antenatal care services in Bajonese Pomalaa, Southeast Sulawesi where shaman have more dominant role than health workers (midwife). In this study, shaman is considered as the main health service provider. Although at the end there are some pregnant women who will go to midwife for pregnancy check, but they will prioritize their first pregnancy check by shaman, so does when they seek help for their delivery process. Society assume that shamans can provide spells for safety during pregnancy and delivery.

This results were similar with a study about Behavior of delivery assistance by shaman in Karawang regency which shows that almost all people believe in sahaman’s ability in helping delivery process, because the shaman is considered to have a reliable spiritual power. In rural areas, most pregnant women still believe in shaman to help their delivery.

Result of previous study stated that Maternal and Child Health problems related to socio-cultural community is becoming problems that require a more in-depth and specific study in each region and certain ethnicities. This because one of the most dominant determinants that encourage mothers to choose shaman for pregnancy check and getting help for delivery process is due to cultural factor which has passed down through generations, where society still rely on shaman in giving health services including pregnancy service.

The pattern of cultural behavior during pregnancy and childbirth which passed down through generations provides a conceptual framework for understanding the essence of all human behavior, including behavior on the selection of service providers for maternal and child health. So it can be understood that each cultural community has its own perspective and different behavior, that is why cultural factors should be getting attention from various related sectors to increase coverage of mother and child health services.
The main health problem in Indonesia is low public health status, which can be seen from the high number of maternal and infant mortality rates and also there are still many indicators of maternal health services (KIA) that is still not ideal\(^7,9\). Maternal mortality and morbidity problems are not inseparable from socio-cultural and environmental factors in the society where they live\(^10,11\).

The low utility of existing health facilities in rural area is often cause by society’s belief in their culture which is still preserved until now, resulting in the low coverage of health services in general and also maternal and child health\(^12,13\). Various factors that influence the utilization of health facilities for ANC (Antenatal Care) examination, have an impact on the low coverage of ANC (Antenatal Care). The utilization level of health facilities is different in every society, including in coastal communities which have a strong belief in local culture.

This statement can be proven from the results of research that has been carried, where most pregnant women prefer shaman than midwife on their health seeking behavior related to their pregnancy check and delivery help. This is cause by cultural factors and society’s high belief in shaman’s knowledge and experience. Selection of helper during pregnancy and delivery can also be seen from the observation conducted during the research, where there are 14 pregnant women, which nine of them doing pregnancy check on shaman with their average pregnancy age is above four months old, while the rest five pregnant women doing their pregnancy check to midwife.\(^14-19\)

**Conclusion**

1. Socio-cultural factors still plays an important role in Bajonese community, where they still perform certain ritual when it comes to health seeking behavior.
2. The low coverage of ANC services is due to the fact that community is more entrusted their pregnancy check by shaman than health workers, although there are still some people who also go to health care facilities.

**Ethical Clearance:** Taken from Faculty member committee

**Source of Funding:** Self

**Conflict of Interest:** None

**References**


Utilization of Mother and Child Health Services in Bajo Transport in the Coastal Area of Hakakutobu Village, Pomalaa District

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Abstract

One of the causes of the still high maternal mortality rate (MMR) and infant mortality rate (IMR) is due to the low utilization of antenatal care (ANC) services, especially by people in remote areas. The low utilization of ANC can be influenced by many factors. This study aims to obtain in-depth information related to the utilization of maternal and child health services in the Bajo tribe in the coastal area of Hakakutobu Village, Pomalaa District in terms of economic aspects, family support and community beliefs. This research is a qualitative research with ethnographic approach. Data obtained through observation and in-depth interviews. Informants in this study were 15 people. Data analysis through three channels, namely data reduction, data presentation, and drawing conclusions. The results show that the low utilization of ANC services is due to the economic limitations of the community so that they find it difficult to access ANC service facilities. Lack of support from her husband’s main family also makes mothers not motivated to take advantage of ANC services. The high level of community trust in traditional birth attendants as pregnancy examiners and birth attendants is due to their high confidence in the ability of traditional healers during hereditary and cultural influences related to rituals they must undergo during pregnancy and childbirth.

Keywords: Antenatal care, economy, family support, belief, Bajo.

Introduction

Maternal and child health is an indicator of a country’s health status. Based on the World Health Statistics 2017 Monitoring Health for the SDGs by WHO, around 830 women die every day worldwide due to complications of pregnancy and childbirth in 2015. The SDG target is to reduce the global maternal Mortality Rate (MMR) from 216 per 100,000 births life in 2015 to be less than 70 per 100,000 live births in 2030⁴.

Indonesia’s Health Profile in 2017 shows that the percentage of maternity mothers assisted by health workers in the health care facilities of Southeast Sulawesi Province is only 60.35%, relatively low compared to other provinces in Indonesia ⁴. Pomalaa District maternal mortality rate is 3% and infant mortality rate is 5%. For the achievement of K1 of 80.9%, K4 of 71.6%, delivery by health workers 68.3%, postpartum visits (KF3) 60.59% and neonatal visits (KN3) 60.59% ⁵. PWS-MCH data Hakatutobu village showed a maternal mortality rate in 2014 of 2 deaths due to bleeding and in 2015 a case of 1 and the infant mortality rate assisted by a TBA in 2015 was 2 cases. Coverage of K1 in 2013 was 38%, in 2014 it was 42%, in 2015 it was 40%. The K4 target is 95% while the K4 coverage for 2013 is 30%, in 2014 it is 33%, and in 2015 it is 39%. The target of deliveries by health workers is 90%, while the coverage of deliveries by health workers in 2013 is 28%, in 2014 38% and in 2015 40%. The childbirth visit target (KF3) is 90%, neonatal visit is 90% while the achievement of childbirth visit (KF3) and neonatal visit (KN3) for 2013 is 40%, 2014 is 50%, in 2015 is 45% ⁶. Village Achievement Hakatutobu is still far below the Renstra standard compared to other villages in the sub-district.

Materials and Method

This research is a qualitative research with an ethnographic approach that aims to get in-depth information about the Utilization of Maternal and Child Health Services in the Bajo Tribe in the Coastal Area of Hakakotubu Village, Pomalaa District. This research was conducted in March 2018. Data were obtained through observation and in-depth interviews. There were 15 research informants consisting of ordinary informants
(pregnant women and post-partum mothers), supporting informants (traditional birth attendants and midwives) and key informants (community leaders). Data analysis through three channels, namely data reduction, data presentation, and drawing conclusions.

Results

Economy: Economy is the entire amount of family income obtained to meet daily needs that can affect the use of ANC services. The interviews found information that:

1. The majority of the main sources of income of informants’ families are from seafood (fishermen) where the average daily income is Rp. 100,000 which is only enough to meet their daily food needs, so they have difficulty if they have to incur additional costs for examining pregnancy in health care facilities.

2. If the informant has a pregnancy check at the puskesmas, they are charged a certain fee at each visit so they feel heavy about the costs.

3. Two informants stating that they prefer to have a pregnancy check up by a shaman, because the fees charged are in accordance with their abilities, the form of payment does not have to be in the form of money, but can be in the form of goods.

4. Three informants who stated they did not want to go to a health care facility because they had to pay additional transportation costs to go there, whereas if they were examined by a dukun they only waited at their home, because the shaman would come to their home.

5. Informants prefer to go to a shaman because with payment according to their respective abilities and is only done once, the shaman not only checks their pregnancy but carries out postpartum care.

Family support: Three people The informant stated that they did not get support from their husbands during their pregnancy. The informant said that their husbands did not have time to deliver to the health workers because they were busy working.

2,3. Two informants stated that their husbands did not want to take them to have their pregnancy examined because the location of the health service facility was far from their home.

Community Confidence: Four informants stated that they were more confident to have a pregnancy check up and give birth in a dukun because they considered shamans to be more skilled and experienced. Two informants expressed public confidence in the ability of shamans not only as a helper during pregnancy and childbirth but could also help for those who have difficulty getting pregnant. In addition, healers are also believed to have the ability to keep away from spirits.

3. Three informants prefer to check the pregnancy to the dukun because of emotional closeness, where the dukun is one of the figures considered important in the daily life of the Bajo people.

Discussion

The Economy: Economy is the overall income derived from the work carried out by the head and family members. The level of the household economy affects all aspects of the lives of family members, including health aspects. The higher the level of the economy in a household, the greater the chance of accessing and utilizing health services, and vice versa. Families with a low economic level cannot afford to provide funds for antenatal care and preparation for birth, because their income runs out just to meet their daily needs. This can also indirectly have an impact on the lack of nutritional intake in mothers and babies during pregnancy and childbirth. Unlike families with adequate economic capacity, they can carry out routine pregnancy checks, plan deliveries to health workers and make other preparations related to pregnancy and childbirth so that the condition of the mother and baby can be optimally maintained.

The economic status of the Bajo is very minimal and even tends to be below the poverty line. The location of settlements that are above the sea resulted in the majority of them depending their daily lives on marine products both for sale and for their own consumption. The maximum income they can get from selling seafood in a day is 100,000, and even then it will usually be used up to pay off debt to. To increase family income, the wives sometimes collect waste to be sold even though the results are not much. For daily consumption, if they don’t have side dishes then they only consume rice sprinkled with salt.

Unlike the case when checking the pregnancy and childbirth with the help of a shaman, they are not charged a certain nominal. Shamans are sufficiently rewarded according to the ability of mothers who can be in the form of money or goods, so that the community does not feel burdened in terms of financing. According to Gamelia about the reasons for antenatal care and childbirth assistance, explained that subjects who use the services of a dukunberanak are because the cost of conducting a pregnancy check-up and birth attendant at a dukun are lighter than examining a midwife, the fee to the dukun is Rp. 10,000 often do not even set a price,
as sincere as giving. It also obtained the ease of making payments which can usually be repaid.

According to Kotler and Armstrong there are many factors that influence the decision to use goods and services differently for each individual. These factors are; (a) cultural factors, (b) social factors, (c) personal factors, and (d) psychological factors. This theory also applies to the Bajo people related to the use of health services, where the economic condition of the family has an impact on the lack of utilization of the ANC.

Family Support: Support or motivation is something that supports the formation of a person’s actions or behavior. Support is anything that refers to encouragement and efforts to satisfy the needs of life or to achieve certain goals. Support is a reason for someone to act in order to meet their needs. During pregnancy and childbirth, a mother does not live alone but lives in a social environment with a complex family, community and culture that is rich in diversity both in terms of culture and tradition. In fact the main role of the husband’s family has a very big influence for pregnant women in supporting every behavior of pregnant women including the utilization of health services. Snehendu B. Kar’s theory concludes that a person’s health behavior is determined, among others, by the presence or absence of support from the surrounding community (social support). People who live in an environment that upholds the health aspect will have a high enthusiasm to make various efforts related to health care and vice versa.

During pregnancy until delivery, a mother needs various forms of support, especially from her husband. The lack of husband support can have a variety of negative effects including the lack of a loving bond between the mother and baby, including in the aspect of health care during pregnancy and carrying out checks on health care facilities. The greater support gained during pregnancy, the greater the chance for mothers to use ANC services.

The results showed that the support of husband and family during pregnancy and childbirth in the Bajo tribe community was still very minimal, because their culture was still very thick with patriarchal culture. They assume that everything related to pregnancy and childbirth is the responsibility of a mother/wife. In daily life a husband only functions as a breadwinner while the task of educating and raising children is left entirely to his wife. This is in line with research conducted by Titaley et al. which shows that social support has a significant effect on the utilization of ANC services.

Observation also shows that the husband and family prefer to encourage the mother to check the pregnancy and assist the delivery process to the dukun rather than to the health service facility because they assume that the dukun is far more experienced than the health worker. This also applies even if pregnancy and childbirth complications occur. These results are in line with research conducted by Reskiani, et al. Showing that there is a relationship between family support and the utilization of ANC services at Antang Health Center. Pregnant women who use ANC services because they have adequate family support, where the husband/family reminds mothers about the schedule of antenatal care and takes the pregnant woman to the puskesmas to check her pregnancy.

Husband’s support is very important during pregnancy because sometimes the wife is faced with situations of fear and solitude, so that the husband is expected to always motivate and accompany pregnant women. Besides the support provided during pregnancy can also reduce anxiety and restore the confidence of expectant mothers during pregnancy. This is in accordance with the concept of standby husband, the husband’s awareness of the danger signs of pregnancy and the husband’s readiness to accompany his wife to a health service for pregnancy checks needed at each pregnancy check-up visit, the husband should always accompany his wife so they know the condition of his wife’s pregnancy.

Good support from her husband can provide positive motivation for mothers in checking their pregnancy. Actual forms of actions that can be taken by the husband during the process of pregnancy to delivery include delivering a wife for antenatal care, meeting nutritional needs, inviting a wife to do light exercise, helping to do daily chores, preparing for labor costs, participating in choosing a place to give birth to his wife, accompany or accompany his wife during childbirth, and remind his wife to provide exclusive breastfeeding. The involvement of the husband from the beginning of pregnancy until delivery and the postpartum period will improve the behavior of the care of pregnant women so as to determine the success of the mother in pregnancy until the postpartum period.
Confidence: Beliefs are assumptions and beliefs that are considered correct by an individual or group, regarding concepts, events, people and certain things. Beliefs grow with the world view that is affirmed by the community, are considered positive and true, forming behavior in a predisposition, beliefs can still be changed depending on the interventions provided. Usually, beliefs tend to differ from one community group to another. This is conditioned by the customs or traditions adopted by the community. As seen in the Bajo tribe who believe in non-medical aspects of their health problems, shaman is a figure that is believed to be able to help health problems including for the health of mothers and children. In this study, the Bajo tribe entrusted the problem of pregnancy and childbirth to untrained birth attendants because it was a hereditary habit.

The tendency to prefer shamans for pregnancy and childbirth problems in the Bajo tribe is a challenge for local health workers. Feeling safe and comfortable when served by a shaman is a psychological factor felt by a mother who subjectively forms beliefs. It has become common in traditional societies who always rely on treatment based on their beliefs, as is the case with Bajo people who believe in dukun expertise in facilitating pregnancy and childbirth through certain rituals. The traditional Bajo community has taboos (pamali) which must not be violated for fear that there will be consequences. This conviction was strengthened because so far there had never been a case that they considered endangered the health and safety of pregnant and childbirth women as a result of being assisted by a shaman.

Linking Rosenstock’s theory of the Health Belief Model to the Bajo community with healthy behavior, the Bajo community does not feel any health problems during pregnancy and childbirth when assisted by a dukun, so that it does not change the perception, attitude and actions to find solutions in handling pregnancy and childbirth. Based on this theory, perceptions of health problems are influenced by three things namely; a) Health values in general, (interests and attention to health); b) Confidence in one’s vulnerability to health problems; and c) Confidence in the consequences arising from health problems.

Changing the basic beliefs in utilizing health facilities such as the Bajo community requires attention in exploring problems, motives for change, and strengthening social factors and values that are hereditary. Likewise, various activities that are intended to be improved and developed through posyandu, puskesmas and counseling programs that are run separately. This needs to be attended to because all of these are efforts to tackle health problems that stem from behaviors that do not harm health.

Conclusion
The inability of the community’s economy, resulting in them preferring to have a pregnancy check up and deliver a birth assisted by a dukun rather than a midwife or to a health care facility. 2. Husband and family support for mothers during pregnancy and childbirth is still very minimal. 3. The Bajo community’s belief in dukunbirun because it is a hereditary habit, and they do not feel any health problems during pregnancy and childbirth when assisted by dukunberanun.

Conflict of Interest: None

Source of Funding: Self

Ethical Clearance: Obtained from Universitas Muslim Indonesia.

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6. Puskesmas Pomalaa PWS-KIA Puskesmas Pomalaa 2015


Influence of Customer Value on BPJS Patients with IUR Cost Satisfaction in Hospital of Makassar City

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Abstract

Hospital as a provider of service of health to the public should be able to improve the quality of service because a good quality of services will be able to generate customer value or good impression in the patients or satisfaction, as the purpose of service of the public which is to satisfy the public. The aimed of the study is to determine the influence of customer value on BPJS Patients with IUR cost Satisfaction in Hospital of Makassar City. The type of research is quantitative analytic method using the approach of cross-sectional, held pad a July to August 2019 in the city of Makassar. The population of the study are BPJS patients that use IUR cost or the difference in cost over the service that they receive in the year 2019. Total sample as many as 30 people were obtained using the technique of purposive sampling. Data collection is done through interviews using a questionnaire. Data were analyzed using a test correlation Pearson on SPSS then presented in the form of tables and narrative. The result shows that there is a correlation between customer value with the satisfaction of BPJS patients use IUR costs at hospital of Makassar with p = 0.001 and the value of Pearson Correlation (r) = 0.701. Based on the results of the research can be concluded that the satisfaction of patients affected by customer value and 70.1% of satisfaction of patients is determined by customer value in patients BPJS use IUR costs at the hospital of Makassar city.

Keywords: Iur cost, BPJS, satisfaction.

Introduction

Health becomes a necessity that is fundamental to society. The need is what makes the community feel the need to maintain health and obtain health services. In line with the increasing demands of society towards servicing the medical cause people to become more selective in choosing a hospital. Changes are caused also by further increasing education and state socio-economic society that give rise to the demands of the community to get good service and quality. Indonesian government through the Ministry of Health since 1st January 2014 held health insurance for the community through the Badan Penyelenggara Jaminan Sosial (BPJS), so the government shall provide the services of health that quality.1

Based on the data month September 2014 the number of participants BPJS Health in Indonesia as much as 127.3 million inhabitants (65%) and continues to increase, the month of November 2017 recorded 183 579 086 participants or approximately (70%) and in September 2018, the number of participants reached 201,660,548 people, and on February 1, 2019, reached 217,549,455 people. By the numbers, 217 million inhabitants of this, meaning that the number of participants BPJS Health have reached 81.8% of the total population of Indonesia is around 265 million inhabitants, as the data are quoted from page official BPJS.3 Data BPJS South Sulawesi shows that in the year 2019 the number of participants

facility health both physically and socially for people to achieve the highest degree of health2 Under the terms of it, the government is obliged to provide facilities or services health through BPJS Health with service that is of quality, in order to meet the needs of patients. Public interest in the BPJS program is shown by the amount of community interest in being a participant in the BPJS program.
BPJS Makassar City as much as 500,061 participants PBI and 857,262 participants of non-PBI. In general, the number of total participants JKN in Makassar that as many as 1,357,323 people. Data BPJS health of South Sulawesi in 2019, especially in the 4 (four) regency/municipality comprised of District Barru, Pare-pare, Pinrang and Sidenreng Rappang which is under the office branch cities Parepare, noted that as many as 863,053 people users JKN, on in January up to July, and there are 15% of patients using the IUR fee, to the the nonparticipants as many as 183,587 people by using the IUR cost as much as 23%. Things that indicate that high expectation or expectations of the services on the service of health who qualified with the consequences of the service to pay the difference in price of a standard right services that are acceptable by the patient. BPJS program health in the ministry, would not be separated from the financing of health, because the cost of healthcare is the number of funds that must be provided to organize and or take advantage of the various efforts of health is needed by individuals, families, groups and communities.

The research that is done on the quality of service, value for the customer and the satisfaction of patients at Home Hospital General in Regency Bandung, Indonesia obtained the results of the study indicate that there is the effect that significant to the quality of service at value for customers and satisfaction of patients, where the services are supplied by hospital can improve implications of customer value on patient satisfaction. The creation of positives rating of the customer on the service that they receive is a necessity, so it can be understood that the creation of customer value is a comparison between the perception of the service that is received with expectation before getting the service it. If expectations are met, means the service that has been giving a quality that is beyond the ordinary and also will lead to satisfaction were high. Conversely, if the expectation is not achieved, it means that the quality of service does not meet what is expected. Based on the description at the top then the researchers are interested to do research on the influence of customer value (assessment of customers) to the satisfaction of patients BPJS that use IUR costs in Hospital of Makassar City in 2019.

Materials and Method
The type of research is using quantitative Method of descriptive-analytic with the approach of cross-sectional study. This research was conducted in Makassar City. The population in the study is that BPJS patients that use IUR fee or the difference in cost over the service that they receive in the year 2019. Samples were obtained by using the purposive sampling and get 30 people respondents. Data are collected through interviews by using questionnaire. The data that collected are characteristics of respondent, BPJS class and class of the treatments are used, customer value, the perception of the IUR cost patients BPJS and satisfaction of patients. Analysis of the data is done by univariate and bivariate

Results
Results of the study showed that the group age most is the group aged 36-45 years as many as 6 people (23.1%), while the group age most bit is the group 76 years and above as much as 1 (3.3%). Respondents education are Bachelor as many as 14 people, Magister as much as 1 (3.3%) and other 8 (26.7%) persons. Class participation BPJS that most lots are class I as many as 20 people (66.7%). Class II as many as 4 people (13.3%) and class III as many as 6 people (20%). Patients BPJS are taking class care that 1 level is higher than the class of membership. So that class I patients who increased their class of care to VIP there was 20 people (66.7%). Class II rise into the class I as many as four people (13.3%) and class III rising levels into grade II as many as six people (20%).

<table>
<thead>
<tr>
<th>Variable</th>
<th>n = 30</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤25</td>
<td>6</td>
<td>20</td>
</tr>
<tr>
<td>26–35</td>
<td>5</td>
<td>16,7</td>
</tr>
<tr>
<td>36–45</td>
<td>10</td>
<td>33,3</td>
</tr>
<tr>
<td>46–55</td>
<td>4</td>
<td>13,3</td>
</tr>
<tr>
<td>56–65</td>
<td>1</td>
<td>3,3</td>
</tr>
<tr>
<td>66–75</td>
<td>3</td>
<td>10</td>
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<tr>
<td>76≤</td>
<td>1</td>
<td>3,3</td>
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<td></td>
</tr>
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<td>15</td>
<td>50</td>
</tr>
<tr>
<td>Female</td>
<td>15</td>
<td>50</td>
</tr>
<tr>
<td>BPJS Class</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st Class</td>
<td>20</td>
<td>66,7</td>
</tr>
<tr>
<td>llnd Class</td>
<td>4</td>
<td>13,3</td>
</tr>
<tr>
<td>1llrd Class</td>
<td>6</td>
<td>20</td>
</tr>
<tr>
<td>Nursing Class</td>
<td></td>
<td></td>
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<tr>
<td>VIP Class</td>
<td>20</td>
<td>66,7</td>
</tr>
<tr>
<td>1st Class</td>
<td>4</td>
<td>13,3</td>
</tr>
<tr>
<td>llnd Class</td>
<td>6</td>
<td>20</td>
</tr>
</tbody>
</table>
The test results of normality of data by using a test Kolmogorv-Sminor v Test obtained result value of \( p = 0.412 \) so that the value of \( p > 0.05 \), it can be interpreted that the data distributed normally.

Figure 1. Graphic of Normality Test

Then test used is a test Pearson Correlation to see the influence of ratings of customers (customer value) to the satisfaction of patients BPJS using Iur costs in Rumah Sakit Makassar.

Table 2. Bivariat Analysis of The Independent Variable and Dependent Variable

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Customer Value</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High</td>
<td>Extremely High</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Young</td>
<td>14</td>
<td>17</td>
</tr>
<tr>
<td>Adult</td>
<td>10</td>
<td>23,1</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>12</td>
<td>20</td>
</tr>
<tr>
<td>Female</td>
<td>12</td>
<td>20</td>
</tr>
<tr>
<td>BPJS Class</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ist Class</td>
<td>17</td>
<td>15</td>
</tr>
<tr>
<td>IInd Class</td>
<td>2</td>
<td>50</td>
</tr>
<tr>
<td>IIIrd Class</td>
<td>5</td>
<td>16,7</td>
</tr>
</tbody>
</table>

Bivariate Analysis

Customer Value-Patient Satisfaction

\( R = 0.701 \)

\( P = 0.001 \)

The result of the test using SPPS obtained value of \( p = 0.001 \) and the value of the coefficient of Pearson Correlation \( (r) = 0.701 \). It is can be interpreted that the customer values affect the satisfaction of patients BPJS using Iur costs in the hospital of Makassar City where 70.1% of satisfaction of patients are determined by customer value.
Regulation of the Minister of Health No. 51 the Year 2018 defines that IUR cost is an extra cost that is paid by participants at the time of obtaining the benefits of ministry of health that can lead to abuse of the service. While that meant the difference in fee is an additional fee that is paid by participants at the time of obtaining the benefits of ministry of health which is higher than the right. Special increment costs, Article 10 paragraph 5 Permenkes 51/2018 regulate that participants JKN-KIS only can go up one level much higher than the class that became due. Chief of Bureau of Law and Organization of the Ministry of Health of the Republic of Indonesia Sundoyo explained that the purpose of the con fee and the difference in cost for participants Guarantee of Health National (JKN) which was held BPJS Health as the control of quality and cost, as well as preventing the misuse of the service facilities of health in the service of JKN.

The value of the customer (customer value) is the difference between the value of customer total and charge customers total in which the value of customer’s total is a set of benefits that are expected by customers of products or services specified and charge the customer the total is a set of costs which are expected by consumers who incurred to evaluate, acquire, use and discarding products or services. Value customers and the loyalty of customers is very important and useful for the improvement of services of the service. Customer value or customer perceived value is customer perception of the value where the company must consider the value in developing products and services so that it is in line with what the customer expects. Monroe states that the value of the customer is the ratio between profit or benefit that is perceived by the sacrifices incurred.

The satisfaction of customers is the response of customers to the discrepancy between the level of interest before and the performance of real-time that he felt after use. The satisfaction of customers is influenced by perceptions of the quality of service, quality of product, price and factors that are personal and that is the situation for a moment. The satisfaction of customers is the response of customers to a discrepancy between the level of interest before and the performance of real-time that he felt after use. One of the factors that determine the satisfaction of customers is the perception of customers regarding the quality of services that focuses on five dimensions of quality of services. The quality that is perceived as directly has the effect of positively towards the satisfaction of customers as a whole. The satisfaction of customers as a whole will impact negatively on the complaints of customers and impact positively on the loyalty or loyalty of customers.

Levels of satisfaction were obtained by the customer is usually highly related closely to the standard quality of the goods or services are enjoyed and services other form of service pre-sales, the current transaction and after-sales. The level of satisfaction is a function of the difference between the appearance of the felt with expectations. Patients are satisfied after receiving services that meet their expectations, the patient decides to provide an assessment of services and acts based on satisfaction. So the value of service quality is the most important part and a measure of patient satisfaction for the hospital.

Assessment of patients to care nurse comes from the experience of patients. The aspect of patient experience can be interpreted as a treatment or action of a nurse who is or has been experienced, felt and borne by someone who uses nurse services. aspects of the satisfaction of the patient is very determined on a model or engineering services, where the provider of services provide care professionally, so that the recipient of service feel satisfied on the service that they receive, and will give you a sense of confidence to hospital as one of the places receiving services are special. The satisfaction of patients who seek treatment at home sick will have an impact on the number of visits to patients at the hospital. Visits were so this by itself will increase the sources of income for hospital.

Results of the research showed that customer value effect is significant to the satisfaction of patients, where 70.1% of satisfaction of patients obtained from the customer value. It is in line moved at the research that is done by Alimuddin, et al. rgery Surabaya obtain results that there is a direct influence of the customer value to the satisfaction of 0.845. Soit can be interpreted that the direct influence of customer value on satisfaction is very significant and positive. Then increasingly higher levels of the value of customer service hospital, getting high is also the satisfaction of the customer and vice versa. The results of the research is also supported by research that is conducted by Maya Utami Ikasari, Sri Sutyoko and Sendhang Nurseto (2013) who find that the variable value of the customers influences the variable patient’s satisfaction. If the level of assessment of customers...
(customer value) higher than getting high also the level of satisfaction of the patient’s homesick, especially in patients BPJS using Iur costs. This is because the patient chooses a class of care that is more than their participation certainly with the hope that the service will get better.

**Conclusions**

The study is concluded customer value or assessment of customers is significantly affecting the satisfaction of patients BPJS use Iur costs at homesick of Makassar. As for the advice that can be given are hospital need to improve the quality of service, attitude of social officers and factors other that can be re-established as well as increase customer value to satisfaction of patients can be further improved so that helped increase the loyalty of patients which resulted in increased profits hospital.

**Conflict of Interest:** None

**Source of Funding:** Self

**Ethical Clearance:** Obtained from Faculty of Public Health, Hasanuddin University.

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10. Arisandy, W.. Health Service Strategies in Improving the Quality of Health Services through the CRC (Citizen Report Card) Method in the City of Surabaya. Airlangga University. 2015
Determinant Factors Affecting the Development of Motor, Cognitive and Socioemotional Children Ages 18-12 Months in the District Jeneponto, Indonesia

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¹Doctoral Student, Faculty of Public Health, Hasanuddin University; ²Public Health Faculty, Hasanuddin University, Indonesia

Abstract

Background: Malnutrition during pregnancy and early childhood causes delays in physical growth, the motor development, and cognitive development disorders.

Objectives: This study aims to Determine the factors that influence motoric, cognitive and socio-emotional development of children aged 18-24 months in Jenepontodistric.

Method: This study is an analytical study with cross-sectional approach. Samples consisted of 32 children aged 18-24 months. Child development was measured using the Caregiver Reported Early Childhood Development Index (CREDI) instrument. Statistical analysis to test the factors that influence motoric, cognitive and socioemotional development using an unpaired T-test with a significance level of 95%.

Results: This study reported that of 32 children born to mothers aged 20-35 years (68.8%), <20 and> 35 years (31.3%) with a primary education level of 34.4% and 65.6% intermediate level. Bivariate analysis found that factors affecting the motor development were birth weight (p = 0.004), cognitive development influenced by maternal age (p = 0.021) and birth weight (p = 0.000) and socioemotional development influenced by maternal education (p = 0.050), breastfeeding (p = 0.010) and stimulation (p = 0.004).

Conclusion: The factors that influence motoric development are birth weight, cognitive development influenced by birth weight and maternal age, while maternal education, breast feeding, and stimulation Affect socioemotional development.

Keywords: Motoric development, Cognitive, and Socioemotional, Children aged 18-24 months.

Introduction

In 2010, an estimated 33% of children aged 3 and 4 years in countries of low and middle income, 80.8 million children fail to meet basic standards in cognitive development and or socioemotional.¹ In 2013, the national prevalence of malnutrition in children under five years-less by 19.6%, which means heavy-less nutritional problem in Indonesia is still a public health problem.² In 2013, the national prevalence of malnutrition in children under five years-less by 19.6%, which means heavy-less nutritional problem in Indonesia is still a public health problem of high prevalence approaching. Among the 33 provinces, three provinces, including the very high prevalence categories, namely West Sulawesi, West Papua and East Nusa Tenggara.²

The Cognitive development of children is influenced by genetic and environmental factors. The child has the potential of genetically cognitive development. However, environmental factors, such as adequate nutrition and the ability of parents to improve food and stimulating home environment also has a positive effect on cognitive development of children³. Optimal health education in the mother can optimize the growth and development of children.⁴

Adequate support to the development of a child when a child can effect motoric development, language, cognitive, social, emotional and behavior, influencing the long-term health and reduce health inequalities and socioeconomic.⁵ In children suspected of having developmental delays or disorders, medical evaluation should be done and development (development assessment) so that early intervention can be done immediately (early intervention) on the child.⁶
Based on the phenomenon of the above results, the main purpose of this study was to determine the determinant factor of motor development, cognitive and socio-emotional in children aged 18 to 24 months in Jeneponto Indonesia.

**Research Method**

This study consisted of children whose mothers enrolled in trials of Moringa leaf powder supplements provided prenatal and postnatal district Jeneponto. Children of mothers who were enrolled in the trial and be eligible to participate in the study of child development when children aged 18 to 24 months time recruitment selection. We chose one district and call mom at random to participate in the study of child development between December 2018 to January 2019, and get as many as 32 children aged 18-24 months. The sample size is limited by those who were not in place when the data collection was done as well as funding constraints.

Child development was assessed using Caregiver Reported Early Childhood Development Index (credi). Credi is a simple device, low cost reported by the caregivers or child care givers, for the household survey. To monitor and measure the child’s development, two research assistants trained in the local language setempep Credi and anthropometric measurements for children and adults, and other study procedures.

We did a statistical analysis to examine the factors that influence a child’s development using an unpaired t test with significance level of 95%, and a linear regression model that is tailored to the characteristics of mothers and children with a significance values at p <0.05.

**Results**

a. Maternal characteristics, prenatal and child development: The relationship between mother and child development characteristics are presented in Table 1. This study found that children whose mothers aged 20-35 years scored significantly higher on cognitive development CREDI (p = 0.021) compared with children whose mothers aged over 35 years. Children whose mothers complete high school education earned scored significantly lower on socio-emotional development (p = 0.05) compared to children whose mothers completed primary education. Maternal body mass index, Moringa leaf powder supplementation and second-trimester anemia status did not significantly affect any of the scales of child development.

b. Characteristics of children, follow-up and development of children: The relationship between the characteristics of children, follow-up and development of children are presented in Table 1. In this study, it was found that children who had birth weight ≥2500 grams have significantly higher scores (p = 0.004) in motoric development, and p = 0.001 on cognitive development than children who had birth weight <2500 g. Children who were breastfed exclusively had lower scores were significantly (p = 0.01) in the socio-emotional development compared with children given non-exclusive breastfeeding.

<p>| Table 1. Effect of the characteristics of the mother and child to the development of motoric, cognitive and socioemotional children aged 18-24 months in Jeneponto |
|-----------------|-----------------|-----------------|-----------------|
| <strong>Characteristics</strong> | <strong>Motor</strong> | <strong>Cognitive</strong> | <strong>Socioemotional</strong> |
|                  | Mean (SD) | p       | Mean (SD) | p       | Mean (SD) | p       |
| <strong>Characteristics of Mother Age Mothers</strong> | | | | | | |
| Age 20-35 years | 4.13 (0.69) | 0.0705 | 14.65 (1.49) | 0.0021 * | 13.6 (3.26) | 0.0494 |
| Age &lt;20 and&gt; 35 years | 4.00 (1.22) | 12.66 (3.16) | 12.77 (2.39) |
| <strong>Education</strong> | | | | | |
| Secondary school | 4.14 (0.65) | 0.0661 | 14.14 (1.45) | 0.0867 | 12.47 (2.20) | 0.0050 |
| Primary school | 4.00 (1.18) | 14.00 (3.34) | 15.09 (3.70) |
| <strong>IMT mother</strong> | | | | | | |
| Normal + skinny | 3.95 (0.58) | 0.0202 | 14.57 (1.50) | 0.0095 | 12.76 (2.68) | 0.0114 |
| Obese + obese | 4.36 (1.20) | 13.18 (3.09) | 14.54 (3.41) |</p>
<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Motor</th>
<th>Cognitive</th>
<th>Socioemotional</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (SD)</td>
<td>p</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td><strong>Supplementation</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moringa flour</td>
<td>3.88 (0.35)</td>
<td>0.71</td>
<td>15:38 (1:50)</td>
</tr>
<tr>
<td>Moringa extract</td>
<td>4:18 (0.75)</td>
<td></td>
<td>14.00 (1.67)</td>
</tr>
<tr>
<td>Tablet Fe</td>
<td>4.15 (1.14)</td>
<td></td>
<td>13.38 (2.75)</td>
</tr>
<tr>
<td><strong>Prenatal Anemia Status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hb ≥ 11 g/dl</td>
<td>4:05 (0.99)</td>
<td>0715</td>
<td>13.65 (2.45)</td>
</tr>
<tr>
<td>Hb &lt;11 g/dl</td>
<td>4:16 (0.57)</td>
<td></td>
<td>14.83 (1.64)</td>
</tr>
<tr>
<td><strong>Characteristics of Children</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sex of the Child</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Man</td>
<td>4:05 (0.93)</td>
<td>0.78</td>
<td>14.05 (2.79)</td>
</tr>
<tr>
<td>Woman</td>
<td>4:14 (0.77)</td>
<td></td>
<td>14.14 (1.29)</td>
</tr>
<tr>
<td><strong>Birthweight</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal (≥ 2,500 g)</td>
<td>4.25 (0.64)</td>
<td>0004 *</td>
<td>14.6 (1.42)</td>
</tr>
<tr>
<td>LBW (&lt;2,500 g)</td>
<td>3.00 (1.41)</td>
<td></td>
<td>10.5 (3.69)</td>
</tr>
<tr>
<td><strong>Age Pregnancy</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At term (≥ 37 weeks)</td>
<td>4.09 (0.97)</td>
<td>0978</td>
<td>14.13 (2.55)</td>
</tr>
<tr>
<td>Preterm (&lt;37 weeks)</td>
<td>4:10 (0.56)</td>
<td></td>
<td>14.00 (1:41)</td>
</tr>
<tr>
<td><strong>Nutritional Status of Children</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Index BB/U (WAZ)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>4.00 (0.89)</td>
<td>0202</td>
<td>13.84 (2.37)</td>
</tr>
<tr>
<td>Under weight</td>
<td>4.50 (0.54)</td>
<td></td>
<td>15.16 (0.98)</td>
</tr>
<tr>
<td>Index PB/U (HAZ)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>4.00 (0.81)</td>
<td>0683</td>
<td>14.20 (1:13)</td>
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<tr>
<td>Stunting</td>
<td>4:13 (0.88)</td>
<td></td>
<td>14.04 (2.60)</td>
</tr>
<tr>
<td>Index BB/PB (WHZ)</td>
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<td></td>
</tr>
<tr>
<td>Normal</td>
<td>4.06 (0.86)</td>
<td>0497</td>
<td>14:03 (2:29)</td>
</tr>
<tr>
<td>Wasting</td>
<td>4.50 (0.70)</td>
<td></td>
<td>15:00 (0:00)</td>
</tr>
<tr>
<td><strong>Breastfeeding 6 Months First</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exclusive breastfeeding</td>
<td>4:07 (0.75)</td>
<td>0928</td>
<td>14.30 (1.03)</td>
</tr>
<tr>
<td>Non exclusive breastfeeding</td>
<td>4:10 (0.93)</td>
<td></td>
<td>13.94 (2.79)</td>
</tr>
<tr>
<td><strong>Giving Stimulation</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High scores (score 6-11)</td>
<td>4.3 (0.63)</td>
<td>0249</td>
<td>14.84 (1.67)</td>
</tr>
<tr>
<td>Low score (score 0-5)</td>
<td>3.94 (0.97)</td>
<td></td>
<td>13.57 (2:45)</td>
</tr>
<tr>
<td><strong>Verbal and Physical Punishment</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not</td>
<td>4.37 (0.74)</td>
<td>0291</td>
<td>14.75 (1.98)</td>
</tr>
<tr>
<td>Yes</td>
<td>4.00 (0.88)</td>
<td></td>
<td>13.87 (2.3)</td>
</tr>
</tbody>
</table>

* Correlation is significant at the 0.05 level (2-tailed)
c. Factors affecting the development of motoric, cognitive and socioemotional children ages 18-24 months

The results of multiple linear regression analysis (Table 3) to test the independent variables that most influence on the high score between maternal characteristics of child development characteristics of children. In this study it was found that all of the variables examined in linear regression simultaneous effect on motoric development (p = 0.001), cognitive development (p = 0.000), and on socio-emotional development (p = 0.001). The results that the birth weight of 28.5% a negative effect on the development of motoric (p = 0.003, t =-3.283), and 65.1% negative effect on cognitive development (p = 0.000, t =-5.348). Giving stimulation 65.1% negative effect on cognitive development (p = 0.035, t =-2.234), and a negative effect on the development of socioemotional 48.4% (p = 0.002, t =-3.519).

<table>
<thead>
<tr>
<th>Table 2. Results of Regression Testing Factors that influence Motoric development, cognitive and socioemotional children aged 18-24 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent Variables</td>
</tr>
<tr>
<td>------------------------</td>
</tr>
<tr>
<td><strong>Motor Trend</strong></td>
</tr>
<tr>
<td></td>
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<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Cognitive Development</strong></td>
</tr>
<tr>
<td></td>
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<tr>
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<td></td>
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<td></td>
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<tr>
<td></td>
</tr>
<tr>
<td><strong>Developments Socioemotional</strong></td>
</tr>
<tr>
<td></td>
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<td></td>
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<tr>
<td></td>
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<td></td>
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<tr>
<td></td>
</tr>
</tbody>
</table>

| R2 (R2adj) | 0.614 (0.285) | F (Sig) | 4.082 (0.010) |
| R2 (R2adj) | 0.854 (0.651) | F (Sig) | 9.263 (0.000) |
| R2 (R2adj) | 0.764 (0.484) | F (Sig) | 5.838 (0.001) |

**Discussion**

**Effect of Age Mothers with Children’s Cognitive Development:** In this study, the results obtained with p value = 0.021 which means there is an influence between the characteristics of the mother’s age with cognitive development in children. A child requires special attention to the optimization of growth. Optimizing the development of the necessary interaction between
children and parents, especially the mother’s role is very beneficial to the overall process of development of children because parents can immediately recognize the disorder as early as possible the process of development of their children. If adjusted to international opinion, then an early age in Indonesia are those from birth (age 0 years) until well into the early primary school level. However, some studies show that since the time of conception (in the womb), the developing fetus and have proven to do stimulation to develop a variety of sensitivity and basic abilities.

Given the 80% growth and brain development in children pasa currently developing an early age, at the age of 1 year of brain growth reached 70% of the adult brain, and in the age of 3 years of a child’s brain has reached 90% of the adult brain. Thus, this period should be best utilized to improve the intelligence of children.

The influence of birth weight with Motor and Cognitive Development of Children: Prenatal and natal factors that affect the development of children one of whom is the birth weight. An estimated 10-15% of premature infants with low birth weight or impaired development, as well as infants born with very low birth weight 3-4 times greater risk for experiencing a developmental disorder. Babies with low birth weight have a brain disorder that can be observed through MRI and a greater risk of an abnormal signal by a larger amount. Besides infants with low birth weight, premature and very low birth weight had serum CRP levels were higher.

According to Piaget, the first stage lasts Cognitive Development in children from birth until the age of 2 years is a sensory motoric development. At this stage the baby to build an understanding of the world by coordinating sensory experiences (sensory) them, such as seeing and hearing) with motoric movement (physical) they, like grabbing, or touched, because that is called sensorimotor. At the beginning of this stage, the baby showed no more than a reflective pattern for adapt with the world, towards the end of this stage, babies showed a pattern more complex sensory-motor.

The results of previous studies which stated that infants with a history of premature or low birth weight risk of impaired cognitive development and motor development and research shows that babies born with low weight the potential to have a developmental disorder in the future. Babies born with low birth weight, especially in infants born with very low birth weight, may have abnormalities in brain structure. Abnormalities of the brain in infancy can affect the child’s development in the future.

Effect of Breastfeeding with socioemotional development Children: Breastfeeding is one of the environmental factors are known to provide a variety of nutritional and immunological advantages in infants.

The American Academy of Pediatrics recommends breastfeeding for human use as an ideal source of nutrition for infant feeding. Infant formula is the second choice and third choice of soy formula. In this study showed that breastfeeding for 6 months had a significant influence on socio-emotional development in infants aged 18-24 months. The development of socio-emotional during infancy and early childhood is described as the ability of children who thrive on experience, control and express feelings, establish connections close interpersonal and secure, investigate the environment and learn, all within the scope of the family, society and culture.

Some studies in the encyclopedia concluded that breastfeeding is not a panacea, but as a mother can breastfeed optimally, the infant or child they will get many benefits, one of them for psychosocial and emotional development in children.

The influence of Stimulation with socioemotional development Children: The development of socio-emotional during infancy and early childhood is described as the ability of children who thrive on experience, control and express feelings, establish connections close interpersonal and secure, investigate the environment and learn, all within the scope of the family, society and culture.

Results of research on the behavior of giving stimulation to the 32 mothers found that children were stimulated high by their parents have higher scores were significantly (p = 0.004) on the development of socio-emotional compared to children who are less stimulated by their parents.

According to research results Supinah, mostly by 53% stimulation skills are good mothers and produce the majority of children aged 2-3 years at 71% had the appropriate gross motor development. Analysis Spearman rho rank generating value calculated at 0.687
indicates that the stimulation skills of mothers with gross motor development in children aged 2-3 years have a strong closeness. That is a good or bad skill in stimulating her mother will be very influential in his gross motor development.

**Conclusions**

Based on research that has been done above, it can be concluded that factors affecting motor development is birth weight ($p = 0.004$), cognitive development is influenced by maternal age ($p = 0.021$) and birth weight ($p = 0.000$) and the development of socioemotional affected by breast feeding ($p = 0.010$) and providing stimulation ($0.004$).

**Ethical Clearance:** Ethical clearance was issued by the Health Research Ethics Committee of the Hasanuddin University School of Public Health, and subjects were asked to sign an agreement before being included in the study.

**Source of Funding:** Self

**Conflict of Interest:** Nil

**References**


9. MOH. Stimulation Guidelines, Detection and Early Intervention Growth in the Level of Primary Health Care. 2006;


Analysis of Human Platelet Antigen (HPA) in Thrombocytopenia Patients

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Abstract

Human Platelet Antigen (HPA) is a form of immunogenic polymorphism of platelet membrane glycoproteins. Human Platelet Antigen can cause platelet alloimmunization response will be clinical manifestations of immune thrombocytopenia, such as Fetal Neonatal Allo-immune Thrombocytopenia (FNAIT), Post Transfusion Purpura (PTP), and Platelet Transfusion Refractory (PTR), Idiopathic Thrombocytopenic Purpura (ITP). The aim of this study to research on seroprevalence (genotype and frequency) of Human Platelet Antigen (HPA) in Patients with Non-Immune and immune Thrombocytopenia.

A Cross sectional study was conducted to 66 patients with thrombocytopenia, Samples were collected during the period Mei-July 2019, and HPA genotypes were identified in buffy coat blood samples. Samples were examined by PCR examination to detect HPA genotype at Medical-Research Center Laboratory/Medical Faculty of Hasanuddin University Hospital, Makassar. Data was analysis by the statistical tests used were Independent-t, Mann-Whitney, Chi-Square and Fisher Exact tests. The results of the test were significant statistically if the p-value <0.05.

Result. From 66 patients thrombocytopena, ages 19-82 years, 41 (62.1%) women and 25 (37.9%) men. 31 (47.0%) patiens were non immune thrombocytopenia and 35 (53.0%) were Immune Thrombocytopenia. The highest HPA frequency (100%) was HPA-1b, 2a, 4a were obtained in both non-immune and immune thrombocytopenia. In this study, there were frequency of HPA 1b, 15a, in both non-immune and immune thrombocytopenia where was not found in the normal population in Makassar (in our research before). Frequency of HPA-4b (2.8%) was obtained in the population of immune thrombocytopenia that was not found in non-immune thrombocytopenia. The Positive distribution HPA-3b was found to be significantly higher in the Immune group (22.9%) than in the Non-Immune group (3.2%) (p <0.05).

Conclusion: The frequency of HPA-3b was found to be significantly higher in immune thrombocytopenia than non-immune thrombocytopenia.

Keywords: Human Platelet Antigen, Non immune, Immune, Thrombocytopenia.

Introduction

Thrombocytopenia is a platelet count less than normal, the normal platelet value is 150,000-400,000/μL. The mechanism underlying thrombocytopenia is due to suppression of platelet production, increased platelet consumption and platelet lysis or damage through immune or non-immune reactions. Thrombocytopenia causa immune is one of the immune diseases characterized by platelet counts of less than 100,000/μL without other causes of thrombocytopenia, with or without a decrease in other haematological parameters (based on consensus results of the International Working Group (IWG) panel in 2009 which published the provided guidance).

1 Decreased platelet count is caused by platelets bound by antibodies, especially IgG, which originate from the patient’s own body. The aetiology of immune thrombocytopenia is still unclear, environmental and genetic factors play an important role in pathogenesis.3

Human Platelet Antigen (HPA) is a form of immunogenic polymorphism of platelet membrane glycoproteins. The HPA nomenclature has now identified 21 HPA bineal systems, generally composed by Single
Nucleotide Polymorphism (SNP) in genes that encode the glycoprotein membrane that is relevant except for one arranged single amino acid substitution.\textsuperscript{4,5}

Platelet plasma membranes consist of many glycoproteins (GP) and phospholipids. The most platelet glycoproteins are GPIIb-IIIa, GPIa-IIa, and GPIb-IX. Twenty-four HPAs have been identified serologically, and the molecular basis of 22 of them has been identified. Twelve HPAs are grouped into six bineals (HPA-1a/1b, 2a/2b, 3a/3b, 4a/4b, 5a/5b, and 15a/15b). Higher frequency alleles are defined as “a” (such as HPA-1a) and low-frequency alleles “b” (such as HPA-1b). \textsuperscript{6} The frequency of the HPA genotype varies between populations and different ethnic groups. \textsuperscript{4,5,6}

Human Platelet Antigen can cause platelet alloimmunization response which can cause clinical manifestations of immune thrombocytopenia, such as Fetal Neonatal Allo-immune Thrombocytopenia (FNAIT), Post Transfusion Purpura (PTP), and Platelet Transfusion Refractory (PTR), Idiopathic Thrombocytopenic Purpura (ITP). \textsuperscript{5,7,8} Establishing an HPA system pattern is the basis for diagnosing and managing risk and managing the diagnosis. \textsuperscript{4,5,9} Knowledge of the HPA genotype and frequency of antigens in a population is important, especially for the supply of appropriate blood components for patients with PTR. \textsuperscript{4,8}

Pai SC, et al., have conducted HPA-1 through-6 and HPA-15 allele genotypes in 998 platelet donors by PCR-RT method at 6 blood service centres in Taiwan, the results of the study showed based on the frequency of HPA-15b alleles. and HPA-3a, which have the most important role as causative factors, FNAIT, PTP, and PTR followed by HPA-2,-6,-1,-5, and-4. Besides, HPA-4b and HPA-5b are also considered to cause immunogenicity.\textsuperscript{8}

Data on the genotype and frequency of HPA in populations in Indonesia do not yet exist, especially in Makassar, so researchers want to research on seroprevalence (genotype and frequency) of Human Platelet Antigen (HPA) in Patients with Non-Immune and immune Thrombocytopenic. Researchers hope the results of this study can be the basis for further research, especially in the management of diseases associated with platelets.

**Method**

**Samples and DNA extraction:** Blood samples were collected from 66 patients Thrombocytopenia, 31 patients were Non-Immune Thrombocytopenia and 35 patients were Immune Thrombocytopenia. The hematologic examination was performed with a Sysmex automatic haematology analyser. DNA was prepared from whole blood in ethylenediamine tetra acetic acid (EDTA) by standard Method. The genotypes of HPA-1 system were determined using the polymerase chain reaction sequence-specific primers (PCR-SSP) method designed by Skogen et al. and the SSPs were used to discriminate between the alleles encoding the six major HPAs in a series of patients and normal blood donors. The thermocycler program consists of an initial step of 94°C for 5 min, followed by 32 cycles of 94°C for 30 s, 65°C for 60 s, 72°C for 60 s, and a final extension step of 72°C for 10 min. The PCR products (15 μL) were subjected to gel electrophoresis on standard 1.5% agarose gel containing 0.5 μg per ml of ethidium bromide. The typing results were examined under UV light transillumination.

**Statistical analysis:** Statistical analysis was performed using SPSS version 12 statistical package for windows. Allele and genotype frequencies were calculated by direct counting.

**Results**

In this study, 66 samples study were obtained, with a diagnosis of thrombocytopenia, ages 19-82 years, 41 (62.1%) women and 25 (37.9%) men. In this study, an analysis of the frequency and genetic HPA of non-immune thrombocytopenia and immune thrombocytopenia also carried out an analysis of the haematological parameters of platelets, leukocytes, and haemoglobin

<table>
<thead>
<tr>
<th>No</th>
<th>Variable</th>
<th>Mean</th>
<th>Max</th>
<th>Min</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Age (years)</td>
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<td>82</td>
<td>19</td>
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<td></td>
</tr>
<tr>
<td>2.</td>
<td>Gender:</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Women</td>
<td></td>
<td>41</td>
<td></td>
<td></td>
<td>62.1%</td>
</tr>
<tr>
<td></td>
<td>Men</td>
<td></td>
<td></td>
<td>25</td>
<td></td>
<td>37.9%</td>
</tr>
</tbody>
</table>

Table 1: Basic data from the study sample
Table 2: Descriptive Statistics of age Platelets, Leukocyte, and Haemoglobin data distribution (n = 66)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Min</th>
<th>Max</th>
<th>Median</th>
<th>Mean</th>
<th>SD</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ages (years)</td>
<td>19.0</td>
<td>82.0</td>
<td>44.0</td>
<td>43.2</td>
<td>16.9</td>
<td>0.042</td>
</tr>
<tr>
<td>Platelets (10^3/μL)</td>
<td>1.0</td>
<td>99.0</td>
<td>60.0</td>
<td>55.4</td>
<td>31.2</td>
<td>0.000</td>
</tr>
<tr>
<td>Leucocytes (10^3/μL)</td>
<td>0.3</td>
<td>98.0</td>
<td>6.3</td>
<td>8.7</td>
<td>12.1</td>
<td>0.000</td>
</tr>
<tr>
<td>Haemoglobin (mg/dL)</td>
<td>3.3</td>
<td>17.7</td>
<td>10.0</td>
<td>10.1</td>
<td>2.9</td>
<td>0.032</td>
</tr>
</tbody>
</table>

*Kolmogorov-Smirnov test

Note:
- Age data of subject, Leucocytes value and Haemoglobin distribution was not normally (p <0.05)
- Platelets have values between 1.0-99.0 with a mean of 55.4 ± 31.1. PT data distribution is normal (p >0.05)

Table 3. Test results of sex differences in non-immune and immune thrombocytopenia

<table>
<thead>
<tr>
<th>Gender</th>
<th>Groups</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Non-Immune</td>
<td>Immune</td>
</tr>
<tr>
<td>Men</td>
<td>N</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>58.1%</td>
</tr>
<tr>
<td>Women</td>
<td>N</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>41.9%</td>
</tr>
<tr>
<td>Total</td>
<td>N</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Chi-Square test (p=0.001)

Note: The distribution of men was significantly more in Non-immune (58.1%) than in Immune, while the distribution of women was more in Immune (80.0%) compared to Non-immune (p <0.01)

Table 4. Test results for differences in age, number of leukocytes, haemoglobin, and platelets in immune and non-immune thrombocytopenia

<table>
<thead>
<tr>
<th>Variable</th>
<th>Groups</th>
<th>N</th>
<th>Min</th>
<th>Max</th>
<th>Median</th>
<th>Mean</th>
<th>SD</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ages (Years)</td>
<td>Non-Immune</td>
<td>31</td>
<td>19</td>
<td>82</td>
<td>53.0</td>
<td>50.9</td>
<td>15.6</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>Immune</td>
<td>35</td>
<td>19</td>
<td>68.0</td>
<td>35.0</td>
<td>36.5</td>
<td>15.2</td>
<td></td>
</tr>
</tbody>
</table>
### Variable

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>Min</th>
<th>Max</th>
<th>Median</th>
<th>Mean</th>
<th>SD</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leukocytes (10^3/μL)</td>
<td>Non-Immune</td>
<td>31</td>
<td>19</td>
<td>68</td>
<td>35.0</td>
<td>15.2</td>
<td>0.797*</td>
</tr>
<tr>
<td></td>
<td>Immune</td>
<td>35</td>
<td>0.3</td>
<td>16.3</td>
<td>6.1</td>
<td>4.3</td>
<td></td>
</tr>
<tr>
<td>haemoglobin (gr/dL)</td>
<td>Non-Immune</td>
<td>31</td>
<td>9.0</td>
<td>17.3</td>
<td>10.2</td>
<td>1.9</td>
<td>0.017*</td>
</tr>
<tr>
<td></td>
<td>Immune</td>
<td>35</td>
<td>3.3</td>
<td>17.7</td>
<td>9.3</td>
<td>3.4</td>
<td></td>
</tr>
<tr>
<td>Platelets (10^3/μL)</td>
<td>Non-Immune</td>
<td>31</td>
<td>1.0</td>
<td>99.0</td>
<td>65.0</td>
<td>28.4</td>
<td>0.031**</td>
</tr>
<tr>
<td></td>
<td>Immune</td>
<td>35</td>
<td>1.0</td>
<td>98.0</td>
<td>55.0</td>
<td>31.9</td>
<td></td>
</tr>
</tbody>
</table>

*Mann-Whitney test  **Independent-t-test

**Note:**

- The age of the subjects in the Immune group was significantly lower than the age in the Non-Immune group (median and mean) (p <0.001)
- The mean haemoglobin was significantly lower in Immune (9.4) than in Non-Immune (10.9) (p <0.05)
- Mean platelets were significantly lower in Immune (47.6) than in Non-Immune (64.1) (p <0.05)

The results of the examination of the frequency and genotype of platelet HPA in non-immune and immune patients the following results are obtained:

### Table 5. Frequency and Genotype results of HPA in non-immune and immune thrombocytopenia

<table>
<thead>
<tr>
<th>Thrombocytopenia</th>
<th>HPA-1a (%)</th>
<th>HPA-1b (%)</th>
<th>HPA-2a (%)</th>
<th>HPA-2b (%)</th>
<th>HPA-3a (%)</th>
<th>HPA-3b (%)</th>
<th>HPA-4a (%)</th>
<th>HPA-4b (%)</th>
<th>HPA-5a (%)</th>
<th>HPA-5b (%)</th>
<th>HPA-15a (%)</th>
<th>HPA-15b (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Immune</td>
<td>87.1</td>
<td>100</td>
<td>100</td>
<td>96.7</td>
<td>87.0</td>
<td>3.2</td>
<td>100</td>
<td>0</td>
<td>38.7</td>
<td>0</td>
<td>16.1</td>
<td>0</td>
</tr>
<tr>
<td>Immune</td>
<td>85.7</td>
<td>100</td>
<td>100</td>
<td>94.2</td>
<td>82.8</td>
<td>22.8</td>
<td>100</td>
<td>2.8</td>
<td>20</td>
<td>0</td>
<td>5.7</td>
<td>0</td>
</tr>
</tbody>
</table>

Furthermore, an analysis of the frequency and genotype of HPA in patients with non-immune thrombocytopenia and immune thrombocytopenia with the following results

### Table 6. Test results of differences in the frequency of HPA in non-immune and immune thrombocytopenia

<table>
<thead>
<tr>
<th>HPA</th>
<th>Non-Immune (n: 31)</th>
<th>Immune (n: 35)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive n (%)</td>
<td>Negative n (%)</td>
<td>Positive n (%)</td>
</tr>
<tr>
<td>HPA-1a</td>
<td>27 (87.1)</td>
<td>4 (12.9)</td>
<td>30 (85.7)</td>
</tr>
<tr>
<td>HPA-1b</td>
<td>31 (100)</td>
<td>0 (0)</td>
<td>35 (100)</td>
</tr>
<tr>
<td>HPA-2a</td>
<td>31 (100)</td>
<td>0 (0)</td>
<td>35 (100)</td>
</tr>
<tr>
<td>HPA-2b</td>
<td>30 (96.7)</td>
<td>1 (3.3)</td>
<td>33 (94.2)</td>
</tr>
<tr>
<td>HPA-3a</td>
<td>27 (87.0)</td>
<td>4 (13.0)</td>
<td>29 (82.8)</td>
</tr>
<tr>
<td>HPA-3b</td>
<td>1 (3.2)</td>
<td>30 (96.8)</td>
<td>8 (22.8)</td>
</tr>
<tr>
<td>HPA-4a</td>
<td>31 (100)</td>
<td>0 (0)</td>
<td>35 (100)</td>
</tr>
<tr>
<td>HPA-4b</td>
<td>0 (0)</td>
<td>31 (100)</td>
<td>1 (2.8)</td>
</tr>
<tr>
<td>HPA-5a</td>
<td>12 (67.7)</td>
<td>19 (32.3)</td>
<td>7 (20)</td>
</tr>
<tr>
<td>HPA-5b</td>
<td>0</td>
<td>31 (100)</td>
<td>0</td>
</tr>
<tr>
<td>HPA-15a</td>
<td>5 (38.7)</td>
<td>26 (61.3)</td>
<td>2 (5.7)</td>
</tr>
<tr>
<td>HPA-15b</td>
<td>0 (0)</td>
<td>31 (100)</td>
<td>0</td>
</tr>
</tbody>
</table>

*Fisher Exact test,  **Chi-Square test
Discussion

In this study, 66 study samples were obtained, with a diagnosis of thrombocytopenia, ages 19-82 years, 41 (62.1%) women and 25 (37.9%) men. Non-Immune Thrombocytopenia was 31 (47.0%) patients, immune Thrombocytopenia was 35 (53.0%) patients, consisted of 24 (36.3%) patients with primary immune thrombocytopenia, and 11 (16.7%) patients with secondary immune thrombocytopenia.

Based on the age of the subjects in the Immune group significantly lower than the age in the Non-Immune group (median and mean) (p<0.001), while the distribution of women had more Immune (80.0%) compared to Non-Immune (p<0.001). This study was appropriate with previous research by Grace, et al, (2012) showed that immune thrombocytopenia generally occurs at a young age and is completely healed, and a small portion continues into adulthood. In this study it was found that there were significant differences in the gender, where women higher than men, this is under research by Andrès E et al. Andrès E, Immune thrombocytopenia often occurs in young adults, especially women in the third or fourth decade. Female dominance shows that sex hormones can play a role in various aspects of ITP.

In this study also carried out an analysis of the haematological parameters obtained Leukocytes mean lower in Immune than in Non-Immune but statistically not significant (p>0.05). In this study the comparison of the mean Haemoglobin was significantly lower in Immune than in Non-Immune (p<0.05) and the Thrombocyte mean was significantly lower in Immune than in Non-Immune (p<0.05). In non-immune patients, leukocytes range between 300-98,000/μL. Increased leukocytes due to the response to infection and also the neoplasm process in leukaemia patients and thrombocytopenia occur due to the inflammatory response an increase in platelet consumption, whereas in neoplasms the hematologic malignancies of thrombocytopenia occur due to suppression of thrombopoiesis. In patients with immune thrombocytopenia caused by platelet lysis by an immunological response, an anti-HPA antigen reaction to platelet HPA occurs. The degree of thrombocytopenia depends on the immunological process. The immunological process does not directly cause effects on other hematologic parameters but does have an impact when the platelet count is very low and causes bleeding.

In this study found the frequency and genotype of non-immune thrombocytopenia patients as follows: HPA-1a (87.0%), 1b (100%), 2a (100%), 2b (96.7%), 3a (87.1), 3b (3.2%), 4a (100%), 4b (0%), 5a (38.7%), 5b (0%), 15a (16.1%), 15b (0%). The frequency and genotype of immune thrombocytopenia of HPA-1a (85.0%), 1b (100%), 2a (100%), 2b (94.2%), 3a (82.9%) 3b (22.8%), 4a (100%), 4b (20%), 5a (20%), 5b (0%), 15a (5.7%), 15b (0%).

In the study of Muhiddin R et al. get the frequency and genotype of HPA in 100 people donor population in Makassar was as follows: HPA 1a (100%), 2a (100%), 2b (80.83%), 3a (75.83%), 3b (57.5%), 4a (99.17%), and 5a (39.17%) were found in the Bugis, Makassarese, Mandarese, and Toraja tribes in Makassar with the most HPA genotypes found, namely HPA 1a and 2a. The HPA genotypes 1b, 4b, 15a, and 15b were not found in the blood donor population in Makassar.

The results of this study showed positive results on HPA-1b both non-immune thrombocytopenia (100%) and immune (100%), while the results found in Muhiddin R showed no frequency of HPA-1b was found in normal donors. In this study also found the frequency of HPA-4b was not found in non-immune thrombocytopenia but found in HPA immune thrombocytopenia (20%). In this study, the frequency of HPA-15a was found in both non-immune thrombocytopenia (16.1) and immune thrombocytopenia (5.7). This study shows that in percentage there is a difference in HPA-3b and HPA-15a in non-immune and immune thrombocytopenia with frequency and genotype in the normal population in Makassar.

The results of this study differ from those found by Pai SC, et al., having conducted HPA-1 through-6 and HPA-15 allele genotypes in 998 platelet donors, the results of the study showed based on the frequency of HPA-15b alleles. and HPA-3a, which has the most important role as causative factors, FNAIT, PTP, and PTR followed by HPA-2,-6,-1,-5, and-4. Besides, HPA-4b and HPA-5b are also considered to cause immunogenicity.

In this study a statistical analysis of the differences in the frequency of HPA-1a, 2b, 3a, 4a, 4b, 5a, and 15a, in non-immune and immune thrombocytopenia, but not significantly.

Positive HPA-3b distribution was found to be significantly higher in the Immune group (22.9%) than in the Non-Immune group (3.2%) (p<0.05). How the mechanism of these differences still requires further research.
Conclusion

In conclusion, the highest HPA frequency 1b, 2a, 4a were obtained in both non-immune and immune thrombocytopenia. In this study, their frequency of HPA 1b, 15a, in both non-immune and immune thrombocytopenia was not found in the normal population in Makassar. Frequency of HPA-4b is obtained in the population of immune thrombocytopenia that is not found in non-immune thrombocytopenia. The frequency of HPA-3b was found to be significantly higher in immune thrombocytopenia compared to non-immune thrombocytopenia.

Conflict of Interest: None

Source of Funding: Self

Ethical Clearance: Obtained from university ethical committee.

Reference


The Application of Nesting and the Light Protective Cover of Incubator to the Stability of Oxygen Saturation and the Pulse of Low Birthweight Babies in the Newborn Intensive Care Unit in RSU Undata Palu, Central Sulawesi

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Abstract

Background and Objectives: During the care period of low birth weight babies (LBWB) at the Undata Hospital, Palu, the nests used consisted of blankets that could change the low birthweight baby (LBWB) and the thin layer incubator cover which still allow lighting to penetrate the incubator. Thus, the researchers initiated to use phlanyl and darco nests and thick incubator covers and observed the effects on the physiological stability of LBWB.

Materials and Method: The study was conducted at the Undata Palu Public Hospital in 2018. Total subjects were 12 LBWB consisting of 7 males and 5 females. The research design was One-group Pretest-Posttest (Single Group Before and After Intervention) because it could collect more reliable data that it was conducted the same subject with two different tests (before and after the intervention). Paired-sample t-test was a statistical test used for a single group that proposed two different tests.

Results: The total means of oxygen saturation before and after intervention were 93.20% (CV = SD = 6.26%; variant = 39.18%) and 96.32% (CV = SD = 3.70%; variant = 13.70%), respectively. The total mean of heart rate before and after the intervention was 93.20% (SD = 6.26%; variant = 39.18%) and 96.32% (SD = 3.70%; variant = 13.70%). There was a significant difference between the oxygen saturation before and after the intervention (p = 0.012 <0.05 significance level) and no significant difference before and after the intervention (p = 0.012 <0.05 significance level).

Conclusion: The nest from phlanyl & dacron and thick incubator cover were proven increasing oxygen saturation of LBWB and not proven to provide a useful contribution in lowering the LBWB pulse. It was probably due to the temperature of LBWB as a confounding factor.

Keywords: Nesting, incubator cover, developmental care, physiological response, low birthweight baby.

Introduction

Based on the Indonesian Demographic and Health Survey in 2007, the infant mortality rate in Indonesia was 34 per 1000 births with a neonatal mortality rate of 19 per 1000 live births (Wijaya, 2009). LBW prevalence was less than 11.1% in 2010 to 10.2% in 2013. Variations between provinces were very striking from the lowest in North Sumatra (7.2%) to the highest in Central Sulawesi (16.9%). For the first time in 2013, data was collected on the length of the baby born, with the National rate of <48 cm short-born babies was 20.2%, varying from the high in East Nusa Tenggara (28.7%) and the lowest in Bali (9.6%)¹.

A number of studies have revealed that stress reduction in newborn babies can be obtained in the Newborn Baby Intensive Care Unit which includes the provision of low light, low sound, warmth, soft touch, pain control, lamping and nesting², adjusting the humidity levels of incubators for LBWB during the first two weeks of age since LBWB was born, temporarily held the infants in the incubator until it had adjusting temperature ability to the changes in ambient...
temperature, giving an incubator cover to protect his eyes from the light³.

The baby’s body position affects stress on LBWB. Supine position has the opportunity to reduce 40% of infant mortality due to infant suds syndrome and prone position to support neuromuscular development, especially the neck and head muscles. Based on the empirical facts as observed, the researchers applied nests that mimicked the condition of the mother’s womb made of phlanyl delicate material containing pieces of cloth (darco) with a length of approximately 121-132 cm and can be adjusted to the baby’s body length. Dacro materials are more elastic and can be adapted to the baby’s posture. The cover of the incubator used was made of a thicker cloth fabric that resembled a dark blanket and covered the entire surface of the incubator, thus preventing the direct lights entering the incubator²-⁴.

Based on the background of the problem stated above, the purpose of this study was to examine the effect of phlanyl and darco body position support media and thick protective light incubator cover on oxygen saturation and pulse Low Birth Weight Babies in Newborn Intensive Care Units (NICU) at Home Undata General Hospital, Palu, Central Sulawesi.

Materials and Method

Research location: The study was conducted in the Newborn Intensive Care Unit of Undata Hospital in Palu City from January 1st to May 2018.

Research Design: The experimental design chosen in this study was One-Group Pretest-Posttest (Single Group Before and After Intervention).

Population and sample: The number of samples was determined using differences test of a paired-group. (Dawson and Trapp, 2001-not in the reference) stated in the equation:

\[ n = \frac{\left(\frac{Z_{\alpha/2} \sigma}{\mu_1 - \mu_2}\right)^2}{\sigma^2} \]

Where:

- \( n \) = number of samples
- \( \mu_1 \) = mean score group 1
- \( \mu_2 \) = mean score group 2
- \( Z_{\alpha/2} \) = significance level 5%
- \( Z, 1-\beta = 80\% \) test power
- \( \sigma \) = difference in variation of 2 samples

The minimum number of samples needed in this study are:

\[ n = 9 \text{ (rounded up)} \]

Statistical analysis: Analysis of the data used in this study consisted of univariate and bivariate analysis.

1. Univariate Analysis: Univariate analysis is the analysis of the characteristics of the descriptive variables studied (Hastono, 2007). The characteristics of the descriptive variables observed in this study were gestational age, birth weight, and body weight during the study by calculating the mean, median, standard deviation (SD), and minimum and maximum values at a significance level of 95% (\( \alpha = 0.05 \)).

2. Bivariate Analysis: This study used a paired sample t-test which compared two different tests in the same single group (Siswosudarmo, 2015). Oxygen saturation and pulse were analyzed by collecting data on mean, median, standard deviation (SD), and minimum and maximum values at a significance level of 95% (\( \alpha = 0.05 \)). In this study a comparison of oxygen and pulse saturation in 12 LBW samples were conducted by using a nest of blankets and incubator cover made from thin material and nest made from phlanyl and darco and thick incubator cover.

Research ethics: All research subjects were treated according to human ethics guided by the Standards of Ethical Nursing Research published by the Association of American Nursing Scholars. Ethical research approval for the research subjects was examined and approved by the Health Research Ethics Comission of Health Polytechnics, the Ministry of Health of Yogyakarta as stated in the Research Ethics Decree with Registration Number N0. L.B.01.01/KE-02/XXIX/711/2017, and written permission statement from parents or legal caregivers of the research subject.
Results

Effects of Physiological Reactions

Table 1. Oxygen saturation levels (% per minute) and heart rate (times per minute) of LBWB (n=12) in test 1 (before intervention) and test 2 (intervention) during the 20-minute measurement interval.

<table>
<thead>
<tr>
<th>Total Sample (n = 12)</th>
<th>Average Oxygen Saturation (%/minute)</th>
<th>Average Pulse Rate (times/minute)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Test 1 Rolled blanket Nest and thin cloth incubator covers</td>
<td>Test 2 Phlanyl/Dacron Based Nest and thick cloth incubator covers</td>
</tr>
<tr>
<td></td>
<td>Test 1 Rolled blanket Nest and thin cloth incubator covers</td>
<td>Test 2 Phlanyl/Dacron Based Nest and thick cloth incubator covers</td>
</tr>
<tr>
<td>LBWB 1</td>
<td>98,1</td>
<td>143</td>
</tr>
<tr>
<td>LBWB 2</td>
<td>98,2</td>
<td>133,2</td>
</tr>
<tr>
<td>LBWB 3</td>
<td>75,4</td>
<td>120,1</td>
</tr>
<tr>
<td>LBWB 4</td>
<td>88,8</td>
<td>135,3</td>
</tr>
<tr>
<td>LBWB 5</td>
<td>97,4</td>
<td>109,1</td>
</tr>
<tr>
<td>LBWB 6</td>
<td>96,3</td>
<td>139,8</td>
</tr>
<tr>
<td>LBWB 7</td>
<td>97</td>
<td>124,3</td>
</tr>
<tr>
<td>LBWB 8</td>
<td>92,1</td>
<td>132,2</td>
</tr>
<tr>
<td>LBWB 9</td>
<td>93,1</td>
<td>131,9</td>
</tr>
<tr>
<td>LBWB 10</td>
<td>94,3</td>
<td>104,2</td>
</tr>
<tr>
<td>LBWB 11</td>
<td>93,2</td>
<td>143,6</td>
</tr>
<tr>
<td>LBWB 12</td>
<td>94,5</td>
<td>140,2</td>
</tr>
<tr>
<td>Total Rerata</td>
<td>93,20</td>
<td>129,42</td>
</tr>
</tbody>
</table>

Theory
- Low oxygen levels, less comfortable
- High oxygen levels are more comfortable
- Low pulse because low temperatures
- High pulse because of high temperature

Result
- Confirmed the theory
- Not confirmed the theory
- Confirmed the theory

Effect of nest on oxygen saturation. Babies were comfortable when oxygen saturation increased.

Effects of non-test on heart rate — babies became stressed and their oxygen saturation decreased.

Body temperature drops, oxygen saturation rises.

The thin cloth covering the incubator caused an increase in the beam of light that hits the baby, increasing the stress on the baby. Stress in babies causes lower oxygen saturation.

Table 2: Normality of oxygen saturation and pulse rate of LBWB (n = 12).

<table>
<thead>
<tr>
<th>Variabel</th>
<th>p Value (Asymp. Sig. Value)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before Intervention</td>
<td>After Intervention</td>
<td></td>
</tr>
<tr>
<td>(Rolled Blanket Nest and thin cloth incubator cover)</td>
<td>(Phlanyl/Dacron Based Nest and thick cloth incubator cover)</td>
<td></td>
</tr>
<tr>
<td>Oxygen Saturation</td>
<td>0,375</td>
<td>0,271</td>
</tr>
<tr>
<td>Pulse Rate</td>
<td>0,631</td>
<td>0,689</td>
</tr>
</tbody>
</table>
The results of the normality test data show that oxygen saturation and pulse rate in the test group 1 (nesting with roll blanket and incubator cover made of thin cloth) and test group 2 (nest made from phlanyl and dacro and thick incubator cover) were normally distributed so that paired t test was used as a parametric test in this bivariate analysis. This is evident from the value of p> 5% significant level.

Description of physiological reaction data comparison of total mean oxygen saturation and pulse before and after intervention is shown in Table 3.

Table 3: Total mean oxygen and pulse saturation levels before and after the intervention (n = 12).

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Independent Variable</th>
<th>Before Intervention</th>
<th>After Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rolled Blanket Nest and thin cloth incubator cover</td>
<td>After Intervention</td>
<td>Phlanyl/Dacro Based Nest and thick cloth incubator cover</td>
</tr>
<tr>
<td></td>
<td>( \bar{x} )</td>
<td>Min.</td>
<td>Max.</td>
</tr>
<tr>
<td>O(_2) Saturation</td>
<td>93.20</td>
<td>6.26</td>
<td>75.40</td>
</tr>
<tr>
<td>Pulse Rate</td>
<td>129.42</td>
<td>12.82</td>
<td>104.00</td>
</tr>
</tbody>
</table>

Table 3 shows the total oxygen saturation level of group 1 (nesting with roll blanket and incubator cover made of thin cloth) at 93.20% (SD = 6.26%; variance = 39.18%), while the total mean oxygen saturation level of group 2 (nest made from phlanyl and dacro and thick incubator cover) at 96.32% (SD = 3.70%; variance = 13.70%).

Bivariate analysis before and after intervention: Bivariate analysis was performed to calculate the difference in the average of total oxygen saturation and pulse before and after the intervention. Table 9 shows the total mean oxygen saturation of LBWB before and after intervention. The total oxygen saturation before intervention was 93.2% (SD = 6.26%), while the total oxygen saturation after intervention increased by 96.317% (SD = 3.70%).

Table 4: Total mean of oxygen saturation at LBWB before and after intervention

<table>
<thead>
<tr>
<th>Pair</th>
<th>Before intervention</th>
<th>After intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>93.20</td>
<td>96.317</td>
</tr>
<tr>
<td>N</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>SD</td>
<td>6.2597</td>
<td>3.7013</td>
</tr>
<tr>
<td>Std. Error Mean</td>
<td>1.8070</td>
<td>1.0685</td>
</tr>
</tbody>
</table>

The difference in total oxygen saturation before intervention and after intervention is 3.1167% shown in Table 10. In Table 10, there were significant differences in oxygen saturation before and after intervention. This was observed from the range of confidence values (CI) not exceeding zero (lower limit =-5.4006; upper limit =-3.003; \( p = 0.012 \) <real level 0.05). Thus, nest made from phalyl/dacron and thick incubator cover made a significant influence on the increase in oxygen saturation compared to the nest of blankets and thin incubator covers.

Table 5. Differences in total mean oxygen saturation before and after intervention (n = 12).

Paired sample t-test

<table>
<thead>
<tr>
<th>Paired Differences</th>
<th>T</th>
<th>df</th>
<th>p-value Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>SD</td>
<td>Std. Error Mean</td>
<td>95% Confidence Interval of the Difference</td>
</tr>
<tr>
<td>Mean</td>
<td>SD</td>
<td>Std. Error Mean</td>
<td>95% Confidence Interval of the Difference</td>
</tr>
<tr>
<td>Pair 1</td>
<td>Before Intervention</td>
<td>After Intervention</td>
<td>-3.1167</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-3.003</td>
</tr>
</tbody>
</table>
Discussion

Nurses have an important role in creating a stress-free care environment. The environment of care can be created through the treatment of growth and development. In this study, the care aspects of developmental care provided included thick-incubators cover to reduce the lighting and installation of nests with dacron materials to support the baby’s body in a flexed position, provide comfort, maintain normality of the torso, and support self regulation.

Oxygen saturation states the percentage of oxygenated hemoglobin in the blood. The important role of hemoglobin is to bind oxygen in each molecule. Hemoglobin is a protein compound that has four globin and porphyrin polypeptide chain subunits, each of which contains heme. Heme itself contains one iron atom in the form of ferro, so that one hemoglobin molecule has four iron atoms that will bind four oxygen molecules. Therefore, if the hemoglobin level in the blood decreases, it can reduce the value of oxygen saturation. This is presumed as a temperature factor affecting the increase in the value of the test pulse 2 (after intervention) compared to the group before intervention. Body temperature factors may be expressed as confounding factors (a confounding factor) on comparisons between groups before intervention and after intervention in this study. Nevertheless, the average value of total oxygen saturation after the intervention experienced a higher increase than the group before the intervention.

Body temperature data 12 LBWB is important included in the general data above (Table 2). Body temperature data need to be measured as a confounding factor which explains why the pulse of the treatment group is higher even though given nest made from phlanyl/dacron and incubator cover made from thicker than before intervention. The body temperature data on LBWB given rolled blanket nest and thin layer cover were measured using paired t-test. Effect of body temperature on the pulse of LBWB given nest made from phlanyl/dacron and thick incubator cover measured using paired-t test.

Conclusion

Nest made from phlanyl & dacron and thick incubator cover proved to be significant in increasing physiological stability of LBWB judging from the increase in LBWB oxygen saturation even though it was not proven to significantly increase the LBWB pulse rate compared to before intervention. Further research on the application of nest made from phlanyl and dacron and thick-coated incubator cover in the Infant Birth Care Unit is needed in order to support the improvement of developmental care approach for reducing neonatal mortality.

Conflict of Interest: None

Ethical Clearance: Obtained from univeristy ethical committee

Source of Fund: Self

References


Effectiveness of Flipchart Toimprove Knowledge and Attitude about Tuberculosis in Mandar Ethnic in Majene District West Sulawesi

Madjid Abdul¹, Muh Syafar², Arsunan, A.A.³, IdaLeida Maria³, Muh Tahir Abdullah⁴, Syamsiar S. Russeng⁵, Anwar Mallongi⁶

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Abstract

Case detection in the TB control program in Majene Regency is still low. This study aims to increase active case detection through counseling to housewives using flipchart containing social determinants of tuberculosis. This study uses a quantitative method with 200 survey respondents selected using the zigzag method. Quantitative data were analyzed using the statistic Wilcoxon signed Ranks Test. The results of the average score of knowledge before 41.86 and after intervention 102.34 with a value of p = 0.000 and attitudes showed there were differences before and after the intervention where the value of p = 0,000 then the detections of cases by mothers and cadres were measured after three months of intervention increased by 100%. Discussion and conclusions; knowledge of attitudes and case-detection actions before and after the intervention increased on average so it can be concluded that the FGD intervention model with counseling was very suitable to be applied to increase the knowledge of mothers detection TB cases.

Keywords: Case Detections, Social Determinants, Empowerment.

Introduction

West Sulawesi Province has also implemented the DOTS strategy as an effort that believed to be effective in stopping the spread of TB, but the results have not been able to reduce the incidence of TB in West Sulawesi Province. Early case detection such as pulmonary tuberculosis can prevent and break the chain of transmission by making early detection and early treatment is prevention and treatment efforts that must be carried out simultaneously (parallel) and is simultaneous in nature. At present, the incidence of tuberculosis is quite high as much as 395 per 100,000 inhabitants (Sulbar TB report. The description of the high incidence that has not been matched by high detections demands that the local government look for the right case detection method and can be scientifically accountable. The idea of detection a case that links social determinants with the flow of TB events is in line with the recommendations of the 2016-2020 RAN for TB Research

Majene Regency is the location of the research. This regency is the center of the Mandar ethnic royalty besides that Majene Regency for 3 years carrying out a strategy but always showing low TB cases detection and never reach the target, seeing that in 2014 the target was set at 80% but the case detection was only 67%, and in 2015 the target was set at 90% but coverage was only 72%, so in 2016 the target was set at 90% and achievement was only 75%³.

As explained earlier in this paper, the cause of tuberculosis is Mycobacterium tuberculosis but the battery is not enough for someone to become ill. With the method of focus group discussion (FGD) using a flip sheet with the concept of Mandar culture as a promotion/communication media, it can give an idea of the level of knowledge and attitudes of respondents regarding TB. Based on the above concept, the researcher tried to understand the differences in the increase in knowledge and attitudes of respondents before and after being given health education regarding TBC with flip sheet
media with a concept that described the condition of the Mandar ethnic real estate in the Rangas urban village.

**Materials and Method**

**Location and Research Design:** This study was carried out in the Rangas urban village, Banggai District, Majene Regency, West Sulawesi in January-November 2018. The type of research is operational research, with a quasi-experimental design.

**Population and sample:** The population in this study were all housewives who were in the area of the Rangas Community Health Center, Banggai Sub-District, Majene Regency, West Sulawesi. Sampling was done using **purposive cluster sampling** with a sample size of 258 people, from the selected sample size refers to 10% of opinions and also refers to SEM modeling, an analysis tool that requires a minimum of 100-200 samples so that 200 samples were taken in this study. Residing in Rangas Urban Village, and is willing to take part in this research as a respondent.

**Data collection Method Data:** Data collection was carried out by researchers using questionnaires (age, sex, education, family income, respondents’ knowledge and attitudes about TB, which were carried out before and after treatment in the form of **Focus Group Discussion (FGD)** with flipchart method. The results of this study presented in the form of tables and narratives.

**Data Analysis:** Data analysis performed was univariate, bivariate analysis with the **Wilcoxon signed Ranks Test**

**Results**

**Sample characteristics:** Table 1 shows the results of univariate analysis, based on sex, showing the highest number of female respondents was 58, 5%. Age shows the highest number of respondents in the age group of 31-40, which was 62.5%. The level of education shows the highest number of respondents at the Elementary School level, which was 62.5%. Based on the work, most respondents work as housewives who sell their husband’s haul was 31.5%. The family income per month for most respondents in the group of Rp.500,001-Rp.1,000,000 was 43.0%.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n = 200</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>a. Male</td>
<td>83</td>
</tr>
<tr>
<td>b. Female</td>
<td>117</td>
</tr>
<tr>
<td>Age</td>
<td></td>
</tr>
<tr>
<td>a. &lt;30 years</td>
<td>57</td>
</tr>
<tr>
<td>b. 31-40 years</td>
<td>81</td>
</tr>
<tr>
<td>c. 41-50 years</td>
<td>45</td>
</tr>
<tr>
<td>d. &gt; 50 years</td>
<td>17</td>
</tr>
<tr>
<td>Education</td>
<td></td>
</tr>
<tr>
<td>a. Not School</td>
<td>9</td>
</tr>
<tr>
<td>b. Elementary School</td>
<td>125</td>
</tr>
<tr>
<td>c. High School</td>
<td>49</td>
</tr>
<tr>
<td>d. College</td>
<td>5</td>
</tr>
<tr>
<td>e. Magister (Professional/Postgraduate)</td>
<td>6</td>
</tr>
<tr>
<td>f. School of Religion</td>
<td>5</td>
</tr>
<tr>
<td>g. Class Literacy</td>
<td>1</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
</tr>
<tr>
<td>a. Free-lancer</td>
<td>53</td>
</tr>
<tr>
<td>b. Farmers</td>
<td>8</td>
</tr>
<tr>
<td>c. Civil Servants</td>
<td>4</td>
</tr>
<tr>
<td>d. Entrepreneur</td>
<td>15</td>
</tr>
<tr>
<td>e. Fishermen</td>
<td>57</td>
</tr>
<tr>
<td>f. Other</td>
<td>63</td>
</tr>
<tr>
<td>Family Income</td>
<td></td>
</tr>
<tr>
<td>a. &lt; Rp.500,000</td>
<td>78</td>
</tr>
<tr>
<td>b. Rp.500,001-Rp.1,000.000</td>
<td>86</td>
</tr>
<tr>
<td>c. Rp.1,000,001-1,500,000</td>
<td>23</td>
</tr>
<tr>
<td>d. 1,500,001-1 Rp.3,500,000</td>
<td>6</td>
</tr>
<tr>
<td>e. &gt; Rp.3,500,000</td>
<td>7</td>
</tr>
</tbody>
</table>

Source: Primary Data, 2018

Based on the research variables, the distribution of respondents based on the level of knowledge and attitudes of respondents regarding TB shows that there were 58.5% of respondents who have a sufficient level of knowledge about TB, and based on the variable attitude of respondents regarding TB there are 75.5% of respondents who have a fairly good attitude, Table 2.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n = 200</td>
</tr>
<tr>
<td>Ranks</td>
<td>-11,375</td>
</tr>
<tr>
<td>p</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Based on table 2, **Ranks have a negative level of 586.0 and the number of positive levels was 18524.0. In table 3, the value of Z = -11,375 and the value of p = 0,000 <0,05, then H0 is rejected, so it can be concluded that there was a difference in knowledge of TB before and after FGD with the flipchart method or it can be interpreted that there was an effect flipchart method for increasing knowledge about TB in respondents.
## Table 2: Distribution of Respondents by Knowledge of TB

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number of</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre-Test</td>
<td>Post-test</td>
<td></td>
</tr>
<tr>
<td></td>
<td>n = 200</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>n = 200</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td><strong>Seriousness of TBC</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Very Seriously</td>
<td>136</td>
<td>68.0</td>
<td>196</td>
</tr>
<tr>
<td>b. Moderate Serious</td>
<td>29</td>
<td>14.5</td>
<td>2</td>
</tr>
<tr>
<td>c. Not Too Serious</td>
<td>35</td>
<td>17.5</td>
<td>2</td>
</tr>
<tr>
<td><strong>Causes of transmitted tuberculosis</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. through handshake</td>
<td>6</td>
<td>3.0</td>
<td>0</td>
</tr>
<tr>
<td>b. through the air when people with TB coughing/sneezing</td>
<td>127</td>
<td>63.5</td>
<td>196</td>
</tr>
<tr>
<td>c. Food share</td>
<td>5</td>
<td>2.5</td>
<td>1</td>
</tr>
<tr>
<td>d. Using the same dishes and food</td>
<td>15</td>
<td>7.5</td>
<td>2</td>
</tr>
<tr>
<td>e. not know</td>
<td>47</td>
<td>23.5</td>
<td>1</td>
</tr>
<tr>
<td><strong>TB prevention</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Avoid sharing dishes</td>
<td>39</td>
<td>19.5</td>
<td>0</td>
</tr>
<tr>
<td>b. Window Covering</td>
<td>12</td>
<td>6.0</td>
<td>2</td>
</tr>
<tr>
<td>c. Good Nutrition</td>
<td>73</td>
<td>36.5</td>
<td>2</td>
</tr>
<tr>
<td>d. Praying</td>
<td>17</td>
<td>8.5</td>
<td>5</td>
</tr>
<tr>
<td>e. Don’t Know</td>
<td>56</td>
<td>28.0</td>
<td>1</td>
</tr>
<tr>
<td>f. Others</td>
<td>3</td>
<td>1.5</td>
<td>190</td>
</tr>
<tr>
<td><strong>Opportunities for Infected with TB</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Anyone</td>
<td>179</td>
<td>89.5</td>
<td>193</td>
</tr>
<tr>
<td>b. Only Poor people</td>
<td>10</td>
<td>5.0</td>
<td>5</td>
</tr>
<tr>
<td>c. Only Alcoholics</td>
<td>2</td>
<td>1.0</td>
<td>0</td>
</tr>
<tr>
<td>d. Smoker</td>
<td>7</td>
<td>2.5</td>
<td>2</td>
</tr>
<tr>
<td>e. others</td>
<td>2</td>
<td>1.0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Causes of TB</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Germs</td>
<td>61</td>
<td>30.5</td>
<td>2</td>
</tr>
<tr>
<td>b. Virus</td>
<td>112</td>
<td>56.0</td>
<td>2</td>
</tr>
<tr>
<td>c. Poisoning Food</td>
<td>1</td>
<td>0.5</td>
<td>3</td>
</tr>
<tr>
<td>d. Curse</td>
<td>1</td>
<td>0.5</td>
<td>0</td>
</tr>
<tr>
<td>e. Genetics</td>
<td>23</td>
<td>11.5</td>
<td>5</td>
</tr>
<tr>
<td>f. Other</td>
<td>2</td>
<td>1.0</td>
<td>188</td>
</tr>
<tr>
<td><strong>Main Symptoms of TB</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Cough</td>
<td>35</td>
<td>17.5</td>
<td>0</td>
</tr>
<tr>
<td>b. Phlegm Cough for&gt; 2 weeks</td>
<td>74</td>
<td>37.0</td>
<td>191</td>
</tr>
<tr>
<td>c. Fever</td>
<td>2</td>
<td>1.0</td>
<td>0</td>
</tr>
<tr>
<td>d. Sweating at Night</td>
<td>10</td>
<td>5.0</td>
<td>0</td>
</tr>
<tr>
<td>e. Blood Cough</td>
<td>64</td>
<td>32.0</td>
<td>9</td>
</tr>
<tr>
<td>f. Other</td>
<td>15</td>
<td>7.5</td>
<td>0</td>
</tr>
<tr>
<td><strong>TB Can Be Cured</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Yes</td>
<td>191</td>
<td>95.5</td>
<td>199</td>
</tr>
<tr>
<td>b. No</td>
<td>9</td>
<td>4.5</td>
<td>1</td>
</tr>
<tr>
<td><strong>How to Cure TB</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Herbal Medicine</td>
<td>6</td>
<td>3.0</td>
<td>1</td>
</tr>
<tr>
<td>b. Rest at home</td>
<td>1</td>
<td>0.5</td>
<td>0</td>
</tr>
<tr>
<td>c. Specific Drugs from CommunityHealth Center</td>
<td>51</td>
<td>25.5</td>
<td>2</td>
</tr>
<tr>
<td>d. OAT Regularly Until Complete</td>
<td>108</td>
<td>54.0</td>
<td>197</td>
</tr>
<tr>
<td>e. Don’t Know</td>
<td>33</td>
<td>16.5</td>
<td>0</td>
</tr>
<tr>
<td>f. Other</td>
<td>1</td>
<td>0.5</td>
<td>0</td>
</tr>
<tr>
<td><strong>TB and TB</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. TB and TB are the same</td>
<td>24</td>
<td>12.0</td>
<td>187</td>
</tr>
<tr>
<td>b. Unequal TB and TBC</td>
<td>174</td>
<td>87.0</td>
<td>13</td>
</tr>
<tr>
<td>c. Don’t know</td>
<td>2</td>
<td>1.0</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: Primary Data, 2018
Table 3. Tests of Normality Knowledge

<table>
<thead>
<tr>
<th></th>
<th>Kolmogorov-Smirnov&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Shapiro-Wilk</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Statistics</td>
<td>df</td>
</tr>
<tr>
<td>Pre post Knowledge TB</td>
<td>.137</td>
<td>200</td>
</tr>
<tr>
<td>Post test Knowledge TBC</td>
<td>.474</td>
<td>200</td>
</tr>
</tbody>
</table>

Source: Primary Data, 2018

Tables 4 and 5 are the results of the Wilcoxon Signed Ranks Test for respondent’s knowledge of TB

Table 4. Ranks knowledge

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
</tr>
</thead>
<tbody>
<tr>
<td>poTOT.PTB–prTOT.PTB</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative Ranks</td>
<td>14&lt;sup&gt;a&lt;/sup&gt;</td>
<td>41.86</td>
<td>586.00</td>
</tr>
<tr>
<td>Positive Ranks</td>
<td>181&lt;sup&gt;b&lt;/sup&gt;</td>
<td>102.34</td>
<td>18524.00</td>
</tr>
<tr>
<td>Ties</td>
<td>5&lt;sup&gt;c&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>200</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Data Primer, 2018

Table 5. Test Statistics Knowledge

<table>
<thead>
<tr>
<th></th>
<th>poTOT.PTB–prTOT.PTB</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Z</td>
<td>-11.375&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.000</td>
<td></td>
</tr>
</tbody>
</table>

Source: Data Primer, 2018

In table 4, Ranks were negative 141.0 and positive numbers are 2634.0, and in table 5 are Z =-6.879 and p = 0.000 <0.05, so Ho is rejected, this can be interpreted as different attitudes before and after FGD with the flipchart method or it can also be interpreted that there is the influence of the FGD with the method of flip sheeting on the attitude of the respondents.

Discussion

The relationship between the level of knowledge and the incidence of Tuberculosis in the community is very close. Courtwright and Tumer (2010) suggest that in addition to increasing knowledge about tuberculosis, it can change one’s mindset and stigma so that prevention or treatment for TB patients can work well. According to the Indonesian Health Profile in 2008, the number of new positive cases of Acid Resistant Basil TB (BTA) in the age group 0-14 years in Indonesia amounted to 1861 cases.

Based on the statistical Wilcoxon signed Rank Test conducted, it was found that there was an increase in the knowledge of the respondents after the intervention was conducted in the form of a focus group discussion using the flip chart method as a promotional media. The results of this study were also supported by previous research which suggested that by promoting TB on flip chart media, or electronic media can increase people’s knowledge about TB<sup>3</sup>. According to Deepa Makesh<sup>4</sup> also researched the treatment of tuberculosis using two Method and one of which was used as flip chart media as a promotional medium, which after the approach was made through the media, the respondents' knowledge increased compared to before.

A similar study carried out in Banyumas-Indonesia, also stated this, that after counseling and counseling through media back ships could significantly increase mothers’ knowledge about pulmonary TB in children<sup>5</sup>. Based on some of these researchers, it can be said that the promotional media in the form of efficient flip sheets increases the knowledge of respondents regarding TB.

The statistical Wilcoxon signed Rank test showed that there was an increase in respondent’s attitudes before and after the intervention in the form of focus group discussions using flip sheets as a promotional medium that contained positive and easily understood things by respondents. Study also explains this, where flip sheets are used as a communication medium to improve the attitude of respondents who previously have also been tested in other pilot locations.

Research that is corresponding obtained by Miller<sup>3</sup>, wherein his research also uses flip sheets as one tool
or media promotion to change or increase the stigma and attitude of the respondents. Croft et al. conducted a survey of the level of knowledge and attitudes about tuberculosis and leprosy in two regions in Bangladesh, the results showed that there were significant differences between regions that received a 2-year education program in the form of day/night mass information programs run from jeeps using flipcharts, loudspeakers and two locally developed slide series that show simple stories about leprosy and TB sufferers who receive successful treatment.

A person’s attitude and knowledge are interrelated so that in other studies, it is said that the low level of knowledge about TB can affect behavior in seeking patient health and maintaining the transmission of disease in the community. The high level of knowledge a person can cause changes in one’s perceptions and habits, behavior based on knowledge will last longer than those not based on knowledge.

Conclusions

This study concludes that based on the Wilcoxon signed Rank Test conducted the results showed that there was an increase in respondents’ knowledge and attitudes after being given intervention in the form of focus group discussion (FGD) using promotional media in the form of a back-note with ethnic Mandar concepts.

Ethical Clearance: Taken from faculty of Public Health ethical committee

Source of Funding: Self

Conflict of Interest: Nil

References

Accelerative, Effective and Efficient Tuberculosis (TB) Response to TB Elimination on 2035 in Medan Year 2017

Syarifah¹, Tukiman¹

¹Public Health Faculty of Sumatera Utara University

Abstract

Indonesia includes the rank of two highest TB loads in the world. Incidence rate of TB in the city of Medan High, the case of TB drug resistance (RO) highest in North Sumatra, low cure rate, high drop out. Research aims to excavate 1) implementation of the mitigation program TB 2) implementation process 3) community participation and NGOS in TB countermeasures program. Research, qualitative study of research informant includes head of health office, head of Puskesmas, manager of TB Private Hospital, physicians of private Practice and clinic, NGO engaged in the response of TB. Data is gathered through in-depth interviews with informant. Processing and analysis of data is done through the stages of creating transcripts and analyzed by content analysis. The results showed that the policy of TB’s handling was appropriate, the implementing actors were right, all the Puskesmas has been implementing the DOTS strategy, but still many people who do not know Puskesmas serve TB for free. Hospital support and physicians of private practice in the reporting of low TB cases resulted in many cases missing, impacting the increased cases of TB MDR so that government burden in the reduction of TB is getting heavier while TB budget is still Dominated by foreign donors. NGOS have played a role in the management of TB but the coordination is not maximized, in the implementation of there are still overlapping reporting activities to the stakeholders is not smooth, Public Private Mix already exists but has not played a lot. In order to reach the elimination of TB year 2035 the Municipal health Department of Medan has compiled a regional action plan (RAD) Countermeasures TB Regulation status of the mayor. It is recommended that RAD should be implanted accordingly, right from the internal and external environment and the accuracy of the accelerometer, effective and efficient process to the elimination of TB.

Keywords: Accelerative, effective, efficient, elimination TB 2035, tuberculosis (TB).

Introduction

In North Sumatra the prevalence of TB of 110,666 with a rate of 794/100,000 inhabitants, a TB incident of 68,828 with a rate of 501/100,000 inhabitants and deaths from TB of 5,714 with a rate of 41/100,000 inhabitants, case detection rates, issuing form a number of 22,961 (33, 3%)¹². MDR-TB figures are estimated at 2% of all new TB cases (2620 cases) and 20% of TB cases with retreatment (42 cases), with a total of 2662 cases. As of March 2016 ⁴ changed found 356 TB MDR cases in Rsup HAM. It is noted that TB MDR increases due to inadequate countermeasures for TB. It is known that the treatment of TB MDR is longer and costs much greater, the effects of adverse reactions are very severe and can transmit TBMDR in the surrounding people. Adviesraad’s average celebrity success figure of TB MDR treatment for the last 4 years is about 37% of the global target of the latest celebrity milestone of celebrities national TB program.

Although nationally demonstrating increased developments in the discovery of cases and levels of healing, achievements at the provincial level still show disparity between regions. The discovery of the case of Medan City increased from 5776 cases in 2014 to 6541 cases in 2015.⁵ The probability of higher TB drug resistance in hospitals and private sectors that have not been involved in national TB control program as a result of high non-compliance and drop out rate of treatment because it was not prepared High DOTS strategy. Data from private service providers is not included in the data on national TB control programs.

While in the hospital in Medan, the new data available comes from about 41% of hospitals that have
implemented the DOTS strategy. The number of TB cases in the city of Medan in 2015 reached 350 cases. Case of TB proportions child of all cases TB reaches 5.4%. This figure is a partial description of the overall case of actual TB of children considering the high case of overdiagnosis in health facilities accompanied by a low reporting of health care facilities.6


Furthermore, the support by the Government to expedite the process is seen among others with the issuance of circular letter from the Ministry of State with No 440/4838 Bangda, on 26 October 2016 to all the governor of Indonesia to Provide accelerated TB response support. Furthermore, in the standard of Minimal service (SPM) health in 2016 is also more firmly stated in the 12th Standart of health services people with TB.7

It is necessary to do research that aims to: 1) Excavate the implementation of TB countermeasures program that has been conducted by the city health agency Medan. 2) Digging process implementation of TB countermeasures program. 3) to explore public and NGO participation in TB countermeasures program.

Method

Research Design: Research is a qualitative study to explore more in-depth policies implemented in TB’s countermeasures program in Medan City to obtain an effective and efficient TB countermeasures strategy. Qualitative Data was collected to explore the policy implementation of policy makers in TB program of the Medan city. Further excavated the role of NGOS and engaged in TB in the program of TB.

Location: This research was conducted in Medan because Medan is the capital city of North Sumatra province with the problem of TB which is quite complex from the heterogeneous population aspects, health services both government and private, as well as TB programs that conducted by NGOS.

Informants: Informant of this research: Head of Health service, head of P2P section, Head of Infectious diseases section as a manager of TB policy and NGO engaged in the response of TB KNCV, JKM, Aisiyah, Buddha She Chi.

Results

Implementation of TB Countermeasures program in Medan Health office: DOTS strategy is a national strategy that has been set in the TB countermeasures program, data shows that all Puskesmas in the city of Medan have been executing the DOTS strategy. However, the difficult practice to implement this strategy is an independent practitioner (DPM) and a private hospital. There are pros and cons between government programs and private physician practices in this regard, such as informant:

“Doctors of independent practice still uphold their diagnosis with photo Thorax/Roentgen While the government is with sputum. In the case of government treatment with the DOTS system and free but DPM with paid. When the case comes first to DPM especially with the low-economic social-then visit only a few times, Karen is unable to pay, it will be released. Patients who after this drug will inevitably spread the case to the surrounding environment so that the incidence of TB cases is still increasing and more severe when severe then the case of visiting health care services and there are those times it has suffered TB RO.

However, funding regulation for TB countermeasures has been aimed at increasing the role of the Government by having compiled the regional Action Plan (RAD) of TB in Medan city which will be strengthened by the legal status to be the rule of Mayor (PERWAL) . In RAD, it has been determined that the case of TB is not only addressed by the Department of Health but must be addressed with cross-sector related, private, educational institutions synergize and set targets for access, executor and funding sources so that when donor assistance has been reduced, the government burden is ready to respond.

Coordination and synergy of the program has begun to be improved both among government health services and DPM where it is currently in case of notification of cases in accordance with Permenkes No 67 year 2016 on the response of TB that each physician must make a report (A mandatory notification) of tuberculosis. It has been done training activities of MN-TB based Android
in Medan City, is expected through this network of TB cases found at DPM can be immediately reported in the Puskesmas in the working area and expected through this network no longer exists Loos to follow TB cases.

Communication process in the implementation of TB countermeasures program in Medan: Communication process between health centers with hospitals, clinics and DPM in its working area is less harmonious especially in terms of reporting. Many cases of TB from hospitals, clinics and DPM who do not want to report a case of TB to Puskesmas even though the notification rules have been in the invitation. To overcome the loss to follow then inevitably the deputy Supervisor (Wasor) TB must fetch TB reports by visiting one by one health facilities, because non-governmental health services consider them not required to report a phrase:

“We have to pick up reports to non-governmental health facilities because they do not feel obliged to report TB cases to the Puskesmas”

Related to communication between hospital Adam Malik as a reference to TB case with Puskesmas and vice versa from Puskesmas to hospital Adam Malik has not run smoothly which resulted in case of missing or drop out. This can occur in the case of TB RO which after TB RO patients submitted to the treatment Puskesmas such as the expression of an informant of Puskesmas officers:

“TB patients who have undergone treatment for approximately 2 weeks, do not want to go to the Puskesmas anymore because of the severe side effects of the drug so the family decides to bring medication to DPM and feel it is getting healthier.”

Family patients with emotional tone say: “Why we have a cure to the Puskesmas when making the body feel sick, we come medicated because it wants to be healthy.”

This Data indicates that the communication between the officers and patients is not maximized where the officers do not have to support the patient to bring to the HOSPITAL Adam Malik because the SOP has been explained that if the problem is experiencing the drug side effects immediately Consultation with the clinical expert team (TAK). “The drug given by the officer is the drug from Puskesmas”

Meanwhile, it is known that there is no TB RO drug from Puskesmas. The above Data indicatess that both vertical and horizontal communication have not been well-done due to the role of the individual and the ability of the intertiller in accordance with the SOP, it is as the same as the results of this study.

Community and NGO participation in TB countermeasures program

Like the following informant phrases: “JKM starts from the preparation of community mobilization, forming a cadre then there TOT. At the same time we strengthen the community leaders and religious figures so that there is special training for religious leaders there are special training for community leaders. Then there is also training for PMO of the patient’s family.”

The results of previous research conducted by (9,10) showed that the discovery of cases in NGOS and Puskesmas officials still scramble because of incentives given to find different cases between NGOS. Bambang’s research in Bantul Regency declares the discovery of cases by officials of formalities and administrations.

As for the training of community leaders according to the informant that focuses on advocacy as said the informant:

“Advocacy is done in order to understand TB at once will be the lower-level advocator. From village and district level to district and Regency and provincial level”

Aisyiyah NGO: This organization has been involved in the response of TB gained funding, training and other supporting facilities. The organization is engaged in health but not in the TB program is called to suspend TB because it has facilities and human resources such as the following informant phrases:

“Organization: Aisyiyah, formed from Aisyiyah Center with the establishment of TB CARE Community Team 2009.”

Gain trust from the government through the GF program participating in TB program. This Program was named Community TB HIV Care Aisyah North Sumatera. Initially the main task in response to TB is like the following informant phrases:

“Looking for suspect TB and these cadres bring TB patients to the Puskesmas. Aisyiyah cadres exist in each sub-district and Kelurahan in Medan. In addition to searching for Suspeck, the Institute also conducts
training in drug monitoring (PMO). The essence of the program is that the patient does not end up with 6 months of medication.” Almost the same study conducted.\(^\text{10}\)

Nevertheless, since the last 2 years, this foundation has begun to handle the TB RO called the Supporter Patient (PS), namely

“The healed TB patients were used as supporters for other TB patients. Currently, this foundation already has 3 PS, each of the PS accompanying 3 patients. In addition in the year 2015, this Foundation has also set up a stopover house to accommodate TB RO patients who should get treatment in the RS referral Adam Malik.”

Research results of Erna M DKK\(^\text{11}\) In 2015 indicates that in the case of the treatment of TB RO still found a drug that has expired, after confirmed with the officer that the year 2014-2015 is indeed too much drug in the drop, but already Stated at that time all drugs should be withdrawn, apparently there are also circulating.

**LSM Buddha Tse Chi:** The participation of NGOS in the TB program actually originated from the movement of this Organization in the field of social and health that has been under the center of the institution in cataract surgery. Subsequently this organization since 2015 began to move in the field of TB, feel called to handle TB cases because of the high number of TB in Indonesia.

“Since Indonesia is independent we already handle TB but why until now still many of the case, because people cannot be overcome, people are uncomfortable to come to the Puskesmas, no lung doctor, not friendly, if come to a specialist doctor initially can but Because expensive finally broke down the drug.”

Based on the facts in the field, the organization coordinates with the city health office by expressing the intention to participate in TB countermeasures Program, no intention to bring religion, and not restrict an area. The head of Medan Health office that welcomes the idea of the foundation as below:

“The most difficult to enter the health workers are the Chinese, especially the ones in the area like Rame.”

For this, the foundation began to be interested in the prevention of TB by establishing TB clinic in the like crowded Puskesmas. But if further analyzed the informant to say the embryos in the handling of TB is actually already a few decades ago: “Cooperation with NGOS and PPTI, but this activity is not the way, because there is no doctor Who wants to practice guard in place. Research on Syarifah \(^\text{12}\) need to engage religious figures in TB response in Medan.”

**Conclusion**

1. Implementation of TB countermeasures in the city health office is already referring to the national strategy but has not been able to run the maximum, because not all health facilities, especially non-extrapding health facilities, private clinics and DPM complies with Established strategies.
2. The process of communication in the implementation of TB countermeasures program has not been maximally both vertical and horizontal communication impacting TB’s tougher response.
3. Already many NGOS are petrified in TB countermeasures program but the invention of the case is not maximal, TB insides, TB RO cases, TB DM, TB HIV and children are still increasing and need complex countermeasures.
4. The elimination of TB will be achieved if the control of TB is not only implemented by the Health office but is addressed along with other related sectors and refers to the regulation of the mayor of Medan No. 85 year 2017 on the regional action plan Response of TB City Medan year 2017-2022 (Medan City News year 2017 number 75).

**Acknowledgement:** Researchers thanked the University of North Sumatra who have given funds through the PNBP of North Sumatera University year 2017. Researchers are also grateful to the Jakarta City Health Office and the provincial Health office of North Sumatra which has provided secondary data and helped expedite the research process. Also to all informants who have been willing to provide data in accordance with the facts for the needs of this research.

**Ethical Clearance:** Taken from University committee

**Conflict of Interest:** Nil

**References**

3. WHO SEARO. *Tuberculosis control in the South-East Asia Region, Annual Report 2016*


6. Dinas Kesehatan Kota Medan; Data Cakupan TB Kota Medan diolah dari SP2TT. 2016


Behavior of Tuberculosis Pulmonary Disease Prevention (Tb Paru) South Sulawesi

Herman

Health Polytechnic Ministry of Health of Makassar, Edi Sukamto (Health Polytechnic Ministry of Health of East Kalimantan), Syahida Djasang (Health Polytechnic Ministry of Health of Makassar)

Abstract

Diseases Tb. Lung is caused by the bacterium *Mycobacterium tuberculosis*, with the incidence rate in Indonesia ranks third after China and India and attacks all age groups of society. The purpose of this research is to know the behavior of disease prevention Tb. Lungs of Makassar City and the influence of disease prevention knowledge Tb. Lung from the aspect of controlling the source of penyakit Tb. Lungs, aspects Lung, and the aspect of increased endurance against the disease Tb. Lungs. The type of research is *analytic survey*. The study population is the people who live in the area of Makassar City. Samples of 335 people obtained by *multi stage sampling*. Data analysis was performed by simple regression test and multiple regression. Results of research that the behavior of disease prevention targets Tb. Lungs of Makassar City are generally good category. Lung effect on disease prevention behavior Tb. Lungs of Makassar City. Lung effect on disease prevention behavior Tb. Lungs of Makassar City.

Keywords: Knowledge, Control, Disease Sources, Agent Disease, Body Resistance and Behavior.

Introduction

The Commitment of the Government in order to decrease the case of Tb in Indonesia, it has been issued Decree of the Minister of Health of the Republic of Indonesia Number 364/Menkes/SK/V/2009 About TB Control Guidelines referring to *Directly Observed Treatment Short-course* (DOTS) strategy and implemented in all parts of Indonesia. DOTS strategy consists of 5 key components, namely: 1) Political commitment, with improvement and sustainability of funding. 2) The discovery of cases through microscopic sputum examination of assured quality. 3) Standard treatment, with supervision and support for patients. 4) Effective management and availability of OAT systems. 5) A recording and reporting monitoring system capable of assessing patient treatment outcomes and program performance. But issue Tb. Lung in Indonesia is still a serious problem because the case is still high and attacking all age groups.°

Case incidence Tb. Lung with BTA (+) in South Sulawesi Province (2013) reported as many as 8,902 cases found in male type as much as 5,259 cases (59,08%) and female gender 3,643 (40,92%). Bina field Disease Prevention and Environmental Health Makassar City Health Office (2014), the discovery rate of new cases of TB BTA (+) in 2013 as much as 72.44% (found 1,811 people from 2,500 mark), this number increased from 2012 with a number of 1,324 sufferers of 1,641 targets. When compared to the 2013 target of 70% then the achievement rate exceeds the target with the percentage of achievement of 72.44%,² (Health Office Makassar, Health Profile Year 2014).

The results of research related to the interaction mentioned above are Media Y (2011) reported that the community of Padang Panjang City has a knowledge level about Tb is relatively good, but as a still assume that the cause of TB lung disease is related to things ghaib/magic and because of heredity; the public perception that the disease is a common cough, so that it relates to people’s lack of concern about the effects of pulmonary TB disease; and the behavior and awareness of some people for sputum examination and use of health service facilities is lacking. Untuk reduce the incidence
rate of disease Tb. Lung can be done by controlling the health behavior of the community. Noatmodjo\textsuperscript{3}, states that \textit{health behavior} is a person’s response to stimuli or objects related to healthy-sickness, illness, and factors affecting health-sickness (health) such as environment, food, drink and service health. In other words, health behavior is any activity or activity of an \textit{observable or unobservable} person related to the maintenance and improvement of health.

Based on the above explanation, the purpose to be achieved from this research is the description of behavior about prevention of disease Tb. Lungs of the people of Makassar, knowledge of disease source control, control agent penyakit, and increased endurance of the patient against disease prevention behavior Tb. Lung and variable knowledge of dominant influence to behavior of disease prevention tb. Lungs of Makassa City.

**Research Method**

Based on the research design that will be used then the type of research is the \textit{analytic survey}. Population referred to in this study is all masomism berdomisisli in the area of Makassar City either healthy or sick or suffering from disease Tb. Lung that has been diagnosed by the doctor. Samples referred to in this study are some of the people who have suffered from TB disease. Lung and who do not suffer Tb. Lung who is domiciled in the working area Pusekesmas Makassar as many as 335 people.

Sampling in this research is with \textit{multi stage sampling technique} that is a way of sampling done by going through stages. The technique as follows:

- The first stage, using all the existing districts within the city of Makassar are as many as 14 districts
- The second stage, determining the number of samples per kecamatan by way of comparison of the number of cases Tb. Lung to total population of Tb. pulmonary tuberculosis (+) multiplied by the number of samples to be studied (335 people).
- The third stage, from the sub-district determined Puskesmas which has the number of cases number Tb. the highest lung as a place of data collection.

**Table 1: Number of Research Sample Per Puskesmas in Persons**

<table>
<thead>
<tr>
<th>No</th>
<th>Districts</th>
<th>Number of Patients Tb. pulmonary tuberculosis (+)</th>
<th>Puskesmas</th>
<th>Number of Samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Ujung Tanah</td>
<td>66</td>
<td>Pattigalloan</td>
<td>13</td>
</tr>
<tr>
<td>2.</td>
<td>Tallo</td>
<td>193</td>
<td>Kaluku Bodoa</td>
<td>37</td>
</tr>
<tr>
<td>3.</td>
<td>Bontoala</td>
<td>85</td>
<td>Layang</td>
<td>16</td>
</tr>
<tr>
<td>4.</td>
<td>Wajo</td>
<td>43</td>
<td>Tarakan</td>
<td>9</td>
</tr>
<tr>
<td>5.</td>
<td>Ujung Pandang</td>
<td>50</td>
<td>Makassar</td>
<td>10</td>
</tr>
<tr>
<td>6.</td>
<td>Makassar</td>
<td>169</td>
<td>Maccini Sawah</td>
<td>32</td>
</tr>
<tr>
<td>7.</td>
<td>Mamajang</td>
<td>79</td>
<td>Cendrawasih</td>
<td>15</td>
</tr>
<tr>
<td>8.</td>
<td>Mariso</td>
<td>148</td>
<td>Pannambung</td>
<td>28</td>
</tr>
<tr>
<td>9.</td>
<td>Tamalate</td>
<td>241</td>
<td>Tamalate</td>
<td>4 5</td>
</tr>
<tr>
<td>10.</td>
<td>Rappocini</td>
<td>201</td>
<td>Kassi-kassi</td>
<td>38</td>
</tr>
<tr>
<td>11.</td>
<td>Panakkukang</td>
<td>182</td>
<td>Pampang</td>
<td>35</td>
</tr>
<tr>
<td>12.</td>
<td>Manggala</td>
<td>124</td>
<td>Antang</td>
<td>24</td>
</tr>
<tr>
<td>13.</td>
<td>Biringkanaya</td>
<td>90</td>
<td>Sudiang</td>
<td>17</td>
</tr>
<tr>
<td>14.</td>
<td>Tamalanrea</td>
<td>85</td>
<td>Tamalanrea</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.756</td>
<td>Total sample</td>
<td>335</td>
</tr>
</tbody>
</table>

In this study, the variables to be analyzed consist of the dependent variable that is tb disease prevention behavior. Lungs and independent variables ie Knowledge of disease source control Tb. Lung, Knowledge of disease agent control Tb. Lung and Knowledge of increased endurance against disease Tb. Lungs.

Analysis technique in this research, used is simple regression test and double regression at error rate equal to 5%.
Research Result

Univariate Analysis


![Distribution of Makassar City Community Behavior in Prevention of Disease Tb. Lung Year 2016](image)

Figure 1. Distribution of Makassar City Community Behavior in Prevention of Disease Tb. Lung Year 2016

Figure 1 shows that out of 335 respondents in Makassar City who have Behavior of Communicable Disease Prevention Tb. Lung category less as much as 6 people (1.79%); sufficient category as many as 114 people (34.03%); good category as many as 181 people (54.02%) and very good category as many as 34 people (10.14%). Based on these data it can be concluded that most respondents have TB disease prevention behavior. Lung category GOOD.

Multivariate Analysis: This analysis aims to determine the influence of variables Penge Penguan Peng Sumber Peng yaki t, Knowledge Controller variables i a n Agent Diseases and knowledge variables Improved endurance against the variable Behavior Prevention Infectious Diseases Tb. Lung of Makassar City people using multiple regression analysis. The results of the study as follows:

1. The Influence of Knowledge of Disease Control Control on Behavior Prevention Behavior Tb.

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regression</td>
<td>94647</td>
<td>1</td>
<td>94647</td>
<td>605.094</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>52.087</td>
<td>333</td>
<td>.156</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>146.734</td>
<td>334</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Dependent Variable: Behavior
b. Predictors: (Constant), PPSP
Table 1: Show that \( p < 0.05 \), The null hypothesis is rejected, and the alternative Hypothesis is accepted. This means that the variable Knowledge Source Control penyaki berpengaruh to variable Tb Disease Prevention Behavior. Lungs of Makassa City.

2. Influence of Knowledge of Agent Control of Disease Against Behavior of Disease Prevention Tb.

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>63.667</td>
<td>1</td>
<td>63.667</td>
<td>255.226</td>
<td>.000 b</td>
</tr>
<tr>
<td>Residual</td>
<td>83.068</td>
<td>333</td>
<td>.249</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>146.734</td>
<td>334</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3: Paru. Tahun 2016


<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>80420</td>
<td>1</td>
<td>80420</td>
<td>403.831</td>
<td>.000 b</td>
</tr>
<tr>
<td>Residual</td>
<td>66.314</td>
<td>333</td>
<td>.199</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>146.734</td>
<td>334</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Model</th>
<th>VAR.COUDUCT</th>
<th>VAR.PPSP</th>
<th>VAR.PPAP</th>
<th>VAR.PPDVV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Correlation</td>
<td>VAR.COUDUCT</td>
<td>1.000</td>
<td>.948</td>
<td>.867</td>
</tr>
<tr>
<td></td>
<td>VAR.PPSP</td>
<td>.948</td>
<td>1.000</td>
<td>.916</td>
</tr>
<tr>
<td></td>
<td>VAR.PPAP</td>
<td>.867</td>
<td>.916</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>VAR.PPDVV</td>
<td>.900</td>
<td>.940</td>
<td>.975</td>
</tr>
<tr>
<td>Sig. (1-tailed)</td>
<td>VAR.COUDUCT</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>VAR.PPSP</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>VAR.PPAP</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>VAR.PPDVV</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
</tr>
</tbody>
</table>
Table 5. Show that the Influence of Knowledge of Disease Control Control on Behavioral Prevention Behavior Tb. Lung $r = 0.948$, Effect of Knowledge of Agent Control of Disease on Behavior of Disease Prevention Tb. Lung $r = 0.867$, and Knowledge of Increased Body Resistance against Disease Prevention Behavior Tb. Lung $r = 0.900$. Based on the coefficient of the correlation, it can be concluded that the knowledge of disease prevention tb. lungs that have the greatest influence influence are Knowledge of Disease Control, followed by Knowledge of Improved Body Resistance, and the last Knowledge of Agent Disease Control.

Discussion

1. Disease Prevention Behavior Tb.

Figure 1 shows that out of 335 respondents in Makassar City who have Behavior of Communicable Disease Prevention Tb. Lung category less as much as 6 people (1.8%); sufficient category as many as 114 people (34.0%); good category as many as 181 people (54.0%) and good category as many as 181 people (54.0%). Based on these data it can be concluded that most respondents have TB disease prevention behavior. Lung category GOOD.

Community behavior referred to in this research is to prevent the transmission of germs disease Tb. Lung is by closing the mouth with tissui or handkerchief at the time of coughing or sneezing, seeking treatment to doctors, clinics, Puskesmas if sick, eradicate germs cause disease Tb. Lung by cleaning the floor of the house with antibacterial every day, lighting the room home with enough eye rays, increase endurance by way of exercise at least 3 times a week, adequate rest at least 8 hours every day, eat a balanced diet, manage stress with well, do not consume alcoholic beverages, avoid drugs, avoid cigarettes and so on.\(^5\,^6\)

2. Influence of Knowledge of Disease Control Control Tb.

Based on the results of research on table 2 above it was concluded that the control knowledge of disease Tb. Lung effect on disease prevention behavior Tb. Lungs in the people of Makassar.

3. Influence Knowledge Control Agent Diseases Tb.

The result of research table 3 shows that Knowledge Control Agent Penyaki Tb. The lung has a disproportionate attitude to the TB Disease Prevention Behavior Tb. Lungs of Makassar City. Lungs that are known by the people of Makassar so that people can prevent transmission of TB disease. Lungs.


Results of the study showed that table 4 Pen Knowledge ingkatan Body Endurance berpengaruh h against Tb Disease Prevention Behavior. Lungs of Makassar City. Knowledge of increasing body endurance is an effort to increase body resistance against disease Tb. Lung is known by the people of Makassar so that people can prevent the transmitters of disease Tb. Lungs.

Herda A\(^4\) there is a significant relationship between the level of knowledge with the compliance of patients with pulmonary TB in Pekakesmas Pekauman Banjarmasin, South Kalimantan. This means that the better the level of knowledge of the patient to the disease, the mode of transmission and treatment of TB Lung will be the better the compliance, and vice versa. Lung Glugur community of Medan. This means that the higher the level of knowledge of drug consumption the more obedient the patient in drug consumption or vice versa.

Conclusion

Based on the results of research and discussion on this study, it can be concluded that g behavior prevention behavior of TB Tb. The lungs of the people of Makassar are generally good category, knowledge of disease source control Tb. Lung effect on disease prevention behavior Tb. Lung of Makassar City, knowledge of disease agent control Tb. Lung effect on disease prevention behavior Tb. Lung of Makassa city r, knowledge of body resistance against disease Tb. Lung effect on disease prevention behavior Tb. Lungs of Makassar City, a variable that is very influential on disease prevention behavior Tb. The lungs of the people of Makassar City are the knowledge of controlling the disease source Tb. Lung, further knowledge of increased body resistance against disease Tb., Lung, and finally the knowledge of agent disease control Tb. Lungs.

Conflict of Interest: None

Ethical Clearance: Obtained from university committee.

Source of Funding: Self
References


Children’s Nutrition Status 7-12 Months Based on Age, Education and Job of their Mother in South Sulawesi

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Abstract

The problem of malnutrition and malnutrition is one of the main health problems faced by developing countries including Indonesia. The incidence of cases of malnutrition is still very high, especially in South Sulawesi, although it is known until now that there are very many negative effects caused by malnutrition.

Purpose: Knowing the nutritional status description of children aged 7-12 months based on age, education and employment of mothers in Jeneponto Regency.

Method: This study uses a quantitative descriptive method with a cross-sectional design approach. Sampling with a total sampling of 131 people. The study was conducted in Jeneponto Regency, South Sulawesi.

Results: Based on the BB/U index, mothers aged 30-34 years had children with poor nutritional status of 1 person (2.7%) but the BB/TB index of mothers aged 25-29 years had children with normal nutritional status as many as 32 people (94.1%). Based on the BB/U index, mothers with elementary school education have children with good nutritional status as many as 32 people (97%), and educated mothers who do not complete elementary school have children with poor nutritional status of 1 person (5%). Based on the BB/U index, mothers who did not work had children with good nutritional status as many as 100 (90.9%) but based on the index BB/TB mothers who did not work had children with very thin nutritional status of 2 people (1.8%)

Conclusion: Mothers aged 30-34 years and mothers with education who did not complete elementary school had children with poor nutritional status, mothers who did not work had children with very thin nutritional status.

Keywords: Nutritional status of children, age, education, mother’s work.

Introduction

Malnutrition in children can cause several negative effects such as slow growth, prone to disease, decreased level of intelligence, and mental disruption. So that serious malnutrition can ultimately cause death1. According to WHO, 54% of the causes of infant and toddler deaths are due to poor child nutrition. The risk of dying from a child who is malnourished is 13 times greater than a normal child2. In general, the proportion of malnutrition and undernourishment in toddlers in terms of body weight according to age (BB/U) is less and worse nutrition 17.7%, while the percentage of nutritional status in South Sulawesi Province has decreased compared to 2013 even though it is still higher than national standards3.

In South Sulawesi there are four districts/cities with the most cases including Bone (16 cases), Pinrang (15 cases), Wajo (11 cases) and Jeneponto (8 cases) (Health Profile of South Sulawesi Province in 2008). In Jeneponto Regency in 2014 it was found that the percentage of children under five weighed 82.08% of the 36,127 toddlers available. Of the 29,652 toddlers
weighed found toddlers with good nutrition as many as 28,625 toddlers (97.64%), malnutrition as many as 687 toddlers (2.32%) and malnutrition as many as 16 people (0.04%).

Efforts to improve infant nutrition are based on that malnutrition at less than 2 years of age will have an impact on decreasing physical growth, brain development, intelligence, and productivity, and this impact is largely irreparable. Micronutrients are needed for brain development during gestation and infancy. This is an important period for brain formation, laying the foundation for the development of cognitive, motor and socio-emotional skills during childhood and adulthood.

Based on this phenomenon, the purpose of this study was to determine the nutritional status description of children aged 7-12 months based on anthropometric index BB/U, TB/U, and BB/TB in Bontoramba District and Binamu District, Jeneponto Regency.

Materials and Method

The design of this study used a quantitative descriptive method to determine the description of the nutritional status of children aged 7-12 months based on a cross-sectional approach. The total sample was 131 people in the Bontoramba and Binamu Subdistricts of Jeneponto Regency. The sampling technique is the total sampling method. Data on maternal and child characteristics were collected through direct interviews using questionnaires, while children’s nutritional status was determined based on anthropometric index (Department of Health, 2011), by measuring body weight according to age (body/age), height/body length by age (TB/U) and body weight according to height (BB/TB). To measure body weight, digital baby scales are used, while length boards are used to measure body length.

Results

Respondents Characteristic

Table 1: Characteristics of Respondents in Jeneponto Regency

<table>
<thead>
<tr>
<th>Variabel</th>
<th>n (131)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>68</td>
<td>51.9</td>
</tr>
<tr>
<td>Female</td>
<td>63</td>
<td>48.1</td>
</tr>
<tr>
<td>Baby Age (month)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>35</td>
<td>26.7</td>
</tr>
<tr>
<td>8</td>
<td>23</td>
<td>17.6</td>
</tr>
<tr>
<td>9</td>
<td>21</td>
<td>16.0</td>
</tr>
<tr>
<td>10</td>
<td>19</td>
<td>14.5</td>
</tr>
<tr>
<td>11</td>
<td>15</td>
<td>11.5</td>
</tr>
<tr>
<td>12</td>
<td>18</td>
<td>13.7</td>
</tr>
<tr>
<td>Mother Age (year)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-19</td>
<td>13</td>
<td>9.9</td>
</tr>
<tr>
<td>20-24</td>
<td>30</td>
<td>22.9</td>
</tr>
<tr>
<td>25-29</td>
<td>34</td>
<td>26.0</td>
</tr>
<tr>
<td>30-34</td>
<td>37</td>
<td>28.2</td>
</tr>
<tr>
<td>≥ 35</td>
<td>17</td>
<td>13.0</td>
</tr>
<tr>
<td>Mother Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unfinished Elementary School</td>
<td>20</td>
<td>15.3</td>
</tr>
<tr>
<td>Graduated Elementary School</td>
<td>33</td>
<td>25.2</td>
</tr>
<tr>
<td>Yunior High School</td>
<td>33</td>
<td>25.2</td>
</tr>
<tr>
<td>Senior High School</td>
<td>30</td>
<td>22.9</td>
</tr>
<tr>
<td>Diploma</td>
<td>15</td>
<td>11.4</td>
</tr>
<tr>
<td>Mother Job</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployment</td>
<td>110</td>
<td>84.0</td>
</tr>
<tr>
<td>Employment</td>
<td>21</td>
<td>16.0</td>
</tr>
</tbody>
</table>

The highest maternal education in the low education group was 33 elementary school and junior high school graduates (25.2%) and the lowest was 15 (11.4%) higher education (Diploma). Regarding the work of the mother, there were at most 110 non-working groups (84%) and those working as many as 21 people (16%).

Distribution of Nutritional Status of Children Based on Mother’s Age

Table 2 Distribution of Nutritional Status of Children Based on Mother’s Age

<table>
<thead>
<tr>
<th>Nutritional Status</th>
<th>Mother Age (Year)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>15-19</td>
</tr>
<tr>
<td>Indeks BB/U</td>
<td></td>
</tr>
<tr>
<td>Malnutrition</td>
<td>0</td>
</tr>
<tr>
<td>Poor Nutrition</td>
<td>1</td>
</tr>
<tr>
<td>Good Nutrition</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>


Based on the index BB/TB, mothers aged 25-29 years had children with normal nutritional status as many as 32 people (94.1%) and the age of mothers> 35 years had children with very thin status as many as 2 people (11.8%).

Distribution of Children’s Nutritional Status Based on Mother’s Education

Table 3: Distribution of children’s nutritional status based on Mother’s Education

<table>
<thead>
<tr>
<th>Nutritional Status</th>
<th>Mother’s Education</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unfinished</td>
</tr>
<tr>
<td></td>
<td>Elementary School</td>
</tr>
<tr>
<td></td>
<td>N</td>
</tr>
<tr>
<td>Indeks BB/U</td>
<td></td>
</tr>
<tr>
<td>Malnutrition</td>
<td>1</td>
</tr>
<tr>
<td>Poor Nutrition</td>
<td>1</td>
</tr>
<tr>
<td>Good Nutrition</td>
<td>18</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
</tr>
<tr>
<td>Indeks TB/U</td>
<td></td>
</tr>
<tr>
<td>Stunting</td>
<td>3</td>
</tr>
<tr>
<td>Normal</td>
<td>17</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
</tr>
<tr>
<td>Indeks BB/TB</td>
<td></td>
</tr>
<tr>
<td>Very Thin</td>
<td>1</td>
</tr>
<tr>
<td>Thin</td>
<td>1</td>
</tr>
<tr>
<td>Normal</td>
<td>17</td>
</tr>
<tr>
<td>Fat</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
</tr>
</tbody>
</table>

In table 3, it appears that the nutritional status of children is based on the BB/U index, so mothers with elementary school education have children with good nutritional status as many as 32 people (97%) and educated mothers do not complete primary school with 1 poor child (5%). Based on the TB/U index, the mothers who graduated from high school had 25 children with normal nutritional status (83.3%) and mothers who graduated from elementary school had 13 stunting children (39.4%). Based on the BB/TB index, mothers with elementary school education had children with normal nutritional status as many as 31 people (93.9%) and educated mothers who did not complete elementary school had children with very thin nutritional status of 1 person (5%).
Distribution of Children’s Nutritional Status Based on Mother’s Work

Table 4: Distribution of children’s nutritional status based on Mother’s Work

<table>
<thead>
<tr>
<th>Nutritional Status</th>
<th>Unemployment</th>
<th>Employment</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Indeks BB/U</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malnutrition</td>
<td>2</td>
<td>1.8</td>
<td>0</td>
</tr>
<tr>
<td>Poor Nutrition</td>
<td>8</td>
<td>7.3</td>
<td>3</td>
</tr>
<tr>
<td>Good Nutrition</td>
<td>100</td>
<td>90.9</td>
<td>18</td>
</tr>
<tr>
<td>Total</td>
<td>110</td>
<td>100</td>
<td>21</td>
</tr>
<tr>
<td>Indeks TB/U</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stunting</td>
<td>31</td>
<td>28.2</td>
<td>5</td>
</tr>
<tr>
<td>Normal</td>
<td>79</td>
<td>71.8</td>
<td>16</td>
</tr>
<tr>
<td>Total</td>
<td>110</td>
<td>100</td>
<td>21</td>
</tr>
<tr>
<td>Indeks BB/TB</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very Thin</td>
<td>2</td>
<td>1.8</td>
<td>0</td>
</tr>
<tr>
<td>Thin</td>
<td>5</td>
<td>4.5</td>
<td>2</td>
</tr>
<tr>
<td>Normal</td>
<td>99</td>
<td>90.0</td>
<td>19</td>
</tr>
<tr>
<td>Fat</td>
<td>4</td>
<td>3.6</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>110</td>
<td>100</td>
<td>33</td>
</tr>
</tbody>
</table>

Source: Primer Data, 2018

Based on the index BB/TB, mothers who do not work have children with normal nutritional status as many as 99 people (90%) and very thin nutritional status of 2 people (1.8%).

Discussion

Characteristics of Respondents: A person’s health status is influenced by four factors, namely behavior, health services, genetics and environment. One of the things related to the environment is culture. Cultural factors influence a person’s health status according to the theory of nursing known as Sunrise Model.

In this study the age of most children at the age of 7 months was 35 people (26.7%) and the least at age 11 months were 15 people (11.5%). This is consistent with a study that produces findings that age is one of the things that affects children’s development.

The highest maternal age at the age of 30-34 as many as 37 people (28.2%) and the least at age 15-19 years as many as 13 people (9.9%).

The highest maternal education in the low education group was 33 elementary school and junior high school graduates (25.2%) and the lowest was 15 (11.4%) higher education (Diploma).

Child Nutrition Status based on Mother’s age:
In reality there are still many women who give birth at <20 years and > 35 years with normal nutritional status of children. This is due to the seriousness of the mother in caring for, caring for and raising her child. Adequate attitudes and knowledge of child nutrition will have an impact on the pattern of feeding given to children under five so that it influences the nutritional status of children under five.

Short child conditions can be prevented but cannot be cured so that improvement efforts are more emphasized on prevention efforts. The improvement efforts that have been made emphasize the identification and rehabilitation of children with severe malnutrition. Whereas the recent improvement efforts have been emphasized on prevention efforts through a combination of aspects of nutrition, disease and treatment/treatment.

Child Nutrition Status based on mother’s education: According to the researchers’ assumptions, the influence of education on the nutritional status of children is due to the fact that the education in the research location is quite good but the education that
respondents have is still not practiced in everyday life. The higher the level of education, knowledge, skills there is the possibility that the better the level of family food security, the better the care of children, and the more families use existing health services and vice versa.

Someone who just graduated from elementary school is not necessarily less able to arrange foods that meet nutritional requirements than other people with high education. Because even if the education is low if the person is diligent in listening to nutrition counseling it is not impossible that his nutritional knowledge will be better. It’s just that it must still be considered that the level of education factors also determine whether or not someone is easy to absorb and understand the knowledge of nutrition they obtain.

A study also showed that there was no relationship between maternal education level (p = 0.646) and family income (p = 1.000) with stunting in toddlers. Although it is understood that increasing the ability of mothers through health education can be done to maximize growth and development of children.

One alternative with health education using the modeling approach that has been carried out by nurses is effective in increasing knowledge, practical ability, mother’s confidence in breastfeeding and stimulating babies, which in turn can optimize infant growth. It was concluded that increasing maternal empowerment through health education improves baby growth.

Conclusion

As a health worker especially focusing on public health, it is very wise to prioritize promotive and preventive efforts without ignoring curative and rehabilitative efforts.

Ethical Clearance: Taken from Hasanuddin University ethical committee.

Source of Funding: Self

Conflict of Interest: Nil

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The Effect of Health Social Determinant on the Life Quality of Pregnant Mother

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Abstract

Objective: This research aims to determine the social determinant factor related to the life quality of pregnant women in Polewali Mandar district.

Method: The research was conducted in July to December 2018 using a cross sectional study design. Sampling by sampling proportional random sampling with 399 peoples distributed in 3 districts and it is analyzed with multivariate logistic regression by backward elimination method.

Results: Mother aged 20-35 years (Adjusted Odds Ratio (AOR): 1.75 [1.15-2.66]), income over or equal to Regional Minimum Wage (Rp. 2.017.780) (AOR: 1.66 [1.01-2.73]) adequate information access (AOR: 1.89 [1.22-2.94]), domiciled in urban areas (AOR: 1.95 [1.27-2.99]) and those who have health insurance (AOR: 2.42 [1.417-4.126]) tend to have a better quality of life.

Conclusion: Life quality of pregnant women is influenced by maternal age, income, access to information, domicile and health costs. Therefore, women should be pregnant at an age that is not at risk and to maintain and improve the life quality of pregnant women, it is very important for pregnant women to be given adequate access to information, a good socio-economic environment and health insurance. This is a responsibility of family and needs to be supported by government policy.

Keywords: Social determinant, quality of life, pregnant mother, access to information.

Introduction

In the world, WHO estimates that there are 303.000 women died due to pregnancy causes, 2.7 million babies die during first 28 days of life. This condition is associated with a low-ANC globally; only 64% of women receive four or more antenatal (prenatal) treatments during their pregnancy. Though this ANC can reduce and prevent high maternal mortality rates. Therefore, we need quality health care for pregnant women.\(^1\) Pregnancy care requires equal and affordable health resources,\(^2\) but in reality it is not evenly distributed and not affordable.

The life quality of pregnant women is related to education, income, but based on data from the Central Statistics Agency of West Sulawesi in 2015 shows the low level of education as seen from the number of school dropouts aged 16-18 or not yet school 36%, and dependency is still high (56.74%)\(^3\). The life quality of
mothers and children is largely determined by early and comprehensive efforts. Health-related quality of life (HRQOL) has become increasingly recognized as an important result of medical care over the past two decades. In this research, the quality of life includes relativity and it is influenced by various factors such as expectations, life attitudes, physical, psychological and social effects, adequate and appropriate care, sufficient information, accessing health facilities and equal adequacy sources.

Until now, maternal mortality is still high, it is estimated 830 women died everyday due to complications of pregnancy or childbirth around the world. As much 99% of all maternal deaths occur in developing countries. Almost all of these deaths are related to low resources, and most can be prevented. Inequality as occur in West Sulawesi based on HDI in 2017, 64.3 ranked 31 after West Papua, Papua and NTT. While, the lowest HDI by district is Polewali Mandar are 62.35. This condition raises problems as a social determinant of health, especially for maternal and child health. As a result the maternal mortality rate is still high. Several studies related to the life quality of pregnant women have been conducted, but with different determinant and especially in Indonesia it is rarely done. This research was aimed to determine the health social determinants associated with the life quality of pregnant mother in Polewali Mandar district.

**Method**

This research was conducted in July to December 2018 by using a cross sectional study design. Sampling by cluster proportional random sampling. The sample was 399 pregnant mother distributed in 3 sub-districts in Polewali Mandar, namely Polewali, Pambusuang, Bulo. Data analysis uses multivariate logistic regression.

**Result**

Table 1 shows the characteristics of respondents. Most respondents at not risk on ages (20-35 years) (76.7%), more high school education (28.6%), generally they were not working or only housewives by 88.0. Furthermore, the dominant ethnic is Mandar (75.9%) and in general pregnant women do not have anemia (73.9%). The quality of pregnant mother tends to be almost equal in number between those who have high and low quality of life.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>Amount</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ages</td>
<td>&lt;20 yrs</td>
<td>36</td>
<td>9.0</td>
</tr>
<tr>
<td></td>
<td>20-35 yrs</td>
<td>306</td>
<td>76.7</td>
</tr>
<tr>
<td></td>
<td>&gt;35 yrs</td>
<td>57</td>
<td>14.3</td>
</tr>
<tr>
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<td>Never school</td>
<td>8</td>
<td>2.0</td>
</tr>
<tr>
<td></td>
<td>Not Elementary School</td>
<td>25</td>
<td>6.3</td>
</tr>
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<td></td>
<td>Elementary School</td>
<td>101</td>
<td>25.3</td>
</tr>
<tr>
<td></td>
<td>Junior High School</td>
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<td>23.1</td>
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<td></td>
<td>Senior High School</td>
<td>114</td>
<td>28.6</td>
</tr>
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<td></td>
<td>Academy/College</td>
<td>59</td>
<td>14.8</td>
</tr>
<tr>
<td>Occupation</td>
<td>Housewives</td>
<td>351</td>
<td>88.0</td>
</tr>
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<td></td>
<td>Trader</td>
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<td>4.0</td>
</tr>
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<td></td>
<td>Private Employee</td>
<td>2</td>
<td>.5</td>
</tr>
<tr>
<td></td>
<td>Public Servant/Army/Police</td>
<td>11</td>
<td>2.8</td>
</tr>
<tr>
<td></td>
<td>Others, Voluntary/Honorarium</td>
<td>19</td>
<td>4.8</td>
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<td>Ethnic</td>
<td>Bugis</td>
<td>64</td>
<td>16.0</td>
</tr>
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<td>Java</td>
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<td>0.5</td>
</tr>
<tr>
<td></td>
<td>Mandar</td>
<td>303</td>
<td>75.9</td>
</tr>
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<td></td>
<td>Pannei</td>
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<td>Patinjo</td>
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<tr>
<td></td>
<td>Pattae</td>
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<td></td>
<td>Toraja</td>
<td>7</td>
<td>1.8</td>
</tr>
<tr>
<td>Status of anemia</td>
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<td>104</td>
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</tr>
<tr>
<td></td>
<td>Not anemia</td>
<td>295</td>
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</tr>
<tr>
<td>Quality of Life</td>
<td>Low</td>
<td>193</td>
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</tr>
<tr>
<td></td>
<td>High</td>
<td>206</td>
<td>51.6</td>
</tr>
</tbody>
</table>

Table 2 shows that mothers aged 20-35 years (Adjusted Odds Ratio (AOR): 1.75 [1.15-2.66]), income over or equal to Rp. 2.017.780 (AOR: 1.66 [1.01-2.73]) adequate access to information (AOR): 1.89 [1.22-2.94]), domiciled in urban areas (AOR: 1.95 [1.27-2.99]) and have health insurance (AOR: 2.42 [1.417-4,126]) tends to have a better quality of life.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Multivariate Logistic Regression</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Year)</td>
<td>Adjusted Odds Ratio (AOR) 95% CI</td>
<td></td>
</tr>
<tr>
<td>&lt; 20 and ≥30</td>
<td>Ref.</td>
<td></td>
</tr>
<tr>
<td>20-35</td>
<td>1.754(1.16-2.66)</td>
<td>0.008</td>
</tr>
<tr>
<td>Variable</td>
<td>Multivariate Logistic Regression</td>
<td>P value</td>
</tr>
<tr>
<td>--------------------------</td>
<td>----------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td><strong>Income (IDR)</strong>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low (less than IDR 2.017.780)**</td>
<td>Ref.</td>
<td>0.004</td>
</tr>
<tr>
<td>High (IDR 2.017.780 and higher)</td>
<td>1.66 (1.01-2.73)</td>
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<tr>
<td><strong>Access to information</strong></td>
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<td></td>
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<tr>
<td>Low</td>
<td>Ref.</td>
<td>0.005</td>
</tr>
<tr>
<td>Adequate</td>
<td>1.89 (1.22-2.94)</td>
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<tr>
<td><strong>Domicile</strong></td>
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<tr>
<td>Rural</td>
<td>Ref.</td>
<td>0.002</td>
</tr>
<tr>
<td>Urban</td>
<td>1.95 (1.27-2.99)</td>
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</tr>
<tr>
<td><strong>Health Cost</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do not have health insurance</td>
<td>Ref.</td>
<td>0.001</td>
</tr>
<tr>
<td>Have health insurance</td>
<td>2.42 (1.417-4.126)</td>
<td></td>
</tr>
</tbody>
</table>

*IDR=Indonesian Rupiah (1 IDR=0.000072 USD on 11th Juli 2018), ** Regional Minimum Wage : IDR 2.017.780

### Discussion

The problem of physical and psychological health for pregnant mother, childbirth, post-partum and breastfeeding were included as risks in pregnancy and childbirth that may arise and have a significant effect on the life quality of mothers. The social determinant of health is a condition in which people live and work, and this condition affects their chances to live in a healthy life. In March 2005, WHO established the Commission on Social Determinants of Health. The commission records determinants such as child development, sex, urbanization, employment, health systems, measurement and evidence, globalization, and social exclusion, as centers for addressing health inequalities as prevail in the world. Most respondents give birth at age 20-35 years which is very good for mother. Therefore, the age of pregnant mother determines their quality of life.

WHO emphasize to avoid four too in a pregnancy namely too young (pregnancy <20 years), too old (pregnancy> 35 years), too many children (over 4) and too close (pregnancy distance <2 years). As many 78 of 124 of women who died were very young, less than 25 years old. Furthermore, 26 of them were aged between 16 and 20 years and nearly 40% of women died during their first pregnancy and another 38% during the second or third pregnancy. At the other end of the spectrum are older women with a history of several pregnancies. In addition being responsible for their daily household, most of women die are laborers or farming workers in other countries. Some of them are migrant workers and even work until the last month of their pregnancy. Economically, employment is able to empower women to take responsibility for their health and facilitate access to health facilities. Therefore, income as comes from mother can affect the life quality of pregnant women. The results of research indicate that most pregnant women do not work and only as housewives. As a result, they do not have authority in obtaining health services, so the quality of life is below as expected. They with high levels of education will increase maternal knowledge, increase self-confidence and also increase awareness related with the use of health resources in the community for maternal health. However, it is found different in this study in which education does not affect the life quality of pregnant women. It can occur due to the lack of other important factors.

Health education media are all means or efforts to show messages or information to be conveyed by communicators, both print media, electronic and outdoor media, so that the target can increase their knowledge and ultimately it is expected can change their behavior towards positive health. One cause of efforts to control anemia in pregnancy must begin by providing health education for pregnant women and their partners, which reinforces mother statements during antenatal care. As results of distributing leaflet media as information can increases the understanding of pregnant women about high-risk pregnancies such as obstetric complications, bleeding and preeclampsia. Therefore, it is necessary to develop promotional media to increase high-risk knowledge. Coupled with the development of social media is very useful to change health behavior. Some pregnant mother states that general complaint of pregnancy as a barrier to accessing health information. Several complaints that are often noted by respondents such as nausea and vomiting that can disrupt their daily routine activities. Some pregnant women also state that fatigue, and sleep problems and followed by lethargy throughout the day, so they do not have time to access information. Similar results were also found in this research, high media access tend to be a good quality of life than opposite.

Life quality of pregnant women in urban areas is better than rural areas. Generally, the rural women are considered to have poor health and higher mortality. This is because rural areas have poor access to perinatal care. In general, health resources are concentrated in...
densely-populated urban areas, while rural women tend to suffer from both their health and lifestyle. As result of Nasem’s(2011) research found that role limitations due to physical problems, perceptions of general health and also due to emotional problems had a significantly lower score in rural women compared to urban women. In this research, domicile has relation with the quality of life, mothers who live in remote areas often experience severe vulnerability. The availability and utilization of reproductive and child health services varies widely from country to country. It is important to understand the extent of poor and non-poor gaps in urban areas across the country apart from their urban poverty.

The level of public policy and financing, according to Egan et al.(2008) that social protection mechanisms and national health insurance schemes targeting marginalized populations, so that all groups can be reached. If a health system develops organically without government supervision, they can even provide services or support facilities for urban health services in remote rural areas. In this research, they had health financing both independently and those receiving aid. Also, in this research the available financing is related to quality of life. For the life quality of mothers to be better, it is expected to improve prenatal care, one of them by considering insurance factors that still need to be improved, as happened to low-income African-American women. It is intended to reduce limitations in obtaining health services.

**Conclusion**

As result and discussion mentioned earlier, it can be concluded that the life quality of pregnant women is influenced by maternal age, income, access to information, domicile and health costs. Therefore, should be the women to become pregnant at not risk age (20-35 years) and to maintain and improve the life quality of pregnant women, it is very important for pregnant women to be given adequate access to information, a good socio-economic environment and health insurance. This is a family responsibility and needs to be supported by government policy.

**Source of Funding:** Ministry of Research and Technology for Grant Program of Dissertation.

**Interest Conflict:** Nil

**Ethical Clearance:** This study was approved by the Research Ethics Committee of the Faculty of Medicine, Hasanuddin University.

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Implementation of Partnership between Midwives and Traditional Birth Attendants in Kotabaru District

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Abstract

Background: Maternal and infant mortality ratio, in the Kota Baru high enough, one of them because of labor that much by the Traditional Birth Attendants (TBA). Midwives offer fewer deliveries and coverage has not reached the 95% target and fewer midwives than TBA.

Objectives: This study aims to know the implementation of the partnership program between midwives and traditional birth attendants in Kotabaru District.

Method: This study use da qualitative approach to the design of case studies, with purposive sampling technique. The number of the main informant as much as 3 people and informant triangulation 6 people. This research was conducted for 1 month consists of content analysis and data processing.

Results: The results show human resources are still lacking, inadequate facilities and funding partnership that is often paid late. Midwives and TBA is not made a written agreement, and over the role of the TBA will not be in accordance with there gulations. The support from the village head and community leader that there is no information and the number of TBA partnering is still less.

Conclusion: Our findings conclude the importance of cross-program coordination and involvement in the District Health Office and across sectors at the District Government level. This participation is urgently needed from local stakeholders playing a major role in the successful implementation of maternal and child health programs.

Keywords: Midwives; traditional birth attendants; implementation of partnerships.

Introduction

Traditional Birth Attendant’s (TBAs), "dukun beranak" in Indonesia, has been around for a long time, and are still practicing labor and childbirth, where most deliveries occur at home and are not assisted by skill birth attendant such as midwives. This situation increases the risk of death for the mother and her baby.¹ TBA is a trusted employee in the family and community in all matters relating to women’s reproductive problems and their work is obtained from generation to generation.² Indonesia, which has a variety of tribes, customs, and cultures in the community, they are considered capable of providing emotional comfort and security to mothers during pregnancy check-ups, assisting mothers and caring for their mothers and babies after birth for up to 40 days. TBA’s knowledge of pregnancy and birth is so lacking that if complications arise they are unable to overcome them even realize it.³ However, in addition to providing technical assistance, TBA also practices unsafe abortion and contraception at high risk and threatening the life of the pregnant woman.⁴

Trained TBAs are family TBAs who have received short training courses through the modern health care sector to improve their skills.⁵-⁶ So, starting in 2007, the government initiated a partnership program by village midwives and traditional birth attendants aimed at reducing maternal and child mortality and morbidity.⁷ This is because the traditional birth attendants do not have enough ability and knowledge to handle obstetric complications and emergencies (EMOC) that occur during...
and after labor. Then, between midwives and doulas, they offer physical, emotional, and ongoing support while simultaneously encouraging patient autonomy. However, disagreements between them also occur from the Middlemiss (2015) study in the UK, differences in the role of doulas and midwives and identify potential for conflict if the role of doulas is misunderstood. Some experts have identified antagonistic attitudes towards doulas that create challenges for midwives, and lead to inter-professional conflicts in the dynamics between midwives and doulas. In Canada, this misconception, midwives and nurses fear that doulas will take over their roles and “grass” jobs.

Death that occurs in a hospital is a referral for labor handled by TBA. Furthermore, in some cases TBAs called on midwives when their mother’s condition was severe. At this time, there are 329 TBAs in Kotabaru District. Their presence is spread in 21 sub-districts. Meanwhile, only 220 midwives served. The coverage of childbirth assistance by health workers is 68.2% which has not increased and has not reached target 95% from 2014 to 2017. Based on this problem, this research is intended to know the implementation of the partnership program between midwives and traditional birth attendants in Kotabaru District.

Materials and Method

The study design uses an explorative qualitative approach. A total of 9 participants consisted of 3 village midwives and 6 triangulation informants. This study was conducted at the Berangas Public Health Center in Kotabaru District, South Kalimantan Province. The selection of research locations was taken through considerations, among others: First, coverage of delivery assistance by health workers in the last 3 years had not met the District target of 95%. Second, their have the highest number of traditional birth attendants from the number of midwives. And, third, their has an ongoing partnership program indicator.

Data collection uses in-depth interviews, and semi-structured interview guides. Processing data with content analysis. The aspects studied include the system of implementing partnerships, namely 1) Human Resources, funding, facilities, and data collection and mapping of traditional birth attendants; 2) Fostering of traditional birth attendants; Written Agreement for Midwives and TBA; and the role of TBA; and 3) Support of Village Heads and Community Leaders.

Results

Characteristics of Participants: Characteristics explained the main informants were 3 midwives in each village in the Puskesmas area. And the triangulation informant consisted of 6 people selected based on competency and representatives who were aware of the partnership program. (Table 1).

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<td>70</td>
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<td>4</td>
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<td>20 years in village</td>
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<td>6</td>
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<td>Female</td>
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<td>Mothers is served by Midwives and TBA</td>
<td>Second Labor</td>
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</table>

Sources: Health Office Report, 2017
Analysis of Results

Human Resources: From the interviews, information was obtained that 1 midwife served 2 to 3 villages at a time, because other villages that did not have midwives to cover all villages in their work area.

“..Serving three villages, meaning one village has three regions: Rampa Kapis, Batu Tunau, and the Coal Mining Company.” (IU2) “Each place only has a few empty villages” (IU1, IU3)

Interview for six triangulation informants, we obtained a statement that three midwives were still not living in the village but were willing to come at any time if needed.

“..do not live in the village every day, if called they are willing” (KD, M) “there is no residence in Berangas village, but if anyone wants to give birth, they are ready to come” (BK)

Half of the midwives, residing in districts and villages, have areas with a geographical area that vary by a distance of 25-30 km.

“I live in urban areas for about 30 minutes from Berangas Village because my children go to school in there” (IU3) “..back and forth to the village, but don’t stay overnight” (BK, M)

Facilities and Infrastructure: They are complete but some people are giving birth at home even though they are near to Puskesmas. Most of them do not have adequate electricity and clear water. Access and difficult terrain is also an obstacle. It must be taken on foot. Medical equipment is very unnoticed, so they add unsafe ingredients to the baby’s umbilical cord.

Funding Source: Specific funds for partnerships do not exist. Companion funds come from Health Operational Assistance (BOK). The funds according to them are insufficient because they are considered too little. Disbursement of funds is not routine every month but has to wait a long time. This is related to TBA not making an Accountability Letter (SPJ) and there are no reports on labor and childbirth period referrals.

Written Agreement for Midwives and TBA: Information from two people revealed never made a written agreement. Only an oral request to call the midwife if there is something

“..nothing.. we just talked..” (IU1, IU2)

Even they do not know the information about the partnership. The coordinating midwife stated that the agreement had not been made, it was still in the planning stage and had not been implemented.

“..up to now has not been implemented, because many other health programs take precedence” (BK)

TBA will call the midwife, if the baby has been born and delivery has been completed just to cut the baby’s umbilical cord.

“..because I am not allowed to cut the umbilical cord with a knife and concoctions” (DB)

Fostering of TBAs: Fostering shamans only through refreshing once a year and not all of them are invited. Midwives provide guidance on useful knowledge.

“Guidance and refreshing shamans have been carried out ..This year is only once, this year just once” (BK, TM)

Different from the 3 other triangulate informants who claimed to have never known and were never invited to refreshing the shaman.

“..never really meetings, try to be invited to meetings” (DB, DT, KD)

The Role of TBAs: Only one midwife informant who collaborated and applied the transfer of roles with TBAs.

“..if at my place, TBA tells me that pregnant women will give birth.. we usually join together to help until parturition “ (IU1) “they usually massage, make herbal concoctions, and midwives care.” (IU2)

Other different information TBAs are not partners, refuse cooperation and complete change of role. Only ever accidentally help together give birth.

“..Ever..she only held the abdomen, if part of the birth ..of course midwife”(IU3)”.Postpartum mothers still visited by midwives.” (BK, DB, M)

Midwives and TBAs seem to compete and look less harmonious. “..they (midwives) hold mother’s full ..if her signs of birth appear, you call me, I better go home” (DT)

It can be concluded that TBA not partnered still does not work together so that their role is still helping birth and the baby independently. In fact, they consider midwives to be powerful over patients.
Support of Village Heads and Community Leaders: Real support was provided from the village head and community leaders, but information about the partnership program was not yet optimal. During this time they made requests to give birth with midwives at the health center. Their support is in the form of regulations, financial assistance, supporting facilities, and invitations to midwives and traditional birth attendants to work together.

Discussions

Human Resources: Resources hold an important influence in the implementation of health care systems, especially partnerships. Resources include implementing personnel, infrastructure, service facilities, and funding. Midwives are competent health workers who are stationed and should reside 24 hours in the work area of the puskesmas. One of the factors that caused the community to choose to be assisted by a dukun is the distance between the community’s house and the dukun in the adjacent village and the TBA is always 24 hours. While many of the midwives reside in areas farthest from the reach of the community.

Facilities and Infrastructure: Based on research by Pramono & Sadewo (2012), that geographical conditions make it difficult to call midwives so that pregnant women choose TBA who are domiciled around their homes. To be able to realize the partnership, childbirth must be assisted by midwives, the government must be able to facilitate adequate health facilities and ensure the availability of quality midwives in each village and easy access to services. Therefore, through a Government Regulation states that childbirth can only be done outside health care facilities if difficult to reach by the community.

Funding Source: The availability of a budget plan for the Birth Waiting Home (RTK) which is a temporary residence for pregnant women who will give birth until the postpartum period including their babies and their companions (husband/family/cadre). For Childbirth Assurance, the Health Allocation Fund (DAK) can be used to cover: operational costs, health workers and companions in RTK or official travel from home to RTK or from RTK to health service facilities. Of the 10% of the Village Fund Allocation (ADD) used to work on maternity guarantee programs, including the Health Operational Assistance (BOK) fund for promotive and preventive activities and funding for midwife and TBA partnership funds.

Written Agreement for Midwives and TBA: A written agreement between the midwife and the dukun is made together, in accordance with the implementation manual which contains information on the mechanism of reference for pregnant women, the referral mechanism for labor cases, the mechanism for distributing labor costs and the schedule for regular meetings. In line with the results of research by Rochmayanti, the partnership did not go according to expectations and targets despite having a memorandum of agreement between them.

Fostering of TBAs: TBAs are also not equipped with knowledge of detection of danger signs in pregnant women, maternity, postpartum and newborn babies as well as ways of referring midwifery. So the TBA only has some knowledge to carry out his partnership role. In fact, for the treatment of the umbilical cord, TBAs still use herbs that are not useful and not clean. In terms of benefits, some TBAs want to follow the call so that they don’t help their own deliveries anymore. But the appeal is not optimal so that they are still many who help deliveries unsafe.

Support of Village Heads and Community Leaders: According to the research of Budiono, et al. (2012), the support of community leaders is needed in collaboration between midwives and TBAs. This support includes socialization and direction through village meetings, mediation between midwives and TBAs and helps influence other parties such as posyandu cadres, village officials, and TBAs to take an active role in the partnership.

CONCLUSIONS

Some obstacles in implementing the partnership program are midwives and TBAs on the utilization of SBA and strengthening the role of each available resource. Funding management from Jamkesmas, DAK and other fund allocations needs to be maximized so that the community realizes that safe delivery with midwives and in health facilities is accompanied by TBAs, not obstacles or concerns from families and communities. Training of skilled TBAs needs to be considered as a refresher in the skills of their childbirth practices under the supervision of the District Health Office, the priority of areas that are difficult to reach.

Conflict of Interest: None

Ethical Clearance: Obtained from university committee

Source of Funding: Author him self
References
Socio-Cultural Transformation through the Process of Internalizing Values in Early Childhood Education in Makassar City (An Ethnographic Study of Education)

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Abstract

The global idea of child education was declared through the Educational For All movement for the first time in 1990 in Thailand and then confirmed in the Dakkar Declaration in 2000. The study aim to examine in depth about the children value for PAUD institutions and the process of socio-cultural transformation through the process of internalization value to children. This research uses an ethnographic approach. Primary data obtained through in-depth interviews, and participant observation. The data was analyzed through a qualitative analysis procedure. The results of the study that changes in the application of the curriculum not only on one “Islamic value” but also universal values through child-friendly learning nuances of “Islamic”. There are nine indicators of basic Islamic values that are structurally internalized to children involve the three pillars of education (parents, educational institutions and the community), synergy and influence each other. There are supporting and challenges factors in implementing Islamic values in TK WU.

Keywords: Early Childhood Education, Transformation, Islamic values, ethnography.

Introduction

The global idea of children’s education was declared through the Educational For All movement for the first time in 1990 in Thailand and then confirmed in the Dakkar Declaration in 2000. At the level of early childhood education (PAUD), the role of educational institutions is very strategic to internalized moral values, cultural values and nationality value to the children. Now education faces the substance of the problems of globalization and the transmission of external values in national life. The orientation of new values has alienated city people from their roots, original culture. In a good and respectable family, their children can become foolish and unexpected, because the determinant of formation is no longer only parents, but the media, peers, education and even markets1. Socio-cultural changes to education when children no longer belong to families, but belong to educational institutions and the environment. The development of communication technology, has totally changed the world culture. Global culture is known as MC Donald2 culture.

In 2011, the Indonesian government launched the PAUD program, one village one PAUD program. PAUD is an instrument to overcome the deficit in the role of family or parents in children’s education.

A number of other relevant studies explain the position of this research, for example Baki3 study; Badruddin4; Rosdiana5; Priwardhani6; Amini7 and a number of other studies on education are portrayed using the perspective of anthropology, sociology, education, religion and so on. Despite the diversity of studies on early childhood education have been conducted by a number of researchers referred to, but there has not been a specific look at the transformation process in early childhood education.

The study of this transformation is a very relevant study using the anthropological approach. Spindler8 believes education as a whole process of development and adaptation, leading to the process of cultural transmission, including skills, knowledge, attitudes, values and beliefs and certain behavioral patterns. The study of how the reality of education in PAUD institutions in its development has also undergone a transformation, to capture the meaning of reality in the world of education using the ethnography as a method also experiences development. The views of Laksono et al.9 agree with the view of George Sprindler, that the ethnography of education is not only the ethnography of schools, but more extensive studies.
This research tries to reveal the process of transformation of values in “Kindergarten of WU” and how the strategy, the process of achieving educational achievement becomes an interesting reality revealed using the “ethnographic” approach. This research takes place in Kindergarten of WU as an educational institution with strong Islamic characteristics and this research location is an effort of resilience to current developments.

The general objective of this research is to examine in depth the phenomenon of transformation or socio-cultural processes working through the process of internalization in early childhood. The specific objectives, as follows:

1. In-depth study of the value of children for PAUD institutions in WU Kindergarten.
2. In-depth study of the process of socio-cultural transformation through the process of internalization of value in children.

**Method**

This research uses an ethnographic approach. The research involved informants such as parents of students (mothers), grandmothers, teachers, school principals, foundation administrators, and baby sisters. Primary data obtained through in-depth interviews, and participant observation. Qualitative data analysis through three processes (1) data reduction, (2) categorization, (3) data interpretation

**Results and Discussion**

**Child Friendly Learning Based on Islamic Values:** Efforts to integrate the curriculum based on Islamic values and eight PAUD Standards in Indonesia. The level of development achievement includes basic competencies and indicators of religious and moral values, motor, cognitive, language, socio emotional and arts. The character or personality of the child becomes the main achievement of education initiated by WU. Basic Competencies are elaborated in daily activities based on the Koran and Hadith.

There are four principles of child-friendly learning indicators initiated by Kindergarten of WU, namely 1) teachers as learning media, 2) learning and playing, 3) creating learning spaces, and 4) schools are part of the daily lives of students.

There are at least five important aspects of child-friendly learning in WU Kindergarten, namely:

a) The teacher knows how to teach children with diverse backgrounds and abilities.

b) All children have the right to learn, regardless of physical, intellectual, social, emotional, linguistic or other differences,

c) In a friendly learning environment, everyone shares a vision of how children should learn, work and play together.

d) They believe that education should be inclusive, fair and non-discriminatory, sensitive to all cultures, and relevant to children’s daily lives.

e) A friendly learning environment, teaches life skills and a healthy lifestyle, so students can use the information obtained to protect themselves from disease. There is no violence against children and physical punishment.

Meanwhile, child-friendly learning has significant benefits, such as benefits for children, teachers, parents and the community.

**Internalization of Islamic Values of Students in Kindergarten of WU**

The social structure internalized in TK WU is formulated in nine points, namely:

a) Children are able to memorize a minimum of 20-30 short suras to a maximum target of juz 30.

b) The child is able to read, write, count and communicate simply in Indonesian.

c) Children are equipped with Islamic moral character education.

d) Children have discipline and independence.

e) The education system is integrated between religious and general sciences.

f) Extracurricular activities vary, planned, directed and systematic.

i) Islamic environment, safe and pleasant.

h) Teachers and human Resources who are friendly, dedicated and professional.

i) Facilities and Infrastructure support teaching and learning process activities.
The Internalization of Islamic values to children is divided into three, namely the value of monotheism, morals, and worship which is carried out in the initial semester for three weeks, using the method of reciting surahs in the Koran and the Hadith with the aim of being a process of habituation to students.

In addition to the family, school and teachers are important determinants of internalizing Islamic values to children. Schools are the second most significant institution in shaping children’s personality. Factors that determine the internalizing Islamic values in early childhood are the environment, such as friendship. In this context, children tend to be more independent, innovative and experience the process of sorting good and bad subjectively. Bun, 27 years old, one of the parents stated:

“... actually what determines good or bad children is not just parents. Teacher or the meaning of school and the environment of his friends is also a big influence. Now what needs to be understood is, which children are more dominantly affected. These parents must understand, in order to balance. For example, don’t let the kids be locked up in the house all the time, or be told to play outside or continue to take care of school. Just be balanced. But many conflict. “

Early childhood has unique characteristics, both physically, socially, morally and so on. According to Aisyah, et al\textsuperscript{13} characteristics of early childhood include; has a great curiosity, is a unique person, likes to fantasize and imagine, the most potential time to learn, shows egocentric attitude, has a short span of concentration power, as part of social beings. According to Bredekamp and Coople\textsuperscript{13}, some aspects of early childhood development such as physical, social, emotional, and cognitive aspects of each other are closely related. Child development and learning are children’s interactions with various contexts through play. The Internalization process here takes place through the play process.

All of these characteristics are very clearly seen in kindergarten of WU. Thus, each stakeholder (parents, teachers and community) is very important to pay attention to the characteristics of this early age. According to Piaget\textsuperscript{14}, children have 4 levels of cognitive development namely sensory motor stages (between 0-2 years), pre-concrete operations (between 2-7 years), concrete operations (between 7-11 years), and formal operations (11 years and above).

After school, the family has the main functions of socialization and education, namely as the first institution in children’s education that designates the role of the family in shaping the child’s personality, through social interaction within the family. Children learn patterns of behavior, attitudes, beliefs, ideals and values in society in the context of the development of their personality. Internalizing values in children is an important process in children’s development. The role of the school (teacher or educator), family (parents and siblings) and the friendship environment must have a positive connection.

Integrated Education: Parent and Teacher Involvement: The form of parental involvement in this research is relevant to the Overlapping Sphere of Influence theory proposed by Epstein.\textsuperscript{15} There are six types of parental involvement, namely (1) parenting education, (2) communication, (3) volunteering (4) learning at home, (5) making decisions and (6) in collaboration with the community.

Parental involvement in education is very much needed at every level of education especially in PAUD institutions, where children are just starting to form character through the development of moral, religious, social and emotional values.\textsuperscript{16} The development of these values can only be achieved maximally with the existence of continuity between education at home and at school, not apart from the participation of parents.\textsuperscript{16}

Research Park et al\textsuperscript{17} that parental involvement has a contribution to the development of cognitive aspects of children and other aspects of development.

The activities of the school committee are to provide education to parents of students through tarbiyah every Friday to harmonize the Islamic values given to children so that parents make habituation routed in their respective homes.

Hand over the role of children’s education to other parties, such as care for the maid or baby sister, then formal education is fully delegated to the school. The role of parents is also often replaced by other family parties, both siblings and grandparents. Child care patterns tend to distance between parents and children, because parents are busy working.

PAUD and Internalization of Islamic Values: The education system developed by TK WU is the integration of formal education based on curriculum with internalization of Islamic values. Education gives
a very big influence and contribution to children’s self development. An action done by an educator (teacher), parent or social environment of the child in order to achieve better goals for children.

The basic values of Islam\textsuperscript{18,19} consist of (a) Faith and devotion, (b) Appreciation of human existence with all its potential, (c) Promoting the principles of freedom and independence, and (d) Social responsibility. Universalism of Islamic teachings contains basic principles regarding social relations, including democracy.

In general, early childhood education, especially in the kindergarten of WU is to build individuals with Islamic personality based on the Koran and Hadith. From this goal individuals are formed with \textit{akhlakul kharimah}, and have emotional and spiritual intelligence (religious), consistency (\textit{istiqamah}), humility (\textit{tawadhu}), totality (\textit{kaffah}), balance (\textit{tawazun}), integrity and perfection (\textit{ihsan}). The need for value education, through the internalizing Islamic basic values in early childhood urban families, has been carried out by the kindergarten of WU.

Changes in children’s behavior are getting better at school and at home after getting invested in basic humanist religious values. Changes in children’s behavior at school include: (a) behavior in \textit{aqidah}, (b) behavior in morals, (c) behavior in worship, (d) behavior in social, emotional, and independence dimensions. Changes in children’s behavior at home shown by: (a) pay more attention and listen to the words of parents, (b) can say and answer greetings in Islam correctly, (c) can distinguish clothes cover the genitalia and not cover genitalia, (d) can pray alone.

Most early childhood education, oriented to the achievement of children’s independence. Independence is considered as the most basic foundation in the stage of child development. Not only in WU Kindergarten, children’s independence is really an important achievement even more priority than reading and writing.

Bordieu\textsuperscript{20} views on the theory of Habitus, field and Capital. Habitus is a product of internalization carried out by structures (agents that influence children) born from the background of parents, the orientation of parents’ values in choosing schools, orientation of educational institutions (organizational values). The struggle or efforts made by parents and educational institutions in conducting coaching (socialization functions) carried out by educational institutions and family institutions are synergized with the three pillars of education.

Habitus\textsuperscript{20} as a determinant component in the process of transformation consisting of cultural values, religious values, and social values that are owned and practiced by children. Based on the Cultural Analysis framework described by Muller\textsuperscript{21}, Habitus is at the mentality level. Transformation or change occurs in the field of education and children are at the level of social structure.

Conclusions

Indicators of Values that are structurally internalized to children are (1) loving the Qur’an and Hadith from an early age by being able to memorize a minimum of 20-30 short surahs to a maximum target of juz 30, (2) Children are able to read, write, count and communicate in Indonesian. (3) Children are equipped with Islamic moral character education, (4) Children have discipline and independence. (5) The education system is integrated between religious and general sciences. (6) Extracurricular activities vary, planned, directed and systematic. (7) Islamic environment, friendly, safe and pleasant. (8) Teachers and human resources who are friendly, dedicated and professional. (9) Facilities and infrastructure support teaching and learning activities.

These values are internalized to students involving the three pillars of education (parents/family, educational institutions and the community/environment) that work together and influence one another.

Supporting factors for implementing values: (1) friendly and competent teaching staff (2) integrated curriculum (Islamic values and universal values); (4) Parental involvement and child-friendly environment. (5) Availability of learning facilities and media (6) Consistency and Commitment of organizers to educational achievements in accordance with the vision and mission of the PAUD institution.

Challenges factors faced: (1) The innate character of students varies (children are unique), (2) Parents of students have not synergized with school programs because parents are busy working; (3) Lack of parents’ understanding of the concept of PAUD as a playground for children, (4) limited facilities for learning and playing space for children; (5) limited teaching staff with adequate qualifications and competencies.

Source of Finance: Self

Conflict of Interest: None
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Risks Assessment of Silica Contamination on the Communities Living Surround the Cement Industry, Pangkep Indonesia

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Abstract

This study focused on the assessment of the potential risks of silica on the ecology and the estimated weekly intake due to the consumption of traditional cake, water and mixed fruits. Soils and traditional cakes were collected from the concerned area where water was collected from the river and drainage basin. Silica potentially toxic elements were analyzed in terms of concentration, potential ecological risk, and human health risk. The highest concentration of Silica pollutant around the Tonasa Cement Industry Pangkep were on well water with (16.18 mg/l), river water (18.12 mg/l), sediment (41.11 mg/l), surface soil (7.92%) and air particulate (2.74%), respectively. In addition, the highest concentration of Silica (SiO$_2$) around the Tonasa Cement Industry Pangkep on mixed fruits with (14.17 mg/l), followed by traditional cake (7.26 mg/l), and drinking water with (0.52 mg/l), respectively. The potential ecological risks posed by silica on all those environment were considerable and moderate, respectively. Estimated weekly intake indicated that non-carcinogenic risks all fell below threshold values. The total carcinogenic risks due to silica was within the acceptable range for communities. This conclusion provides a scientific basis for the control of potentially toxic element pollution and environmental protection of the ecology and food for communities who are living surround the Cement Industry, Pangkep.

Keywords: Potentially silica toxic element; pollution level; well water; sediment; surface soil; ecological risk and weekly intake.

Introduction

The transformation and migration patterns of silica and others elements potentially toxic in the aquatic environment are complex and a long processes. The rapid urbanization and industrialization activities, toxic contaminants are continuously and increasingly entering the urban soils, water and leading to environmental and health problems$^{1-4}$. Urban soils and water are certainly regarded as an important component of the urban ecological system, and excessive amount inputs of toxic element pollutants may deteriorate the water and soil ecological environment and change the physical and chemical properties of soils, as a results agricultural and food may get the bad effect$^{3,4}$. A more serious problem is that these pollutants may travel from urban water and soils to humans through various pathways (e.g., direct ingestion, inhalation, and via skin contact or called absorption) and lead to negatively impact human health$^{5}$. Therefore, the main purposes of our study were to test the following three hypotheses: (a) trace metals accumulate in the water and soils; (b) the potential ecological and human health risks from trace silica metals intensify in the water and soils of developing Pangkep districts; (c) human activities are the main sources of silica trace metals.

Silica exposure is associated with a wide series of effects, including many neuro developmental outcomes, mortality (mainly due to cardiovascular disease), decreased renal function, hypertension, impaired fertility and adverse consequences on pregnancies. Typically, the majority of released metals/metalloids accumulate in the surficialsedimentinaquatic systems via adsorption, chelation, and sedimentation processes$^{6}$, and about 10% of them exist in the water column in the dissolved form$^{7,8}$, or are associated with suspended particles.
Furthermore, the sediments also play very important roles in the aquatic safety and in assessing the potential ecological risk of the pollutants in the aquatic environment. Although several studies were conducted about Silica concentrations in food, however to our knowledge, up to now few studies have investigated silica concentrations in traditional cake, soils where silica released from cement industry were supposed to be less available.

**Materials and Method**

This analytic observational research applied quantitative approaches and cross sectional research designs. The purpose of this study is to find out the relationship between the independent variable and the dependent variable, and to assess the ecological risks and to estimate weekly intake. The population in this study is the people who live around the Semen Tonasa Industry, Pangkep Indonesia. The sample in this study amounted to 50 people. Data were collected using a questionnaire given to respondents, measurement of dust exposure, measurement of lung vital capacity, and direct observation. Analysis of the data used in the form of univariate and bivariate analysis using chi square test. Silica levels were determined in samples using graphite furnace and cold vapor atomic absorption spectrometry.

**Results**

**Ecological risks assessment of Silica**: Common Method suitable for potential ecological risk assessment of soil heavy metal pollution include the geoaccumulation index methodand the potential ecological risk index method. In this study, we attempted to use these two Method to evaluate the ecological risk of soil heavy metals in the study area, and we summarized the results of the two Method to find the general law of the problem.

The potential ecological risk was assessed by on the well water, river water, sediment, surface soil and air particulate. Table 1 presents the calculated results silica on the environment.

<table>
<thead>
<tr>
<th>Stations</th>
<th>Well water</th>
<th>River water</th>
<th>Sediment</th>
<th>Surface Soil</th>
<th>Air particulate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.75</td>
<td>3.55</td>
<td>0.26</td>
<td>3.47</td>
<td>3.73</td>
</tr>
<tr>
<td>2</td>
<td>0.81</td>
<td>4.01</td>
<td>0.22</td>
<td>4.10</td>
<td>3.30</td>
</tr>
<tr>
<td>3</td>
<td>0.60</td>
<td>3.63</td>
<td>0.29</td>
<td>7.92</td>
<td>2.94</td>
</tr>
<tr>
<td>4</td>
<td>0.67</td>
<td>9.06</td>
<td>0.41</td>
<td>6.90</td>
<td>3.36</td>
</tr>
<tr>
<td>5</td>
<td>0.95</td>
<td>3.56</td>
<td>1.52</td>
<td>4.15</td>
<td>3.91</td>
</tr>
<tr>
<td>6</td>
<td>0.75</td>
<td>3.09</td>
<td>0.19</td>
<td>2.88</td>
<td>7.43</td>
</tr>
<tr>
<td>7</td>
<td>0.88</td>
<td>4.16</td>
<td>0.23</td>
<td>4.28</td>
<td>4.43</td>
</tr>
<tr>
<td>8</td>
<td>1.08</td>
<td>5.71</td>
<td>0.39</td>
<td>5.40</td>
<td>7.30</td>
</tr>
<tr>
<td>9</td>
<td>0.81</td>
<td>4.72</td>
<td>0.22</td>
<td>10.15</td>
<td>9.13</td>
</tr>
<tr>
<td>10</td>
<td>0.93</td>
<td>6.09</td>
<td>0.31</td>
<td>9.90</td>
<td>3.93</td>
</tr>
</tbody>
</table>

Table 1 described the potential ecological risks of silica where the highest risks value were in surface soil with 10.15 then followed by on air particulate with 9.13 and river water 9.06, respectively. The Ecological risks assessment of Silica in surface soil was significantly higher than those in well water and air particulate.

**Estimated weekly intake traditional cake and drinking water and mixed fruits**: Tolerable weekly intake estimates the amount per unit body weight of a potentially harmful substance or contaminant in food or water that can be ingested over a lifetime without risk of adverse health effects.

Silica concentrations in the traditional cake, drinking water and mixed fruits were assessed for human risks uses according to provisional tolerable weekly intake. Table 2.

<table>
<thead>
<tr>
<th>Stations</th>
<th>Estimated Weekly Intake of Silica</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Traditional cake</td>
</tr>
<tr>
<td>1</td>
<td>0.003</td>
</tr>
<tr>
<td>2</td>
<td>0.003</td>
</tr>
<tr>
<td>3</td>
<td>0.006</td>
</tr>
<tr>
<td>4</td>
<td>0.006</td>
</tr>
<tr>
<td>5</td>
<td>0.001</td>
</tr>
<tr>
<td>6</td>
<td>0.003</td>
</tr>
<tr>
<td>7</td>
<td>0.003</td>
</tr>
<tr>
<td>8</td>
<td>0.019</td>
</tr>
<tr>
<td>9</td>
<td>0.006</td>
</tr>
<tr>
<td>10</td>
<td>0.003</td>
</tr>
</tbody>
</table>

Table 2. Estimated weekly intake traditional cake and drinking water and mixed fruits around the Tonasa Cement Industry Pangkep, Indonesia
Table 2 indicated the results of EWI results calculation for Silica, which show that the highest of EWI in drinking water (0.096) followed in mixed fruits (0.095) and in traditional cake (0.019). All of the EWI values were still < than 1.

Discussion

Ecological risks assessment of Silica: This study revealed that the potential ecological risks of silica. The highest value risks value were in surface soil with 10.15 then followed by on air particulate with 9.13 and river water 9.06, respectively. These value indicated that the level of risks at those environment was in the level of medium risks. The reasons for higher Silica contents in surface soil are complex. Greater Silica in air are mostly due to high Silica concentrations released in to the atmosphere by the cement industry.

Based on the results of evaluation and potential ecological risk valuation, it showed that the potential ecological risk of air and water in the study are a is generally at a moderate level, also and it is feasible to carry out reclamation.

Estimated weekly intake traditional cake and drinking water and mixed fruits: The provisional tolerable weekly intake (PTWI), recommended by the Joint FAO/WHO Expert Committee on Food Additives (JECFA), show appropriate safe exposure levels and is used to estimate the amount of contaminants, ingested over a lifetime without appreciable risk. The excessive amounts of silica in in food chain can cause health problems for humans and ecosystem. Such as traditional cake and drinking water and mixed fruits is an important food in human diet. Many countries were infected to water and soil pollution crisis to heavy metals including silica. Human beings cause this contamination type through different ways.

Table 2 indicated the results of EWI results calculation for (SiO$_2$), which show that the highest of EWI in drinking water (0.096) followed in mixed fruits (0.095) and in traditional cake (0.019). All of the EWI values were still < than 1. The estimated values of all metals in samples in this study were below the established values. Therefore, it can be concluded that those silica in these three variables posed no health problems for consumers.

Conclusion

The conclusion of this study showed the roll of food and beverage on transferring silica from soil, water and food to humans. Of the obtained result it’s concluded that water and is contaminated with silica. Therefore, more attention should be given and remediation action should be set to minimize the concentration and ecological impacts of silica in the study area. Further research should be conducted on human health impact of silica in all aspect of life.

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Conflict of Interest : The authors declare that they have no competing interests.

Source of Fund: Directorate of Research and Community Service (DRPM) for funding the research.

Ethical Clearance: Obtained from the faculty of public health ethical clearance committee.

References


Overview of TB Patients and their Behavior in the Buginese and Makassarnese South Sulawesi

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Abstract

Background: Tuberculosis (TB) is included as a Global Emergency Health Health which is a lung disease due to mycobacterium tuberculosis. TB has a high prevalence and incidence which can cause wider contact and socioeconomic contact to increase. Therefore the purpose of this study was to determine the epidemiological picture of TB sufferers in the BungoroPrimary Healthcare in Pangkep Regency.

Method: This research is in the form of descriptive epidemiology with a total sample of 60 people. Sampling using a purposive sampling method.

Result: Characteristics of the host of TB sufferers, Most sufferers are aged 25-40 years, male sex, elementary school education, civil servant work and contact for more than 8 hours. Description of the characteristics of TB agents, diagnosis based on clinical symptoms, physical, bacteriological, radiological and routine blood tests. For bacteriological examination/sputum examination using new GeneXpert technology. The most characteristic depiction of the environment of TB patients is found in semi-permanent housing conditions, dirt floors, high occupancy density, ventilation and humidity that do not meet health requirements.

Conclusion: The epidemiological picture of TB patients in the working area of Bungoro Health Center shows that Indonesia is still listed as one of the countries with a high burden of tuberculosis.

Keywords: Tuberculosis, epidemiology, host, agent, environment.

Introduction

Tuberculosis (TB) is an old disease that has existed in the world affecting humans thousands of years ago. In Indonesia, TB control began in 1969 with the standard drugs INH, PAS and Streptomycin for one to 2 years. Along with the development of time in 1976, Rifampicin included in the Anti-Tuberculosis Medication guidelines (OAT) changed the relatively short treatment time. Clinical trials continue to develop and finally found a “Test Run” about short-term treatment guidelines consisting of INH, Rifampicin, and Ethambutol for 6 months. In 1992 Indonesia began testing the DOTS (Directly Observed Treatment Short Course) strategy, a year later WHO issued a Global Emergency Status. In 2014 there were 9.6 million people in the world were infected with TB germs. Global TB reports that TB incidence in Indonesia is lower than in 5 countries1.

Indonesia is still listed as one of the countries with a high burden of tuberculosis or TB. Tuberculosis is globally classified as “Global Public Health Emergency”2. The South Sulawesi Provincial Health Office reported that there were 12,625 TB sufferers, in Pangkep the prevalence survey results were 215 per 100,000 population while there were only 643 people cases3. Seeing the high prevalence and incidence of TB each year will provide major problems in the community and have an impact on several things, namely the occurrence of wider household contact. These conditions will have a high risk of transmitting the disease to others and can also develop into a Multi-drug Resistant (MDR).

Although the diagnosis and treatment of tuberculosis are free, TB patients continue to face psychological burdens and economic burdens, among others, transportation costs, accommodation, nutrition and loss.
of income due to inability to work and even some are laid off. The high financial burden can cause patients to not get a diagnosis, do not start treatment or start treatment with various complaints that can even stop and not continue treatment, resulting in drop out.

We always think about health, how to find TB sufferers and treat it. In the case of prolonged socioeconomic problems with TB sufferers, attention must be paid to the government, along with relevant cross-sectoral governments, to intervene to ease the burden on the sufferer’s family. To follow up on the various conditions mentioned above, it is necessary to conduct research on how to describe the epidemiology of TB patients in the Bungoro Pangkep Primary Healthcare.

**Materials and Method**

This research is a descriptive study that aims to describe the incidence, natural history, and factors associated with TB in the Bungoro Primary Healthcare area. The study population was TB patients who visited the Bungoro Primary Healthcare between April and May 2019 with a sample of 60 people who were determined using purposive sampling techniques. The research variables were age, sex, knowledge, occupation, contact intensity, house type, floor type, occupancy density, availability of sunlight, ventilation of the house, availability home page and plants, and humidity. Data were collected using observational sheets and questionnaires. Data are presented using tables to illustrate the distribution and frequency of TB sufferers.

**Results**

Table 1. Patient’s description according to host

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age (Years)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-24</td>
<td>9</td>
<td>15</td>
</tr>
<tr>
<td>25-40</td>
<td>23</td>
<td>38.3</td>
</tr>
<tr>
<td>41-50</td>
<td>17</td>
<td>28.3</td>
</tr>
<tr>
<td>50+</td>
<td>11</td>
<td>18.3</td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>36</td>
<td>60</td>
</tr>
<tr>
<td>Female</td>
<td>24</td>
<td>40</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elementary School</td>
<td>24</td>
<td>40</td>
</tr>
<tr>
<td>Junior High School</td>
<td>22</td>
<td>36.6</td>
</tr>
<tr>
<td>Senior High School</td>
<td>8</td>
<td>13.3</td>
</tr>
<tr>
<td>Bachelor</td>
<td>6</td>
<td>10</td>
</tr>
</tbody>
</table>

Descriptions of sufferers from interviews and field observations: The main complaints that are often raised by TB sufferers are airway disorders in the form of mild to severe coughing that lasts more than two weeks, coughing accompanied by mucus mixed with blood and no appetite, decreased body weight, night sweats even in an atmosphere of high humidity, difficult sleep and body weakness. This situation is responded by sufferers with behavior different. There are sufferers who respond to cough immediately with treatment at the health center or doctor’s office and some are coughing up blood coughing and shortness of breath.

Description of Patients Based on Agent: People who come for a check-up at the health center are netted as TB sufferers after being examined based on clinical symptoms, physical examination, bacteriological, radiologic examination and other supporting laboratory examinations. The most important TB diagnosis is sputum smear examination using a new technology called Gene Xpert MTB / RIF or also called Molecular Rapid Test or Rapid Molecular Diagnostic. This tool is an automatic diagnostic test that can give results no more than 2 hours and can identify DNA Mycobacterium Tuberculosis. The radiological examination which is usually called X-ray (Ro) is done if the results of the BTA Negative sputum examination while the clinical symptoms and physical examination of the patient support TB cases. Laboratory tests that are commonly done are Blood Sludge Check (LED), these LEDs often increase in the active process, but normal LEDs do not eliminate TB.

Description of patients according to the environment: The description of patients according to the environment can be seen with various things such as housing conditions in the form of permanent and semi-permanent, the type of floor, the number of household members, the availability of sunlight in the house, the
availability of ventilation and the availability of a yard grown with lush greenery and moisture.

Table 2: Patient’s description according to environment

<table>
<thead>
<tr>
<th>Risk Factors</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>House-type</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Permanent</td>
<td>15</td>
<td>25</td>
</tr>
<tr>
<td>Semi-permanent</td>
<td>26</td>
<td>43.3</td>
</tr>
<tr>
<td>Traditional House</td>
<td>19</td>
<td>31.6</td>
</tr>
<tr>
<td><strong>Floor-type</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Floor tiles</td>
<td>15</td>
<td>25</td>
</tr>
<tr>
<td>Mud</td>
<td>26</td>
<td>43.3</td>
</tr>
<tr>
<td>Wood</td>
<td>19</td>
<td>31.6</td>
</tr>
<tr>
<td><strong>Occupancy Density</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-3 People</td>
<td>9</td>
<td>15</td>
</tr>
<tr>
<td>4-6 People</td>
<td>26</td>
<td>43.3</td>
</tr>
<tr>
<td>7-10 People</td>
<td>34</td>
<td>56.6</td>
</tr>
<tr>
<td><strong>Availability of Sunlight</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Qualify</td>
<td>36</td>
<td>60</td>
</tr>
<tr>
<td>Not qualify</td>
<td>24</td>
<td>40</td>
</tr>
<tr>
<td><strong>Ventilation of house</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Qualify</td>
<td>32</td>
<td>53.3</td>
</tr>
<tr>
<td>Not qualify</td>
<td>28</td>
<td>46.6</td>
</tr>
<tr>
<td><strong>Availability Home page and plants</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>There is no home page and plants</td>
<td>29</td>
<td>48.3</td>
</tr>
<tr>
<td>Have home page but not have plants</td>
<td>20</td>
<td>33.3</td>
</tr>
<tr>
<td>Have home page and plants</td>
<td>11</td>
<td>18.3</td>
</tr>
<tr>
<td><strong>Humidity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Qualify</td>
<td>38</td>
<td>63.3</td>
</tr>
<tr>
<td>No qualify</td>
<td>22</td>
<td>36.6</td>
</tr>
</tbody>
</table>

Source: Primary Data 2019

**Occupancy Density**: Occupancy density is a risk factor for TB. The denser the occupancy of TB disease transmission is easier and faster. Family members suffering from TB with positive smear who accidentally cough can infect other family members. The size of the residential area is closely related to the incidence of pulmonary TB, the more residential the faster the air inside the house is contaminated. The increasing number of occupants will affect the oxygen content in the room, including humidity and air temperature. Increased oxygen in the home will provide the opportunity for mycobacterium tuberculosis to multiply and support transmission between residents and sufferers.

Communities that have strong communal cultures and traditions such as Buginese and Makassar have a high risk of experiencing TB and infecting other family members. This condition is also affected because people who do not have the knowledge and awareness about TB are easily transmitted through the air. Mycobacterium tuberculosis bacteria will stay in the air for approximately 2 hours so that it has the possibility to transmit the disease to members who have not been exposed to tuberculosis bacteria.

**Discussion**

WHO data in 2014, there were, 9.6 million world population infected with TB germs, in 2014 in Indonesia showed 460,000 new cases, in 2018 in South Sulawesi TB patients were 12,625, in Pangkep found a prevalence of 215 TB per 100,000 population and 643 new cases. The high prevalence and incidence of TB causes wider contact and socioeconomic conditions to decline. The most common picture of sufferers according to age was 25-40 years old, 23 respondents and the least obtained at age 15-24 years old, 9 respondents. Based on sex, most TB sufferers were found in men, 36 (60%) respondents. Education level most sufferers were found at the elementary school level, namely 24 (40%) respondents. Based on work, most TB sufferers were found in civil servants namely 14 (23.3%) respondents. Based on contact, the most was found in patient contact > 8 hours i.e 36 (60%). The most important TB diagnosis is the sputum smear examination using Gene Xpert (TCM).

The results showed that the majority of TB sufferers were of productive age (25-50), Likewise of 60 male sex respondents 36 (60%) had the opportunity to suffer from TB, the high TB incidence rate in men was due to men having higher mobility than women so that the likelihood of exposure is greater, besides smoking and consuming alcohol can make it easier for men to get infected with the lungs. This is consistent with research conducted by Indah Mahfuzah. Low education level with 24 (40%) respondents were found to have TB more, this is in line with research conducted by Deni Sri Wahyuni. Employment of 60 respondents who work as civil servants 14 (23.3%) of the largest respondents suffers from TB. When compared with respondents with other types of work almost no effect on the incidence of TB, type of work does not have a significant effect on the incidence of lung infection. A history of contact with TB sufferers is a risk factor for transmission.

Description of the environment is important to know because the environment is a transmission medium for transmitting diseases, the environment in question is housing as a place of rest after carrying out activities.
in meeting daily needs\textsuperscript{11}. Other physical requirements of house Ventilation, sunlight, humidity, flooring and occupancy density all have the potential to cause environmental-based illness\textsuperscript{12-15}.

**Conclusion**

The epidemiological picture of TB sufferers in the working area of the Bungoro Community Health Center in 2019 can be concluded that Indonesia is still listed as one of the countries with the highest burden of Tuberculosis. Even though TB diagnosis and treatment is free, TB sufferers still face psychological burden and economic burden. Description of patients based on the environment, most often found in TB patients with semi-permanent housing conditions, dirt floors, high occupancy density, ventilation and humidity that do not meet health requirements and the absence of a home page and green plants. To prevent TB transmission, people are encouraged to maintain physical health and enhance immunity through improved nutrition, sports, and environmental health. To the government through relevant agencies to continue to pay attention to health facilities and infrastructure to realize the sustainability of public health services.

**Ethical Clearance:** Taken from University committee.

**Source of Funding:** Self

**Conflict of Interest:** Nil

**Reference**

Possible Role of BK Polyomavirus in Prostate Cancer

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Abstract

The study was conducted in Kirkuk city-Iraq from February 2018 to September 2018. The number of prostate cancer patients under study were 60 patients whose ages were between 40-70 years old. These patients admitted to Kirkuk oncology center. The control group who were matched to the patients studied, included 30 healthy blood donor and their ages were between 30-75 years old. Blood samples were collected for detection of BK polyomavirus DNA by real time-PCR. The study showed that the highest rate of BK polyomavirus DNA occurrence were recorded in patients with prostate cancer when compared with control group (51.66% versus 3.33%) (P: <0.01). The study showed that the highest mean level of PSA was recorded in patients with prostate cancer comparing with the control group (78.42 v.s. 3.40 ng/ml). The result was highly significant. The present study demonstrated that the highest mean level of PSA was found in prostates cancer patients who were positive to BK polyomavirus DNA comparing with BK polyomavirus DNA negative (52.54 versus 25.88 ng/ml)

It was concluded that BK polyomavirus was frequently detected in prostate cancer patients and could play a relevant role in the development and progression of human prostate cancer

Keywords: Prostate cancer; BK polyomavirus, BKPyV

Introduction

The prostate is a compound tubuloalveolar exocrine gland of the male reproductive system in most mammals (¹). It differs considerably among species anatomically, chemically and physiologically. The function of the prostate is to secrete a slightly alkaline fluid, milky or white in appearance, that in humans usually constitutes roughly 30% of the volume of the semen along with spermatozoa and seminal vesicle fluid (²). Semen is made alkaline overall with the secretions from the other contributing glands, including, at least, the seminal vesicle fluid. Most prostate cancers are slow growing; however, some grow relatively quickly. The cancer cells may spread from the prostate to other parts of the body, particularly the bones and lymph nodes (³). It may initially cause no symptoms. In later stages it can lead to difficulty urinating, blood in the urine, or pain in the pelvis, back or when urinating. A disease known as benign prostatic hyperplasia may produce similar symptoms. Other late symptoms may include feeling tired due to low levels of red blood cells (¹). Factors that increase the risk of prostate cancer include: older age, a family history of the disease, and race. Human polyomaviruses (HPyVs) are small, nonenveloped viruses with a circular double-stranded DNA genome of about 5000 base pairs that encode for about six main proteins (⁵). Of these, two are functional: large T antigen (LTag) and small T antigen; three are structural: viral capsid protein (VP) 1, 2, or 3, although Merkel cell polyomavirus (MCPyV) lacks VP3; one is a small non-structural protein, the agnoprotein, which is only detected in BK polyomavirus (BKPyV) and JC polyomavirus (JCPyV), whose function remains to be confirmed (⁶). Among the 13 HPyVs discovered so far, only MCPyV has been clearly identified as neither “passenger” nor “bystander” virus but as an infectious agent having a putative role in the onset of an aggressive primary cutaneous neuroendocrine carcinoma, the Merkel cell carcinoma (MCC) (⁷). Indeed, about 80% of MCC-bearing patients show MCPyV DNA clonally integrated into the genome of infected cells. The oncogenic properties of BKPyV are well-demonstrated in in vitro and in vivo experimental
models. The transforming activity has been mapped in the early region of the BKPyV genome, which encodes two viral oncoproteins: the large T-antigen (TAg) and the small t-antigen (tAg). These viral products induce alterations in the normal cell cycle, ultimately leading to cell immortalization and neoplastic transformation. Various authors have detected BKPyV genetic material in a wide range of human tumors. For instance, the early BKPyV genome region has been detected in brain tumors, osteosarcomas, Ewing’s tumors, neuroblastomas and genitourinary tract tissues tumors, including prostatic and bladder cancer. In contrast, other authors reported no association between BKPyV DNA and tumors. In any case, the mere presence of BKPyV DNA does not necessarily reflect a neoplastic involvement of the virus. In some cases, BKPyV may not be directly involved in the development of cancer, but instead, play a role as a co-factor in the carcinogenic process. For instance, the virus may co-infect cells that were previously infected by another oncogenic virus, increasing susceptibility to cancer. The gap between the experimental findings observed in animals and the difficulty to reproduce them in humans leads to the conclusion that there is insufficient information to prove their specific role in human cancers, particularly prostate cancer (PCa). The disparity between the negative to moderate to high BKPyV detection at molecular level and the negligible to rare BKPyV protein expression in cancer specimens, is considered a paradox. An exception is the presence of the virus at both levels in some case reports of urogenital-tract malignancies, particularly where immune suppression represents a strong risk factor for BKPyV-associated human malignancies. The aim of the study was to study the relation of BK polyomavirus (BKPyV) in prostate cancer.

Material and Method

The study was conducted in Kirkuk city-Iraq from February 2018 to September 2018. The number of prostate cancer patients under study were 60 patients whose ages were between 40-70 years old. These patients admitted to Kirkuk oncology center. The control group who were matched to the patients studied, included 30 healthy blood donor and their ages were between 30-75 years old. Blood samples were collected (3ml EDTA and 2ml for serology) for detection of BKPyV DNA by real time-PCR and the level of PSA by immunefluorescent technique.

DNA extraction: DNA was extracted from all prostate samples by lysis and proteinase K digestion in EDTA, and 0.1% sodium dodecyl sulfate (SDS), the samples were extracted with phenol chloroform and precipitated with ethanol. DNA concentration and purity was determined by spectrophotometry at λ=260/280nm. The extraction process was performed in an area that was BKV free while great care was taken during the tissue sectioning procedure in order to avoid any contamination. Sectioning of the tissues was carried out using a clean microtome and a separate new blade in each case, as well as clean gloves and forceps. The sections were placed in autoclaved DNase-free microtubes for the DNA isolation procedure.

Real time PCR: The BKPyV Real-TM Quant kit (SaCycler Biotechnologies) is a Real-Time test for the Qualitative and Quantitative detection of BKPyV in the biological materials. DNA is extracted from samples, amplified and detected using fluorescent reporter dye probes specific for BKPyV DNA.

![Figure 1: Real-time curves of BKPyV DNA detection](image)

Statistical analysis: Computerized statistically analysis was performed using Mintab ver 18.0 statistic program. Comparison was carried out using Chi-square ($X^2$) for determination of the $P$. value.

Findings: The study showed that the highest rate of BKPyV DNA occurrence were recorded in patients with prostate cancer when compared with control group (51.66% versus 3.33%) ($P$: <0.01), Table 1.
### Table 1: Detection of BKPyV DNA in prostate cancer patients and healthy control

<table>
<thead>
<tr>
<th>BKPyV DNA (RT-PCR)</th>
<th>Prostate cancer</th>
<th>Control group (blood donors)</th>
<th>P. value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Positive</td>
<td>31</td>
<td>51.66</td>
<td>7</td>
</tr>
<tr>
<td>Negative</td>
<td>29</td>
<td>48.33</td>
<td>23</td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
<td>100</td>
<td>30</td>
</tr>
</tbody>
</table>

The study showed that the highest mean level of PSA was recorded in patients with prostate cancer comparing with the control group (78.42 v.s. 3.40 ng/ml). The result was highly significant, Table 2.

### Table 2: Serum PSA levels in patients with prostate cancer and the control group.

<table>
<thead>
<tr>
<th>PSA level (ng/ml)*</th>
<th>Patients with prostate cancer</th>
<th>Control group</th>
<th>P. value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>60</td>
<td>30</td>
</tr>
<tr>
<td>Mean</td>
<td>78.42</td>
<td>3.40</td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td>12.745</td>
<td>1.59</td>
<td></td>
</tr>
</tbody>
</table>

*Normal ranges (ng/ml):

- Less than 40 years: 0.21-1.4
- 40-49 years: 0.27–2.0
- 50–59 years: 0.27–3.1
- 60–69 years: 0.22–4.1
- More than 70 years: 0.21–6.2

The present study demonstrated that the highest mean level of PSA was found in prostates cancer patients who were positive to BKPyV DNA comparing with BKPyV DNA negative (52.54 versus 25.88 ng/ml), Tale 3.

### Table 3: Frequency of BKPyV DNA in prostate cancer patients according to PSA level

<table>
<thead>
<tr>
<th>PSA level (ng/ml)</th>
<th>BKPyV DNA (RT-PCR)</th>
<th>P. value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive</td>
<td>Negative</td>
</tr>
<tr>
<td>No.</td>
<td>31</td>
<td>29</td>
</tr>
<tr>
<td>Mean</td>
<td>52.54</td>
<td>25.88</td>
</tr>
<tr>
<td>SD.</td>
<td>12.745</td>
<td>1.59</td>
</tr>
</tbody>
</table>

### Discussion

The oncogenic properties of BKPyV are well-demonstrated in vitro and in vivo experimental models. The transforming activity has been mapped in the early region of the BKPyV genome, which encodes two viral oncoproteins: the large T-antigen (TAg) and the small t-antigen (tAg). These viral products induce alterations in the normal cell cycle, ultimately leading to cell immortalization and neoplastic transformation (15). In one study, transfection of embryonic fibroblasts or cells cultured from kidney or brain tissues of diverse mammalian origin with complete or sub-genomic fragments of BKPyV DNA, containing the early coding region, lead to cell transformation. Early reports demonstrated that BKPyV is highly oncogenic in rodents (16,17). Assays conducted in newborn hamsters, mice, and rats inoculated with the virus showed that these animals developed tumors at various locations that contained BKPyV DNA sequences, either integrated into the host genome or in a free episomal form with constitutive TAg expression (18). In addition, animals injected with BKPyV frequently developed ependymomas, pancreatic islet tumors, osteosarcomas, fibrosarcomas, liposarcomas, osteosarcomas, nephroblastomas and gliomas (18). Dalrymple and Beemon also observed two types of alterations: enlarged thymuses and renal adenocarcinomas. Moreover, BKPyV TAg expression in these mice was restricted to the epithelial cells of the kidney tumors and enlarged thymuses (19). Various authors have detected BKPyV genetic material in a wide range of human tumors (18,20). Balis et al (5) in a study of sequencing analysis of the polyomavirus-positive specimens revealed the presence of BKV in all samples of prostate cancer and BKV-positive prostate samples was successfully achieved in cell culture and progeny viral particles were obtained, confirming the presence of the virus in the human biopsies. The presence of BKV sequences in tumors has been reported in several studies (21,22). There are contradictory reports on the presence of BKV DNA in urinary tract tumors: the authors of one study detected BKV DNA using PCR in 31 of 52 samples, whereas other authors were unable to find it (6,23). Zambrano et al (23) detected BKV in 4 of 30 fresh tissue prostate samples and were unsuccessful with archival specimens, and Das et al (6) observed the virus in atrophic lesions in prostate tumors. One of the most important proteins for BKV is the replicational regulatory protein, the large T-antigen that binds onto the tumor suppressor proteins p53 and pRb1, inhibiting their functions and leading to a variety of transforming effects. Given the low frequency of either TP53 or RB1 mutations in prostate cancer, it was intriguing to investigate the prevalence of BKV in prostate tumor samples.
Conclusions

BKV was frequently detected and could play a relevant role in the development and progression of human prostate cancer

Conflict of Interest: Non

Source of Findings: Self findings.

Ethical Clearance: This research was carried out with the patient’s verbal and analytical approval before the sample was taken. According to this approval, all the samples were collected and the tests were carried out. A copy of the results of the tests was then given to the patients.

References


A Meta-heuristic to Generate Rules for the Diagnosis of Heart Disease in Maysan Teaching Hospital

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Abstract

One of the most important tasks in data mining development is the classification rule mining which is tried for finding the rules small set of training data set by the objectives that are pre-determined. Disease of Heart leads the millions of death in all over the world. Algorithm of Particle Swarm Optimization (PSO), that has currently appeared as the novel Meta-heuristic achieved of the nature, has absorbed a lot of interests of researchers.

Algorithm has been used successfully for some issues of reduction optimization, however, this algorithm usage for the classification rule mining in data mining context still is the area of study that some people have attended for exploring. Diagnosis of heart disease is a progress for predicting, detecting heart disease of medical data of the patient.

In the current study, the method of PSO algorithm is used to generate rules for the diagnosis of heart disease in Maysan teaching hospital. The results of experiments showed that the accuracy of proposed method for real data is 77%.

Keywords: Data mining, Particle swarm optimization, Heart disease, Meta-heuristic.

Introduction

In style of modern life, the health diseases are extremely increasing, the life style of the man had a significant effect on his health leading to heart diseases, about 60% of individuals enduring heart diseases (1).

Heart diseases early diagnosis able to avoid rate of deaths, people are not aware about heart disease diagnosis sooner due to lack of knowledge, techniques of data mining are utilized for eliminating interdepend, redundant data that aids investigators to gain the new, deep visions in the great datasets of medical, data mining main purposes is to describe the diseases prediction, obtained via variables set processing (features) in dataset, as well as to find remainder variables future position, (2), in the last few years, novel study roads like KDD (knowledge discovery in databases) containing the techniques of data mining, become the favorite tool of study for the medical investigators (3).

Data storage of heart diseases include; storage of data pre-processed for making process of mining more effective, in association rule of first step is utilized pre-processing due to control the values which are missing (4).

In the current study; PSO algorithm usage investigated to rules production in the heart disease of main tests on the true datasets of Maysan teaching hospital in Iraq, it is utilized for producing the rules for the heart disease, in the beginning, casual rules are encoded, after that they are optimized according to the accuracy by utilizing the algorithm of PSO, then the data compared with the algorithm of C4.5, (5).

For improving Naive Bayes classifier accuracy utilized PSO to the attribute selection of subset that obtains better/alike performance of classification, purpose was obtained successfully with evolving the new algorithm maximizing performance of classification, as well as minimizing features number, (6).

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Radial Basis Function Neural network (RBFN), hybridized PSO has been suggested to improve the prediction accuracy of cardiac arrhythmia. RBFN is really susceptible for the parameter like spread, \(^{(7)}\).

Genetic, two methods of PSO are composed for increasing the great system of prediction, it is so easy, fast for implementing, graphs of efficiency analysis indicate that Genetic, PSO composed is better than single methods, \(^{(8)}\). PSO raises the accuracy of classification, decline necessarily chosen features number to the classification/does both, \(^{(9)}\).

PSO is the novel technique of computation based on population, \(^{(10)}\), it was first described in 1995, \(^{(11)}\), PSO is the effective, efficient algorithm of global optimization that simulates the insects swarm social behavior (particles), \(^{(12)}\).

**Methodology:** The purpose is to investigate PSO algorithm capability for discovering the rule of classification with higher accuracy which is predictive, also much smaller list of rule, before introducing the stages to the use PSO for discovering rules of classification several meanings should be explained:

**Representation of rule:** for encoding particles in the application of rule discovery, there were 2 techniques: the first one, every population particle presents the prediction rules set, such as the whole solution that is candidate and known as the approach of Pittsburgh, the second one includes the particle presents one rule, such as the candidate solution part, it is known as the approach of Michigan.

**Showing the particle:** the first part of the implementation of PSO algorithm is the choice of the appropriate encoding method for the rules used in this method. These initial rules have been modified during the multi-steps repetition of PSO algorithm, so that they can produce the best particle at each repetition and at the end, we also expect after repeating the PSO algorithm, the optimized rules display after the maximum execution. In the proposed strategy, it is necessary to encode the rules by considering a constant length of the particle, for example, as shown below try to encode the data in length \(m\), table 1, is the display of a fixed-length particle with \(m\) attribute that is used to define a rule, each condition is the display of an attribute of a rule that \(Attr\) is considered as the main attribute along with the entire interval,

\[ Op = \text{the display of comparison operator which is } = \text{ for nominal data and } \geq \text{ and } < \text{ for continuous data, and } Val \text{ is the value of the data attribute.} \]

**Proposed Algorithm:** the PSO algorithm has a lot of dependence on the initial parameters, the coefficients such as that of Inertia, as well as the Personal Learning Coefficient and Global Learning Coefficient, have a great influence on the algorithm’s performance.

In the current study with mathematical proofs, values for the mentioned coefficients obtained, which, by applying these coefficients on the proposed algorithm, has considerably improved significantly. Consider two numbers, both of which are greater than zero, and the sum of these numbers must be greater than 4 in accordance with the following, equations, 1 & 2.

\[
\begin{align*}
\varnothing_1 \cdot \varnothing_2 &> 0 \\
\varnothing &\leq \varnothing_1 + \varnothing_2 > 4 
\end{align*}
\]

A phrase equivalent to the following equation was considered\(^{(13)}\)

\[
\chi = \frac{2}{\varnothing - 2 + \sqrt{\varnothing^2 - 4 \varnothing}}
\]

**Table 1: A view of a constant-length particle**

| Attribute
| Condition
| Condition
| val| Op| Attr| Val| Op| Attr |
|---|---|---|---|---|---|---|
| \(m\) | \(m\) | \(m\) | \(m\) | \(m\) | \(m\) | \(m\) |

The pseudo-code of algorithm is shown in figure, 1, at first start with the initialization of the parameters to work with the PSO, then prepare for each output class, the training and test data with 10 fold method. The initial
1. Initialize;
2. for each value of classification attribute
3. for 10 run as 10fold approach
4. set_PSO_Parameters();%Eq.(1),(2)
   % Constriction Coefficients
   a. phi1 = 2.05;
   b. phi2 = 2.05;
   c. phi=phi1 + phi2;
   d. chi = 2 / (phi-2 + sqrt (phi^2-4*phi));
   a. w=chi; % Inertia Weight
   b. wdamp = 1; % Inertia Weight Damping Ratio
   c. c1 = chi * phi1; % Personal Learning Coefficient
   d. c2 = chi * phi2; % Global Learning Coefficient
5. generate_random_population;
6. update_position();%Eq.(1)
7. update_velocity();%Eq.(2)
8. update particles
9. generate_trainset;
   1. generate_testset;
   2. best_solution,best_Fitness=pso_main_loop;
   3. cal_accuracy_testset;%Eq.(3)
4. end
5. selected_rule_classification_value=select_best
6. end

Figure 1: Pseudo-code of the proposed algorithm

Population is generated and then the main repetition loop begins for particle convergence towards the best particle, so that in each repetition starting with the initial random values, and determining the best particle in terms of the maximum value of the function of fitness, the particles move to this direction as long as the repetitions for particle convergence occur, at the end of the repetition to calculate the evaluation of the rule extracted from the best particle, we calculate the percentage of the accuracy on the test set.

Evaluation of rule; the particle navigator in the population is directed toward an optimal answer using the fitness function. In general it is assumed that the particle with the greatest amount of fitness is the best value of the particle, fitness function that we considered in this PSO algorithm is like the equation, 3.

\[
0.8 \times \frac{(TP + TN)}{(TP + TN + FN + FP)} + 0.2 \times \left(1 - \frac{(\text{countatt}-1)}{18}\right)^3
\]

In this equation, countatt means the number of decision-making attributes in dataset. After production the primary population casually divide dataset for testing, training set, utilizing the dataset of train in the evaluation of fitness, the rules exploited.

Results

For evaluating the two discovered rules; generalization and accuracy, tests were carried out on every set of data, set of data was shared in two sections: set of training, as set of test utilizing ten-fold approach that we introduced previously. Experiment purpose was evaluating ability of generalization, evaluated as accuracy of classification on the set of test.

In examining the results, these formulas are used; by considering a as the condition of the rule and c the desired class.

\[
\begin{align*}
TP &= \text{Number of examples satisfying A and C} \\
FP &= \text{Number of examples satisfying A but not C} \\
FN &= \text{Number of examples not satisfying A but satisfying C} \\
TN &= \text{Number of examples not satisfying A nor C.}
\end{align*}
\]

Experiment 1: Assessing rule set accuracy is performed by utilizing the technique that is called as tenfold cross-validation\(^{(14)}\), the remaining 3 as the sets of training, ten various set of rules are achieved, average indicators, like time spent, number of rule each set, accuracy, number of attribute tests each rule are calculated. Some other values for separating have been attended, except the research that is theoretical\(^{(15)}\) and has indicated that ten suggests the best errors estimate.

For each experiment full set of instance was shared in ten equal sections; every of the sections is iteratively utilized as the set of test, remaining 9 as the sets of training. It is performed for providing the important algorithm efficiency averaged measure, it is known as tenfold cross-validation.

Results of experiment 1 values of accuracy averaged over ten runs on the set of training for the two levels. Accuracy values that correspond on the set of test are provided in various functions of fitness, table 2.
Table 2: Accuracy values in various functions of Fitness.

<table>
<thead>
<tr>
<th>Fitness function</th>
<th>Class 0</th>
<th>Class 1</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0.8{(TP/(TP+FP)) <em>(TP/(TP+FN))} + 0.2</em> (1- (countatt-1)/18)$</td>
<td>80%</td>
<td>74%</td>
<td>77%</td>
</tr>
<tr>
<td>$(TP+TN)/(TP+TN+FP+FN)$</td>
<td>76%</td>
<td>76%</td>
<td>76.7%</td>
</tr>
</tbody>
</table>

Also, on average, the accuracy values have reached more than ten runs in the both classrooms training sets, these accuracy values for the proposed PSO evolutionary algorithm showed in table 2, the results showed that the proposed algorithm has better performance in terms of prediction accuracy and generalizability, if each ten scenarios maximum values were selected, function of fitness, has totally the better accuracy 77%. In this experiment, the final rules discovered by PSO in experiments, are mentioned in table, 3. The results show that the number of rule sets are relatively short, there are a few rules in the rule set, so the competitive rules are understandable.

Heart disease dataset: The dataset used in our study is a comprehensive collection of recoded data derived from Maysan teaching hospital. The dataset details are provided below, dataset includes 16 attributes, 510 patients studied, attributes stated in table, 4.

Parameter evaluation: A more precise measurement parameters for a more precise comparison of these two methods used, one of the solutions used to show the accuracy of data classification in the PSO algorithm is finding the accuracy value of the output rules.

Accuracy test is the ability to differentiate levels properly, to estimate test of accuracy should compute true negative, true positive proportion in the whole cases that are evaluated. It can be explained mathematically, as in equation 4.

Table 3: Rules extracted by PSO from the first experiment

<table>
<thead>
<tr>
<th>Class (0= no Patient and 1= Patient)</th>
<th>Rules</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1. Age != 99 &amp;&amp; vent rate !=101 &amp;&amp; P = 0</td>
</tr>
<tr>
<td>0</td>
<td>2. Age != 99 &amp;&amp; Chronic disease = 1 &amp;&amp; vent rate=70 &amp;&amp; p!=318 &amp;&amp; PR!=216 &amp;&amp; RR=534 &amp;&amp; QRS = -755</td>
</tr>
<tr>
<td>0</td>
<td>3. Chronic disease != 7 &amp;&amp; Job=1 &amp;&amp; Genetics=2 &amp;&amp; vent rate!=101 &amp;&amp; QRS !=433 &amp;&amp; RR=387</td>
</tr>
<tr>
<td>0</td>
<td>4. Chronic disease = 2 &amp;&amp; vent rate=70 &amp;&amp; T!=222</td>
</tr>
<tr>
<td>0</td>
<td>5. Chronic disease = 2 &amp;&amp; Weight=68 &amp;&amp; Genetics=2 &amp;&amp; vent rate!=101 &amp;&amp; PR=60 &amp;&amp; P=718</td>
</tr>
<tr>
<td>0</td>
<td>6. Sex =1 &amp;&amp; Smoking=1 &amp;&amp; vent rate!=101 &amp;&amp; PR=68 &amp;&amp; P=1 &amp;&amp; QRS=-755</td>
</tr>
<tr>
<td>0</td>
<td>7. Smoking != 1 &amp;&amp; vent rate!=101 &amp;&amp; QT!=437</td>
</tr>
<tr>
<td>0</td>
<td>8. vent rate=70 &amp;&amp; PR!=342 &amp;&amp; QRS !=391 &amp;&amp; RR=535</td>
</tr>
<tr>
<td>0</td>
<td>9. Genetics=2 &amp;&amp; vent rate!=101 &amp;&amp; QRS=43 &amp;&amp; T!=219</td>
</tr>
<tr>
<td>0</td>
<td>10. vent rate !=101</td>
</tr>
<tr>
<td>1</td>
<td>11. QRS !=112 &amp;&amp; QT != 3559 &amp;&amp; QTC = 454 &amp;&amp; RR=812 &amp;&amp; QRS=-28</td>
</tr>
<tr>
<td>1</td>
<td>12. Weight=8 &amp;&amp; vent rate=101 &amp;&amp; RR=112 &amp;&amp; T!= 319</td>
</tr>
<tr>
<td>1</td>
<td>14. RR != 596 &amp;&amp; QTC!= 857 &amp;&amp; QRS !=25</td>
</tr>
<tr>
<td>1</td>
<td>15. Job=1 &amp;&amp; vent rate=101 &amp;&amp; PR=612 &amp;&amp; QT=1589 &amp;&amp; QRS=-336</td>
</tr>
<tr>
<td>1</td>
<td>16. Genetics=1 &amp;&amp; vent rate=101 &amp;&amp; RR=987 &amp;&amp; T!=313</td>
</tr>
<tr>
<td>1</td>
<td>17. vent rate=101 &amp;&amp; QRS=43 &amp;&amp; QT!=3559 &amp;&amp; T=98</td>
</tr>
<tr>
<td>1</td>
<td>18. RR != 553 &amp;&amp; QT!= 368 &amp;&amp; T !=319</td>
</tr>
<tr>
<td>1</td>
<td>19. RR != 597 &amp;&amp; QT!= 3353 &amp;&amp; T !=319</td>
</tr>
<tr>
<td>1</td>
<td>20. Status !=3 &amp;&amp; Job=1 &amp;&amp; vent rate=101 &amp;&amp; T !=319</td>
</tr>
</tbody>
</table>
Table 4: Attribute information.

<table>
<thead>
<tr>
<th>#</th>
<th>Attribute</th>
<th>Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sex</td>
<td>Gender of male or female</td>
</tr>
<tr>
<td>2</td>
<td>Age</td>
<td>The patient’s age</td>
</tr>
<tr>
<td>3</td>
<td>Smoking</td>
<td>Does the patient smoke or not?</td>
</tr>
<tr>
<td>4</td>
<td>Chronic disease</td>
<td>Whether the patient has chronic diseases such as high blood pressure, glucose,…</td>
</tr>
<tr>
<td>5</td>
<td>Weight</td>
<td>The much does the patient weigh?</td>
</tr>
<tr>
<td>6</td>
<td>Status</td>
<td>Determines the material status of the patient whether she is married or not</td>
</tr>
<tr>
<td>7</td>
<td>Job</td>
<td>Does the patient work or not?</td>
</tr>
<tr>
<td>8</td>
<td>Genetics</td>
<td>Whether the patient has a genetic condition or not</td>
</tr>
<tr>
<td>9</td>
<td>Vent rate</td>
<td>Heartbeat</td>
</tr>
<tr>
<td>10</td>
<td>PR</td>
<td>PR if the gap between p and r increases, this gap causes a problem, and if they decrease, they will cause a problem, too</td>
</tr>
<tr>
<td>11</td>
<td>QRS</td>
<td>Reduces heart ventricle contraction</td>
</tr>
<tr>
<td>12</td>
<td>RR</td>
<td>The gap between the top of R and the other R</td>
</tr>
<tr>
<td>13</td>
<td>QT/QTC</td>
<td>The gap between QT and QTC is divided</td>
</tr>
<tr>
<td>14</td>
<td>P/QRS/T</td>
<td>Represents the heartbeat</td>
</tr>
<tr>
<td>15</td>
<td>Is this person sick or not</td>
<td>Determines if he is patient or not</td>
</tr>
</tbody>
</table>

Proposed algorithm is evaluated with the two algorithm of decision tree (C4.5)\(^{(16)}\) the dataset in terms of the parameter of rules’ accuracy of the proposed method was better than the other two methods and the number of rules has also declined, table, 5.

\[
\text{Accuracy Rate} = \frac{TP+TN}{TP+FP+FN+TN}
\]

Table 5. Comparison of proposed accuracy method with other methods.

<table>
<thead>
<tr>
<th>Method</th>
<th>Accuracy</th>
<th>Number Rules</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decision Tree [15, 16]</td>
<td>0.69</td>
<td>98</td>
</tr>
<tr>
<td>PSO [12, 15]</td>
<td>0.77</td>
<td>52</td>
</tr>
<tr>
<td>PSO-proposed</td>
<td>0.77</td>
<td>20</td>
</tr>
</tbody>
</table>

Conclusion

Heart disease occurs more often in people over 40 years of age, but it can be seen in any age group, it is more common in men, but its incidence has also increased in women. The current study uses particle swarm optimization (PSO) method to produce the best rules for diagnosing heart disease on the real datasets of Maysan teaching hospital. Experiment results show that the proposed PSO evolutionary algorithm has the better efficiency in terms of accuracy than the real data.

References

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The Effect of Different Concentrations of the Blue-Green Algae Water Extract *Anabaena oryzae* on the Adult Beetle (*Calosoma inquisitor*) Order: Coleoptera for 24 Hours and 48 Hours after Treatment in Samarra, Iraq

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¹Department of Biology, College of Education, University of Samarra

**ABSTRACT**

The present study included the effect of different concentrations of water extract of algae *Anabaena oryzae* on the adult beetle (*Calosoma inquisitor*) after 24 hours and 48 hours of treatment. The results showed that all concentrations were effective in giving a percentage of loss in *Calosoma inquisitor*. The results showed that the highest significant difference between the treatments was at 100% concentration with a loss rate of (90% and 100%) after 24 hours of treatment, and that the least significant difference in the coefficients was at the concentration (25%) with 18% 36 after 24, 48 hours of treatment respectively.

**Keywords:** *Anabaena oryzae*, *Calosoma inquisitor*, Coleoptera, Anatitoxin.

**Introduction**

The land beetle (*Calosoma inquisitor*) is a flexible insect that spreads in large numbers that can reach thousands in one place. It activates at night and is very attracted to light. It emerges from rocks, wood, hay and under the soil in agricultural fields in search of food. They are small insects that cause confusion in homes because they can enter your food store and sometimes scare children if they are in large numbers.

The secretion of unpleasant odors act as a defensive if exposed to the harm and these smells are the pharaohs repulsive of the objects that attack [1]. The beetle extends from 2.8-5 mm long and has a strong external structure, A reinforced head, a molar mouth, and sheath wings. Therefore, it belongs to the Coleoptera wings and has a dark brown color. The damage caused by the beetle in feeding on skin, silk, wool, and hair, therefore it is an economically harmful insect [2]. Due to the confusion and anxiety that this insect has caused, many individuals prefer to get rid of them and to fight them. Because of the recent trends in the non-use of chemical pesticides in the control of insects because of the severe damage to the future. Recent studies have resorted to the use of purely biological methods to eliminate this insect and other insects [3].

The study included the use of water extract for *Anabaena oryzae* for its effective effect in eliminating the bugs of this insect because it contains some different types of toxins, including Anatoxin, analyzed for the bodies of organisms including insects [4]. It also contains alkaloids, Anatoxins, and saxitoxins that infect various organs of the body [5]. The effectiveness of this moss has been shown to eliminate this insect and in turn, is one of the best biological control methods against this insect (Cleopatra).

**Materials and Method**

**Method of Collecting Insect samples:** Samples of insects collected by hand [6], from agricultural fields and housing in Samarra, 720 samples for the period from 15/3/2019 to 1/6/2019. They were placed in sealed plastic containers with a small nozzle to ensure breathing. They were given carbohydrate-based food items until they were used in experiments.

**Method of preparation of different concentration of Water Extract Blue-Green algae *anabaena oryzae*:**

Different concentrations of water abstraction were prepared *Anabaena oryzae* 25 %, 50%, 75%, 100%

Used in experiments and placed in a sprayer capacity of 250 ml in the treatment of adult insects.
Evaluation of Toxicity Efficiency for Different Concentration of Water Extract *Anabeanaoryzae*: 
Take 60 samples of adult beetle and add 5 ml of each concentration 25%, 50%, 75%, 100%

The percentages of the killings were then calculated.

**Statistical Analysis:** The data was analyzed using a contrast test Analysis one-way variation (ANOVA) The application of the statistical program Minitab, The coefficients of the coefficients were measured using the Duncan Multiple Range Test level probability P 0.05 [7].

**Results and Discussion**

Table 1: Effect of different concentrations of water extract of blue-green algae *Anabeanaoryzae* on Adult (*Calosomainquisitor*) after 24,48 hours of treatment

<table>
<thead>
<tr>
<th>Different concentrations of water abstraction <em>Anabeanaoryzae</em></th>
<th>Percentage of an adult after 24 hours</th>
<th>Percentage of an adult after 48 hours</th>
<th>The average</th>
</tr>
</thead>
<tbody>
<tr>
<td>25%</td>
<td>18 Aa</td>
<td>36 Ba</td>
<td>27 aC</td>
</tr>
<tr>
<td>50%</td>
<td>46 Ab</td>
<td>55 Cb</td>
<td>50.5 bB</td>
</tr>
<tr>
<td>75%</td>
<td>70 ad</td>
<td>85 De</td>
<td>77.5 cB</td>
</tr>
<tr>
<td>100%</td>
<td>90 Ad</td>
<td>100 Bd</td>
<td>95 Cd</td>
</tr>
<tr>
<td>The average</td>
<td>56 Aa</td>
<td>69 Bb</td>
<td></td>
</tr>
</tbody>
</table>

* Values represent averages ± standard error
** The Similar big letters mean significant differences at the significant level P 0.05
*** Similar small letters mean that there are no significant differences at the significant Line P 0.05

The results showed in Table 1 that the percentage of the killing of the water extract for Algae *Anabeanaoryzae* at the concentration 25% was 18% after 24 hours, While 36% after 48 hours of treatment compared to control group, which did not have any percentage of the loss of adults. At 50% concentration, the death rate was 46% after 24 hours of treatment, while 55% after 48 hours of treatment. In the 75% concentration, the loss rate was 70% after 24 hours, while the loss rate was 85% after 48 hours of treatment. Finally, at 100% concentration, the death rate was 90% after 24 hours of treatment, while 100% after 48 hours of treatment.

Thus, we can conclude that the greater the concentration, the greater the rate of death, The cumulative effect of blue-green algae affects the digestive tract of the insect, leading to damage to the enzymes responsible for detoxification known as the name (MFO) Mixed Function Oxidation [8][9].

The results of this study converge with the results of other studies which confirm that the greater the concentration of toxins produced by blue-green algae, including *Microcystisaruginosa*

Because of the secretion of microcystin produced by this moss, which leads to the decomposition of insect bodies including *Culexpienis, Culexpienismostes* [10]. Studies also show that more of poisonous toxins are produced by the blue-green algae: *Nostoc, Oscillatoria, Nodularia*, including *A.oryzae*. As soon as they touch or eat the water containing the toxins produced by these species of blue-green algae leads to shortness of breath, to the bodies of animal organisms and also produce toxins that affect the nervous system of animals, leading to death [11][12][13][14]. This is consistent with the results of this study, which confirmed that the effectiveness of algal blooms of the green algae of the algae, *A.Oryzae* in the killing and decomposition of the bodies of the beetle (*Calosomainquisitor*).

And the toxins produced by *A.Oryzae* are systemic toxins (systematic toxin) and also called neurotoxins, The toxin is called Anatoxin-a responsible for decomposing the body wall of animals and destroying its nervous system, This is consistent with the results of this study, which proved the deadly effect of the water extract *A.Oryzae* on the adult beetle (*Calosomainquisitor*) caused by the toxicity of the Algae, which is due to the substance of the Anatoxin, which led to the decomposition of the body wall beetles and the destruction of the fatty layer and the disruption of the enzymes responsible for the removal of toxic (MFO) And the formation of a layer of insulation between the body of the insect and oxygen, which leads to the decay of the body of the insect and its death.

**Conclusions and Recommendations**

**Conclusions:** There is a direct relationship between the exposure factor and the concentrations of the water extract of algae: *Anabeanaoryzae*.

The toxins produced by blue-green algae, including toxins produced by *A. oryzae*, are an optimal method of biological control.
The effect of *A. oryzae* concentrations on the insect was observed, and the concentration of 100% gave the highest percentage of the adult beetle *Calosoma inquisitor*.

**Recommendations:** We recommend extensive studies of the use of *A. Oryzae* toxins as a chemical alternative, whether economically harmful or of medical importance.

Isolate the active compounds of *A. Oryzae* and the rest of the blue-green algae blooms by HPLC, Tlc, and ELISA using the antibody technique directed to the toxin molecules.

To compare the effectiveness of algae toxins with blue-green algae and chemical pesticides on the insect under study and other insects and their different stages.

**Conflict of Interest:** There is no conflict of interest among the authors.

**Source of Funding:** Self

**Ethical Clearance:** This study is ethically approved by the Institutional ethical Committee.

**REFERENCES**

Learning Cardiopulmonary Resuscitation (CPR) Using an Interactive Method for Students of an Elementary School in Indonesia

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¹Nursing School, Faculty of Medicine, Universitas Brawijaya, Malang, Indonesia

ABSTRACT

Background: The prevalence of cardiac arrest each year in the world is still high, and yet no first aid curriculum is incorporated for students of elementary schools in Indonesia. Cardiopulmonary resuscitation (CPR) education for young people is important to increase awareness and proper initial treatment. The aim of this study was to determine the effect of playing puzzles on the level of knowledge of CPR.

Method: This study had a true experimental design with a randomized pretest/post-test control group with 50 subjects. We randomized subjects through a simple random sampling method. Subjects were divided into two groups: the intervention group (n = 25) and the control group (n = 25). The intervention group was given education via a “playing the puzzle” method, and the control group was educated via a seminar method only. The variables were measured by the level of knowledge of CPR questionnaires. Data analysis was performed using SPSS and Wilcoxon signed rank and Mann-Whitney tests, with α = 0.05.

Results: The level of knowledge about CPR as analyzed with the Wilcoxon signed rank test had a significant p value (= 0.000; p < 0.05) in both groups. The differences between the two groups as analyzed with the Mann-Whitney test showed pretest results of p = 0.319 (>0.05) and post-test results of p = 0.351 (>0.05). From these results, it is clear that playing a puzzle and a seminar method can both increase the level of knowledge about CPR among elementary school students, with no significant differences between the two groups.

Conclusions: Playing a puzzle can be alternative and fun way to educate young people to learn CPR. It can encourage the students to look for the meaning in the picture and increase their curiosity. As a suggestion, we have to control the atmosphere of the class to become more conducive when playing the puzzle.

Keywords: Puzzle; Cardiopulmonary resuscitation; Knowledge

Introduction

The incidence of cardiac arrests in the world is still increasing. Cardiac arrest occurs in 50–100/100,000 population in the USA, Ireland, and China ¹. Cardiac arrest most often occurs out of hospital. The occurrence of intra-hospital cardiac arrest (IHCA) in the USA numbers 209,000 adults and 6000 pediatrics, while out-of-hospital cardiac arrest (OHCA) reaches 326,000 each year and the survival rate of OHCA still low². The number of such incidences of OHCA means a need for faster and correct initial treatment.

People in the community who can perform cardiopulmonary resuscitation (CPR) and who witness a cardiac arrest can play an essential role in performing initial treatment of cardiac arrest using CPR. Effective CPR by a bystander on cardiac arrest victims can increase the survival rate of the victim by two- or three-times more than victims who did not receive CPR ³.⁴.⁶

Thus, educating the lay person about CPR is important because of the high incidence and low survival rate ⁷. In Norway, CPR training has been incorporated
into the school curriculum as school-aged children are considered fast learners. This is therefore considered as a cost-effective method to increase the number of trained bystanders in CPR [9]. CPR education in Indonesia has not been incorporated into an intra-curriculum program, but it is given as an extra-curricular healthcare program. Therefore, not all students can participate and nor are the teachers trained to perform CPR.

One of the factors for successful learning is the environment, including the classroom, instructional media, and the material. Several studies have suggested that lectures and audiovisually can be used as instructional media to teach CPR. The lecture is most commonly used to deliver the lesson through a verbal explanation. However, the students may find this difficult to understand if they do not have any past experiences, and the content may quickly be forgotten.

Puzzles are instructional media that are interactive and relaxing for students. The puzzle is a game where pieces of pictures or words are rearranged to become one piece. This game can stimulate student creative thinking ability and enhance their active participation. The students are also motivated to about the object, they learn with fun, and increase their memory and imagination. In a study on electrocardiogram education, the puzzle demonstrated a similar effect to a traditional lecture because it facilitated the student-centered learning process. That study showed no significant result and only used a small sample size with 15 students.

We were interested in conducting a further study about how puzzles can become a fun learning method to increase knowledge about CPR among elementary school students in Dinoyo 3 state elementary school, Malang. The aim of this study was to explore the effect of playing CPR puzzles on CPR knowledge of the elementary students.

Material and Method

We conducted a randomized control group pretest/post-test study with fifty respondents divided into two groups, intervention and control groups, which contained 25 students in each group. The intervention group was given a playing puzzle and clarification about the puzzle’s contents; meanwhile, the control group was given CPR lesson through a seminar with a PowerPoint presentation.

We randomized the groups using a simple random sampling with several inclusion criteria, such as aged 10–12 years, and had not previously participated in a CPR training study. Randomization was obtained by the student taking a number: an odd number and they were included in the intervention group, an even number and they were included in the control group. The study was conducted in Dinoyo 3 state elementary school in Malang in February 2016. Multiple choice questions were used to measure the CPR knowledge which contained the definition, indications and contraindications, and CPR techniques. The score of students was then categorized into three levels: good, fair, and poor. The data were further analyzed using Wilcoxon and Mann-Whitney (α = 0.05) tests with 95% confidence intervals. Ethical approval was obtained from the Health Research Ethical Committee of the Medical Faculty at Brawijaya University.

Findings

Sample characteristics: Table 1 shows the ages and gender of the subjects. Most respondents in the intervention group were male (60%) and most respondents in the control group were female (52%). In the intervention group, most were aged 10 years old (56%) and, in the control group, most were 11 years old (48%).

Table 1: Samples characteristic

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Intervention</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>15</td>
<td>12</td>
</tr>
<tr>
<td>Female</td>
<td>10</td>
<td>13</td>
</tr>
<tr>
<td>Total</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 years old</td>
<td>14</td>
<td>6</td>
</tr>
<tr>
<td>11 years old</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>12 years old</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td>25</td>
<td>25</td>
</tr>
</tbody>
</table>

Source: primary data

The effect of a CPR puzzle on CPR knowledge among elementary students: Bivariate analysis with a Wilcoxon signed rank test showed that both the intervention group and control group demonstrated a significant p value (0.000; Table 2). The results indicate that there was a significant effect on learning CPR using the CPR puzzle among elementary students. However, the result of a Mann-Whitney analysis (Table 3) showed that there were no significant differences between the two groups (pretest, \( p = 0.319 \); post-test, \( p = 0.351 \)).
Table 2: Wilcoxon signed rank test of intervention and control groups

<table>
<thead>
<tr>
<th>Category</th>
<th>Pretest</th>
<th>Post-test</th>
<th>Wilcoxon</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td><strong>Intervention</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>5</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Fair</td>
<td>16</td>
<td>64</td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>25</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>25</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td><strong>Control</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>3</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Fair</td>
<td>16</td>
<td>64</td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>25</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>25</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Source: primary data

Table 3: Mann-Whitney analysis on pretest and post-test of intervention and control groups

<table>
<thead>
<tr>
<th>Category</th>
<th>Intervention</th>
<th>Control</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td><strong>Pretest</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Fair</td>
<td>9</td>
<td>36</td>
<td>6</td>
</tr>
<tr>
<td>Poor</td>
<td>16</td>
<td>64</td>
<td>19</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>25</td>
<td>100</td>
<td>25</td>
</tr>
<tr>
<td><strong>Post-test</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>5</td>
<td>20</td>
<td>3</td>
</tr>
<tr>
<td>Fair</td>
<td>16</td>
<td>64</td>
<td>16</td>
</tr>
<tr>
<td>Poor</td>
<td>4</td>
<td>16</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>25</td>
<td>100</td>
<td>25</td>
</tr>
</tbody>
</table>

Source: primary data

Discussion

Level of CPR knowledge among elementary student in the intervention group: The level of CPR knowledge of most students before the intervention was poor (64%). Poor knowledge was shown by the fact that they could not answer the questions, with more wrong answers than correct ones. This may be a result of the fact that they have not yet been exposed to CPR. In Indonesia, children are not exposed to CPR at the elementary school level. Furthermore, CPR or other emergency procedures are not included in the national curriculum, but are included in extracurricular programs such as those of the Youth Red Cross or Palang Merah Remaja (PMR). This organization only exists at junior and senior high school level, and not all students participate in the group.

The puzzle that we created can increase CPR knowledge among elementary students. The students are playing with fun, enthusiasm, and they can see the contents of it directly. Their comprehension also triggered some questions about the content. Our puzzle can involve the students to be more curious, and they started to enjoy the game. The results were consistent with a previous study that playing puzzles can increase the level of knowledge of students whilst providing relaxation 12. Furthermore, it can help the student pay more attention to the content so that they try to understand why they look. Previous
studies have suggested that it can increase the memory and imagination of the students.\textsuperscript{13,14}

**Level of CPR knowledge among elementary students in the control group:** The initial level of knowledge of respondents in the control group was poor because they had not yet studied CPR. After we performed the seminar, there was a significant enhancement in their knowledge level. The seminar, through a PowerPoint presentation, showed an increase in the level of knowledge since this method allowed the students to listen to the lesson and receive information through passive learning.\textsuperscript{15}

The differences between playing CPR puzzles and seminars on CPR knowledge levels: The Mann-Whitney test result showed that there were no significant differences between the two groups. A factor that may affect this result was that both methods used a verbal explanation to deliver the information. Although there were no differences between the two methods, we assumed that learning CPR through the puzzle could be more fun than a seminar. Another study revealed that games are more fun than the traditional lecture for fifth-grade students, and they prefer to learn in groups rather than by themselves. Learning with games can prevent the students feeling bored because they are involved in physical and cognitive activities. These activities can help them to increase their creativity and imagination. Learning through games is informal learning, which can increase their desire to learn as well as building an independency and interaction with their friends.\textsuperscript{16}

Playing puzzles and using lecture methods can increase the level of knowledge about CPR. Nevertheless, the lecture is the oldest method to provide information. The lecture method tends to make students bored and it is difficult to get them to achieve critical thinking and problem solving.\textsuperscript{15} There were some limitations in our study related to uncontrolled class environment, the noise level, and an ineffective learning environment. An ineffective class atmosphere can disturb other students so that the information cannot be optimally retained.

**Conclusions**

In conclusion, playing a CPR puzzle can increase the CPR knowledge level among elementary school students in the state elementary school Dinoyo 3, Malang, Indonesia. However, were no significant differences found between playing puzzles and using a seminar or lecture methods. Playing puzzles can be an alternative method for educating young people about CPR with a more fun atmosphere. The puzzle can encourage the students to look for the meaning of the picture and to increase their curiosity. We suggest controlling the class environment to be more conducive during the playing of the puzzle. An ineffective class environment or a noisy class environment can reduce the effectiveness of puzzle games to increase the knowledge levels on CPR.

**Abbreviations**

CPR, Cardiopulmonary resuscitation
IHCA, Intra-hospital cardiac arrest
OHCA, Out-of-hospital cardiac arrest
PMR, Palang Merah Remaja (Youth Red Cross)

**Source of Funding:** Publication of this article was funded by the University of Brawijaya.

**Ethical Clearance:** Ethical approval was obtained from the Health Research Ethical Committee of the Medical Faculty of Brawijaya University.

**Conflict of Interest:** The authors declare that they have no competing interests.

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Concentrations of Lead, Cadmium and Mercury in Cord Blood and Prematurity in the Sidi Bel Abbes Region (West of Algeria)

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ABSTRACT

Background: Exposure to heavy metals such as lead, cadmium and mercury during pregnancy carries a great risk to the mother as well as the fetus.

Method: Lead, cadmium and mercury were measured in umbilical cord blood samples of 3 groups women (30 women’s for lead, 30 cadmium and 10 from mercury) in maternity of Sidi Bel Abbès region in Algeria between 2016 and 2017. The objective of this study was to measure in the blood of the umbilical cord the concentration of lead (Pb), mercury (Hg) and cadmium (Cd), and to evaluate the relationship between these levels and prematurity. The lead, cadmium and mercury levels were measured by atomic absorption.

Results: The study showed obvious variations in, maternal characteristics. The results revealed several factors predisposing to prematurity. The mean concentrations of cord blood lead, cadmium and mercury were; 18.97 µg/L, 0.26 µg/L, and 6.20 nmol/L, respectively. There was a highly significant direct correlation between cord lead concentrations and gestational age (r=0.43; P = 0.017), and we found that gestational age and birth weight inversely correlated with cord mercury concentration (r=0.44 and r=0.57 respectively). No correlation was observed between cord cadmium concentrations and gestational age.

Conclusion: This study has shown that pregnant women in this region were exposed to high levels for heavy metals which need an intervention.

Keywords: Lead, Cadmium, Mercury, Pregnancy, Prematurity, Fetal exposure, Algeria.

Introduction

Pregnant women and their fetuses are susceptible to the effects of exposure to environmental toxicants including lead, mercury and cadmium. Metals are ubiquitous in the environment, and exposure occurs through ingestion of food, water, soil, or dust; inhalation from air; and through direct contact with consumer products. Exposure to heavy metals during pregnancy carries a great risk to the developing fetus. Metals are potential risk factors for small for gestational age (SGA) births, and are hypothesized to induce growth restriction through oxidative stress mediated pathways. Cigarette smoking is source of cadmium exposure. Scientists suggest that cadmium may damage the placenta and reduce weight of newborn baby in pregnancy. Toxicity from mercury may cause learning disabilities and it effects reproductive system and produces defects such as infertility, miscarriage and prematurity. The aim of this study was to measure in umbilical cord blood, at delivery, the concentration of lead (Pb), mercury (Hg) and cadmium (Cd), and evaluate the relationship between this levels and prematurity.

Patients and Method

A prospective study was conducted in public maternity in Sidi Bel Abbes region (west of Algeria), over a period of 01 years from December 2016 to October 2017. The ethical committee of our department approved the study. After signing a written informed consent, the patients were recruited to the study.

Gestational age patients over 36 weeks of amenorrhea were excluded from the study. Eventually, a total of number 70 pairs of mother-newborn were included in the study. All the patients completed questionnaires including information about age, ethnic origin, Socio-economic level, Level of education, BMI, history for prematurity and abortion and smoking habits.

Five mls of umbilical cord blood was collected immediately after delivery. The samples were chilled at (+4°C) until delivery to the laboratory CERBA France for detection of the trace elements. Inductively Coupled Plasma Mass Spectrometry (ICP/MS Agilent 7700 CE and 7500 CE) was used to measure the concentrations of lead and cadmium for 60 samples umbilical cord blood (30 samples for each metal). Thereafter, Mercury concentrations have been measured from 10 samples umbilical cord blood, by Atomic absorption spectrophotometer (AAS, FIMS 400 Perkin Elmer) in the same laboratory. Recapitulating, lead was measured in 30 subjects, cadmium in 30 and mercury in 10 subjects. The detection limits for this study were as follows: Blood Pb (0.1µg/dL), Cd (0.2 µg/L), totalHg (5nmol/L).

The data collected during the research were analyzed using the statistical software (Spss version 22). To report the results we used a descriptive analysis method, calculating the means and standard deviations for the continuous data, the means were then compared using the Student’s Test, for the nominal data we calculated the percentages of the different categories. Differences in patient’s level of Mercury, lead and Cadmium according to different variables were assessed using the ANOVA test.

We evaluated the impact of the different heavy metals analyzed on birth weight and gestational age using the Pearson correlation. The result is reported in form tables and curves. These statistical tests were considered significant if p <0.05.

Results

A total of 70 deliveries were reported during the study period, lead and cadmium were measured in 30 subjects respectively and mercury in 10 subjects. The study showed obvious variations in maternal characteristics, socioeconomic status and obstetric/gynecological history. We defined three groups; lead dosage group (30 subjects), cadmium dosage group (30 subjects), and mercury dosage group (10 subjects).

Concentration of lead, cadmium and mercury in umbilical cord: The dosage of these three metals revealed the following concentrations: lead concentrations ranging between 0 and 75µg/L (18.97 ± 14.22µg/L), cadmium between 0 and 0.4µg/L (0.26 ± 0.07 µg/L), mercury concentrations ranged between 0 and 9 nmol/L (6.20 ± 1.64nmol/L). (Table1)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Médiane</th>
<th>Interquartile range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cadmium µg/L</td>
<td>0,20</td>
<td>0,20-0,30</td>
</tr>
<tr>
<td>Lead µg/L</td>
<td>15,15</td>
<td>10,35-21,75</td>
</tr>
<tr>
<td>Mercury nmol/L</td>
<td>1,20</td>
<td>1,00-1,50</td>
</tr>
</tbody>
</table>

Relationship between concentration of metals and maternal characteristics: The average concentration was measured for each metal, Pb, Cd and mercury in the cord blood and were all correlated with maternal characteristics (Table2).

Lead concentrations and maternal characteristics: The difference between the different Age groups of mothers and lead concentrationswas statistically significant (P<0.001), the highest rate of lead (20.57 ± 11.01) is found in the category over 35 years old(Table2). In this group, a single subject less than 20 years old has a high level of lead (73.3µg/L), this result cannot have statistical significance. According to statistical analysis, patients with low socioeconomic status have the highest rates of lead (28.14 ± 22.05) (Table2). No other statistically significant relationship could be detected between lead and the rest of the maternal characteristics studied (Table2).
Table 2: Relationship between concentration of metals and characteristics of the mother

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Lead (n = 30)</th>
<th>Cadmium (n = 30)</th>
<th>Mercury (n = 10)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean Rank</td>
<td>Mann-Whitney U-test</td>
</tr>
<tr>
<td>History of prematurity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>YES</td>
<td>3</td>
<td>14,67</td>
<td>38,000</td>
</tr>
<tr>
<td>No</td>
<td>27</td>
<td>15,59</td>
<td></td>
</tr>
<tr>
<td>History of abortion</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>YES</td>
<td>9</td>
<td>13,44</td>
<td>76,000</td>
</tr>
<tr>
<td>No</td>
<td>21</td>
<td>16,38</td>
<td></td>
</tr>
<tr>
<td>Level of education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>9</td>
<td>15,67</td>
<td>91,000</td>
</tr>
<tr>
<td>Secondary/university</td>
<td>21</td>
<td>15,11</td>
<td></td>
</tr>
<tr>
<td>Passive smoking</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>YES</td>
<td>19</td>
<td>15,18</td>
<td>98,500</td>
</tr>
<tr>
<td>Non</td>
<td>11</td>
<td>16,05</td>
<td></td>
</tr>
<tr>
<td>Residence</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>12</td>
<td>18,25</td>
<td>75,000</td>
</tr>
<tr>
<td>Rural</td>
<td>18</td>
<td>13,67</td>
<td></td>
</tr>
<tr>
<td>Socio-economic level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>7</td>
<td>19,71</td>
<td>51,000</td>
</tr>
<tr>
<td>Normal</td>
<td>23</td>
<td>14,22</td>
<td></td>
</tr>
</tbody>
</table>

Cadmium concentrations and maternal characteristics: Regarding the relationship between cadmium concentrations and maternal characteristics, our results did not reveal any statistically significant relation (Table 2).

Mercury concentrations and maternal characteristics: Our result observed a significant relationship between birth weight, History of abortion and mercury concentrations (P = 0.012). No other statistically significant relationship could be detected between mercury and the rest of the maternal characteristics studied (Table 2).

Correlation between gestational age, birth weight and cord concentrations of lead, cadmium and mercury: As shown in figure 1, a highly significant direct correlation was found between cord lead concentrations and gestational age (r=0.55; P = 0.002). Furthermore, a clear correlation was found between the concentration of cadmium in the umbilical cord and the birth weight (r= 0.25), (figure 2), (Table 3). Finally we found that gestational age and birth weight inversely correlated with cord mercury concentration (r=0.44 and r=0.57 respectively), (figure 3).
Figure 2: relation between Cord blood Cadmium and birth weight

Table 3: Spearman correlation of mother’s age, gestational age, birth weight and BMI with levels of lead, cadmium and mercury

<table>
<thead>
<tr>
<th></th>
<th>Lead R</th>
<th>Lead P</th>
<th>Cadmium R</th>
<th>Cadmium P</th>
<th>Mercury R</th>
<th>Mercury P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother’s age</td>
<td>0.274</td>
<td>0.143</td>
<td>-0.30</td>
<td>0.899</td>
<td>-0.304</td>
<td>0.619</td>
</tr>
<tr>
<td>Gestational age</td>
<td>0.550</td>
<td>0.002**</td>
<td>0.005</td>
<td>0.982</td>
<td>0.152</td>
<td>0.807</td>
</tr>
<tr>
<td>Birth weight</td>
<td>0.144</td>
<td>0.448</td>
<td>0.250</td>
<td>0.275</td>
<td>0.105</td>
<td>0.866</td>
</tr>
<tr>
<td>BMI</td>
<td>-0.141</td>
<td>0.458</td>
<td>-0.167</td>
<td>0.470</td>
<td>0.108</td>
<td>0.863</td>
</tr>
</tbody>
</table>

Figure 3: Relation between Cord blood Mercury and gestational age
Discussion

The mean concentration of lead in cord blood found in this study was 1.89 µg/dL. Reports from South Africa a cord blood median lead concentration of 2.39µg/Dl13. A Canadian study found a cord blood arithmetic mean lead concentration of 2.8 µg/dL, and another study in Saudi Arabia found 2.5 µg/dl14. Also, Mean cord blood lead was higher than those reported in Brazil were (1.194µg/dL) 15.Belgium (1.47µg/dL) and Turkey (Eskisehir; 1.65µg/dL)16, 17, 18.

In our study highly significant direct correlation was found between cord lead concentrations and gestational age (P = 0.017). Multiple studies have found an association with SGA7, 19, 20, 27.

In our Study the mean concentration of cadmium in cord blood was 0.26 µg/L, a value lower than that reported in Saudi Arabia (GM = 0.78 µg/L)22,23, and consistent with the values reported in many studies conducted in other areas in China (GM = 0.20µg/L)24, Nepal (GM = 0.29 µg/L)25.

Our findings that not exceed the allowed level determined by OHSAS (5µg/L) 26,27,28. Pregnancy is a critical period in terms of cadmium toxicity, and several adverse outcomes such as preeclampsia, LBW, prematurity. Cadmium accumulates in the placenta interacting with the transport of micronutrients and may play a key role in the occurrence of intrauterine growth restriction29, 30. In this study, we found a clear correlation between the concentration of cadmium in the umbilical cord and the birth weight, in literature two studies found no effect of cadmium on fetal growth outcomes30, 31, while others found relationships with birth weight or length32, 33, 34, 35.

The average mercury content in the cord was 2.24µg/L. this value was lower than the Environmental Protection Agency (EPA) reference dose of 5.8 µg/L36.

In our study mercury cord levels were higher than those found in Canada (Montreal; 0.69µg/L), Poland (0.88µg/L), Slovakia (0.8µg/L), South Africa (1.2µg/L), Sweden (organic; 1.4µg/Land inorganic; 0.34µg/L) and Turkey (0.5µg/L)37.

Also, statistically significant relationship was observed between mercury exposure and abortion history in our study. Their teratogenic and foetotoxic roles were established. According to the WHO, it played a key role in the occurrence of spontaneous abortions38, 39, 40. However, later analysis of a more complete dataset disproved42. Concerning level of mercury and gestational age, four studies used mercury measurements in cord blood and maternal blood with higher exposure levels with larger samples than our study found an association between mercury and small gestational age20, 41.

Conclusion

The results of the present study provide relatively comprehensive information concerning the Pb, Cd and Hg levels in the cord of preterm newborns from west of Algeria. This study has shown that pregnant women in this region of the country were exposed to similar levels, compared to pregnant women in industrialized countries, or even higher levels for lead. Further research incorporating larger samples is needed to investigate the effects of pregnant women’s exposure to heavy metals - particularly Pb, Cd, Hg and its impact on small gestational age. The health effects of prenatal exposure to heavy metals as well as to other pollutants to which human population is exposed should alert countries governments to endorse stricter standards and tighten legislation to protect future generations from diseases that may develop following prenatal exposures.

Conflict of Interest: Authors declared they have no competing of interest.

Source of Funding: Biotoxicology Laboratory

REFFERENCES


The Potency of Private Practitioners on Tuberculosis Cases Finding and the Factors Associated in Surabaya City, East Java, Indonesia

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1Faculty of Public Health, Universitas Airlangga; 2School of Public Health, Faculty of Medicine, Universitas Udayana; 3Department of Occupational Health and Safety, Faculty of Public Health, Universitas Airlangga

ABSTRACT

Private practitioners (PPs) have an important role for TB cases findings. The study aimed to assess the characteristic and potency PPs on TB cases finding. This was an operational research conducted from April until August 2018. PPs is general practitioners who have valid license and private practice session in Surabaya city. Data were collected through face to face interview using a structured questionnaire. The study succeeded interviewing 86 PPs, 35(40.7%) found presumptive TB at the last 3 months, 30(85.7%) of them refer the presumptive TB for smear examination and 21(60.0) manage the presumptive until definite the TB status. PPs who have average patients a day 15 persons and more have higher potency to found presumptive TB. This study shows the high potency and good willingness of PPs on presumptive TB and cases finding. First priority is involving PPs who have average patients a day 15 persons or more.

Keywords: Private practitioners, tuberculosis cases finding, public-private mix.

Introduction

The National Tuberculosis Control Program (NTP) in Indonesia faces the low of tuberculosis (TB) cases finding. In 2016, the national Cases Notification Rate (CNR) were 128 per 100.000 persons and 2017 were 152 per 100.000 persons. There is a large gap between CNR compare to the TB prevalence (660 per 100.0000 persons). The National Cases Detection Rate also did not reach the target. In 2016 the CDR were 33% and 2017 were 40%1,2. One of important strategy to increase TB cases finding is to involve all private health care providers in NTP (NTP Private Practitioners partnership)3. Private practitioners (PPs) have an important role for TB cases findings and Directs Observe Treatments Short-course (DOTS) expansion 4.

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The involvement of PPs in health services delivery is an important strategy in health systems strengthening 5. The engangement of PPs on NTP were roled in public-private mix (PPM) scheme. Base on national TB prevalence survey more than 40% people with TB symtomps sought treatment to PPs. Hence, the contribution of PPs to presumptive and TB cases finding relatively low compare to public health center (PHC) and hospital. A study involving telephone interviews of 25% of the private practitioners in Jogjakarta Province another Indonesian city shows that most PPs (63%) reported to have seen TB presumptive in their private practice 6.

Improving the contribution of PPs will effect to increase and accelerate TB cases finding. TB cases that found by PPs mostly at earlier stage and this is give good effect to prevent TB infection 7. Many related studies show the involvement of PPs on TB control program, factors associated and intervention supporting but in the setting of Surabaya a comprehensive study is need to assess the characteristic and potency PPs on TB cases finding in Surabaya City on DOTS implementation. This study aimed to assess the potency of PPs on tuberculosis cases finding and identify the factors associated to their potency.
Method

Design: This was an operational research for evidence support to improve program performance. The design is cross-sectional study.

Study Settings: The study conducted for 5 months since from April until August 2018 in Surabaya City, the capital of East Java Province, Indonesia. Surabaya city is the second biggest city in Indonesia with population in 2017 was 3.057.766 persons.

Study population and sampling design: The study population private practitioners in Surabaya City, East Java Province. PPs were general practitioner who registered in the medical care unit of health office. We were selecting and visiting all PPs in East Surabaya as the samples of this study. We divided the interviewers in certain area and responsible visiting all PPs (sweeping) in that area. Through this strategy we could validating the PPs data from the register and minimize the sampling bias.

Data Collection and Analysis: PPs are general practitioners who have valid license and private practice session in Surabaya city. Potency defined as presumptive TB found at last 3 months at the practice site. Data were collected through face to face interview using a structured questionnaire. We collected information about the characteristics of the private practitioners (age, sex, qualification, type of practice), number of patient a day, opening hours per day and potency of private practitioners.

We trained 16 interviewers to perform the data collection. They trained to approach private practitioners and make an interview. Data was analysed descriptively and delivered in table and narration. Logistic regression was performed to identify characteristic and factor that associated the potency. The ethical clearance was obtained from The Ethical Committee of Faculty of Public Health, Universitas Airlangga.

Results

The Characteristic of Private Practitioners: The study succeeded interviewing 86 PPs with average of age 36.7 years old, 44 (51.2%) were male, 74(86.0%) were full time private practice and 57(66.3%) were practice with associate (group). Average length of practice were 4.5 years and average patients load a day were 14.2 persons (Table 1).

Table 1: The Characteristic of Private Practitioners

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>(n = 86)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
</tr>
<tr>
<td>means (SD)</td>
<td>36.7 (11.1)</td>
</tr>
<tr>
<td>&lt; 35 years old</td>
<td>47 (54.7)</td>
</tr>
<tr>
<td>≥ 35 years old</td>
<td>39 (45.3)</td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>44 (51.2)</td>
</tr>
<tr>
<td>Female</td>
<td>42 (48.8)</td>
</tr>
<tr>
<td><strong>Main occupation</strong></td>
<td></td>
</tr>
<tr>
<td>Full time private Practitioners</td>
<td>74 (86.0)</td>
</tr>
<tr>
<td>Government employee</td>
<td>12 (14.0)</td>
</tr>
<tr>
<td><strong>Type of practice</strong></td>
<td></td>
</tr>
<tr>
<td>Group</td>
<td>57 (66.3)</td>
</tr>
<tr>
<td>Individual</td>
<td>29 (33.7)</td>
</tr>
<tr>
<td><strong>Length of practice (year)</strong></td>
<td></td>
</tr>
<tr>
<td>Means (SD)</td>
<td>4.5 (5.3)</td>
</tr>
<tr>
<td>&lt; 5 years</td>
<td>28 (32.6)</td>
</tr>
<tr>
<td>≥ 5 years</td>
<td>58 (67.4)</td>
</tr>
<tr>
<td><strong>Average number patient a day</strong></td>
<td></td>
</tr>
<tr>
<td>Means (SD)</td>
<td>14.2 (11.8)</td>
</tr>
<tr>
<td>&lt;15 persons</td>
<td>52 (60.5)</td>
</tr>
<tr>
<td>≥15 persons</td>
<td>34 (39.5)</td>
</tr>
</tbody>
</table>

SD = Standard deviation

The Potency of Private Practitioners on TB Cases Findings: PPs who found presumptive TB at the last 3 months were 35(40.7%), most of them, 30(85.7%) refer the presumptive TB for smear examination) to PHC or private laboratory. 18 (51.4%) PPs say that they also refer the presumptive TB for chest X-Ray. Most of PPs who found presumptive TB, 21(60.0) managed the presumptive until definite the TB status (Table 2).

Table 2: The Potency of Private Practitioners on TB Cases Findings

<table>
<thead>
<tr>
<th>Variables</th>
<th>(n = 86)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Found presumptive TB cases at last 3 months</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>51 (59.3)</td>
</tr>
<tr>
<td>Yes</td>
<td>35 (40.7)</td>
</tr>
<tr>
<td>Refer the patient to PHC or Lab for smear examination? (n = 35)</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>5 (14.3)</td>
</tr>
<tr>
<td>Yes</td>
<td>30 (85.7)</td>
</tr>
<tr>
<td>Refer the patient for chest X-ray? (n = 35)</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>17 (48.6)</td>
</tr>
<tr>
<td>Yes</td>
<td>18 (51.4)</td>
</tr>
<tr>
<td>The examination complete until the TB diagnosis confirmation (n = 35)</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>35 (40.0)</td>
</tr>
<tr>
<td>Yes</td>
<td>21 (60.0)</td>
</tr>
</tbody>
</table>
The Factors Associated to Presumptive TB Cases Finding By Private Practitioners: The characteristic of PPs who found more presumptive TB were male and have average number of patients ≥15 persons a day. The PPs who practice with their associate (groups) and have good knowledge regarding TB controls program also tend to found more presumptive TB. PPs with average patients a day 15 persons and more have higher potency to found presumptive TB (AOR: 10.5; 95%CI: 3.4-32.4). Male PPs have higher potency to found presumptive TB compare to female (AOR: 3.3; 95%CI: 1.04-10.6) Table 3.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Found Presumptive TB Cases At Last 3 Months</th>
<th>Simple Logistic Regression</th>
<th>Multiple Logistic Regression</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>Yes</td>
<td>OR (95%CI)</td>
</tr>
<tr>
<td>Age, means (SD)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;35 years old</td>
<td>29(61.7)</td>
<td>18(38.3)</td>
<td>ref</td>
</tr>
<tr>
<td>≥35 years old</td>
<td>22(56.4)</td>
<td>17(43.6)</td>
<td>1.2(0.5-3.0)</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>30(71.4)</td>
<td>12(28.6)</td>
<td>ref</td>
</tr>
<tr>
<td>Male</td>
<td>21(47.7)</td>
<td>23(52.3)</td>
<td>2.7(1.1-6.7)</td>
</tr>
<tr>
<td>Main occupation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full time Private Practitioners</td>
<td>43(58.1)</td>
<td>31(41.9)</td>
<td>ref</td>
</tr>
<tr>
<td>Government employee</td>
<td>8(66.7)</td>
<td>4(33.3)</td>
<td>0.7(0.2-2.5)</td>
</tr>
<tr>
<td>Type of practice</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group</td>
<td>30(52.6)</td>
<td>27(47.4)</td>
<td>ref</td>
</tr>
<tr>
<td>Individual</td>
<td>21(72.4)</td>
<td>8(27.6)</td>
<td>0.4(0.2-1.1)</td>
</tr>
<tr>
<td>Length of practice (year)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;5 years</td>
<td>18(64.3)</td>
<td>10(35.7)</td>
<td>ref</td>
</tr>
<tr>
<td>≥5 years</td>
<td>33(56.9)</td>
<td>25(43.1)</td>
<td>1.4(0.5-3.5)</td>
</tr>
<tr>
<td>Average number patient a day</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;15 persons</td>
<td>30(71.4)</td>
<td>12(28.6)</td>
<td>ref</td>
</tr>
<tr>
<td>≥15 persons</td>
<td>21(47.7)</td>
<td>23(52.3)</td>
<td>11.7(4.2-32.6)</td>
</tr>
<tr>
<td>Knowledge regarding TB program</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack</td>
<td>39(66.1)</td>
<td>20(33.9)</td>
<td>ref</td>
</tr>
<tr>
<td>Good</td>
<td>12(44.4)</td>
<td>15(55.6)</td>
<td>2.4(1.0-6.2)</td>
</tr>
</tbody>
</table>

Discussion

This study assessed the PPs potency on presumptive and TB cases findings. Results show that most of the PPs were found presumptive TB cases on their practice site. The high potency shows the important partnerships TB program with PPs. A good model collaboration should be built to involve and improve the TB cases finding from PPs. For the first step, the program may priorities to certain characteristic of PPs. PPs who have more patients a day, practice in group should be involved first on collaboration scheme. Prioritization will make the collaboration more feasible and cost effective to impact the TB incidence world over, there is an urgent need to address and accelerate TB control activities in the country. Nearly, half of the TB patients first seek TB care in private sector. However, the participation of private practitioners (PPs. This finding is similar to study regarding public private mix (PPM) in Pakistan that found and suggest selection criteria for PPs involved in the TB program. The selection criteria were important to prevent failure and increase the cost effective.

The potency of PPs in presumptive TB finding are quite high because we identify 59.3% of PPs found presumptive TB cases at last 3 month and most of them (85.7%) refer presumptive TB cases to the public health center for smear examination. The results of potency are lower compare to previous study in Jogjakarta that found 63.4%, this because we assess only in 3 months. In term of referring presumptive TB our result are higher compare to Jogjakarta only 41.5%.

Table 3: Factors Associated to Presumptive TB Cases Finding By Private Practitioners
good willingness should be followed and accommodated by sustain response and care. The engagement of PPs on TB case finding will reduce diagnostic delay and TB transmission 11.

High potency of PPs on TB presumptive and cases finding also indicate opportunity involve them on TB reporting. PPs who found presumptive and TB cases should report to the program. This will decrease TB under reporting in private sector. An innovative collaboration model should be arranged to involving PPs. Previous study that conducted in several countries including Indonesia found that PPM intervention not yet succeeded to increase TB cases finding 12. Lesson learn from previous study and intervention regarding PPM is needed.

Innovative approach through good communication and trust building strategies should be arrange to encourage PPs involve on TB program 13. Training and education for PPs should focus on achieving the minimum standard of TB diagnosis, drug adherence guaranty, prevent the using of inappropriate second line drugs that could lead to more cases of drug resistant TB and simple reporting to program 14. Furthermore, intervention to engage PPs should consider the notification and reporting mechanisms. Notification mechanisms should address their perceived barriers, improve the efficiency and simplicity of the notification process. Internet and mobile phones may be use in reporting presumptive and TB cases by PPs to the program 15.

Previous study in Bandung, the other city in Indonesia, learn about the effectiveness of face to face education using catharsis education action (CEA) method in improving the adherence of PPs to national guideline on management of TB. The study found that this method as effective as brief reminder with provision of pamphlet in improving the adherence of PPs to national guideline on management of TB. This finding indicate a psychoeducational strategies is important in influencing physician decision and behaviour 16. This method is a counselling technique that brings out the psychological concerns that result from wrong perception of reality and hinder appropriate behaviour 17. This method may an alternative method to inform and encourage PPs to participate on TB program.

These study findings have important policy implications. First, the study shows as the high potency of PPs involved in TB control program. Second, the prioritization should be arranged for first step program to involve PPs in TB control program in Surabaya. The priority is involving the male PPs and who have average patients a day 15 persons or more, practice in group and increase their knowledge regarding TB control program. The involvement of PPs should be arrange in a bold collaboration and good evaluation. The collaboration program should be support for increase the factor associated to PPs contribution on referring the presumptive TB such as supervising or visiting PPs practice site, providing referral forms of presumptive TB and give the feedback of the examination results 18.

Conclusions

This study shows the high potency and good willingness of PPs on presumptive and TB cases finding. The involvement of PPs in Surabaya City on TB cases finding should be arrange in a bold collaboration. First priority is involving the male PPs and who have average patients a day 15 persons or more and increase their knowledge regarding TB control program. The method and materials for PPs training and education should be arrange in a workshop involving their professional organization.

Acknowledgements

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Ethical Clearance: Taken from Ethics Committee of the Public Health Faculty of Airlangga University with ethics number 189-KEPK

Source of Funding: The article “The Potency of Private Practitioners on Tuberculosis Cases Finding and The Factors Associated in Surabaya City, East Java, Indonesia” was supported by Faculty of Public Health, Airlangga University, Indonesia, 2019.

Conflict of Interest: The authors declare that we have no competing interests.
REFERENCES


The Effect of Family Assessment of Less Chronic Energy (LCE) Pregnant on Nutritional Status of Pregnant and Baby Birth Size

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ABSTRACT

The study aimed to determine the effectiveness of Family Assessment and Less Chronic Energy (LCE) pregnant to improve the nutritional status of pregnant and the size of the birth weight and length of babies in Bengkulu and Bandar Lampung City in 2018. The study used a quasi-experimental method. Assessment is carried out by health cadres and health workers for 6 months. Samples were LCE pregnant trimester II consisting of 30 intervention groups and 30 control groups for each study location. Data analysis using hypothesis testing different mean two independent and dependent groups. The results of the study found that family assessment effectively increased the upper arm circumference (UAC) average, there was an increase in the size of the UAC between the intervention and control groups, but there was no difference in the mean weight increase between the intervention and control groups. In Kota Bengkulu there was no difference in mean birth weight between the intervention and control group (p=0.719), but in Bandar Lampung City there were significant differences (p=0.02). There was a difference in the mean length of birth of the baby between the intervention and control group. Family assistance with LCE pregnant needs to be done to ensure that pregnant carry out healthy behaviors in nutritional intake and utilization of health services to improve the nutritional status of pregnant and the size of the baby’s birth.

Keywords: Family Assessment, LCE pregnant, upper arm circumference, birth weight, birth length

Introduction

LCEs during pregnancy are a condition in which the nutritional status of a pregnant woman is in a bad condition due to the unmet needs of macro and micro nutrients, while the nutritional needs of pregnant in crease than usual when they are not pregnant so there is a need to increase the consumption of nutritious foods, especially consumption of food sources of energy. If energy needs are not met in the long run, it produces less energy, causing chronic energy shortages.

Nationally, the prevalence of LCEs in 2007 was 21.6% and then increased in 2013 to 24.2%. Prevalence of LCE pregnant in Indonesia is a public health problem because the prevalence is more than 20%. Ministry of Health of the Republic of Indonesia provided a budget for the recovery of under-nutrition status for infants and LCEs for pregnant with LCE through the Health Operational Assistance Fund allocated in each puskesmas, through the Supplementary Feeding Programme (SFP) to pregnant with LCE. This SFP is based on local food ingredients with a regional specialty menu that is adapted to local conditions as additional food, not substitute for daily main meals. But the data shows the prevalence of LCE pregnant is still high, then the SFP is also not optimal.

National data shows that only 25.2% of LCE pregnant received SFP, from those who received SFP only 89.7% of SFP from the program. The study results in Jatinangor District found that only 29.5% of LCE pregnant received interventions, namely weight and UAC measurements, nutrition awareness counseling and SFP. Of the 29.5% who received the intervention, only 36.3% received the SFP of LCE pregnant. This results in pregnant from LCE unable to restore their nutritional status.
LCEs during pregnancy have a negative impact on the mother, labor and fetus and baby. Various effects of LCE on pregnant are the basis need for interventions carried out for LCE pregnant. The purpose of this study was to determine the effectiveness of assessment families and LCE pregnant in improving nutritional status of pregnant and the size of weight and length birth in Bengkulu and Bandar Lampung City.

Method

This study used Quasi experiment with non randomized control group pre-test – post-test design. Intervention in the form of families assessment and LCE pregnant by health cadres in fulfilling nutritional intake of LCE pregnant in trimester II pregnant to 6 months. The control group received standard puskesmas services and were given a booklet without assistance. The study was conducted from May to October 2018. The population in this study were LCE pregnant in Bengkulu and Bandar Lampung City. Exclusion criteria are pregnant in high risk groups and pregnant suffering from diabetes mellitus, hypertension, and other comorbidities. A total sample of 60 intervention dan 60 control group pregnant with LCE. UAC data were collected and maternal weight before pregnancy or in the first trimester of the Maternal and Child Health (MCH) book. Data analysis using independent t test, Mann Whitney U, paired t tests and Wilcoxon Rank Test.

Results

Table 1: Changes in UAC of Less Chronicle Energy Pregnant

<table>
<thead>
<tr>
<th>Bengkulu</th>
<th>Pre</th>
<th>Post</th>
<th>Pvalue*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Min-Max</td>
<td>± SD</td>
<td>Min-Max</td>
</tr>
<tr>
<td>Intervention</td>
<td>19-23.5</td>
<td>21.99 ± 1.22</td>
<td>23.0-26.0</td>
</tr>
<tr>
<td>Controls</td>
<td>18-23</td>
<td>21.85 ± 1.41</td>
<td>21-25.5</td>
</tr>
<tr>
<td>Pvalue**</td>
<td>0.675</td>
<td>0.015</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Changes in Body Weight of Pregnant Less Chronicle Energy

<table>
<thead>
<tr>
<th>Bengkulu</th>
<th>Pre</th>
<th>Post</th>
<th>Pvalue*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Min-Max</td>
<td>± SD</td>
<td>Min-Max</td>
</tr>
<tr>
<td>Intervention</td>
<td>38-61</td>
<td>47.48 ± 5.18</td>
<td>45-58</td>
</tr>
<tr>
<td>Controls</td>
<td>36-68</td>
<td>49.32 ± 7.78</td>
<td>36-68</td>
</tr>
<tr>
<td>Pvalue**</td>
<td>0.23</td>
<td>0.624</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bandar Lampung</th>
<th>Pre</th>
<th>Post</th>
<th>Pvalue*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Min-Max</td>
<td>± SD</td>
<td>Min-Max</td>
</tr>
<tr>
<td>Intervention</td>
<td>39.5-84</td>
<td>8.5 ± 52.62</td>
<td>45.86</td>
</tr>
<tr>
<td>Control</td>
<td>38.5-73.0</td>
<td>49.91 ± 6.82</td>
<td>42.7-74</td>
</tr>
<tr>
<td>Pvalue**</td>
<td>0.178</td>
<td>0.1</td>
<td></td>
</tr>
</tbody>
</table>

*Wilcoxon Rank Test **Mann Whitney U
Table 2 shows both City there was no difference in mean maternal weight between intervention and control group. After nutrition assistance there was no difference in mean maternal weight. But by comparing the average maternal weight before and after nutritional assistance, both in the intervention and the control group there were differences in the average maternal body weight before and after in both City.

<table>
<thead>
<tr>
<th>Group</th>
<th>Bengkulu Min-Max</th>
<th>± SD</th>
<th>Bandar Lampung Min-Max</th>
<th>± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention</td>
<td>1.0-20.0</td>
<td>7.15 ± 5.05</td>
<td>1-6</td>
<td>2.88 ± 1.07</td>
</tr>
<tr>
<td>Controls</td>
<td>-9.0-19.0</td>
<td>6.43 ± 6.28</td>
<td>1-5.2</td>
<td>2.48 ± 1.26</td>
</tr>
<tr>
<td>Pvalue*</td>
<td>0.628</td>
<td>0.185</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*independent t test

Table 3 show that in both City there was an increase in the average body weight in the intervention and the control group. but there was no difference in the average weight gain between the intervention and the control group (p> 0.05).

Table 4 show that in Bandar Lampung city, average birth weight in the intervention group was higher than the control group, but in the Bengkulu city there was no difference in mean birth weight between the intervention and control group (p=0.719).

Table 5 show that the average length of birth in the intervention group was higher than the control group. and the difference was significant in the two study locations.

**Discussion**

**Family assessment and Nutritional Status of Pregnant:** The results showed that after nutrition assistance there was also no difference in the average weight of LCE pregnant between the intervention and control group in both cities. However, when compared to the results of measurements before and after treatment. both in the intervention and control group there was an increase in body weight before and after in both cities. Nutritional counseling can increase the knowledge and motivation of pregnant to adopt a healthy diet during pregnancy so that they have normal weight gain as a
manifestation of a healthy diet\textsuperscript{10}. The study in Surabaya city also found that supplementary feeding was able to provide changes in nutritional status of LCE pregnant to normal\textsuperscript{11}. The government program for LCE pregnant is expected to be effective in restoring the nutritional status of LCE pregnant. SFP is carried out for 90 days and evaluates every month by looking at weight gain and UAC, so that the nutritional status of the mother becomes normal\textsuperscript{12,13}.

There was no difference in the average weight of pregnant between the intervention and control group in the two cities likely related to consumption of SFP in pregnant, because both in the intervention and control group received SFP in pregnant. The government has made a SFP program for pregnant, but this feeding is only focused on pregnant with LCE status and low socio-economic conditions. This is a problem because it is feared that the food provided by the government through the puskesmas is not only consumed by pregnant but also by other family members so that it is less effective\textsuperscript{12}.

The increase in UAC size and body weight in LCE pregnant is related to food consumption and SFP intake of pregnant. The provision of SFP aims to meet maternal nutritional needs during pregnancy, especially the adequacy of protein\textsuperscript{5}. The right time in the implementation of SFP as a nutritional supplementation program for pregnant is in the second and third trimesters because at the gestational age the nutritional needs increase and fetal growth runs fast\textsuperscript{12}.

**Nutritional Assistance and Infant Birth Size:** The results of this study indicate the low average birth weight of LCE pregnant. This finding relevant with the results study at Yogyakarta, average birth weight of infants in LCE pregnant was 2873.33 grams while in pregnant who were not LCEs there were 3107.01 grams. There is an average difference of 233.68 grams\textsuperscript{13}. Intervention in LCE pregnant gave a positive effect on infant birth weights, where the risk of IUGR or LBW decreased with intervention in LCE pregnant\textsuperscript{14}. Research in East Java also suggested that early detection and intervention can be carried out by measuring the UAC to be carried out routinely every time a antenatal care with the aim of detecting and reducing the risk of pregnancy and birth\textsuperscript{13}.

The theory explains that a pregnant woman who experiences a lack of nutritional intake will cause abnormalities in the fetus she contains. The inability of pregnant to meet their nutritional needs will have an impact on the weight of babies born\textsuperscript{15}. The study found that LCE pregnant had a risk of 7.9 giving birth to LBW compared to mothers who were not LCEs. The LCE status of pregnant greatly affects the growth of the fetus in the womb, if the maternal nutritional status is poor before and during pregnancy will cause LBW. Malnutrition in pregnant for a long time and continuously during pregnancy will result in worse for the fetus\textsuperscript{16}. The other consequences of LCE pregnant is damage to the central nervous system, especially in the first stage of brain growth that occurs during the womb\textsuperscript{13}.

The results of this study showed differences in the average length of birth of babies between LCE pregnant who receive assistance and do not receive assistance. But the average length of birth of a baby is still low, which is less than 50cm. The study found that the average length of birth from LCE pregnant was 47.86 cm\textsuperscript{13}. In theory, the LCE pregnant means that the mother has experienced a state of malnutrition in the long term. If this happens, the nutritional needs of the fetus’s growth process will be hampered, so that babies are born short and LBW. LCE causes pregnant not to have adequate reserves of nutrients to provide the physiological needs of pregnancy, namely hormonal changes and increase blood volume for fetal growth, supply of nutrients in the fetus decreases as a result of stunted fetal growth and development\textsuperscript{17}.

**LCE maternal companion cadres are able to motivate mothers to increase consumption of balanced foods and adhere to consuming SFP for pregnant and blood boosting tablets. The Khatijah et al (2010) states that there is a relationship between adherence to taking iron tablets with the incidence of anemia. Pregnant who consume only one tablet a week have an increased risk of anemia when they are pregnant 12 times compared to mothers who consume iron tablets every day\textsuperscript{18}. Consumption of iron tablets less than 90 tablets will increase the risk of anemia 1.81 times because iron is an important component in the formation of hemoglobin\textsuperscript{19}. Iron deficiency is at risk for the fetus and pregnant. The fetus will experience disorders or obstacles to growth, both body and brain cells. Besides that it can also cause death in the fetus in the womb, abortion, congenital defects and LBW\textsuperscript{20}. The study showed that there was an effect of giving SFP to pregnant with infant nutritional status. The SFP proved to significantly influence the birth weight\textsuperscript{12}.**
This result relevant with research in India, show that energy intake has a significant effect on the incidence of LBW so that mothers who receive good nutrition will have the opportunity to have babies with greater birth weight. The intake of protein and Fe which is getting closer to the number of nutritional adequacy (RDA) will further increase the baby’s birth weight. Protein is one of the macro-nutrients needed by pregnant for fetal growth and development in the womb.\textsuperscript{21,22}

**Conclusion**

The family assessment of pregnant less chronic energy effective in restoring maternal nutritional status and improving birth weight and length. Need to conduct nutrition and health interventions for LCE pregnant by empowering the community (health cadres) by fostering by health workers and the need for family empowerment to monitor and ensure that LCE pregnant consume nutritious food and receive health services. Health workers need to be trained to detect early risk factors. Complications and impacts that occur in pregnant with LCEs. Then it needs collaboration between health workers in providing care for pregnant with LCEs. Collaborating with the community to explore the potential of local food ingredients to meet the nutritional needs of LCE pregnant so that they can restore LCE conditions to normal and give birth to healthy babies with normal birth weights and lengths.

**Conflict of Interest:** The authors declare that there is no conflict of interest.

**Source of Funding:** We are very grateful for the funding from Ministry of health of the Republic of Indonesia which has provided supported in doing this research.

**Ethical Clearance:** This study received Ethical Acceptance approval from the Health Research Ethics Comitte of Health Polytechnic Tanjung Karang for Number 77/EC/KEP-TJK/V/2018 dated May 3 2018.

**REFERENCES**


Safe Concentration of Mercury (Hg) Exposure in Fish Consumed by the Residents of Bulawa Subdistrict, Bone Bolango District, Gorontalo Province, Indonesia

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ABSTRACT

Mercury is one of the persistent chemicals and is bioaccumulative in the ecosystem. It negatively affects human health and environment. Indonesia has been identified in the use of mercury in industrial sector, especially small industries. High level of mercury needs to be reduced and eliminated. The present study aims to determine the safe concentration of mercury that has negative impact on health of the community of Bulawa Sub-district, Bone Bolango District, Gorontalo. The approach taken in this study was cross-sectional with observational research. In the present study, the population was all residents of Bulawa Subdistrict, Bone Bolango District, Gorontalo who were exposed to mercury from fish. The sample in this study was 100 residents who consumed fish caught in Bulawa waters. Sampling was carried out by purposive sampling. Data analysis performed in manual quantitative data analysis to determine the safe (C safe) concentration of mercury for workers. Experimental data includes white rats (W animals), body surface area of white mice (BSA animals), body weight (W), workers’ height (h), workers’ respiratory rate (BR), workers’ body surface area (BSA), working time (t), mercury concentration (C), NOAEL, animal km, human km, and safe limits for toxin doses (RfD).

The results showed that the measurement of mercury concentration in Bulawa District, Bone Bolango District, Gorontalo was 0.128 mg/m³ (0.0156 ppm). This value can be used as a reference limit for safe concentration of mercury in the residents who consume fish originating from the waters of traditional mining areas in Indonesia. Control efforts can be created by reducing mercury concentrations in fish, or reducing the rate of fish consumption and limiting the duration of exposure.

Keywords: Mercury (Hg), safe concentration, residents

Introduction

Mercury is one of the persistent chemicals and is bioaccumulative in the ecosystem. It has negative impact on human health and the environment. Indonesia has been identified in the use of mercury in industrial sector, especially small industries. The high level of mercury use needs to be reduced and eliminated to avoid health impact (Permenkes, 2016) (¹).

Mercury is a naturally occurring metal found throughout the environment. Mercury enters the
environment as the result of the normal breakdown of minerals in rocks and soil from exposure to wind and water, and from volcanic activity. Mercury releases from natural sources have remained relatively constant in recent history, resulting in a steady rise in environmental mercury. Human activities since the start of the industrial age (e.g., mining, burning of fossil fuels) have resulted in additional release of mercury to the environment(12).

That is true, most of the mercury found in nature is produced by industry; reaching +- 10,000 tons annually. The use of mercury is very high with +- 3,000 types of uses in the processing industry of chemicals, process of making drugs used by humans as well as the basic ingredients of making insecticides for agriculture (Christian et al., 1970) (2).

All components of mercury - both in the form of methyl and alkyl forms - which enter the human body continuously can cause permanent damage to the brain, liver and kidneys (Roger et al., 1984)(3).

There is a safe limit for mercury entering the body so as not to cause health problems. The limit of mercury in fish is ≤ 1 mg/kg (Permenkes, 2016)(4). According to the Indonesian National Standard (2009) mercury concentration in fish is 0.3 mg/kg(4).

According to the research results conducted by Singga (2013), Mercury concentration in fish samples in Bulawak Subdistrict, Bone Bolango District, Gorontalo Province was 0.0298 mg/kg(5). This shows that Mercury concentration in fish in the area was still below the Threshold Value issued by the Indonesian National Standard (2009) by 0.3 mg/kg(6).

In the previous study on the analysis of the health risk of mercury exposure in the community, Bulawa Subdistrict- a subdistrict located in Bone Bolango District, Gorontalo was one of the sub-districts prone to potential danger of mercury pollution due to Illegal Gold Mining (PETI) activities. The mining is located in the upper side of the rivers that pass through the village, causing the villages to potentially be contaminated with mercury from the illegal mining activities. Mercury that is carried by the river water flow changes to methyl mercury and pollutes the sea and fish in the coastal district of Bulawa. This is what causes the community of Bulawa District to be exposed to mercury. Previous research has not calculated the safe concentration of mercury for fish in these waters, is it safe to eat or not. Therefore, a research related to safe concentration of mercury exposure in the community of Bulawa Subdistrict, Bone Bolangan District, Gorontalo is needed.

Material and Method

The present study aims to determine the safe concentration of mercury in fish caught in Bulawa Subdistrict, Bone Bolango District, Gorontalo. The approach taken was cross sectional with observational research. The population in this study was all communities of Bulawa Subdistrict, Bone Bolango District, Gorontalo who were exposed to mercury from fish. The sample in this study was 100 residents consuming fish caught in Bulawa waters. Sampling was carried out by purposive sampling.

The design of the study includes laboratory examination data taken from mercury concentrations in the blood and hair and mercury concentrations in fish. In addition to laboratory data, several other data were also taken such as respondents’ weight, primary data from interview questionnaires to the public in the form of respondent characteristics, exposure frequency, duration of exposure, and consumption rate.

The variables in this study include the characteristics of experimental animals in the form of mice, community characteristics which include body weight, body surface area, and worker breathing rate. In addition, mercury concentration was also included in the study variables obtained from previous research literature studies.

Determination of safe (C safe) concentration of Mercury (Hg) is calculated using the following formula (Tualeka, 2019)(6).

\[
C_{safe} = \frac{(Rfd)(Wb)}{(\alpha)(R)}
\]

Where:

\(C_{safe}\): safe concentration (mg/kg)

\(Rfd\): Reference dose (mg/kg)

\(\alpha\): % substance absorbed in the lungs

\(R\): consumption rate (kg/hari)

Findings

A. Characteristics of Experimental Animal and Surface Area of Experimental Animal (White Mice): Toxicity test of chemical compounds in humans can generally be tested in animals for human response to toxicity is qualitatively similar to that of animals. In carrying out the toxicity test, white mice were selected.
Table 1: Distribution of Characteristics of Experimental Animal W (kg) BSA (m²)

<table>
<thead>
<tr>
<th>Experimental Animal</th>
<th>W (kg)</th>
<th>BSA (m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.1405</td>
<td>0.024165</td>
</tr>
<tr>
<td>2</td>
<td>0.1405</td>
<td>0.024165</td>
</tr>
<tr>
<td>3</td>
<td>0.1410</td>
<td>0.024223</td>
</tr>
<tr>
<td>4</td>
<td>0.1410</td>
<td>0.024223</td>
</tr>
<tr>
<td>5</td>
<td>0.1395</td>
<td>0.024050</td>
</tr>
<tr>
<td>6</td>
<td>0.1415</td>
<td>0.024165</td>
</tr>
</tbody>
</table>

Animals (White Mice): Based on white rat body weight data, the body surface area of white mice was calculated using the following formula:

\[ \text{BSA} = 0.09 \times W^{0.67} \]

where:
- BSA: Body Surface Area (m²)
- W: Weight (kg)

A. Workers’ Characteristics, Body Surface Area and Respiratory Rate: Characteristics taken from the community of Bulawa District, Bone Bolango District, Gorontalo include weight and duration of exposure. The duration of exposure in a day in this study was 24 hours. The weight of the respondents studied was categorized into 40 kg, 45 kg, 50 kg, 55 kg, 60 kg, 65 kg and 70 kg. The height used is height from the average Indonesian adult at 159 cm.

Based on these data the body surface area of the community and respiratory rate are calculated using the following formula:

1. Body Surface Area

\[ \text{BSA} = \sqrt{W \times h / 3600} \]

Where:
- BSA: Body Surface Area (m²)
- W: Weight (kg)
- H: Height (cm)

Table 2: Respondents’ Weight Distribution and Body Surface Area (BSA)

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Wb (kg)</th>
<th>h (cm)</th>
<th>BSA (m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>40</td>
<td>159</td>
<td>0.88</td>
</tr>
<tr>
<td>2</td>
<td>45</td>
<td>159</td>
<td>0.99</td>
</tr>
<tr>
<td>3</td>
<td>50</td>
<td>159</td>
<td>1.10</td>
</tr>
</tbody>
</table>

From the calculation, the average body surface area of the respondent is 1.21 m².

2. Fish consumption rate:

\[ R = 0.2 \text{ kg/day} \]

Table 3: Distribution of Respondents’ Characteristics, Rate of Fish Consumption

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Wb (kg)</th>
<th>h (cm)</th>
<th>BSA (m²)</th>
<th>R fish (kg/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>40</td>
<td>159</td>
<td>0.88</td>
<td>0.2</td>
</tr>
<tr>
<td>2</td>
<td>45</td>
<td>159</td>
<td>0.99</td>
<td>0.2</td>
</tr>
<tr>
<td>3</td>
<td>50</td>
<td>159</td>
<td>1.10</td>
<td>0.2</td>
</tr>
<tr>
<td>4</td>
<td>55</td>
<td>159</td>
<td>1.21</td>
<td>0.2</td>
</tr>
<tr>
<td>5</td>
<td>60</td>
<td>159</td>
<td>1.32</td>
<td>0.2</td>
</tr>
<tr>
<td>6</td>
<td>65</td>
<td>159</td>
<td>1.43</td>
<td>0.2</td>
</tr>
<tr>
<td>7</td>
<td>70</td>
<td>159</td>
<td>1.54</td>
<td>0.2</td>
</tr>
<tr>
<td>Average</td>
<td>55</td>
<td>159</td>
<td>1.21</td>
<td>0.2</td>
</tr>
</tbody>
</table>

The average rate of consumption of fish and drinking water in table 3 is 0.2 kg/day.

B. Mercury Consumption: The results of measurements of mercury concentration in Bulawa Subdistrict, Bone Bolango District, Gorontalo were 0.0298 mg/kg (0.0036 ppm). (5)

Mercury concentration in fish consumed by the residents in Bulawa Subdistrict is below the national standard for mercury concentrations in fish by 0.3 mg/kg(7).

C. NOAEL (No Observed Adverse Effect Level): To find out a value that can cause adverse health effects for humans, a toxicity test is carried out. Toxicity test is one of the activities in the field of toxicology research which aims to evaluate a substance against living things. To find out the safe dosage that does not cause an effect, a toxicity test was carried out with No Observed Adverse Effect Level (NOAEL).

According to World Health Organization (WHO) NOAEL value of the mercury is 0.23 mg/kg (8).
D. Reference Dose: Tualeka (2013) states that the Dose Reference (RfD) of toxin exposure can be calculated using the following formula\(^9\):

\[
R_{fD} = \frac{\text{NOAEL}}{100}
\]

Based on the above formula, the RfD value is obtained in the following way

\[
R_{fD} = \frac{0.23}{100} = 0.0023 \text{ mg/kg}
\]

Where:

- \(R_{fD}\): Reference Dose (mg/kg)
- NOAEL: No Observed Adverse Effect Level (mg/kg)

Based on the formula, the calculation results show that the safe limit of mercury doses is 0.0023 mg/kg.

E. Limits of Safe Mercury Concentration:

According to Tualeka (2013)\(^9\), determination of the safe limits of mercury concentration is as follows

\[
C_{\text{safe}} = \frac{(R_{fD})(Wb)}{(\delta)(R)}
\]

\[
C_{\text{safe}} = \frac{(0.0023)(55)}{(80\%)(0.2)} = 0.79 \text{ mg/kg}
\]

Where:

- \(C_{\text{safe}}\): safe concentration (mg/kg)
- \(R_{fD}\): Reference dose (mg/kg)
- \(\alpha\): % substances absorbed by the lungs
- \(R\): consumption rate (kg/day)

The molecular weight of mercury is 200.59\(^{22}\), while the percentage of mercury absorbed by the lungs is 80\%.\(^{10}\)

Based on the results of calculations above the safe concentration of mercury exposure in fish in Bulawa Subdistrict, Bone Bolango District, Gorontalo is 0.79 mg/kg.

The results of maercury safe limit concentration in Bulawa Subdistrict, Bone Bolango District, Gorontalo can be used to predict safe toxin concentrations and as a comparison with the NAB determined by the National Standardization Agency, ACGIH, NIOSH and OSHA (William, 1985 in Tualeka, 2013)\(^9\).

Discussion

Determination of safe concentration of mercury in Bulawa District, Bone Bolango District, Gorontalo Indonesia is based on No Observed Adverse Effect Level (NOAEL). No Observed Adverse Effect Level (NOAEL) used in this study is from ATSDR and WHO with NOAEL value of fish mercury 0.23 mg/kg.

RfD Value Based on the calculation result is 0.0023 mg/kg. The results of this research are lower than that of the Environmental Protection Agency (EPA) in Broussard, L.A. et.al.\(^7\) which shows Rfd in mercury 0.3 mg/kg. Thus, the result of this research shows that the safe Rfd in the study area is safer for the community.

Based on the results of this study, the value of safe concentration of mercury in Bulawa Subdistrict, Bone Bolango District, Gorontalo is 0.79 mg/kg. The value result of this research is also lower than the FDA (1996) Food and Drug Administration provision on mercury limit in fish by \(\leq 1\) mg/kg (Broussard, L.A. Et. Al.)\(^7\). Thus, the results of this research can be used as a reference for the safe concentration of mercury in people who consume fish originating from the waters of traditional mining areas in Indonesia.

Conclusion

The results of mercury NOAEL measurements in Bulawa District, Bone Bolango District, Gorontalo Province, Indonesia was 0.0051 mg/kg. Reference Dose (Rfd) of Mercury after calculation is 00075 mg/kg. Safe concentration of mercury in Bulawa District, Bone Bolango Regency, Gorontalo Province, Indonesia is 0.0042 mg/m\(^3\) (0.0014 ppm).

The use of mercury can cause health effect, such as incidence of mercury poisoning. So, control recommendations for mercury problems in Bulawa Subdistrict, Bone Bolango District, Gorontalo Province, Indonesia are to reduce mercury concentration in fish or reduce fish consumption rates and limit the duration of exposure. The residents must be able to sort out any fish with low mercury concentrations so as not to cause health problems later on. Also the government should
give the information about mercury and its impacts for health and environment, and the government should take measurement of mercuy levels in the environment regulary\(^{(13)}\).

**Conflict of Interest:** All authors have no conflicts of interest to declare.

**Source of Funding:** This is an article “Safe Concentration of Mercury (Hg) Exposure in Fish Consumed by the Residents of Bulawa Subdistrict, Bone Bolango District, Gorontalo Province, Indonesia” of Occupational Health and Safety Department that was supported by Faculty of Public Health, Airlangga University.

**Ethical Clearance:** The study was approved by the institutional Ethical Board of Health Polytechnic of Ministry Health, Kupang Indonesia.

**REFERENCE**


11. ACGIH. Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs). Cincinnati; 2012.


Evaluation of Abutment Health Related to Two Different Retention Methods of Maxillary Obturator (Randomized Control Trial)

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ABSTRACT

Statement of Problem: The majority of maxillary defects can be rehabilitated with conventional simple obturator prosthesis. However, inadequate retention, stability, support, and its effect on the abutment is the questionable for each case. Telescopic crowns have been used to retain obturator for some time. The use of telescopic crown in a dentate maxillectomy patient can yield significant functional improvement while maintaining the obturator’s aesthetic advantages, and abutment health. In this study the abutment health was evaluated through radiographic evaluation pocket depth, to compare between those two types of obturators.

Subjects and Method: Sixteen patients were selected with unilateral maxillectomy. The criteria for inclusion were the presence of remaining maxillary teeth adequate for placing conventional definitive obturator and no history or planning for radiation therapy. They were divided into two groups according to treatment modality. Group(1): wearing obturator with telescopic attachment. Group(2): wearing obturator with conventional clasping. After delivery of each obturator type the abutment was evaluated at 3, 6, 9, 12 months the pocket depth was measured using periodontal prop, the radiographic evaluation was measured in from of bone density and bone height.

Results: The results showed that there were no significant differences between clasping and Telescopic groups regarding bone height and bone density, while there was increase in pocket depth with conventional obturator.

Conclusion: Under the limitations of this study we can conclude that: the obturator retained by telescopic crown satisfactory treatment modality for unilateral maxillary cases.

Keywords: Obturator, telescopic crown, Abutment health, retention.

Introduction

Patients with intraoral defects can be treated either surgical or prosthetic according to size and cause of the defect. A firmly retained prostheses is very important for function and psychological support of the patient. Achieving retention and preservation of the remaining abutment for maxillary obturator is a great challenge for the prosthodontist.

Telescoping crowns were introduced in the 20th century. Telescoping refers to the use of a primary full coverage casting luted to the prepared tooth with a secondary casting, which is part of denture framework and is connected by means of interfacial surface tension over the primary casting.[1]

The assessment of abutment tooth bone support is fundamental to the clinical utility of the abutment. Radiographs are a critical tool for the assessment of bony architecture.[2]
Aim of the Study

The purpose of this study was to evaluate abutment health by measuring pocket depth and radiographic bone changes related to two different retention treatment modalities of maxillary obturator.

Subject and Method

Sixteen patients were selected with unilateral maxillectomy in this study Fig.(1).

We exclude smokers, probability of tumor recurrence, and patients have systemic metabolic diseases. These patients randomly divided according to treatment modality into:

**Group (1):** patient rehabilitated with conventional claspig obturator.

**Group (2):** patient rehabilitated with telescopic attachment obturator.

A primary impression with alginate impression material and provisional bite was taken, and then diagnostics cast was obtained and mounted on mean value articulator for studying the cases and choosing the best design. For group (1): A preparation of abutment teeth to receive surveyed crowns, then secondary impression of prepared abutment was taken. Fabrication of the surveyed crowns was formed. The crowns were cemented. A secondary impression with altered cast technique was taken to construct metal framework. A metal try in was preformed, and jaw relation was taken. Try in of partial denture was done then denture insertion of removable prosthesis

For group (2): Mouth preparation of abutments was prepared with a chamfer finish line for the primary coping. Impression was made by using a polyvinyl siloxane elastomeric impression material (putty and light body) to fabricate the primary coping. The primary copings were fabricated by using milling machine to insure parallelism fit of the primary coping were evaluated in the patient’s mouth, and cemented on the abutment with glass ionomer cement. Another impression was made by two step putty wash technique after the cementation of the primary copings, by using a custom acrylic resin tray to obtain a cast on which the secondary copings with small metal projections will be fabricated. The secondary coping were seated over the primary coping and an overall impression was taken for maxillofacial prosthesis construction. The secondary copings were placed on the master cast, covered with wax and the trial denture base was fabricated with chemically cured acrylic resins. Occlusion rims were added over the trial denture base to register the jaw relation with check bite technique. Try in was done and then delivery of finished hollowed maxillofacial prosthesis. Pocket depth and radiographic evaluation of the abutments was done at time of delivery 3, 6, 9, and 12 months.

The pocket depth was measured from the gingival margin to bottom of the sulcus using graduated periodontal probe. Probing depth was measured for abutments at mesio-buccal, mid-buccal, disto-buccal, mesio-lingual, mid-lingual, disto-lingual surfaces. Then divided by four.

The bone changes mesial and distal to the abutments were monitored by peri-apical radiographs taken with standardized long cone paralleling technique.

- A Rinn (XCP) periapical film holder was used. The occlusal surfaces of the abutment and their opposing teeth were painted petroleum jelly. A chemically activated transparent acrylic resin was applied over the bite block of the Rinn (XCP) film holder.

The patient was asked to close his teeth over the holder and acrylic in centric contact position until complete setting of the material.

- A long cone (sixteen inch in length) was mounted to the x-ray tube and a plastic aiming ring of XCP film holder was fixed to the round end of the long cone tube.

- Double package of Periapical x-ray film was used. One film was immediately developed for bone loss and another one kept in refrigerator to be developed as a consecutive film of follow up period for measuring the bone density.
All the films were exposed using the same x-ray machine. “Rinn Corporation, XCP instrument for extension cone paralleling technique, USA.” at 70 kilovolts and 8 milliampere for 0.6 second with the central rays perpendicular to the films. These films were developed using automatic Processor “Owandy Sas 2, rue des Vieilles Vigres, Croissy-Beauborg, 77435 Marne-la-vallee”. The exposure parameters were fixed for all the patients during the follow up period. A package of periapical x-ray film” DÜRR Dental, DL 26, XR 24 Nova, GmbH&Co.KG, Höpfigheimer Strape 17.74321 Bietigheim-Bissingen, Germany” was mounted to the film plate of the bite block. The bite block was applied on the radiographic template at the imprints of its serration.

A. Image analysis and measuring of crestal bone changes: Indirect digital radiography was used to measure the amount of mesial and distal crestal bone loss around the abutment during the follow up periods. After photographing of the obtained periapical radiographs using a digital camera” Canon, Power Shot A 2000 IS, PC 1310, Canon Inc., China.” image readout was displayed on the computer screen then the readout image was stored to be analyzed by special linear measurement Digora software (version 1.51 for windows) “ Digora software, Orion Corporation, soredek medical system, Helsinki, Finland”

The mean bone level changes or and the mesial and distal aspects were calculated, tabulated and statistically analyzed

B. Bone density measurements: The software of the Diagora was again used for assessing the bone density changes mesial and distal to the abutment during the follow up period.

Two lines were drawn parallel to the mesial and distal abutment surface. Extended from the crestal bone level of the tooth to the abutment apex passing tangential to the abutment and perpendicular to a tangent drawn to the tooth apex.

Bone density along each of these lines was recorded and then the mean value of the three readings was calculated for each surface. The mean value of the mesial and distal bone density measurements for each tooth during the follow up intervals were calculated, tabulated and statistically analyzed.

Results

Pocket Depth: showed the result of the comparison between two groups regarding pocket depth. The results revealed that there were significant differences between the two groups as regard pocket depth at all time of tests (pre, 3, 6, 9 and 12 months), clapping group had slightly pocket depth means than telescope group.

![Fig. 2: Comparison between groups regarding pocket depth](chart)

Radiographic Evaluation: Fig.(3) Showed the result of the comparison between two groups regarding bone density. The results revealed that there were slightly higher bone means than telescope group.

![Fig. 3: Comparison between groups regarding bone density](chart)

Also, the results showed that there were no significant differences in bone density among different time of tests (pre, 3, 6, 9, and 12 months) in both groups, but clapping group had significant differences between the two groups as regard bone density.
Discussion

The restoration of function and esthetics in the patients with gross defects of the oral cavity is a valuable and often dramatic service provided by the maxillofacial prosthodontist. Obturator prosthesis was the first line of treatment for this patient. Investigations have confirmed the effectiveness of obturator prostheses in terms of speech, masticatory function, swallowing and appearance.[3]

A comparison was done between conventional clasp, and telescopic attachment in maxillary obturator for the treatment of unilateral maxillectomy cases. Aramany Class I, and Class II maxillary defect was selected for this study because it is the most challenging cases due to lack of support, retention, and stability particularly the completely edentulous ones.[4]

Rehabilitation of such challenging cases, the obturator portion should be well-extended in to the defect area so that the resultant prosthesis will be retentive and stable enough and aids in holding the prosthesis intact. A stable and retentive prosthesis can better be achieved with adjunctive support of dental implants or natural teeth rather than conventional modalities in maxillectomy patients.[5]

Sixteen patients were selected from the outpatient Clinic Prosthodontics department, Faculty of dentistry Minia University, to participate in this study.

The abutment of obturator with conventional clasp were covered by surveyed crowns to decrease the rate of caries.

The obturator was constructed from a combination metal and acrylic to resist fracture.

With telescopic obturator, the insertion and removal is much easier for the patient and thus improves the prognosis of the complex partial denture. This type of telescopic retainer provides guidance, support, and protection from dislodgement and it transfers bite forces along the long axis of the abutment teeth.

Milling of the crowns to achieve parallelism and the clearance for rotation offered more frictional retention and greater stability for the prosthesis. The disadvantages of this type of attachment are the loss of tooth substance during preparation and possible overcontouring of the crown. Despite these disadvantages, the telescopic-crown technique is well established and has good long term performance.[6]

The alloys preferred for fabrication of copings were predominantly base alloys, which gradually replacing high gold-content alloy. They dominate the market, because of the low cost of the metal, ease of casting, high yield strength and modulus of elasticity. It exhibits the property of porcelains but eliminates the cost factor, processing time and technique sensitivity of porcelain. It also eliminates the technique sensitivity of composites and has better physical and optical properties.

The secondary coping were constructed with extension known as a retentive beads, which helped in the mechanical interlocking of the secondary copings in the denture base.

In the current study the obturator with clasps show increased levels of gingival inflammation in regions covered by the dentures and below the clasp arms in abutment teeth. This may be due to the approximation of the retentive tip to the free gingival margin and changes of abutment’s contour which may have led to plaque accumulation, gingival inflammation, then increased pocket depth. This change of contour may have also affected the natural stimulation of the free gingival margins by the food deflections.

Radiographic evaluation was made using direct digital radiography following the long cone parallel technique. Periapical radiographs may suffer from distortion and magnification. The long cone parallel technique eliminates distortion and limits magnification to less than 10 %. It was reported that, digital images have the ability to reveal early to moderate bone loss than did the conventional images.[7]
Conclusion

With telescopic obturator, the insertion and removal is much easier for the patient and thus improves the prognosis of the abutment health under complex partial denture. Telescopic obturator provides guidance, support, retention and protection from dislodgement and it transfers bite forces along the long axis of the abutment teeth than conventional clasping obturator.

Recommendation

Due to small number of cases included in this study, which is the main limitations, the differences between groups in some variables did not reach a statistically significant differences. Thus, further studies are needed with bigger sample size to evaluate conventional clasping and telescopic attachment in maxillary obturator for the treatment of maxillectomy cases.

Conflict of Interest: No

Source of Funding: Self-funding

Ethical Clearance: Every patient in this study had given their informed consent for inclusion before their participation. Which is conducted in accordance with the declaration of Helsinki, it was approved by the Ethics Committee of Minya University.

REFERENCES


Antibacterial Activity of Silver-Nanoparticles Synthesized Using *Trichoderma Harzianum*

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ABSTRACT

Among the various methods used to synthesize nanoparticles is the biological method is best favorable. Fungi supply several advantages in this context. In this study, extracellular synthesis of silver nanoparticles from *Trichoderma harzianum* isolated from soil samples. The aim of this study is the biosynthesis of silver nanoparticles by *Trichoderma harzianum* and evaluating their biomedical action against multidrug resistant bacterium (MDR) of every gram positive & gram negative bacteria (*Enterobacter* spp. & *Acinetobacter* spp.). The characterization can done with the help of XRD, SEM and AFM.

**Keywords:** Biosynthesis Ag-NPs, *Trichoderma harzianum*, Antibacterial activity, Nanotechnology.

Introduction

Nanotechnology is a wide field of science that represents the synthesis, characterization and application of materials¹², and nanoparticles are observed as fundamental building blocks of nanotechnology¹⁵. Microorganisms have been explored as possible biofactories for synthesis of nanoparticles like cadmium, sulphide, gold, and silver⁴,⁵. *T. harzianum* that’s found in all soils. Silver nanoparticles are of interest because of the various properties e.g. size, shape⁶ resistance to antimicrobial agents by pathogenic bacteria has which enabled it incorporated into antimicrobial uses⁶. The size range of silver nanoparticles are 1–100 nm⁶. A fungus produces many of hydrolytic enzymes¹⁰,¹¹. Application of microorganisms is one of the most obvious methods among many bio-methods for nanoparticle production¹²,¹³. Ag-NPs have been extensively used for identification, treatment & drug delivery¹⁴,¹⁵. Physical and chemical methods are more expensive and in actuality toxic to the environment¹⁶. Growth of dependable, nontoxic and green techniques for synthesis of nanoparticles is the most essential to multiply their biomedical uses. One of the choices to achieve this goal is to use microorganisms to synthesize nanoparticles¹⁷,¹⁸. The functions of Ag-NPs as antiviral, antimicrobial, antitumor, and anti-inflammatory agents in which one use of silver ion or metal silver in addition to silver nanoparticles can be exploited in medicine for burn treatment, dental materials, etc.¹⁹. Using microorganisms in the synthesis of nanoparticles emerges as an eco-friendly exciting approach for production of Ag-NPs because of its low toxic, environmental compatibility²⁰.

Materials and Method

**Isolation & identification of fungal isolates:** In this present study, a total of 50 different fungal isolates had been obtained one isolate only *T. harzianum* from soil. The soil sample was collected via the usage of a sterile spatula and by serial dilutions were used for getting pure culture using (PDA) media. The medium was also a mended with antibiotic chloramphenicol (0.25 g/ml) to reduce bacterial contamination after serial dilution the petri dishes are incubated at temperature (28 ± 2 °C) for 5 days. Then the fungus isolates were recognized depending on morphological and microscopical examination by using field microscopy observations of lacto phenol cotton blue stained fungal specimen at 40×.

**Biogenic of silver nanoparticles (Ag-NPs):** Biological methods may be used to synthesize Ag-NPs without
the usage of any harsh, toxic and expensive chemical materials\textsuperscript{21,22}. For the biosynthesis silver nanoparticles only isolated \textit{T.harzianum} become used to synthesis of Ag-NPs through extracellular biosynthesis was grown by adding the fungal disk in a liquid PDB media and incubated at 28 C\textdegree for 5days, the produced fungal was filtrate via using centrifuge and thoroughly washed 2-3 times by using distilled water to remove the residual media part and different particles, then 200 ml of cellular filtrate mixing with 20 ml AgNO\textsubscript{3} solution (1Mm). The consequent solution is incubated in shaking incubator at 150 rpm at 28 C\textdegree for 96 hrs. this step was prepared in dark condition to avoid any photochemical reactions\textsuperscript{23}. After incubation the color alteration, the supernatant was discarded, the pellet collection of nanoparticles were dried in oven at 40\textdegree C. The dried powder was collected cautiously and saved for further examination\textsuperscript{24}.

**Characterization of silver nanoparticles**

**XRD Analysis:** X-ray diffraction was used to characterization of silver nanoparticle. Department of Geology, Faculty of Science/Baghdad University.

**SEM Analysis:** SEM was used to characterization the morphology of nanoparticles in electron microscope unit, Faculty of science/Kufa University.

**AFM Analysis:** Atomic force microscope (AFM) was used to characterization the silver nanoparticle. Department of chemistry Faculty of science/Baghdad University.

**Antibacterial activity of nanoparticles:** The antimicrobial activity of silver nanoparticles were tested against different kinds of pathogenic multidrug resistant bacteria of each gram positive and gram negative, For antibacterial activity agar well-diffusion method was followed, Muller-Hinton Agar (MHA) plates the usage of sterile cotton swabs. Agar wells were punched with sterilized cork borer. The wells were loaded with solution of silver nanoparticles, incubated for 24 hrs. at 37\textdegree C, after the inhibition zones have been measured in millimeter diameter\textsuperscript{25}.

**Results & Discussion**

**Biosynthesis of Silver nanoparticles:** Cell-free filtrate of \textit{T.harzianum} was incubated with silver nitrate, The color of the culture filtrate with silver nitrate modified from yellow to reddish brown after incubated in shaking incubator in 96 hrs., 28\textdegree C at 150 rpm, whereas the control did not exhibit any color alteration as in (fig.1). The advent of a brown color in solution as indicator for biosynthesis of Ag-NPs by the reducing agents including enzymes and proteins, etc.\textsuperscript{26}. The color exhibited through metal nanoparticles is a result of the coherent excitation of complete free electrons within the passage band, leading to (SPR)\textsuperscript{27}.

![Fig. 1: Color of sample A) Crude cell filtrate of \textit{T. harzianum} before immersion of AgNo3 B) after immersion of AgNo3](image1)

**Characterization of Ag-NPs:** Were characterized by using

**SEM analysis of nanoparticles:** SEM is used to decide the shape and size of biogenic nanoparticles, experimental results displayed well- dispersed nanoparticles with diameter of 64-100nm for silver nanoparticles biosynthesized using \textit{T. harzianum} with variable shapes most of them found in spherical shape as in (fig.2)\textsuperscript{28,29}.

![Fig. 2: SEM micrograph of biogenic silver nanoparticles](image2)
XRD analysis of nanoparticles: XRD showed that *T. harzianum* produced silver nanoparticles with average size 16nm (fig.3) the Ag-NPs biosynthesized from *T. harzianum* was 16.73 nm\(^{29}\).

Fig. 3: XRD analysis of biosynthesized nanoparticles size from *T. harzianum*

AFM analysis of nanoparticles: AFM analysis presented the three dimensional form of silver nanoparticle, average diameter was 78.58 % from *T. harzianum* as in fig.4.

Fig. 4: Atomic Force Microscopic analysis of biosynthesized silver nanoparticle from *T. harzianum*

Antibacterial Activity: Results showed that Ag-NPs has the capacity to inhibit the bacterial growth gram positive and Gram-negative bacteria. The inhibition zone was more in gram positive than in gram negative bacteria (table 1) & fig.6.The most important inhibition zone of Ag-NPs in Gram positive bacteria was 26.5 mm with concentration 1mg/ml, while the largest inhibition zone in Gram negative bacteria was 21 mm with same concentration, due to the fact the Gram-positive species containing a large amount of peptidoglycans, monolayer, the content of lipids more less than Gram-negative and have sensitive more to antibiotic from G- which have resistant to antibiotics. When increase the concentration of silver nanoparticles displayed increase in the antibacterial activity \(^{30,31}\). The antimicrobial effect due to the positive charge on the silver ion as its able to attract the negatively charged of microorganisms through the electrostatic interaction. This attraction possibly overcomes other factors, including size and shape, which could influence the bacterial cell death \(^{32,33}\).

Table 1: Inhibition Zones of different pathogenic bacteria by using Ag-NPs synthesized by *T. harzianum*

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Ag-NPs form different concentration</th>
<th>0.1mg/ml</th>
<th>0.5mg/ml</th>
<th>1 mg/ml</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Organism (bacteria)</td>
<td>Zone of inhibition (mm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Enterobacter (G+)</td>
<td>21mm</td>
<td>24.5mm</td>
<td>26.5mm</td>
</tr>
<tr>
<td>2</td>
<td>Acinetobacter (G-)</td>
<td>18.5mm</td>
<td>20.5mm</td>
<td>21mm</td>
</tr>
</tbody>
</table>
Fig. 6: Antibacterial activity showing zone of inhibition activity against pathogenic bacteria. A- Acinetobacter B – Enterobacter

Conclusion

This report conclude that the nanoparticles synthesized from the fungus Trichoderma harzianum has excessive potential as antimicrobial compound in opposition to pathogenic microorganisms studied.

Conflict of Interest: There are no conflict interest.

Source of Funding: The authors declare that they have no competing interests.

Ethical Clearance: All authors are in accordance with the ethical standards of the responsible committee on human experimentation (institution and national) and with the Helsinki Declaration of 1975, as revised in 20

REFERENCES


Incidence of Bacterial Vaginosis and Aerobic Vaginitis before and after Pessary Insertion in Indonesia

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ABSTRACT

Background: Pelvic organ prolapse (POP) is the most common gynecological condition in women and its incidence increases with age. Among all treatments option available, the most commonly used was pessary treatment. However, the use of pessary has several side effects, and the most common one is leucorrhoea due to Bacterial Vaginosis (BV) or Aerobic Vaginitis (AV). This study aims to evaluate the incidence of BV and AV before and after pessary insertion in postmenopausal women with POP in Indonesia.

Method: This study was an observational analytical study conducted at outpatient clinic Department of Obstetric and Gynecology Dr. Soetomo General Hospital on August-October 2016. Subject of this study was postmenopausal women with POP who were about to be treated with pessary. Vaginal secretion samples were taken before pessary insertion and 4 weeks after insertion. Gram staining, microbiology culture, and pH evaluation was done for BV and AV evaluation.

Result: There were a total of 20 patients included in this study. The incidence of BV before and 4 weeks after pessary insertion was significantly higher (0 vs 16, p < 0.05), while the incidence of AV before and 4 weeks after pessary insertion was not significantly higher (1 vs 5, p = 0.29). There was a significant increase in the pH evaluation before and after pessary insertion (6.2 ± 0.62 vs 6.4 ± 0.53, p= 0.008). The most common microorganism found in vaginal swab was Escherichia coli.

Conclusion: BV incidence was significantly increased after pessary insertion in postmenopausal women with POP.

Keywords: Aerobic Vaginitis, Bacterial Vaginosis, Postmenopause, Pelvic organ prolapse, Pessary

Introduction

Pelvic organ prolapse (POP) is the most common gynecological condition in women and its incidence increases with age. It is defined as the descent of uterus and vaginal walls through vaginal canal. Not only causing discomfort, POP is also having a negative impact on quality of life.

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Treatment for POP is offered when the patients develop symptoms attributable to the prolapse that they find bothersome. Until now there are 2 available option for treating POP, which are conservative treatment and surgical treatment. However, surgical treatment is generally reserved when conservative treatment has failed. One of the conservative treatments for POP is the use of pessary. From many types of pessaries, ring pessary have been widely used as conservative therapy for women with pelvic organ prolapse because of its easiness for insertion and removal. Compare to surgical therapy, patients with pessary reported to experience similar improvement in micturition, bowel movements, and quality of life. However, the use of pessary has several side effects, and the most common one is leucorrhoea. A study in postmenopausal women
using pessaries reported a significant increase in vaginal discharge, leukocytes, and parabasal cells which illustrate the presence of vaginal inflammation. The inflammation is caused by either Bacterial Vaginosis (BV) or Aerobic Vaginitis (AV) due to the changes in the vaginal ecosystem.

BV is a clinical condition which is characterized by changes in vaginal ecology that normally contains morphotype *Lactobacilli spp* flora into a mixture of flora, specifically a combination of anaerobic bacteria and *Gardnerella vaginalis*. AV, on the other hand, is a condition where *Lactobacillus* flora is disrupted, followed by signs of inflammation and predominance of aerobic bacteria composed of commensal or pathogenic enteric bacteria.

The composition of *Lactobacillus* in the vagina of each individual is different, and it depends on geographic location, race and ethnicity. In Indonesia, analytic studies examining the effect of the pessary insertion in pelvic organ prolapse patients on the incidence of BV and AV is scarce. Given the geography, race and ethnicity of Indonesian women that are different from other countries, this study aims to analyze the difference of BV and AV incidence before and after pessary insertion in postmenopausal women with POP.

**Material and Method**

This study was an observational study conducted from August to October 2016 at Department of Gynaecology Dr. Soetomo General Hospital Outpatient Clinic, Surabaya, Indonesia. Subject of this study was postmenopausal women with POP who were about to be treated conservatively with pessary. POP were diagnosed according to the Pelvic Organ Prolapse Quantification System (POP–Q). Patients with intrauterine device, underwent hormonal replacement therapy, and had an uncontrolled diabetes mellitus were excluded from this study. Drop-out criteria for this study was patients whose pessary was expelled before four weeks of insertion and those who consumed antibiotics during the first four weeks of pessary insertion.

Vaginal secretion samples were taken before pessary insertion and 4 weeks after insertion. Gram staining, microbiology culture, and pH evaluation was done for BV and AV evaluation. BV was evaluated using Nugent criteria scoring system. Microbiology culture was done in blood agar plate for aerobic organism and MacConkey agar plate for gram-negative aerob organism. Culture was done at the Clinical Microbiology Laboratory Dr. Soetomo General Hospital.

Acquired data was analysed using SPSS version 18.0. Data distribution was analysed using Shappiro-Wilk test. Incidence of BV and AV before and after pessary insertion was analysed using McNemar test. pH evaluation before and after pessary insertion was analysed using paired T-test. The p-value of < 0.05 was considered as statistically significant.

This study follows the principles of the Declaration of Helsinki. This study had received ethical clearance from Dr. Soetomo General Hospital before the study began. All subjects gave their informed consent prior to their inclusion in the study. Information for informed consent was given before subjects signed the informed consent. Details that might disclose the identity of the subjects under study were omitted.

**Results**

There were 26 patients with POP that met the criteria to be involved in this study. During the study period, 6 patients were dropped out from the study because of pessary expulsion and antibiotic use. The average age of the study subject was 63.8 ± 8.2 years. The menopause duration was 14.9 ± 8.5 years. Most of the study subjects were in the POP stage 3. There were 2 patients who had an intercourse during the first 4 week of pessary insertion (table 1).

**Table 1: Characteristics of the Study Subject**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>N= 20 n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (mean ± SD)</td>
<td>63.8 ± 8.2</td>
</tr>
<tr>
<td>Menopause duration (mean ± SD)</td>
<td>14.9 ± 8.5</td>
</tr>
<tr>
<td>BMI (mean ± SD)</td>
<td>25.3 ± 2.39</td>
</tr>
<tr>
<td>Education attainment</td>
<td></td>
</tr>
<tr>
<td>Elementary school</td>
<td>9 (45)</td>
</tr>
<tr>
<td>Middle school</td>
<td>7 (35)</td>
</tr>
<tr>
<td>High school</td>
<td>4 (20)</td>
</tr>
<tr>
<td>Degree of Prolapse</td>
<td></td>
</tr>
<tr>
<td>Stage 2</td>
<td>3 (15)</td>
</tr>
<tr>
<td>Stage 3</td>
<td>17 (85)</td>
</tr>
</tbody>
</table>
Before pessary insertion, no patient had BV and only 1 patient were positive for AV. Four weeks after pessary insertion, 16 patients were positive for BV and 5 patients were positive for AV (table 2). From 16 vaginal swab samples of BV patients, none of the samples had Lactobacillus and Mobiluncus. Six samples had Bacteroides/Gardnerella as many as 5-30/visual field, and 10 samples had more than 30/visual field. No clue cell was found in all samples. The pH value of patients’ vaginal swab specimens before and after pessary insertion was significantly different (6.2 ± 0.62 vs 6.4 ± 0.53, p= 0.008). Microbiological culture of vaginal swab specimens showed that the most common microorganism before and after pessary insertion was Escherichia coli, and the second most common was Staphylococcus coagulase negative (table 3).

**Table 2: Incidence of Bacterial Vaginosis and Aerobic Vaginitis before and 4 weeks after pessary insertion**

<table>
<thead>
<tr>
<th></th>
<th>Pre-pessary insertion</th>
<th>Post-pessary insertion</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bacterial Vaginosis</td>
<td>0</td>
<td>16 (40)</td>
<td>&lt;0.05*</td>
</tr>
<tr>
<td>Aerobic Vaginitis</td>
<td>1 (2,5)</td>
<td>5 (12,5)</td>
<td>0.219#</td>
</tr>
</tbody>
</table>

*p < 0.05 was considered statistically significant
#McNemar test was used

**Table 3: Distribution of microbiological culture from vaginal swab specimens before and 4 weeks after pessary insertion**

<table>
<thead>
<tr>
<th>Isolates</th>
<th>Pre-pessary insertion</th>
<th>Post-pessary insertion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N = 20 n (%)</td>
<td>N = 20 n (%)</td>
</tr>
<tr>
<td>Gemella haemolysan</td>
<td>1 (1,9)</td>
<td>1 (1,9)</td>
</tr>
<tr>
<td>Streptococcus α haemolyticus</td>
<td>2 (3,8)</td>
<td>1 (1,9)</td>
</tr>
<tr>
<td>Corynebacterium spp.</td>
<td>2 (3,8)</td>
<td>1 (1,9)</td>
</tr>
<tr>
<td>Escherichia coli</td>
<td>8 (15,3)</td>
<td>12 (23)</td>
</tr>
<tr>
<td>Proteus mirabilis</td>
<td>1 (1,9)</td>
<td>0</td>
</tr>
<tr>
<td>Staphylococcus haemolyticus</td>
<td>2 (3,8)</td>
<td>1 (1,9)</td>
</tr>
<tr>
<td>Staphylococcus aureus</td>
<td>1 (1,9)</td>
<td>2 (3,8)</td>
</tr>
<tr>
<td>Streptococcus viridans</td>
<td>1 (1,9)</td>
<td>1 (1,9)</td>
</tr>
<tr>
<td>Streptococcus mutans</td>
<td>1 (1,9)</td>
<td>1 (1,9)</td>
</tr>
<tr>
<td>Streptococcus non haemolyticus</td>
<td>1 (1,9)</td>
<td>0</td>
</tr>
<tr>
<td>Pseudomonas spp.</td>
<td>1 (1,9)</td>
<td>0</td>
</tr>
<tr>
<td>Morganella morgani</td>
<td>0</td>
<td>1 (1,9)</td>
</tr>
<tr>
<td>Streptococcus uberis</td>
<td>0</td>
<td>1 (1,9)</td>
</tr>
<tr>
<td>Streptococcus β haemolyticus</td>
<td>0</td>
<td>1 (1,9)</td>
</tr>
<tr>
<td>Staphylococcus coagulase negative</td>
<td>3 (5,7)</td>
<td>4 (7,69)</td>
</tr>
<tr>
<td>Streptococcus agalactiae</td>
<td>1 (1,9)</td>
<td>0</td>
</tr>
</tbody>
</table>

**Discussion**

**Characteristics of Study Subjects:** Subjects of this study were postmenopausal women ranging from 48 to 80 years. Previous study from South Korea found that the prevalence of POP increases with age and reach it peaks on the age of 75 years old 11. Majority of the patients had elementary education, followed by secondary education.
Educational level is known to correlate with individual hygiene and sanitation. A study involving 500 married non-pregnant women revealed a significant association between the incidence of Bacterial Vaginosis and level of education (p <0.025) 12. Another study involving 85 sex workers also revealed that the level of education was significantly related to the incidence of sexually transmitted diseases 13.

Behaviors such as sexual intercourse, smoking and douching also have an effect on the incidence of BV. In this study, all patients did not smoke or douche. There were 2 patients that had sexual intercourse during the study, with a frequency of 1 to 2 times in four weeks. A prospective study involving 1248 women who did not initially suffer BV reported that the incidence of BV was associated with smoking, douching, and not using contraception, with risk factors for non-white BV was associated with smoking, douching, and not initially suffering BV reported that the incidence of BV before and after pessary insertion was statistically significant (p<0.05). A case control study at Mount Sinai Hospital involving 44 women with POP using pessary with a control of 176 women found that pessary insertion significantly increased the incidence of BV (OR 4.37), where the incidence mostly occurred in the first 6 months after the insertion 5.

Incidence of BV before and after pessary insertion: BV is a clinical condition characterized by changes in vaginal ecology, which in normal conditions contains morphotype flora Lactobacilli spp into a mixture of flora combined of anaerobic bacteria and Gardnerella vaginalis. It is defined as an abnormal vaginal ecosystem characterised by a decreased concentration of Lactobacillus and an increased concentration of anaerobic bacteria such as Bacteroides spp., Mobiluncus spp., and Gardnerella vaginalis. There are four bacteria related to BV, including Gardnerella vaginalis, Gram negative anaerobic rod bacteria, Mycoplasma hominis, and Mobiluncus spp 6.

Incidence of BV before and after pessary insertion in this study was statistically significant (p< 0.05). A case control study at Mount Sinai Hospital involving 44 women with POP using pessary with a control of 176 women found that pessary insertion significantly increased the incidence of BV (OR 4.37), where the incidence mostly occurred in the first 6 months after the insertion 5.

BV is evaluated based on Nugent criteria and/or the presence of clue cells 10. In this study, the diagnosis of BV is based on a decrease in the number of Lactobacillus and an increase in Bacteroides/Gardnerella like. In microscopic examination of vaginal swab specimens from patients with positive BV, Lactobacillus morphotype was not found, but Bacteroides/Gardnerella morphotype was found in large quantities. The absence of Lactobacillus in vaginal swabs in this study is most likely because subjects were postmenopausal women, hence the decrease in estrogen resulted in a decrease in the amount of Lactobacillus. This is in accordance with several studies which state that in postmenopausal women, the decrease in estrogen results in a reduced in glycogen metabolism in epithelial cells, which causes a decrease in the amount of Lactobacillus and an increase in vaginal pH 6,15. However, no clue cells were found in all positive BV specimens. We argue that the absence of clue cell formation in this study is likely due to fewer amounts of Gardnerella vaginalis compared to other anaerobic bacteria 16.

In this study, it was found that the average of vaginal pH before pessary insertion was 6.2 ± 0.62 and significantly increased to 6.4 ± 0.53 in 4 weeks after the insertion. An increase in vaginal pH will result in a shift in vaginal flora towards the mixed flora that causes BV and AV 17. In normal condition, the average pH of postmenopausal women is > 5.3 18. According to one of the Amsel’s criteria for the diagnosis of BV, vaginal pH had to be > 4.5 19. Therefore, Amsel’s criteria could not be used to diagnose BV in postmenopausal women.

Incidence of AV before and after pessary insertion: AV is an abnormal condition vaginal ecosystem with reduced concentration of Lactobacillus and increased concentration of aerobes such as Escherichia coli, Staphylococcus aureus, group B Streptococcus and Enterococcus. AV is diagnosed based on an increased leukocyte count of ≥10, decreased Lactobacillus, and the presence of parabasal cells and aerobic bacteria in vaginal swabs 7. In this study, AV is defined as an AV score of ≥3.

Incidence of AV post-pessary insertion was higher compare to pre-pessary insertion. However, the difference was not statistically significant. The result of this study is in accordance with a study involving 100 postmenopausal women, which showed an increase in leukocytes and parabasal cells at 2 weeks, 3 months and 6 months of pessary insertion. Pathological organisms tend to increase after pessary insertion although the increase is not significant.

The most common bacterial isolate in vaginal fluid culture was Escherichia coli. This finding is consistent with a study by Donders et al. which states that the most
common microorganism found in AV is *Escherichia coli*. A study by Hitti et al. reported that *Escherichia coli* was the only microorganism found in the vaginal fluid culture of women with vaginal infections.

**Conclusion**

Incidence of BV in Indonesia increases significantly after pessary insertion in postmenopausal women with POP, while AV incidence did not increase significantly.

**Conflict of Interest:** The authors declare that there is no conflict of interest regarding the publication of this article.

**Source of Funding:** This study was privately funded by the authors.

**REFERENCES**


Mother’s Independence Model within Caring for Low Birth Weight Babies at Home after Hospital Care Based on Mother Factors, Family Support, and Social Support

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¹Doctoral Student, Faculty of Public Health, ²Professor, Faculty of Nursing, Universitas Airlangga; ³Department of Neonatology, Dr. Soetomo Hospital, Surabaya, Indonesia

ABSTRACT

Introduction: Mother, as the primary care provider for the baby, is expected to be able and independent in caring for the baby. Many factors can influence the independence of mothers in treating low birth weight babies. The purpose of this study was to develop a model of maternal independence in caring for low birth weight babies at home.

Method: This study used an explanation survey. The samples were 160 mothers who had low birth weight babies. The samples were obtained through purposive sampling. The data were collected through a questionnaire and analyzed using Partial Least Squares.

Result: The mother’s independence model is formed from maternal and health worker factors. The biggest effect is on the factor of health officers, with a statistical value of $T = 3.061$

Conclusion: Factors of health workers in making visits after mothers and babies go home and the care needed to be considered in increasing the independence of mothers to care for low birth weight babies at home are discussed. Further research is needed in the model of visits of nurses by involving families to improve the ability of mothers to care for low birth weight babies.

Keywords: low birth weight, home care, independence of mother, model.

Introduction

Low birth weight babies are those born with a body weight of fewer than 2,500 grams; the number of low birth weight infants in Indonesia is still quite high. The figure accounts for more than 20 million babies worldwide or 15.5% of all births and 95.6% of them in developing countries. Low birth weight babies have a 20 times higher risk of being likely to die than a normal baby. In the long term, low birth weight babies have been associated with the probability of infection, malnutrition and higher disability conditions during childhood, mental deficiencies, and problems related to behavior and learning during childhood. The number of low birth weight babies births in East Java is 11.2% while Indonesia’s national figure is 10.2%¹,²,³

Low birth weight babies are very susceptible to illness and death, especially in the first month to the third month after birth. Emerging health problems include hypothermia, lack of ability to consume nutrients and infections such as febrile/infection, dehydration, shortness of breath, vomiting, and diarrhea⁴–⁷. The health condition of low birth weight babies after returning home must be maintained properly because health problems are still prone to occur. The survey results in hospitals in Malang, East Java, Indonesia, show, on average, re-hospitalization of low birth weight babies as much as 10% in the first month after leaving the hospital. The mother, as the primary care provider for low birth weight babies, must have ability include knowledge, mental readiness, and skills in carrying out baby care. Research results in Indonesia show that mothers’ knowledge of maintaining a baby’s body temperature and warmth is 75.56% of mothers with insufficient knowledge⁸.

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Mothers who have low birth weight babies often experience obstacles in carrying out their roles both internal and external, including insufficient knowledge, stress, economic problems, and family and social support. Mothers need knowledge/information and care support from the environment from both health and family officers up to the first six months after birth. Family support is very important to improve the ability and confidence of mothers in caring for babies, but family support in the care of low birth weight babies is sometimes less than optimal.

**Method**

**Research Design:** This study used explanatory survey design, which explains the factors that influence the independence of mothers in treating low birth weight babies after they are released from the hospital.

**Respondents:** This study was conducted on mothers who had low birth weight babies and had returned from treatment at a hospital or health center from September to December 2018 in Malang, East Java, Indonesia. This study involved 160 respondents obtained by purposive sampling. The inclusion criteria were mothers who gave birth to low birth weight babies (body weight less than 2,500 grams with a baby aged 0-2 months and infants who did not experience congenital defects).

**Data Collection:** Data were obtained by going to the home of mothers who had LBW based on the data obtained from the local health center. Data collection was done through questionnaires, interviews, and observations. Maternal factors included knowledge, stress, and family support. Mother’s knowledge about LBW care was measured using a modified questionnaire from LBW care consisting of 15 question item.

**Instruments:** The family support variable instrument was compiled based on a measurement questionnaire by Mercer with modifications adjusted to families who had LBW.

Mother’s perception used the Parental Perceptions Questionnaire by Pasquali and Araújo, which was simplified into 15 items of questions for mothers. Each question item used the answer on a five-point scale. The instrument of the ability of mothers to carry out treatment based on LBW care books and health manuals used a 5-point scale.

All instruments were tested for validity and reliability in a pilot study consisting of 15 respondents. Each item in the statement reached validity ($r>0.529$) and each questionnaire also achieved reliability ($>0.8$). The development of the independence model of mothers caring for babies with low weight was carried out through focus group discussions with informants who played a role in establishing a model of maternal independence, namely mothers representing respondents, health workers, and holders of maternal and child health programs. After collecting data, we conducted a Focus Group Discussion with respondents and health workers.

**Data Analysis:** Data were collected and analyzed using Smart PLS.

**Result**

Table 1 shows that all indicators with the number 11 indicators are valid, with an outer loading value $>0.5$. Table 2 shows the results of the model reliability test. The reliability test results can be seen from Cronbach’s Alpha and the Composite Reliability value. Constructs or variables are said to be reliable when the value of the composite variable is $>0.7$ and the value of Cronbach Alpha $>0.6$. All constructs in this study have Cronbach Alpha $>0.7$ with the minimum composite value of 0.922.
Conted…

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4.</td>
<td>Mother’s independence</td>
<td>Y1.1 Hypothermia prevention</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Y1.2 Fulfillment of nutrition</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Y1.3 Prevention of infection</td>
</tr>
</tbody>
</table>

Table 2: The reliability test results for developing a model for the independence of mothers caring for LBW babies at home

<table>
<thead>
<tr>
<th>No.</th>
<th>Variable</th>
<th>Cronbach Alpha</th>
<th>Composite Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Mother factor</td>
<td>0.975</td>
<td>0.984</td>
</tr>
<tr>
<td>2.</td>
<td>Health worker factor</td>
<td>0.996</td>
<td>0.998</td>
</tr>
<tr>
<td>3.</td>
<td>Interactions</td>
<td>0.886</td>
<td>0.994</td>
</tr>
<tr>
<td>4.</td>
<td>Mother’s independence</td>
<td>0.898</td>
<td>0.922</td>
</tr>
</tbody>
</table>

Based on Table 3, it can be seen that there is significant influence between maternal factors (T=2.638), health worker factors (T=3.061), and interaction factors on maternal independence (T=2.222). Maternal factors that have a large influence are maternal knowledge and family support, while health worker factors are strongly influenced by the number of visits.

Table 3: The results of the hypothesis development test model for the independence of mothers caring for LBW babies at home

<table>
<thead>
<tr>
<th>No.</th>
<th>Variable</th>
<th>Path Coefficient</th>
<th>Standard Deviation</th>
<th>T Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Mother factor -&gt; Interaction</td>
<td>0.232</td>
<td>0.088</td>
<td>2.638</td>
</tr>
<tr>
<td>2.</td>
<td>Health worker factor -&gt; Interaction</td>
<td>0.170</td>
<td>0.056</td>
<td>3.061</td>
</tr>
<tr>
<td>3.</td>
<td>Interactions -&gt; Independence</td>
<td>0.166</td>
<td>0.075</td>
<td>2.226</td>
</tr>
</tbody>
</table>

Figure 1: The results of the analysis on the development of a model for the independence of mothers caring for LBW babies at home
Discussion

Maternal factors in the application of independent care in treating LBW are shaped by indicators of knowledge, stress and family support felt by the mother in infant care. Knowledge is the result of knowing, and this happens after the person feels a certain object. Knowledge can also be defined as facts or information that we consider to be correct based on thoughts that involve empirical testings or based on other thought processes such as providing logical reasons or solving problems.

Almost all mothers had mobile communication media that could access the internet or asked neighbors who had given birth or from relatives. Mothers considered that information about baby care is the main requirement of postpartum mothers. There are four postpartum maternal needs, namely: information needs, psychological support needs, need to share experiences and need for practical and material support. Stressful condition of the mother will disrupt the daily activities of the mother, including the task of caring for the baby. Confusion, maternal pressure, and anxiety are signs of prominent psychological disorders when discharged from the hospital. This psychological pressure will be weighted by family environment factors, such as low family income and a large number of family members that are dependent on living costs.

The results of the study show that prevention of infection in LBW has the smallest number in the ability of mothers to prevent infection in the care of their babies, so there should be active efforts by health workers, both in the perinatology treatment room setting and those responsible in the area/village midwives, to actively counsel and assist so that the baby does not have the potential for infection and illness. LBW babies will experience 30% pain after taking care at home. The high birth rate of LBW and premature babies puts a burden on parents and a public health burden because of the impact of morbidity and mortality.

Family support is given by providing maternal needs and trying to prevent the risk of postpartum psychological stress during the postpartum period. In carrying out the role of a mother, a harmonious relationship between husband and mother-baby and with other family members is the most important factor.

Family support increases peoples confidence. Family is a power that is owned by the family to regulate their values, communication patterns and the role of the family as a lifestyle so that families are able to carry out their functions well. Health worker has a higher influence than the maternal factor. The indicator of health workers in this study is the number of visits and healthcare provided.

The visit of community health workers is highly expected and the results are proven to increase the interaction and communication of mothers and health workers so that they are able to effectively solve health problems for babies and infants, especially from the first month to the sixth month. Babies with problems or high-risk babies are vulnerable groups who must get special care and assistance, receiving visits so that mothers are not too stressed and are able to independently care for their babies. The depression rate among nursing home patients is three to four times higher than among community-dwelling older people, and a large overlap of anxiety is found. Therefore, identifying nursing strategies to prevent and decrease anxiety and depression is of great importance for nursing home patients’ well-being. Nurse-patient interaction is described as a fundamental resource for meaning in life, dignity and thriving among nursing home patients. The study employed a cross-sectional design. The data were collected in 2008 and 2009 in 44 different nursing homes from 250 nursing home patients who met the inclusion criteria. DESIGN: A sample of 202 cognitively intact nursing home patients responded to the Nurse-Patient Interaction Scale and the Hospital Anxiety and Depression Scale. A structural equation model of the hypothesised relationships was tested by means of Lisrel 8.8 (Scientific Software International Inc., Lincolnwood, IL, USA). The efforts of infant health services in Indonesia after the baby’s birth, according to the government’s program committee for the maintenance of the health of the first 1,000 days of life, comprised neonatal visits and postpartum maternal visits.

Baby condition monitoring and maternal assistance are also very important to maintain a conducive situation for the care of LBW babies. Good care will minimize the occurrence of LBW health problems, such as the risk of infection, poor nutritional intake and hypothermia problems. Independence in preventing hypothermia and fulfillment of infant nutrition is much better because the direct effects of this behavior can appear as a cold baby and weight loss, while infection prevention behaviors have a lag time for a decrease in endurance, infection, and illness.
Conclusion

The ability of mothers to care for LBW babies independently is very important to prevent babies from getting sick and dying. The most influential factor for the independence of mothers in the first two weeks is health workers. Mothers need guidance on knowledge, motivation and mentoring by health workers to be able to properly care for their LBW babies. This guidance is carried out by visiting the house at certain time intervals. The factor of family support is also important to help mothers carry out their roles and duties.

Ethical Clearance: Ethical clearance was conducted by the Faculty of Public Health ethics team, number 504-KEPK dated September 3, 2018.

Source of Funding: Self-funding

Conflict of Interest: None.

REFERENCES


The Evaluation of My Home My Village Method to Support the Complete Basic Immunization Programme in Surabaya, Indonesia

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ABSTRACT

Introduction: The My Village My Home (MVMH) community-level tool was designed by the Maternal and Child Health Integrated Program (MCHIP) to provide the community and local health functionaries are a visual depiction of the immunization status of all infants born in a village. It ensures that every child receives immunization they need. In Indonesia, MVMH tool is used at the community level (called “Posyandu”). This research objectives is to evaluate My Village My Home (MVMH) method. It supports the Complete Basic Immunization Programme in Surabaya, Indonesia.

Method: This research was an observational study with cohort retrospective design. The exposure population of this research was Public Health Center (PHC) that has received MVMH training on March-April 2018 and the non exposure population of this research was PHC that has not received MVMH training yet. It was determined by using simple random sampling.

Results: 80% of cadres in the group that had received prior training were well-informed and in the group that did not get training 85% had good knowledge of 5% enough, 10% less. Knowledge of mothers in the cadre group who received training was 85% good and in the group of cadres who did not get 75% good training. Both cadres and mothers in the group of cadres who received training and did not receive training had a good attitude.

Conclusion: Most of the cadre with or without training and mothers have good knowledge. They have a good attitude towards the My Village My Home.

Keywords: Evaluation, Immunization, My Village My Home.

Introduction

The incidence of Vaccine Preventable Disease with immunization such as measles in the East Java Province is still relatively high. It includes the number of measles cases suspects cases and positive measles cases¹. The East Java Provincial Health Office data shows that the measles suspect cases were still found from 2012 to 2016 and continues increasingly. The highest measles suspect cases were recorded in 2016, amounting to 3,506 cases, and the lowest cases were recorded in 2012 with 398 cases. Numbers of positive measles cases are increase²⁻³.

Immunization is one of the most cost-effective public health interventions to prevent children from contracting vaccine-preventable diseases. Indonesia launched the Expanded Program for Immunization (EPI) in 1977. However, immunization coverage remains far below the United Nations International Children’s Emergency Fun (UNICEF) and World Health Organization (WHO) target of 80%⁴⁻⁵.
Low vaccination coverage often reflected services that were not easily accessible, uncomfortable, unreliable, or unfriendly officers. It may also be related to a lack of public trust in vaccination services. The level of vaccination coverage in a given community depends on both service factors and the degree to which the public trust in immunization services. Most interventions to raise vaccination coverage focus on improving services or on informing and motivating families.

The My Village My Home (MVMH) community-level tool is designed by the Maternal and Child Health Integrated Program (MCHIP) to provide the community and local health functionaries a visual depiction of the immunization status of all infants born in a village to ensure that every child receives every immunization they need. The MVMH tool designed for use at the community level by field-level workers, such as Auxiliary Nurse Midwives, Accredited Social Health Activists, and the community to efficiently and accurately track children’s immunization status. In Indonesia, MVMH tool used at the community level (called “Posyandu”) by under supervised immunization coordinator cadre at Public Health Center. The community leaders, cadres, volunteers, and health workers are allowed by MVMH to monitor the vaccination status of every young child in participating communities and reminder guiding, and motivational visits.

The MVMH shows information on all children less than 2 years of age in a community under the roof of a house. Each row (from bottom to top), composed of boxes, is indicative of one beneficiary, and each box indicates an antigen that is to be provided to the beneficiary.

The objective research is to evaluate My Village My Home (MVMH) method, and to support the complete Basic Immunization Programme in Surabaya, Indonesia.

**Method**

This research was an observational study with cohort retrospective design. It was conducted in Surabaya, since September to December 2018.

The Public Health Center (PHC) was the exposure population of this research that has received MVMH training from Faculty of Public Health Universitas Airlangga on March-April 2018 and the non-exposure population of this research was Public Health Center that has not received MVMH training yet. The MVMH tool is a large poster-sized record on which every infant in a community has his or her own row, with spaces for the child’s name, date of birth, and dates of each vaccination. Respondents were 60 cadres and 60 mother with children under 2 years in Surabaya. The number of exposure samples used in this research was 10 PHC and non-exposure samples was 40 PHC. It was determined using simple random sampling technique.

The data that had been collected was in form of primary data, that it was obtained from an interview between the cadres and mother of children under 2 years with questionnaires. Before the interview taken, respondents would be given this research explanation, they were asked to sign the informed consent. Prior to the interview, respondents were given an explanation and then asked to sign an informed consent. Then, the data that had been collected were analyzed descriptively and it was presented in the form of narration and tables that illustrated the investigated variables.

**Results**

The result of this research was the socio-demographic characteristics cadre and mother with children under 2 years, descriptive analyze for input, process and output components about My Village My Home in Surabaya.

**Socio-Demographic Characteristics:** The average age of mothers is 32.67 years with a range of 21-54 years, while the average age of Posyandu cadres is 47.58 years with a range of 25-68 years. Age distribution of respondents can be seen in table 1.

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cadre</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-30</td>
<td>2</td>
<td>3.3</td>
</tr>
<tr>
<td>31-40</td>
<td>10</td>
<td>1.7</td>
</tr>
<tr>
<td>41-50</td>
<td>23</td>
<td>38.3</td>
</tr>
<tr>
<td>51-60</td>
<td>19</td>
<td>31.7</td>
</tr>
<tr>
<td>61-70</td>
<td>6</td>
<td>10.0</td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
<td>100.0</td>
</tr>
<tr>
<td>Mother</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-30</td>
<td>27</td>
<td>45.0</td>
</tr>
<tr>
<td>31-40</td>
<td>27</td>
<td>45.0</td>
</tr>
<tr>
<td>41-50</td>
<td>4</td>
<td>6.7</td>
</tr>
<tr>
<td>51-60</td>
<td>2</td>
<td>3.3</td>
</tr>
<tr>
<td>61-70</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 1: Distribution of cadre and mother with children under 2 years based on age in Surabaya, 2018
**Descriptive Analysis for Input Components from the My Village My Home:** The input component for Human Resources described is the knowledge of cadres and mothers about the MVMH. Cadre’s knowledge about MVMH was measured using 8 questions with a choice of right or wrong answers.

**Table 2: Distribution of Knowledge about MVMH in Surabaya, 2018**

<table>
<thead>
<tr>
<th>Level</th>
<th>Exposure Group</th>
<th>Non Exposure Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Cadre:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>16</td>
<td>80.0</td>
</tr>
<tr>
<td>Middle</td>
<td>4</td>
<td>20.0</td>
</tr>
<tr>
<td>Low</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>100.0</td>
</tr>
<tr>
<td>Mother:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Known</td>
<td>18</td>
<td>90.0</td>
</tr>
<tr>
<td>Unknown</td>
<td>2</td>
<td>10.0</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>100.0</td>
</tr>
</tbody>
</table>

The results showed that cadres in both groups mostly had good knowledge about. But there are still less knowledgeable cadres.

Facilities and infrastructure referred to here are MVMH Sheets (seen from the quantity and quality), stationery to fill in the MVMH, board or area to attach to the MVMH. More information is presented in table 3 the following.

**Table 3: Distribution of MVMH media facilities and infrastructure in Surabaya, 2018**

<table>
<thead>
<tr>
<th>MVMH Media</th>
<th>Exposure Group</th>
<th>Non Exposure Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Availability:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>19</td>
<td>100.0</td>
</tr>
<tr>
<td>No</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>19</td>
<td>100.0</td>
</tr>
<tr>
<td>Amount &amp; Quality according to standards</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>17</td>
<td>89.5</td>
</tr>
<tr>
<td>No</td>
<td>2</td>
<td>10.5</td>
</tr>
<tr>
<td>Total</td>
<td>19</td>
<td>100.0</td>
</tr>
<tr>
<td>Availability of space to attach MVMH media</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>19</td>
<td>100.0</td>
</tr>
<tr>
<td>No</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>19</td>
<td>100.0</td>
</tr>
</tbody>
</table>

The results showed that all cadres in the two groups said that the MVMH was available at the Posyandu. The number and quality are in accordance with the standard. Posyandu still exists that does not have an area to attach to the Immunization House during the Posyandu schedule. In this study also identified the availability of the MVMH budget in each Puskesmas that was the location of the study. Most cadres said that the source of the budget came from the Puskesmas and was adequate.

Indeed the procurement of MVMH from the Puskesmas. A cadre who said that there was a budget from community self-help, was intended for stationery to fill in the columns in the MVMH.

**Table 4: Distribution of Budget Availability for MVMH in Surabaya, 2018**

<table>
<thead>
<tr>
<th>Budget</th>
<th>Exposure Group</th>
<th>Non Exposure Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Source</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community</td>
<td>5</td>
<td>25.3</td>
</tr>
<tr>
<td>Government</td>
<td>14</td>
<td>73.7</td>
</tr>
<tr>
<td>Total</td>
<td>19</td>
<td>100.0</td>
</tr>
<tr>
<td>Availability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>18</td>
<td>94.7</td>
</tr>
<tr>
<td>No</td>
<td>1</td>
<td>5.3</td>
</tr>
<tr>
<td>Total</td>
<td>19</td>
<td>100.0</td>
</tr>
</tbody>
</table>

**Descriptive Analysis for Process Components from the My Village My Home:** Data sources for filling in MVMH at the beginning were cohort books, auxiliary books, Health Towards Cards and Baby & Mom’s books as well as reports from the community and house-to-house visits.

**Table 5: Distribution of Data Source for MVMH in Surabaya, 2018**

<table>
<thead>
<tr>
<th>Data Source</th>
<th>Exposure Group</th>
<th>Non Exposure Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Door to door</td>
<td>8</td>
<td>42.1</td>
</tr>
<tr>
<td>Community</td>
<td>4</td>
<td>21.1</td>
</tr>
<tr>
<td>Cohort book</td>
<td>3</td>
<td>15.8</td>
</tr>
<tr>
<td>Help book</td>
<td>6</td>
<td>31.6</td>
</tr>
<tr>
<td>Health Towards Cards</td>
<td>15</td>
<td>78.9</td>
</tr>
<tr>
<td>Baby &amp; Mom’s books</td>
<td>7</td>
<td>36.8</td>
</tr>
</tbody>
</table>
The results showed that most Posyandu cadres in both groups said that filling in the MVMH for infants and children who did immunization at the Posyandu was at the end of every Posyandu activity. Filling the MVMH should be every time a newborn is born and every baby or child is immunized.

In the group of cadres who had received training, most said that monitoring of immunization schedules for immunized infants and children in Posyandu and Puskesmas was close to the Posyandu schedule (68.4%). While in the cadre group who did not receive training, most said that monitoring of immunization schedules for infants and children immunized in Posyandu and puskesmas was during the implementation of Posyandu (57.9%). More information is presented in table 6.

In the group of cadres who had received training, most said that monitoring of immunization schedules for infants and children immunized not at Posyandu was close to the immunization schedule (68.4%). Whereas in the group of cadres who did not receive training, (52.6%) cadres said that monitoring of immunization schedules for immunized infants and children was not in Posyandu, namely during the implementation of Posyandu.

Table 6: The Frequency Distribution Monitoring of Infant and Child Immunization Schedules Immunization at Posyandu and at the Puskesmas in Surabaya, 2018

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Exposure Group</th>
<th>Non Exposure Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(n)</td>
<td>(%)</td>
</tr>
<tr>
<td>Each approaching the Posyandu schedule</td>
<td>2</td>
<td>10.5</td>
</tr>
<tr>
<td>During the implementation of the Posyandu</td>
<td>14</td>
<td>73.7</td>
</tr>
<tr>
<td>Never</td>
<td>1</td>
<td>5.0</td>
</tr>
<tr>
<td>Total</td>
<td>19</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 7: The Frequency Distribution of of Cadre’s Activity to Record Immunization Data from Cohort Book to MVMH in Surabaya, 2018

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Exposure Group</th>
<th>Non Exposure Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(n)</td>
<td>(%)</td>
</tr>
<tr>
<td>Every time a newborn is born and each baby is immunized</td>
<td>9</td>
<td>47.4</td>
</tr>
<tr>
<td>At the end of Posyandu activities</td>
<td>9</td>
<td>47.4</td>
</tr>
<tr>
<td>End of month</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Never</td>
<td>1</td>
<td>5.3</td>
</tr>
<tr>
<td>Total</td>
<td>19</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Discussion

Immunization are important to reduce vaccine-preventable diseases in children, and consistent control of vaccine-preventable diseases depends on fairly high immunization coverage 10).

A person’s behavior is influenced by 3 factors, they are predisposing factors, reinforcing factors, enabling factors. One of the predisposing factors that influence health behavior is knowledge. It is the basic foundation of attitudes and positive action of a person 11). It means that a person good knowledge would showed that attitude good. A person’s knowledge is very influential on the actions they take. Knowledge is the result of knowing something and knowledge occurs after someone senses a particular object. The sensation can be through the senses of sight, hearing, smell, taste, and touch. Most human knowledge is obtained through the ears and eyes12).

Knowledge of cadres and mothers of toddlers about MVMH was measured by 8 questions about the description of the contents of the MVMH, those who played an active role in the MVMH, as well as the goals and benefits of the MVMH. Cadre in heath volunteers, selected by the community, most of active cadres entirely female, although it may be a cadre of men 13). Mostly, training cadres or without training have MVMH good training.

Most of the baduta mothers accompanied with cadres with training have known about the MVMH while for mothers with cadres without training, 50% of mothers
do not know the MVMH. Most of the respondents who knew about the MVMH had sufficient knowledge about MVMH both for mothers with cadre with and without trainings. The 8 questions that were asked to the mother of baduta mostly answered incorrectly, these questions related to the purpose and benefits of the MVMH. One of question, namely “The home of immunization can be used as a means of communication between midwives, cadres, and the community regarding immunization” and “The MVMH provides an illustration of infant immunization status at the posyandu only”. There is a significant difference between mothers and cadres who have received training and mothers with cadres who do not receive training are related to whether or not the MVMH is available.

They inform and motivate about immunization to mothers and fathers during their regular visits as well as in meetings and other community activities. Although rarely needed, they also do home visits to motivate the parents of a child who has fallen behind in his/her immunizations.

The results showed that both cadres and mothers had good knowledge about MVMH because they had to be in every Posyandu while maintaining the existence and sustainability of the MVMH method therefore 3 all under-aged children were immunized in order to improve the Complete Basic Immunization Program in Surabaya.

Conflict of Interest: The authors have no conflicts of interest associated with the material presented in this paper.

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Ethical Clearance: Received from Health Research Ethics Committee, Faculty of Public Health, Universitas Airlangga.

REFERENCES


Safe Concentration of Benzene on Workers at Public Gas Stations around Diponegoro University Semarang, Indonesia

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ABSTRACT

Benzene is a liquid aromatic hydrocarbon compound that is clear, colorless, flammable, and volatile. This study aims to determine safe concentration of benzene at public gas stations workers around Diponegoro University Semarang. This is descriptive, observational, and cross sectional study. A total of 28 workers were then taken as sample. Data was taken in form of primary and secondary data, then analyzed manually through calculation of safe concentration of benzene after determination of weight, body surface of experimental animals, body weight body surface area, breathing rate of workers, benzene concentration, Animal Km, Human Km, highest dose of toxin without causing effect, and reference concentration of benzene for workers.

The measurement of average concentration of benzene in the air showed a value of 0.82 mg/m³ (0.25 ppm). This result is lower than benzene Threshold Limit Value according to Ministry of Manpower Regulation Number 5 of 2018 of 0.5 ppm. In contrast, manual calculation of safe concentration of benzene was 0.01 ppm. In conclusion, average value of benzene concentration is not safe for workers. Efforts to control benzene exposure in work environment are needed to ensure workers health such as use of Personal Protective Equipment in form of half mask respirators with organic vapor cartridges, consumption of CYP2E1 enzymes in beef liver and salmon meat, procurement of Golden Phothos or Boston plants, and inspection and regular monitoring of benzene exposure biomarkers in work environment.

**Keywords:** Benzene, Safe Concentration, Workers

**Introduction**

Benzene is a liquid aromatic hydrocarbon compound that is clear, colorless, flammable and volatile with a smell like gasoline. Benzene is carcinogenic to humans and associated with an increased risk of developing lymphatic and hematopoietic cancers, acute myelogenous leukemia and chronic lymphocytic leukemia(1). According to World Health Organization (2010), narcosis with symptoms of headache, drowsiness, confusion, and loss of consciousness is the effect of acute exposure to benzene(2). The effect of chronic exposure to benzene is cancer.

According to Agency for Toxic Substances and Disease Registry, there is a causal relationship between exposure to benzene in workplace as a major cause of increased leukemia. This is supported by National Cancer Institute and Chinese Academy of Preventive Medicine study conducted on 74,828 workers in China exposed...
to benzene. The risk of leukemia increases at average exposure of 10-24 ppm and cumulative exposure of 40-99 ppm/year\(^5\).

The benzene compound has value of Inhalation Reference Concentration for non carcinogenic effects by 3x10-2 mg/m\(^3\) (0.0086 mg/kg/day) and Cancer Slope Factor for carcinogenic effects by 2.2x10\(^{-6}\)-7.8x10\(^{-6}\) mg/m\(^3\) (0.1-0.34 mg/kg/day) that has been determined by Integrated Risk Information System U.S. Environmental Protection Agency\(^4\). The volume of benzene in oil and gas industry functions as an octane-enhancing solvent for gasoline products is about 1-5\%. Occupational Safety and Health Standards states that exposure limit in working period is 1 ppm\(^6\). American Conference of Government Industrial Hygienists in 2012 recommended exposure to working period of 0.5 ppm\(^7\). In Indonesia, benzene Threshold Limit Value by Ministry of Manpower Regulation Number 5 of 2018 is 0.5 ppm\(^8\).

Semarang has the highest population growth rate in 2010-2017 at 1.72\%, especially Tembalang and Banyumanik sub-districts at 21.03\% and 14.03\%\(^9,10,11\). High number of population have impact on the use of motorized vehicles that reached 48,663 and 17,121 units\(^12\). It influences increase in fuel demand and availability of public gas stations around Diponegoro University.

The Ministry of Mining and Energy Decree Number 1585/K/32/MPE/1999 concerning Marketing Requirements and Domestic Gasoline and Solar Fuel Types states the gradual elimination of lead and substitution with benzene doesn’t reduce the carcinogenic effect because gas stations workers remain directly exposed to these compounds through inhalation, ingestion, and continuous contact with skin\(^13\).

Based on study conducted by Sukaisi (2018), there was an increase in lymphocyte content of public gas stations workers in Medan\(^14\). Content of lymphocyte in leukocytes is around 20-30\%. Leukocyte is the most sensitive cell to benzene exposure\(^15\). If leukocytes increase, leukocytosis will occur and trigger lymphocytosis which can cause enlargement of liver, spleen, and glands that are site of lymphocyte formation\(^16\). Winek et al. (1967) in the Agency for Toxic Substances and Disease Registry (2007) stated that fifteen male workers were exposed to benzene with concentration of >60 ppm, causing 80\% of workers have mucous membrane irritation and 67\% have shortness of breath for 3 weeks\(^3\). Thus, safe limits of benzene concentration need to be known.

Dimas Triyadi (2016) showed the measurement of benzene concentration at public gas stations on the highest value of 2.08 ppm\(^17\). This concentration exceeds benzene Threshold Limit Value. It is concluded to be unsafe that creates risk of causing non-carcinogenic and carcinogenic effects. This is supported by study in Korea that showing exposure to benzene in workplace as cause of increase in hematopoietic disease even though workplace environment had been improved\(^18\).

Based on previous study, no safe concentration has been calculated. This calculation is important to ensure the health of workers. Safe concentration of benzene was calculated by using Reference Concentration formula with No Observed Adverse Effect Level adjusting the research data so as not to cause health problems and carcinogenic effects on workers\(^19\). The author calculates the safe concentration of benzene by using Reference Concentration formula with No Observed Adverse Effect Level as safe limit of benzene concentration in workers of public gas stations.

**Material and Method**

This study aims to determine safe concentration of benzene at public gas stations workers around Diponegoro University Semarang. This type of study was descriptive, observational, and cross sectional. The population was all workers at four public gas stations by 78 people. The sample was calculated using Slovin formula and proportional random sampling, taken by using a purposive sampling technique and inclusion criteria which resulted into 28 people.

The study began by collecting secondary data and primary data obtained through filling out questionnaires, weighing weight, and measuring concentration of benzene in the air directly inhaled by public gas stations workers with personal dust sampler and coconut shell charcoal. The variables were weight, body surface area of experimental animals, body weight, body surface area, breathing rate of workers, benzene concentration, Animal Km, Human Km, highest dose of toxin without effect, reference and safe concentration of benzene for workers. Data analysis was carried out by using quantitative data analysis manually to determine the safe concentration of benzene.
Findings

A. Characteristics and Body Surface Area of Experimental Animals: The experimental animals used was white mice (Rattus norvegicus).

Table 1: Distribution of Characteristics of White Mice

<table>
<thead>
<tr>
<th>Experimental animals</th>
<th>W</th>
<th>BSA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.1405</td>
<td>0.024165</td>
</tr>
<tr>
<td>2</td>
<td>0.1405</td>
<td>0.024165</td>
</tr>
<tr>
<td>3</td>
<td>0.1410</td>
<td>0.024223</td>
</tr>
<tr>
<td>4</td>
<td>0.1410</td>
<td>0.024223</td>
</tr>
<tr>
<td>5</td>
<td>0.1395</td>
<td>0.024050</td>
</tr>
<tr>
<td>6</td>
<td>0.1415</td>
<td>0.024165</td>
</tr>
</tbody>
</table>

The body surface area is calculated by using following formula.

BSA = 0.09 W^{0.67}

B. Characteristics, Body Surface Area, and Workers Respiratory Rate: The characteristics were weight and length of work of workers. The average body weight is 58.57 kg and length of work is 6.5 hours/day. The average height of workers is the average height of Indonesian men 159 cm. The body surface area and respiratory rate of workers can be calculated using following formula.

1. The surface area of the workers body

   \[
   \text{BSA} = \sqrt{\frac{W \cdot h}{3600}} \\
   \text{BSA} = \sqrt{\frac{W \cdot h}{3600}} = \sqrt{\frac{58.57 \cdot 159}{3600}} = 1.6 \text{ m}^2
   \]

2. Workers’ Breathing Rate

   \[
   \text{BR} = \frac{5.3 \ln W - 6.9}{24} \\
   \text{BR} = \frac{5.3 \ln W - 6.9}{24} = \frac{5.3 \ln 58.57 - 6.9}{24} = 0.6 \text{ m}^3/\text{hour}
   \]

Table 2: Distribution of Characteristics, Respiratory Rate, and Duration of Work of Public Gas Stations Workers around Diponegoro University Semarang

<table>
<thead>
<tr>
<th>Number of sample</th>
<th>W (kg)</th>
<th>h (cm)</th>
<th>BSA (m²)</th>
<th>BR (m³/h)</th>
<th>t (h/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>28</td>
<td>58.57</td>
<td>159</td>
<td>1.6</td>
<td>0.6</td>
<td>6.5</td>
</tr>
</tbody>
</table>

The average body surface area and breathing rate of workers are 1.6 m² and 0.6 m³/hour.

C. Benzene Concentration: The average concentration of benzene in the air directly inhaled by public gas stations workers around Diponegoro University Semarang is 0.82 mg/m³. The formula and results of conversion from mg/m³ to ppm are as follows.

\[
C = 24.45 \times C (\text{mg/m}^3) \div \text{molecular weight}
\]

\[
C = 24.45 \times C (\text{mg/m}^3) \div 78.11 = 0.25 \text{ ppm} (< 0.5 \text{ ppm})
\]

The average benzene concentration is lower than benzene Threshold Limit Value. However, the benzene highest concentration reached 2.08 ppm. This exceeds Threshold Limit Value permitted in Ministry of Manpower Regulation Number 5 of 2018 by 5 ppm.

D. Animal Km dan Human Km: Determination of safe dosage of toxin in workers begins with calculation of Animal Km and Human Km.

1. Animal Km

   \[
   \text{Animal Km} = \frac{W \text{ animal}}{\text{BSA animal}}
   \]

   Table 3: Animal Km Calculation Results

<table>
<thead>
<tr>
<th>Experimental animals</th>
<th>W</th>
<th>BSA</th>
<th>Animal Km</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.1405</td>
<td>0.024165</td>
<td>5.814194082</td>
</tr>
<tr>
<td>2</td>
<td>0.1405</td>
<td>0.024165</td>
<td>5.814194082</td>
</tr>
<tr>
<td>3</td>
<td>0.1410</td>
<td>0.024223</td>
<td>5.820914007</td>
</tr>
<tr>
<td>4</td>
<td>0.1410</td>
<td>0.024223</td>
<td>5.820914007</td>
</tr>
<tr>
<td>5</td>
<td>0.1395</td>
<td>0.024050</td>
<td>5.8004158</td>
</tr>
<tr>
<td>6</td>
<td>0.1415</td>
<td>0.024165</td>
<td>5.855576247</td>
</tr>
<tr>
<td>Average</td>
<td>0.1407</td>
<td>0.024165</td>
<td>5.82</td>
</tr>
</tbody>
</table>

The results of Animal Km are shown in table 3 with the average Animal Km in white mice of 5.82.

2. Human Km

   \[
   \text{Human Km} = \frac{W \text{ human}}{\text{BSA human}}
   \]

Table 4: Human Km Calculation Results

<table>
<thead>
<tr>
<th>Number of sample</th>
<th>W (kg)</th>
<th>h (cm)</th>
<th>BSA (m²)</th>
<th>BR (m³/h)</th>
<th>t (h/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>28</td>
<td>58.57</td>
<td>159</td>
<td>1.6</td>
<td>0.6</td>
<td>6.5</td>
</tr>
</tbody>
</table>
Table 4: Human Km Calculation Results

<table>
<thead>
<tr>
<th>Number of sample</th>
<th>W</th>
<th>BSA</th>
<th>Human Km</th>
</tr>
</thead>
<tbody>
<tr>
<td>28</td>
<td>58,57</td>
<td>1,6</td>
<td>36,6</td>
</tr>
</tbody>
</table>

The results of Human Km are shown in table 4 with average Human Km for public gas stations workers around Diponegoro University Semarang of 36.6.

E. No Observed Adverse Effect Level (NOAEL):
To find out the safe limits of concentration, No Observed Adverse Effect Level toxicity test needs to be carried out without causing any effects on experimental animals\(^{20}\). Swaen et al. (2010) stated that No Observed Adverse Effect Level benzene is 3.0 mg/m\(^3\) or 0.022 mg/kg obtained from following formula\(^{21}\).

\[
\text{NOAEL benzene} = 3.0 \text{ mg/m}^3
\]

\[
\text{NOAEL benzene} = \frac{3 \times 0.00013 \times 8}{0.1405} = 0.022 \text{ mg/kg}
\]

F. Inhalation Reference Concentration: In book Industrial Toxicology and Risk Assessment (2013)\(^ {22}\), the safe limits of reference concentration on workers are calculated using formula from Shaw et al. (2007) as follows.

\[
\text{RfC} = \frac{\text{animal Km}}{\text{human Km}}
\]

The benzene Reference Concentration were obtained from No Observed Adverse Effect Level, average Animal Km, and Human Km are as follows.

\[
\text{RfC} = \frac{\text{animal Km}}{\text{human Km}} = \frac{5.82}{36.6} = 0.003 \text{ mg/kg}
\]

G. Safe Concentration of Benzene: In book Industrial Toxicology and Risk Assessment (2013)\(^ {22}\), safe concentration of benzene was calculated using formula used after obtaining Reference Concentration with No Observed Adverse Effect Level, average body weight, length of time worked, and breathing rate of workers as follows.

\[
\text{Safe C (mg/m}^3\) = \frac{(\text{RfC})(W)}{(\delta)(\text{BR})(r)}
\]

\[
\text{Safe C (mg/m}^3\) = \# mg/m\(^3\) \times 24,45 \text{ molecular weight}
\]

\[
\text{Safe C (mg/m}^3\) = \frac{(\text{RfC})(W)}{(\delta)(\text{BR})(r)} = \frac{(0,003)(58,57)}{(50\%)(0.6)(6.5)} = 0.059 \text{ mg/m}^3
\]

\[
\text{Safe C (mg/m}^3\) = \# mg/m\(^3\) \times 24,45 \text{ molecular weight} = \frac{0,059 \times 24,45}{78,11} = 0.01 \text{ ppm}
\]

Safe concentration of benzene at public gas stations workers around Diponegoro University Semarang was 0.059 mg/m\(^3\) (0.01 ppm). These results can be used to compare with benzene Threshold Limit Value permitted by Ministry of Manpower in 2018 and other institutions such as Occupational Safety and Health Standards, American Conference of Government Industrial Hygienists, or National Institute for Occupational Safety and Health then be basis for efforts to control benzene exposure in work environment to be safe for workers.

The average concentration of benzene reached 0.25 ppm and the highest reached 2.08 ppm; exceeding benzene Threshold Limit Value. The safe concentration of benzene was calculated based on Reference Concentration with No Observed Adverse Effect Level. In this study, the value of No Observed Adverse Effect Level benzene using white mice was 0.022 mg/kg. The same result was obtained by Swaen et al. (2010) with 0.022 mg/kg\(^ {21}\). Meanwhile, this result is smaller than Agency for Toxic Substances and Disease Registry (2007) study which states 3 ppm for exposure through inhalation\(^ {3}\). In conclusion, No Observed Adverse Effect Level benzene was safe for workers.

Benzene Reference Concentration obtained from value of No Observed Adverse Effect Level, average Animal Km, and Human Km is 0.003 mg/kg/day. This result is smaller than Integrated Risk Information U.S. Environmental Protection Agency in 2003 which was 0.0085 mg/kg/day\(^ {4}\). This result is also smaller than study conducted by Salim (2012) and Hayat (2013) which were 0.01 and 0.0086 mg/kg/day\(^ {24,25}\).
The safe concentration of benzene was 0.01 ppm. This result is smaller than benzene Threshold Limit Value and limit of benzene exposure set by Occupational Safety and Health Standards and American Conference of Government Industrial Hygienists by 1 ppm and 0.5 ppm\(^{[6,7,8]}\). The safe concentration of benzene in this study can be used as reference to determine the limits of benzene exposure in work environment so that it is safe for workers.

**Conclusion**

The average concentration of benzene in the air directly inhaled by public gas stations workers around Diponegoro University Semarang show a value of 0.25 ppm that it is still lower than 0.5 ppm as benzene Threshold Limit Value. Unlike that, the manually calculated safe concentration of benzene was 0.01 ppm. Thus, the average value of benzene concentration is not safe for workers. In addition, the highest benzene concentration reached 2.08 ppm; exceeding Threshold Limit Value and safe concentration of benzene. Therefore, efforts to control benzene exposure in the work environment are needed to ensure the health of workers.

Efforts to control benzene exposure recommended are the use of Personal Protective Equipment in form of half mask respirators with organic vapor cartridges to minimize inhalation of benzene exposure in the air, consumption of CYP2E1 enzymes in beef liver and salmon meat to reduce the concentration of benzene in the body, procure Golden Phothos or Boston ornamental plants to absorb and reduce the concentration of benzene in the air, and check and monitor benzene exposure biomarkers periodically in work environment to control benzene concentrations in the air\(^{[23]}\).

**Conflict of Interest:** All authors have no conflicts of interest to declare.

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**Ethical Clearance:** The study was approved by the institutional Ethical Board of the Public Health Faculty, Diponegoro University.

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Operations Strategy as a Strategic Reconciliation towards a World Class University in Indonesia

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ABSTRACT

The purpose of this study is to conduct literacy studies on phenomena that are becoming the main focus for universities in the world in an effort to improve the quality of internationally standardized education and get the best ranking in the world. The perspective used in conducting the literature review is to include strategic management theory, especially the concept of developing models or operations strategy frameworks as university strategic reconciliation reaches world class university.

The content of the operations strategy is an interaction between goals and operating performance decisions that pay attention to the translation of the resources they have. The important thing about the content of this operations strategy is an understanding of the importance of the role of operating performance goals and understanding the effect of operating performance goals in determining decisions based on organizational resource capabilities. One of the state universities which is an example in describing an operations strategy model is Universitas Airlangga. The main focus of Universitas Airlangga as one of the leading universities in Indonesia is to improve academic quality over time to reach the world’s top 500 ranking.

The expected theoretical contribution is to be able to complement the strategic management research and operations strategy and business process management in the management of universities in developing a specific framework regarding operating strategies as strategic reconciliation towards world class university. While the expected empirical or practical contribution, namely the uniqueness of the operations strategy framework developed by Universitas Airlangga towards world class university, is able to inspire and be adopted by other universities who wish to improve the quality and achievement of a world-class reputation.

Keywords: operations strategy, world class university, quality improvement, strategic reconciliation, competitiveness

Introduction

World-class universities, which are usually referred to as the most prominent research universities, have a very important role in developing competitiveness in the international knowledge economy. These universities play a key role in generating and disseminating knowledge, educating individuals who are highly skilled in leadership, and serving the needs of the community. In recent years, the development of world-class universities has been prominent in the strategic planning of various countries. Various development strategies at the national and institutional level have been developed and implemented in such a way as to achieve international or global scale quality.

In this context, Shanghai Jiao Tong University has initiated the International Conference for World Class Universities, to bring together university managers and leading researchers from all over the world to
discuss issues related to world-class universities, in the context of increasing the number of countries and higher education institutions that face the challenges of achieving academic excellence. Universities in developing countries seek to improve their ability to improve the performance of their research to achieve and maintain their position and status throughout the world.  

World Class University: World class university sometimes referred to as a global research university is an academic institution dedicated to creating and disseminating knowledge in various disciplines and fields, providing high-quality education at all levels, serving national needs, and advancing international public interest. The main attributes of world-class universities include the availability of qualified faculties, academically gifted students, excellence in research, quality teaching with international standards, high funding levels, and complete facilities. A world-class university is able to attract students who excel in the academic field and the most highly qualified lecturers (researchers and researchers), and also have access to abundant funding sources and offer a diverse (rich) learning and research environment, so that they can respond flexibly and appropriate to the changing demands of the international market.  

In addition to the amount of funds needed, the problem of mentality to make changes is also another important thing. Hayward states that “Change will not take place without the general recognition within the university community that it is necessary. Part of the process of strategic planning is to get people to recognize the need for change”.[4] Altbach suggests that many universities in various parts of the world have claimed to be universities that have reached world class; but the claim, actually does not have enough justification. According to him at least is a university that has fulfilled several relevant characteristics which indicate that it already has the status of a world class university.  

Nowadays economic growth and global competition that continue to increase are in fact influenced by science, which causes universities to play an important role. The rapid progress of science and technology in various aspects of life provides tremendous potential for the development of the country’s economy. In the World Development Report of 1998/1999 from the World Bank it was stated that there are four key strategic dimensions that complement each other in developing an economy based on science: corresponding institutionalization and economics, a strong foundation of human resources, a dynamic information infrastructure, and a system efficient national innovation.  

In this case the tertiary institution plays a central role in these four dimensions, especially in two respects, namely: building a strong foundation of human capital and an efficient national innovation system. universities support the state by building a global competitive economy from the aspect of developing a skilled, productive and flexible workforce and creating, implementing and disseminating new ideas and inventions and technologies.  

The world class university development strategy at the institutional level is directed at strong leadership, a clear vision of the university’s mission, goals and strategic planning clearly articulated in translating its vision into concrete targets and programs. universities that have aspirations to produce something that is better coupled in an objective evaluation/evaluation of their strengths and domains that require improvement, compile the achievements to be achieved, and design and implement plans that have been updated that will lead to improving the performance of universities to be better. But on the contrary, if the university is satisfied with the existing conditions, it is less ambitious to make things better in the future, so the final performance that is displayed is the higher lag of the college with competitors - other universities both at the regional level national, let alone international.  

Operations Strategy: The term operation is often interpreted as part of the organization creating and or delivering products and services. Every good organization engaged in manufacturing and services is certain to carry out the transformation process. Slack and Lewis state the reason for every organization trying to add value to the products and services produced to its customers is to satisfy the needs and demands of consumers for continuous quality improvement. In the transformation process, two important things that must be considered for good management are all types of resources and processes. Resources in this case are what types of raw materials, information, humans, building technology and other things that are right used to achieve organizational goals, while the process is how all these resources are organized to create products and services that consumers want.  

The operations strategy must reflect four perspectives: top-down, bottom-up, market requirements and operations resources.
The four perspectives that underlie the understanding of the formation of operating strategies in the organization to carry out the transformation process and create added value and make the organization have competitive advantages are (1) Top-down perspective where operating strategies should be interpretations or strategies at higher levels (in above) and the term “top down” reflects or gives meaning to what the organization manager wants to do, especially from the top management level; (2) The bottom-up perspective where the operations strategy should learn from day to day experience based on the operational experience of the company’s daily activities and the meaning of bottom up is that all operational improvement activities are carried out cumulatively according to the strategies produced in the top down perspective; (3) Perspective operations resources where operating strategies must build capabilities or operational capabilities based on the resources owned by the company; and (4) The market requirements perspective where the operations strategy must satisfy the company’s market and the company’s perspective on its external conditions and how market demand influences the organization’s operations strategy.

The results of strategic reconciliation between market demand and operating resources can be seen in the dimensions of operating performance in the form of quality, speed, dependence, flexibility and cost. These five dimensions will generally determine the competitive advantage of each organization where the organization can show qualities that exceed other organizations. Determining the exact dimensions of operating performance is strongly influenced by how well the organization understands the market which includes understanding of the needs of its customers, the position of the organization in the market and the activities of its competitors. These dimensions will then be used to determine strategic decisions in various areas or fields.

An operations strategy matrix is a description of the operations strategy as a result of reconciliation between the objectives of the company’s performance and the area of decision making. This emphasizes the iteration between what is needed from the operation function (the relative priority given to each performance goal), and how the operation tries to achieve this through a series of choices made (and capabilities that have been developed) in each decision area. Any operation that claims to have an operations strategy might have some kind of story to tell to each iteration. This should explain exactly how the capacity strategy will affect quality, speed, dependency, flexibility or cost. This should be able to explain exactly how flexibility is influenced by capacity, supply networks, process technology and development decisions and organizations, and so on. In other words, the matrix helps the operations strategy to be comprehensive. Also, it is not possible for all vertices in the matrix to be of the same importance. Some iterations will be more critical than others. Which iterations are critical goals, of course, depend on the company and the nature of its operations, but tend to reflect the relative priorities of the performance goals and regional decisions that influence, or are influenced by, the company’s strategic resources.

Towards World Class University in Indonesia: Several universities in Indonesia are currently competing to carry out various strategic efforts in order to achieve the criteria of world class university, including Universitas Airlangga which is one of the state universities in Indonesia that is targeted to become one of the world-class universities like other universities. One of the state universities which is an example in describing an operations strategy model is Universitas Airlangga. The main focus of Universitas Airlangga as one of the leading universities in Indonesia is to improve academic quality over time. Globalization is not considered an obstacle but as an opportunity to carry out the development of education, research, and various public services. Universitas Airlangga continues to innovate to actualize the integration and collaboration of various disciplines, especially in the fields of health,
In order for Universitas Airlangga to become a world class, Universitas Airlangga must continue to strive to be the best. This has clear implications for the quality of higher education. The difference between universities and their academic excellence depends on maintaining a long-lasting and prolonged level of academic excellence and education. University competitiveness is influenced by the support of those who manage and have an interest in the institution.\[^{[9]}\] The world-class quality expectations that Universitas Airlangga wants to be ranked in the top 500 universities in the world, have not been able to be realized by Universitas Airlangga, where until 2018 Universitas Airlangga is still ranked 700th in the world. Therefore, it is necessary to carry out research that is expected to be able to provide a clear model or strategic framework of operations as Universitas Airlangga’s strategic reconciliation in order to achieve world-class universities (top 500 of the world) so as to enable Universitas Airlangga to face the challenges and problems that are expected. Later able to be adopted by other world-class universities. Some important questions that need to be explored to develop a model or operations strategy framework are how to develop the status of a world-class university; how to face the same problems and challenges experienced by other world-class universities; what is the market demand faced; what is the stiff competition with other universities; what is the availability of operating resources that can be seen from the dimensions of operating performance in the form of quality, speed, dependence, flexibility and cost; and what is the strategic decisions in various fields. Referring to the answers of several participants who are strategic decision makers at Universitas Airlangga, they will be able to describe a model or framework regarding operating strategies as strategic reconciliation towards world class university. The uniqueness of this operations strategy model is expected to be able to inspire later and be adopted by other universities who wish to improve the quality and achievement of a world-class reputation.

**Conclusion**

World-class universities, which are usually referred to as the most prominent research universities, have a very important role in developing competitiveness in the international knowledge economy. These universities play a key role in generating and disseminating knowledge, educating individuals who are highly skilled in leadership, and serving the needs of the community. The main attributes of world-class universities include the availability of qualified faculties, academically gifted students, excellence in research, quality teaching with international standards, high funding levels, and complete facilities.

The content of the operations strategy is an interaction between goals and operating performance decisions that pay attention to the translation of the resources they have. The important thing about the content of this operations strategy is the understanding of the importance of the role of operating performance goals and understanding the influence of operating performance goals in determining decisions based on organizational resource capabilities. Business carried out by the organization. The strengths and weaknesses of resources and business processes are always understood before carrying out these strategic decisions.

One of the state universities as an example in describing an operations strategy model is Universitas Airlangga. The main focus of Universitas Airlangga as one of the leading universities in Indonesia is to improve academic quality over time. Globalization is not considered as an obstacle but as an opportunity to carry out the development of education, research, and various public services. The phenomenon of Universitas Airlangga’s performance problems arises when viewed from the context of ranking on the basis of several indicators assessed on aspects used by the Higher Educations Ministry and applied and treated equally on all universities in Indonesia, both State Universities and Private Universities. The ranking is still in the level of quality competition with all universities in Indonesia. To achieve the target of world-class universities, it is necessary to know the empirical conditions of Universitas Airlangga in the global or international scope. The world-class quality expectations that Universitas Airlangga wants to be ranked in the top 500 universities in the world, have not been able to be realized by Universitas Airlangga, where until 2018...
Universitas Airlangga is still ranked 700th in the world. Therefore, it is necessary to carry out research that is expected to be able to provide a clear model or strategic framework of operations as Universitas Airlangga’s strategic reconciliation in order to achieve world-class universities so as to enable Universitas Airlangga to face the challenges and problems that are expected. later able to be adopted by other world-class universities.

The expected theoretical contribution is to be able to complement the strategic management research and operations strategy and business process management in the management of universities in developing a specific framework regarding operating strategies as strategic reconciliation towards world class university. While the expected empirical or practical contribution that is the uniqueness of the operations strategy framework developed by Universitas Airlangga towards world class university is able to inspire and be adopted by other universities who wish to improve the quality and achievement of a world-class reputation.

**Ethical Clearance:** No need because this article is a literature review

**Source of Funding:** Universitas Airlangga, Indonesia

**Conflict of Interest:** None

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Analysis Factors Related to Coronary Heart Disease Prevention in Families by Adolescents: A Cross-Sectional Study

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ABSTRACT

Introduction: Problems with coronary heart disease (CHD) can be prevented by involving the family. The purpose of this study is to develop an anticipatory persuasive model by adolescents as an effort to prevent CHD by families.

Method: This study using observational analytic study with the cross-sectional approach. The sample was 180 students aged 16-18 years who have families with CHD. The variables of this study were adolescents as a source of messages, dimensions of message strength, family characteristics, persuasive promotion, anticipatory attitudes and prevention of CHD. Data collection used a questionnaire. The analysis used descriptive analysis and testing of structural models were done with Partial Least Square.

Results: The promotion of family persuasiveness, Family characterization factors affects the prevention of CHD through a family anticipatory attitude. influence the prevention of CHD directly. Persuasive promotion does not affect the prevention of CHD if not through anticipatory attitudes. Improved family prevention of CHD is better after more positive anticipatory attitude changes following persuasive promotions. The new discovery of the research is a model of persuasive anticipative promotion by adolescents as an effort to prevent CHD.

Conclusions: The anticipatory attitude of the family is an important factor in preventing CHD by the family following persuasive promotion. The training program, in collaboration with schools, is a way to make adolescents as health cadres for families in the prevention of CHD.

Keywords: Persuasive Promotion, Anticipatory Attitudes, Prevention of Coronary Heart Disease

Introduction

The 2013 Riskesdas¹ data showed that the highest prevalence for cardiovascular disease in Indonesia was coronary heart disease (CHD), which amounted to 1.5%. The most appropriate interventions for CHD are primary prevention or early prevention by eliminating altered CHD risk factors. The community must begin the quality of healthy life with an awareness of the need to change self-behavior for the better by implementing a good lifestyle². Knowledge, attitudes, perceptions, motivations, family support and sources of information are factors that play a role in secondary prevention measures of CHD risk factors³.

Preventive behavior requires knowledge enhancement activities that can be carried out through health promotion. The promotion of sustainable cardiovascular health and disease prevention is very important, and the family is the central entity in this process. The mechanism that contributes to the importance of families for the promotion of cardiovascular health is family system interdependence⁴. Based on this research, it can be explained that health promotion is not only the responsibility of health workers but can also be done by family members, one of whom is a teenager. Adolescents

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can persuade parents by becoming a sharing friend for parents by being an agreeable discussion partner, so as to provide input to parents as long as the delivery is polite and adapted to the capacity that adolescents have. The previous study\(^4\) showed that intergenerational communication and learning by empowering different generations by appreciating their knowledge is very effective in the transfer of knowledge.

Adolescents’ ability to persuade families in internal promotional activities is expected to convince families in anticipating CHD events. Persuasive methods are more effective in improving attitudes. Learning does not have to be from older people\(^5\). Promotion by adolescents with the aim of family members at risk of developing CHD is a form of family support. Family support is one of the factors that greatly influence positive behavior\(^6\). Through a promotion with a persuasive approach by adolescents, it can generate anticipatory attitudes to prevent CHD by the family. Based on this, the purpose of this study is to develop adolescent anticipatory persuasive promotion models for efforts to prevent CHD by the family.

### Method

The study design was observational analytic with the cross-sectional approach. The population of this study was adolescents undertaking high school education in Bangkalan Regency. The total sample of 180 adolescents aged 16-18 years was taken by cluster simple random sampling technique. The variables of this study were adolescents as message sources, message strength dimensions and family characteristics as exogenous variables. Persuasive promotion, anticipatory attitudes, and prevention of CHD were endogenous variables. Data collection was done using a questionnaire. The analysis used descriptive analysis and testing of structural models with Partial Least Square (PLS).

### Results

**Construct Validity Test Results:** The results of the construct validity test to find out a valid indicator in explaining the latent variables are explained in Table 1. It is known that adolescent sex and content dimensions do not significantly measure latent variables.

<table>
<thead>
<tr>
<th>Table 1: Cross Loadings Results of Convergent Validity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Constructs and Indicators</strong></td>
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<tr>
<td>--------------------------------</td>
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<tr>
<td>Adolescent factor as the source of the message</td>
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<td></td>
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<tr>
<td>Message strength dimension</td>
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<td></td>
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<tr>
<td>Family characteristic factors</td>
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<tr>
<td>Persuasive promotion by adolescent</td>
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<td></td>
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<tr>
<td>The anticipatory attitude of the family</td>
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</tr>
</tbody>
</table>
Structural Model Test Results: The results of testing the significance of influence are explained in Table 2 as follows. Table 2 explains that each exogenous variable has a significant effect on endogenous variables (with T values > 1.96) except for persuasive promotion of prevention of CHD by families with a value of T < 1.96, which means there is no influence. Furthermore, the model formed with statistical T-values is explained in Figure 1.

<table>
<thead>
<tr>
<th>No.</th>
<th>Causality Relations</th>
<th>Coefficient</th>
<th>T-statistic</th>
<th>Influence</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(X1) Adolescent factors as message sources (Y1) Persuasive promotion</td>
<td>0.217</td>
<td>3.056</td>
<td>Sig.</td>
</tr>
<tr>
<td>2</td>
<td>(X2) Dimension of message strength (Y1) Promotion of adolescent persuasion</td>
<td>0.233</td>
<td>3.165</td>
<td>Sig.</td>
</tr>
<tr>
<td>3</td>
<td>(X3) Characteristics of families (Y1) Promotion of persuasive adolescents</td>
<td>0.179</td>
<td>2.318</td>
<td>Sig.</td>
</tr>
<tr>
<td>4</td>
<td>(Y1) Adolescents persuasive promotion (Y2) The anticipatory attitude of the family</td>
<td>0.359</td>
<td>6.308</td>
<td>Sig.</td>
</tr>
<tr>
<td>5</td>
<td>(Y1) Promotion of persuasive adolescents (Y3) Prevention of CHD by families</td>
<td>0.035</td>
<td>0.503</td>
<td>Not sig.</td>
</tr>
<tr>
<td>6</td>
<td>(X3) Family characteristics (Y3) Prevention of CHD by the family</td>
<td>0.026</td>
<td>3.550</td>
<td>Sig.</td>
</tr>
<tr>
<td>7</td>
<td>(Y2) The anticipatory attitude of the family (Y3) Prevention of CHD by the family</td>
<td>0.538</td>
<td>9.131</td>
<td>Sig.</td>
</tr>
</tbody>
</table>
Discussion

Adolescent factors as a source of messages have a significant influence on the promotion of persuasion by adolescents in the prevention of CHD. Adolescents are required to have good knowledge and communication skills. Parents are no longer the main source of knowledge for children. Scientific and technological knowledge in the information society has reduced the role of parents as knowledge authorities. Emotional closeness due to family factors is an important factor in communication to convey the desired message. The message delivered must be a message designed to foster attention, able to be understood, clear and in accordance with the family need, provide practical information and the facts and offer recommendations.

The message strength, content and time dimension has a significant influence on the promotion of persuasion by adolescents in the prevention of CHD by families. This is certainly contrary to the principle of communication states that one aspect of communication is the aspect of message content. The message becomes very valuable when the family needs it. Because of the dimension of time, the information has value. The communication process should be a message that meets the rules of relevance. Timeliness (time) of events involves things that have just happened or have just been stated.

The message must be planned well, and according to one’s needs and the message must attract the recipient’s personal interests and needs and generate satisfaction. Persuasive communication theory is known as the Monroe motivational sequence which states that the message of persuasive communication must be well designed so that it has appeal in the eyes of the communicant.

The level of family education contributes to the promotion of persuasive adolescents in the prevention of CHD. Cognitive is also called a perceptual component, which contains beliefs that influence information from others. Culture is a universal experience so there is no exact same culture. Culture is filled and determined by human life itself without realizing it. Family resilience increases if per capita income increases per month and family-owned assets increase. If income is lacking, the tendency for the family to focus is to meet economic needs compared to parenting, communication, the application of educational norms or increased knowledge. Families play an important role in all forms of health promotion and risk reduction. The health promotion model in Pender’s nursing practice explains the family. Service provider groups are important interpersonal sources that influence health promotion behavior.

Persuasive promotion by adolescent influences family anticipatory attitudes in the prevention of CHD. Persuasive promotion variables by adolescents consist of several indicators: ability to build trust, to provide information and to persuade, willingness to remind parents of their responsibility in preventing disease. Health promotion accompanied by motivation by community leaders is more effective in changing attitudes and behavior compared to leaflets.

The effect of persuasive promotion influences anticipatory attitudes. Persuasion is an attempt to change individual attitudes by incorporating ideas, thinking, new opinions and even facts through communicative messages. Promotion is able to increase public anticipation by increasing knowledge and attitudes in preventing disease because of trust in the promoter.

The results show that family characteristics influence the prevention of CHD. The function of healthcare or care (the healthcare function) is to maintain the health condition of family members in order to continue to have high productivity. This function was developed as a family task in the field of health. The continuity of family functions is closely related to its characteristics. Family characteristics that influence the prevention of CHD are education, family type, attitude, a culture of healthy living and income. Different levels of education directly or indirectly affect the mindset, the point of view and acceptance of the client for the treatment actions he has received. There is a positive relationship between education level and disease prevention behavior. Mother education associated with disease prevention.

Family type is the dominant factor influencing the behavior of disease prevention. The attitude of the family is considered as a general predisposition to respond or act positively or negatively to an object or person accompanied by positive or negative emotions. Family-Centered Nursing Theory family support is one of the factors that influence a person’s behavior in making decisions more precisely. Income levels can affect someone in healthcare because someone with a high income can launch healthcare activities.
behavior affects the behavior of other family members in dealing with health problems. Financial support improves the welfare of pregnant women.

Behavior is a function of predisposing factors, namely factors that exist within the individual in which there is an attitude of the individual. Attitude is said to be an evaluative response. Evaluative response means the form of reaction that is expressed as good and bad values, positive-negative, which then crystallizes as a potential reaction to the object of attitude. To improve the ability of families to prevent CHD, it is necessary to change family attitudes about CHD from negative to positive and manifest these in action.

The persuasive promotion model by adolescents influences the prevention of CHD by the family. Persuasive promotion affects family attitudes more anticipatively, which illustrates the family’s response to the importance of preventing CHD. Promotion carried out by adolescents as members of the family makes it easier to deliver messages because of their emotional closeness. The family, groups and healthcare providers are important interpersonal resources that influence, increase or decrease the desire for health promotion behavior.

**Conclusion**

Adolescents as a source of messages are an important factor in efforts to prevent CHD for families, even though the effect is indirect because it has to go through persuasive promotion by adolescents and family anticipatory attitudes in the prevention of CHD. Empowerment of adolescents as family members is quite effective in promoting the prevention of CHD using a persuasive approach.

Adolescents have an important role to play in changing the anticipatory attitudes of families in the prevention of CHD through promotion using a persuasive approach. Anticipatory attitude is the key to improving the family’s ability to prevent CHD. The study identified a model of anticipatory persuasive promotion by adolescents in efforts to prevent CHD by families, composed of the following components: adolescents as the source of the message, message strength dimension, family characteristics, persuasive promotion, family anticipatory attitudes and prevention of CHD by the family. Persuasive promotion by adolescents makes family anticipatory attitudes more positive so as to increase the prevention of CHD by families.

**Ethical Clearance:** This study has received ethical approval from the Health Research Ethics Committee of the Health Ministry of Surabaya, health ministry number 219/S/KEPK/VI/2018.

**Source of Funding:** Self-funding

**Conflict of Interest:** None

**REFERENCES**


Risk Factors of Gonorrhea Infection among Indirect Female Sex Workers (IFSW) in Indonesia 2015

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ABSTRACT

Background: *Chlamydia trachomatis* is the most common cause of curable bacterial sexually transmitted infection (STI) worldwide. Indirect Female sex workers (IFSWs) are the key population to be affected by sexually transmitted infections (STIs). In Indonesia, little is known about Chlamydia infection in most at risk population. This study aimed to know the risk factors of gonorrhea infection among IFSW in Indonesia 2015.

Method: This research uses Cross Sectional study design. This study used secondary data based on the Integrated Biological and Behavioral Survey (IBBS) 2015. The study population was 3,153 IFSWs who registered in the IBBS 2015 in 13 districts and cities Indonesia. The study sample was derived from an eligible population that met the inclusion criteria=813 responden.

Results: The results show the prevalence of gonorrhea among IFSWs was 9.4%. Gonorrhoea infection is associated to Chlamydial infection (OR=4.29 ; 95%CI=3.124–5.891) and age (OR=1.52 ; 95%CI=1.104-2.096).

Conclusion: IFSW who also suffer from chlamydial infection and are <28 years old are more at risk to gonorrhea infection. For this reason, IFSW infected with chlamydia and young people must be treated thoroughly and prioritize safe sex to avoid gonorrhea infection. Gonorrhea infections among IFSW warrant the need to strengthen intervention efforts.

Keywords: gonorrhea, chlamydia, Indirect Female Sex Workers, Integrated Biological and Behavioral Survey

Introduction

Sexually transmitted infections (STIs) are a major public health problem worldwide, affecting quality of life and causing serious morbidity and mortality. STIs have a direct impact on reproductive and child health through infertility, cancers and pregnancy complications, and they have an indirect impact through their role in facilitating sexual transmission of human immunodeficiency virus (HIV) and thus they also have an impact on national and individual economies. More than a million STIs are acquired every day. In 2012, an estimated 357 million new cases of curable STIs (gonorrhoea, chlamydia, syphilis and trichomoniasis) occurred among 15–49 year-olds worldwide, including 78 million cases of gonorrhoea ¹

The prevalence of STIs in FSW in Indonesia has not been systematically observed and is only measured sporadically. In Indonesia, based on research conducted in 9 provinces, prevalence is 28.6%², while based on 2013 STBP data the prevalence of gonorrhea in WPSTL is 17.7%³. Gonorrhea is a bacterial exudative infection caused by Neisseria gonorrhoeae, a fastidious gram-negative bacteria. N. gonorrhoeae was first described by Neisser in 1879, and is a gram-negative, nonmotile, non-spore-forming diplococcus, belonging to the family Neisseriaceae ⁴. Untreated gonorrhea can cause serious and permanent health problems in both women and men. In women, gonorrhoea can spread into the uterus or fallopian tubes and cause pelvic inflammatory disease (PID)⁵. Some epidemiological data have suggested that gonorrhea contributes to increased HIV transmission. (Puspitosari, et al., 2014). More than that, increased resistance to most antibiotics used to treat gonococcal infections has been reported worldwide, raising concerns about the eventual development of untreatable gonococcal infections with serious sexual and reproductive health consequences ¹.
Gonorrhea transmission is related to sexual behavior, such as having multiple sex partners, unsafe sex and and lack of knowledge. Indirect Female Sex Worker (IFSW) are a population at high risk for STIs. In certain geographical areas STIs is transmitted by IFSW which acts as a core group to customers as a bridging population and will then transmit to their partners in the general population. Compared to Direct Female Sex Worker (DFSW) who openly work as sex workers, IFSW generally covers their work as sex workers and this has an impact on supervision and access to health services and which results in the vulnerability of IFSW to STI. Based on the estimation of the key population of HIV in Indonesia in 2016, the number of key population of FSW was 226,791 people and the number of WPS customers was 5,254,065 people.

Sex work is usually classified as “direct” (open, formal) or “indirect” (hidden, clandestine, informal). Direct FSW are typically women who do define themselves as sex workers and earn their living by selling sex. Indirect FSW are women for whom sex work is not the first source of income. They may work as waitresses, hairdressers, tailors, massage girls, street vendors, or beer promotion girls and supplement their income by selling sex on a regular basis or occasionally.

To achieve target of Indonesia free prostitution in 2019, until the end of 2018 the Ministry of Social Affairs and Regional Government has closed 151 of the total 168 prostitution localization in Indonesia and repatriated more than 20.00 Female Sex Work. On the other hand, the closure of localization has resulted in the loss of income from the FSW, since most of them are the backbone of the family, they also have difficulty finding other jobs, because they get the stigma from the community. There are several facts found related to the situation after the closure of places of localization. WPS do not change professions, but only move to new locations such as boarding houses, massage places, streets or graves. Thus in the future it is predicted that the number of IFSW will increase due to the possibility of DFSW turning into IFSW.

Several risk factors and indicators are associated with differing prevalence gonorrhea infections including sex, age, geography, membership in a vulnerable group, high-risk sexual behaviors, and biological and epidemiological factors and recommendations as well as implementation considerations (e.g., population groups, testing and case management. Several previous studies have shown an associated between gonorrhea infection and several factors including: age, marital status, education level, chlamydial infection, consistency of condom use, age at first sexual intercourse, duration of sex work, number of client, use of drugs before sexual intercourse, dan STI information.

The aim of this study was to determine the prevalence of gonorrhea and identify factors associated with gonorrhea infection in Indirect Female sex worker in Indonesia 2015

Materials and Method

The design of this research was cross sectional study by using secondary data sources from the 2015 IBBS. The independent variables in this study were age, marital status, chlamydial infection, vaginal douching, duration of sex work, number of customers, drugs use before sexual intercourse in the last 3 months, and STI information, while the dependent variable is the incidence of gonorrhea infection. The target population in this study were all IFSW in 13 districs dan cities in Indonesia.

The inclusion criteria in this study were IFSW who were 15 years of age or older who had commercial sex with at least one customer in the last month and were at the survey site at the time of the survey team’s visit, while the exclusion criteria in this study namely incomplete or missing data. The minimum samplesizes is 508 respondents, after the exclusion criteria were carried out, the total sample in this study was 1.955 respondents. Statistics data analysis using computer software included univariate, bivariate (chi square) and multivariate (regression logistics prediction factor model)

Results

Table 1: Bivariate Analisis Associations of Dependen Variable with Gonorrhea Infection Among IFSW

<table>
<thead>
<tr>
<th>Variable</th>
<th>Gonorrhea Infection</th>
<th>OR</th>
<th>95%CI</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive</td>
<td>Negative</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (in year)</td>
<td></td>
<td></td>
<td>n = 184</td>
<td>9.4%</td>
</tr>
<tr>
<td>&lt;28</td>
<td>113</td>
<td>828</td>
<td>1.81</td>
<td>1.328-2.474</td>
</tr>
<tr>
<td>≥28</td>
<td>71</td>
<td>943</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on table 1 above, it is known that the prevalence of gonorrhea in IFSW in 13 districts and cities Indonesia is 9.4%. Bivariate analysis was conducted to assess the correlation between independent variables and gonorrhea infection as independent variable. From the results of chi-square test, the correlation among both variables can be examined by looking at the p value and Odd Ratio (OR). If the value of p < 0.05 and OR > 1 or <1, then both variables have a significant correlation. Based on Chi-square test results, there is a significant correlation between age (p value= 0.000 ; OR=1.81 ; 95%CI=1.328-2.474), marital status (p value= 0.001 ; OR=1.71 ; 95%CI=1.244-2.359), chlamydial infection (p value=0.000 ; OR=4.49 ; 95%CI=3.280-6.148), duration of sex work (p=0.022). Whereas the variables that did not have a significant relationship with the incidence of gonorrhea (p> 0.005 ; OR=0.69 ; 95%CI=0.512-0.941).

Bivariate analysis is also used for variable selection that enters to multivariate analysis. variables that have p value <0.25 are included in multivariate analysis. As for the variables entered into multivariate analysis were : age, marital status, chlamydial infection, condom consistency, vaginal rinse, length of work, and STI information. Then multivariate analysis was carried out using logistic regression with the backward analysis.
method, then eliminating one by one variables that were not significant (p value <0.05) until the final model was obtained. The final model in this study can be seen in table 3 below:

Table 2: Final Model of Risk Factors for Gonorrhoea Infection

<table>
<thead>
<tr>
<th>Variabel Independen</th>
<th>P value</th>
<th>OR</th>
<th>CI 95%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>0.010</td>
<td>1.52</td>
<td>1.104–2.096</td>
</tr>
<tr>
<td>Chlamydial Infection</td>
<td>0.000</td>
<td>4.29</td>
<td>3.124–5.891</td>
</tr>
</tbody>
</table>

From the final result of multivariate analysis using logistic regression by removing one by one the variable with p>0.05, it is known the variables that having correlation with gonorrhoea infection in Indonesia are age (p value=0.010 ; OR=1.52 ; 95%CI=1.104-2.096) and chlamydial infection (p value=0.010 ; OR=4.29 ; 95%CI=3.124-5.891). Chlamydial infection variable is the most significant factor since it has the largest OR value.

Discussions

Based on the results of the study, it is found that gonorrhoea prevalence among IFSW in Indonesia is 9.4%. Multivariate analysis showed a significant predictor of gonorrhoea infection in IFSW are age and chlamydial infection. IFSW <28 years old had a risk of 1.53 times for gonorrhoea infection compared to those aged ≥ 28 years. IFSW with chlamydial infection were 4.29 times at risk of gonorrhoea compared to those who did not suffer from chlamydial infection. The results of statistical tests it is known that the age variable has a relationship with the incidence of gonorrhoea in the IFSW, the results of this study are in line with the research conducted by Afriani on Female Sex Workers in 16 City and Districts in Indonesia in 2011, where IFSW aged <29 years had a risk of 1.53 times being infected with gonorrhoea compared to those aged ≥ 29 years (OR: 1.53; 95% CI: 1.30-1.79)11.

Young people are a critical target group for sexually transmitted infections (STI) surveillance due to their particular behavioural and social related vulnerability. Gonorrhoea is the most common sexually transmitted infection in young people ages 15-24 years5. One explanation for the observed age disparity in STI is immature reproductive and immune systems in younger adolescents19. Young age is related to changes in sexual hormones for the maturity of sexual organs, sexual hormones can increase sexual drive so that it affects sexual behavior at a young age. Young IFSWs are susceptible to gonorrhoea because they are more sexually active and usually the younger IFSWs are more attractive so that they get more buffets, this is related to the higher number of sex partners which is a risk factor for gonorrhoea.

Based on the results of the study, chlamydial infection variable is the most significant factor for gonorrhoea infection among IFSW in Indonesia. Similar results were reported in other studies conducted among FSWs Yangzhou and Changzhou, China, was known that female sex workers who suffer from chlamydia are a risk factor for gonorrhoea infection (p value=0.01 ; OR=1.99 ; 95%CI=1.43–2.79)15. Sexual transmission is the primary route of gonorrhoea infection and chlamydial infection, As all these infections share the similar mechanisms of transmission, infection by one organism offers more potential opportunities for others. Chlamydia trachomatis is an obligate intracellular parasite, this parasite causes infection in columnar epithelium. Symptoms that arise are caused by inflammation in endocervical gland, which produces mucopurulent or endoservical secretions. If infected, endocervical tissue will usually swollen and reddish17. The presence of inflammation in the reproductive tract is the entry point for other sexually transmitted infections, including being the entry point for neisseria gonorrhoea bacteria.

Conclusion

Gonorrhoea is the second most common bacterial STI after chlamydia and results in substantial morbidity and economic cost. Because and gonorrhoea and chlamydia are usually asymptomatic, screening is necessary to identify most infections. Screening of all sexually active women younger than 28 years old and women with risk factors such as multiple partners. STI screening and treatment in high-risk groups is a form of intervention to prevent further complications and spread of the diseases. Screening and treatment of chlamydial and gonorrhoea infections in female sex workers aims to prevent complications, spread the disease further and co-infection, especially at the young IFSW.

Limitation of Study: This study used a cross sectional study design so that there was no clear temporal time relationship. In addition, not all variables were examined so that they were still unable to explain thoroughly about other risk factors related to the association of chlamydia infection among IFSW. Bias information that might occur in this study are questions that explore information that has long happened (retrospective)
Acknowledgement

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Conflict of Interest: The authors declare that they have no conflict of interest.

Ethical Clearance: The formal permission was also obtained from Sub Directorate HIV/AIDS and PIMS, Ministry of Health of Indonesia

Source of Funding: Self funding.

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Occupational Stress Due to Additional Tasks of Procurement of Goods and Services in Provincial Health Office, East Java, Indonesia

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ABSTRACT

Hospitals under the coordination of the Provincial Health Office do not have particular employees to manage the procurement of goods and services so that the task charged to the existing employee as an additional task. Among them, 56.25% were health workers, and 43.75% were non-health workers. Preliminary studies show that 100% of procurement officials in the Technical Implementation Unit (well known in Bahasa as Unit Pelaksana Teknis, UPT), Health Office, experience job stress and it potentially continuously occurred, specifically in the UPT of East Java Provincial Health Office as the locus of this research, if it not adequately controlled. Therefore, this study aims to understand and explore the sources of work stress on employees who concurrently become procurement officials in hospitals at the East Java Provincial Health Office. This study uses qualitative-approach and the data analyzed using content analysis. The study was held during April and May 2019 by collecting data from six people who met the inclusion criteria through in-depth interviews to understand the job stressors experienced by procurement officials. Job stress on procurement officials originates from workloads, role conflicts, unfit person jobs, stagnation of roles, and interpersonal demands. Furthermore, findings of the sources of work stress on procurement officials, can be considered as a strategy for organizational approaches.

Keywords: job fit, job stress, role conflict, role stagnation, work-related stress, workload.

Introduction

Nine hospitals under the supervision of the East Java Provincial Health Office did not have officials to procure goods and services. Consequently, procurement tasks charged as additional tasks to employees of each hospital. This additional task must be completed together with their primary task. Among them, 56.25% are health workers, and 43.75% are non-health workers.

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Preliminary study conducted by measuring the stress level of the work of procurement officials in the UPT of the East Java Provincial Health Office. The results of the preliminary study show that 100% of procurement officials at the Health Office UPT experience job stress with variations in stress levels: very low (8.34%), low (41.66%), moderate (41.66%) and high (8.34%).

Research on work stress on employees is essential to understand the sources of work stress. By understanding the sources of work stress, organizations can precisely determine stress control strategies. Thus, this study aims to explore and understand the sources of work stress on employees who concurrently become procurement officials in hospitals at the East Java Provincial Health Office. The findings in this study will make hospitals begin to consider the prevention of stress with an organizational approach rather than just individual oriented by increasing stress coping skills.
Method

Research Design: This research is a descriptive study with a qualitative approach because they can produce descriptions of phenomena of additional assignments experienced by hospital employees will be a concern in this study. The qualitative approach in this study aims to explore the source of stress felt by employees.

Sample: This research involved 6 individuals who experienced the phenomenon of additional duties as procurement officials at least 1 (one) year. The informants of this study were considered to represent 9 (nine) hospitals in terms of the size of the budget and the specialization of the hospital.

Data Collection: The data collected through in-depth interviews using semi-structured interview guidelines (Table 1). Before the interview, informants asked for their willingness to sign an informed consent form. Open questions are used to allow participants to express their detailed experiences and perceptions. Informants were asked to disclose and explain their experiences and perceptions of work stress and asked further questions related to the answers given by them. The duration of each interview varies from 30 to 60 minutes until no new information identified.

Table 1: Interview Guideline

<table>
<thead>
<tr>
<th>No.</th>
<th>Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>How far do you feel stressed in your work?</td>
</tr>
<tr>
<td>2.</td>
<td>What are the main causes of stress in your work environment?</td>
</tr>
<tr>
<td>3.</td>
<td>Please give me an example of a work situation that really stresses you out?</td>
</tr>
<tr>
<td>4.</td>
<td>Can you give me a comment on your experience in carrying out goods and services procurement, if you consider it a source of work stress?</td>
</tr>
</tbody>
</table>

Location and Duration of Research: The research was conducted at the hospital under the coordination of the East Java Provincial Health Office, from April to May 2019.

Data Analysis: The analysis step refers to Miles et al.² including data reduction, data display, and conclusion drawing. Data reduced by making a summary by choosing the main things, focusing on important things, looking for themes and patterns, and discarding what is considered unnecessary. The presentation of data is done using narration and directed so that the reduction data can be organized, arranged in a relationship pattern so that it is easy to understand, can be concluded to achieve the research objectives.

Results

From the results of in-depth interviews with procurement officials, several causes of stress can be identified, including workload, role conflict, unfit person jobs, role stagnation, and interpersonal demands.

Workload: The majority of procurement officials feel a high workload due to multiple positions held. One of the informants (A4) completed an additional and the main task at home to pursue a monthly deadline. Another informant (A6) claimed that additional work as procurement was very time-consuming, even though they also had to fulfill their primary duties in serving patients. Following are interview quotes that support:

“My main task is to serve patients. This procurement seems to be time-consuming. I have to meet the provider; eventually, the patient could be neglected.” (A6).

The workload feels increasingly heavy with the deadlines set. One informant (A4) claimed to be hunted to complete procurement tasks because of deadlines every month. If he does not meet the deadline, it will disrupt the service in the hospital. Following are interview quotes that support:

“Yes, I am hunted for deadlines every month. If I do not finish the job this month, I cannot order items for the following month.” (A4)

The workload of procurement officials is increasingly heavy with the variety of variants for each type of item purchased. The workload of procurement officials felt to be very high, as perceived by the informants as follows:

“My task is that all procurement starting from fuel, consumption, maintenance, medical devices, medicines, reagents.” (A3).

Some procurement officials feel a high workload because they do not have a staff who can help documenting all procurement activities. The following are excerpts of interviews that support:

“The workload that burdens me is typing procurement documents. I do not have the staff. That is why I feel that my time is being consumed a lot.” (A6).
Role Conflict: All informants stated that the procurement tasks took up almost all of their daily time compared to their primary tasks. The majority of them have difficulty dividing roles because they are required to carry out their primary duties, and it ultimately makes their workload more difficult because the main task cannot be abandoned.

Procurement work is work that cannot be postponed. If postponed, it will have an impact on the continuation of services in their agencies. Thus, the majority of them carry out procurement tasks every day, not their primary task. The following are the results of interviews that support:

“Every day I have to deal with the procurement process. Moreover, even then, I must always be in contact with drug partners. After that, I have to ask one by one in the budget section. Because they are interrelated.” (A5)

In their assessment of employee performance, procurement tasks are not listed in the main element, so that time-consuming work is not included in the performance assessment. They stated it impacted the acquisition of their remuneration benefits. The following are the results of interviews that support:

“Additional tasks are more time-consuming than the main task. So that it affects the remuneration.” (A5).

Person-Job Unfit: Procurement officials feel incompetent in carrying out procurement tasks because they did not have a health education background. It makes always anxious when there is an audit by the auditor regarding the specifications of the goods. The following are the results of interviews that support:

“Actually, I was unable to procure and could not enjoy work. Therefore I was afraid when an auditor arrived. I was faced with an auditor for two weeks.” (A3)

The failure factor of job fit ultimately made the majority of procurement officials intend to resign from procurement officials. Some of them have expressed their wishes to their leaders.

Role Stagnation: One informant (A3) claimed that he had been in the procurement office for six years and did not know when they would be replaced. For those who have become health workers such as (A4), he wants to immediately focus on pursuing their profession and feels that he is not developing if he continues to work in procurement. The following are excerpts of interviews that support:

“It has been three years, I want to get out of procurement but I cannot. Then I have never learned about my profession” (A4)

On average, those who are current procurement officials are already involved in the structure of the previous procurement manager. As previously stated (A4), they tried to get out of the procurement manager but could not. The following interview supports:

“I have been a procurement officer for six years. There has never been rolling. Replace once a year.” (A3)

Interpersonal Demands: Stress is experienced because the relationship with co-workers occurs in the majority of procurement officials at the UPT Dinkes. Procurement officials have tried to explain the dual conditions of their positions, but procurement officials feel uncomfortable with other staff. As they feel the following:

“So sometimes I also clash with friends in the pharmacy. Even though the leadership has said that I am if I hold a position.” (A4)

Discussion

The management of the procurement of goods and services puts hospital staff into procurement officials with various stressors namely workload, role conflict, person job unfit, stagnation of roles, and interpersonal demands.

Job stress felt by procurement officials is influenced by the high workload in the procurement of goods and services. Quick et al.³ conclude that overloading work, time pressure, and changing tasks or activities is one of the most significant sources of work stress for people in many jobs and organizations. The high workload experienced by procurement officials is due to many things, among others: multiple positions held, deadlines for completion of work, types of procurement of goods and services that are very diverse and absence of procurement staff or assistants. Ilies et al.⁴ mentioned that the single most consistent factor associated with stress in the workplace is the amount of work, followed by the shadowing deadline. Incompatibility between the number of employees’ needs and the number of jobs will increase the workload of employees because employees are forced to do multiple jobs so that they have the potential to cause stress⁵.
Procurement tasks prevent them from carrying out their primary tasks in a focused and maximal manner so that many jobs were neglected and they had not finished. This condition corresponds to a study that showed that work stress not only harms individuals but also harms the organization.\(^6\)\(^7\)

The role conflict affects the occurrence of stress on officials of the procurement of goods and services. These results correspond to the conclusions of Jin et al.,\(^8\) stating that role conflict could increase work stress among Chinese correctional staff. Previous research shows that role stress reduction is associated with reduced overall job stress, and that work stress decreases, in turn, can be associated with higher job satisfaction.\(^9\)

In addition to workload and role conflict, the person-job factor is unfit to influence work stress events in procurement officials. Person-job fit can be explained as employee perceptions of how well they fit or match their job position in terms of knowledge, skills and abilities to successfully perform the tasks expected of them.\(^10\)\(^11\)\(^12\) Deniz et al.,\(^13\) revealed that paying attention to person-job fit and adjusting employees to organizations is an essential factor in reducing work stress. Procurement officials claim they do not understand the specifications of medical goods and services because they have no medical education background, which makes them always anxious when there is an audit by the auditor regarding the specifications of the goods. The gap between employment and educational background is stressful since inappropriate educational backgrounds can also lead to work stress.\(^14\)

The majority of procurement officials claimed to intend to leave the procurement management structure at their UPT. These results are in line with Kristof’s conclusion that person-job fit also influences job satisfaction and in turn, the commitment and intention of employees to leave their jobs. A research\(^12\) confirms that the person-job fit has the most significant impact on employee turnover intentions.

Stagnation of roles also affects the incidence of stress on procurement officials. Pareek\(^14\) identifies the stagnation of roles as one of the conditions responsible for work stress. Pareek\(^15\) defines role stagnation as the feeling of being “trapped” in the same role as is the recognition of most procurement officials that they have tried to get out of the procurement tasks but cannot.

The stagnation of the role experienced is feared to have a negative impact in the future. Srivastava\(^16\), in his study, revealed that stress arising from role ambiguity and role stagnation is the most correlated with anxiety.

Interpersonal demands from coworkers also influence job stress events for procurement officials. Procurement officials experience stress because they are often required to carry out their primary tasks. These demands relate to the dual role experienced by procurement officials. This condition is in line with the statement of Quick et al., \(^3\) that stress due to interpersonal demands is somewhat broader and more personal than stress due to the demands of the role.

**Limitation:** This qualitative research has limitation. The limitation is the sample size representing a small number of procurement officials in Indonesia. So that the findings of this research could limit the generalization to other regions. Therefore, the results of this study must be interpreted with caution when applying them to procurement officials in other regions of Indonesia.

**Conclusion**

The findings of this study clarify that procurement officials have experienced work stress and need more attention from the supervisor and works stress prevention strategies required with an organizational approach. Recruitment or assignment of functional employees who specifically handle the procurement is an urgent matter to eliminate role conflict and role stagnation. The formation of a management team for the procurement in hospitals is expected to reduce workload. Technical competency training for procurement official can reduce the person job unfit. Understanding of the stressors faced by procurement officials in hospitals makes us think of developing strategies that are not only focused on increasing stress-coping skills on individuals but rather a more preventive organizational strategy.

**Acknowledgement**

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**Conflict of Interest:** The author states that there is no conflict of interest regarding the publication of this article.
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Ethical Clearance: Ethical clearance taken from Universitas Airlangga, Faculty of Dental Medicine, Health Research Ethical Clearance Commission with letter number 118/HRECC.FODM/IV/2019.

REFERENCE


Healthy Reflection of Behavior Modification Strategies on Snatch Lift Technical Performance for Students of the College of Physical Education and Sports Sciences

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ABSTRACT

The strategy adopted by the subject teacher in the development of the skilled performance level of the students in the effectiveness of weightlifting (snatch). Behavioral modification strategies have positively contributed to post-tests in developing the skill performance level of weightlifting (snatch). The strategy of controlling the troublemaker has helped educating the students better than other strategies.

Keywords: Healthy Reflection, Behavior, Snatch Lift

Introduction

The diversity in the application of teaching strategies in the field of physical education to learn lessons and receive information through modern strategies that would provide the teachers with the opportunity to know the capabilities, abilities, tendencies and desires of the learners. Further, such modern strategies that would motivate the learner to gain expertise and knowledge are better than using response-based teaching strategies that are limited in achieving the outputs of the educational process[1].

Research Problem

The aim is to develop an educational curriculum that includes modern information received by the student through using an educational booklet and special pictures of the snatch lift technical performance.

Objectives of the Research

To identify a number of behavior modification strategies (Reinforcement - Punishment - Exclusion - Formation - Control of the troublemaker) and its impact on the cognitive acquisition.

Recognition of the effect of some behavior modification strategies (Reinforcement - Punishment - Exclusion - Formation - Control of the troublemaker) in the snatch lift technical performance of students in the first grade in the College of Physical Education and Sports Sciences at Al-Qadisiyah University.

Methodology

The researcher has adopted the experimental approach through designing compatibility groups.

Material and Method

The current research sample consisted of (160) students of the construction and technicians sample from the students of the College of Physical Education and Sports Sciences at Al-Qadisiyah University.

To determine the types of behavior modification strategies, the researcher, through the agreement with the supervisor and the committee to approve the subject, decided on the selection of behavior modification strategies, which are (Reinforcement – Punishment – Exclusion – Formation – Control of the troublemaker). The researcher has initially prepared the measurement phrases, which were (90) phrases divided into two positive and negative parts.
Chi-squared test was used to identify the valid phrases. The results showed the validity of seventy-nine (79) phrases to represent the types to which they belong.

Table 1: The discriminatory ability of the Behavior Modification Strategies Scale (Punishment)

<table>
<thead>
<tr>
<th>Sr.</th>
<th>Phrases</th>
<th>Supreme Group</th>
<th>Lower Group</th>
<th>F-calculated</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>S</td>
<td>P</td>
<td>S</td>
<td>P</td>
</tr>
<tr>
<td>1.</td>
<td>I do not care about the teacher rebuking of me when I commit undesired behavior.</td>
<td>1.867</td>
<td>0.900</td>
<td>2.167</td>
<td>1.487</td>
</tr>
<tr>
<td>2.</td>
<td>I feel pain when the teacher rebukes me when I commit undesired behavior.</td>
<td>4.800</td>
<td>0.551</td>
<td>4.033</td>
<td>1.497</td>
</tr>
<tr>
<td>3.</td>
<td>It is difficult to focus my attention when making some mistakes during the lecture for undesired behavior</td>
<td>4.267</td>
<td>0.691</td>
<td>2.667</td>
<td>0.711</td>
</tr>
<tr>
<td>4.</td>
<td>I am not afraid of being punished during the lecture</td>
<td>3.000</td>
<td>1.576</td>
<td>2.033</td>
<td>1.129</td>
</tr>
<tr>
<td>5.</td>
<td>After the lecture, I feel that I was at the best level.</td>
<td>4.467</td>
<td>0.730</td>
<td>3.633</td>
<td>1.066</td>
</tr>
<tr>
<td>6.</td>
<td>I cannot remember what happened in the lecture after its end.</td>
<td>2.667</td>
<td>1.322</td>
<td>2.433</td>
<td>1.251</td>
</tr>
<tr>
<td>7.</td>
<td>When the teacher or one of my colleagues criticizes me during the lecture, I find it difficult to concentrate</td>
<td>3.933</td>
<td>1.258</td>
<td>2.900</td>
<td>1.423</td>
</tr>
<tr>
<td>8.</td>
<td>I do not give up easily when the situation worsens during the lecture</td>
<td>4.333</td>
<td>0.802</td>
<td>3.867</td>
<td>1.167</td>
</tr>
<tr>
<td>9.</td>
<td>When things get worse in the lecture, I fight as hard as I can</td>
<td>4.400</td>
<td>0.894</td>
<td>3.500</td>
<td>1.280</td>
</tr>
<tr>
<td>10.</td>
<td>I try to avoid contact with the teacher for fear of punishing me</td>
<td>4.600</td>
<td>0.814</td>
<td>3.000</td>
<td>1.619</td>
</tr>
<tr>
<td>11.</td>
<td>I am very saddened when I punished in front of my colleagues</td>
<td>4.733</td>
<td>0.785</td>
<td>3.733</td>
<td>1.363</td>
</tr>
<tr>
<td>12.</td>
<td>If the teacher uses the method of punishment with me, I try to avoid him</td>
<td>4.867</td>
<td>0.346</td>
<td>3.433</td>
<td>1.331</td>
</tr>
<tr>
<td>13.</td>
<td>I do not act violently with my colleagues during the lecture for fear of being punished.</td>
<td>4.800</td>
<td>0.551</td>
<td>3.167</td>
<td>1.392</td>
</tr>
<tr>
<td>14.</td>
<td>I love to be committed to my duty during the lecture for fear of being punished.</td>
<td>4.800</td>
<td>0.407</td>
<td>3.733</td>
<td>1.484</td>
</tr>
<tr>
<td>15.</td>
<td>I find it difficult to talk to the teacher</td>
<td>3.800</td>
<td>1.126</td>
<td>1.800</td>
<td>0.887</td>
</tr>
<tr>
<td>16.</td>
<td>I insult my colleagues a lot which leads to my punishment</td>
<td>2.200</td>
<td>1.669</td>
<td>1.533</td>
<td>0.900</td>
</tr>
<tr>
<td>17.</td>
<td>I think there is a reason for being punished in the lecture</td>
<td>3.667</td>
<td>1.516</td>
<td>2.667</td>
<td>1.061</td>
</tr>
</tbody>
</table>
### Table 2: The discriminatory ability of the Behavior Modification Strategies Scale (Exclusion)

<table>
<thead>
<tr>
<th>Sr.</th>
<th>Phrases</th>
<th>Supreme Group</th>
<th>Lower Group</th>
<th>Calculated value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I would like to return to the lecture when I am excluded for committing an undesired behavior.</td>
<td>4.667 0.758</td>
<td>3.633 1.497</td>
<td>3.373</td>
<td>0.001</td>
</tr>
<tr>
<td>2.</td>
<td>I find it difficult to return to the lecture when I am excluded for committing an undesired behavior.</td>
<td>3.667 1.516</td>
<td>3.600 1.221</td>
<td>0.188</td>
<td>0.852</td>
</tr>
<tr>
<td>3.</td>
<td>I sometimes rejoice when I return to the lecture after my exclusion for committing an undesired behavior.</td>
<td>4.267 1.363</td>
<td>2.833 1.577</td>
<td>3.766</td>
<td>0.000</td>
</tr>
<tr>
<td>4.</td>
<td>I often feel exhaustion, tension and fatigue when I am excluded for committing an undesired behavior.</td>
<td>4.667 0.606</td>
<td>3.367 1.098</td>
<td>5.676</td>
<td>0.000</td>
</tr>
<tr>
<td>5.</td>
<td>I tend not to start talking to the teacher when I am excluded for committing an undesired behavior.</td>
<td>4.667 0.547</td>
<td>2.600 0.968</td>
<td>10.179</td>
<td>0.000</td>
</tr>
<tr>
<td>6.</td>
<td>I often lose the ability to think when I am excluded from the lecture for committing an undesired behavior.</td>
<td>4.467 0.860</td>
<td>2.967 1.299</td>
<td>5.272</td>
<td>0.000</td>
</tr>
<tr>
<td>7.</td>
<td>I find it difficult to try to sleep after being excluded for committing an undesired behavior.</td>
<td>4.800 0.407</td>
<td>3.967 1.159</td>
<td>3.715</td>
<td>0.000</td>
</tr>
<tr>
<td>8.</td>
<td>I try to avoid the mistakes I made in the lecture for committing an undesired behavior.</td>
<td>4.733 0.785</td>
<td>2.967 1.189</td>
<td>6.794</td>
<td>0.000</td>
</tr>
<tr>
<td>9.</td>
<td>I am afraid of my exclusion even before the lecture for committing an undesired behavior.</td>
<td>4.533 0.900</td>
<td>4.100 1.155</td>
<td>1.621</td>
<td>0.110</td>
</tr>
<tr>
<td>10.</td>
<td>When the teacher gets anger, I try not to oppose him because I committed an undesired behavior.</td>
<td>2.600 1.714</td>
<td>1.800 1.186</td>
<td>2.102</td>
<td>0.040</td>
</tr>
<tr>
<td>11.</td>
<td>I prefer playing with my selfish colleagues.</td>
<td>4.733 0.785</td>
<td>3.400 1.476</td>
<td>4.368</td>
<td>0.000</td>
</tr>
<tr>
<td>12.</td>
<td>I am influenced by the performance of my colleagues as well as my teacher because of my undesirable behavior.</td>
<td>4.733 0.583</td>
<td>3.667 1.348</td>
<td>3.979</td>
<td>0.000</td>
</tr>
<tr>
<td>13.</td>
<td>I hate to get out of the lecture.</td>
<td>3.167 1.621</td>
<td>2.467 1.252</td>
<td>1.872</td>
<td>0.066</td>
</tr>
<tr>
<td>14.</td>
<td>I had the feeling of being excluded out of the lecture.</td>
<td>3.767 1.165</td>
<td>2.633 1.402</td>
<td>3.406</td>
<td>0.001</td>
</tr>
<tr>
<td>15.</td>
<td>I prefer playing with my colleagues who do not make the lecture a struggle.</td>
<td>4.600 0.932</td>
<td>3.600 1.610</td>
<td>2.944</td>
<td>0.005</td>
</tr>
</tbody>
</table>

Experimental tests were carried out for the experimental sample groups in the technical performance of the snatch lift in the weightlifting hall at the College of Physical Education and Sports Sciences at the University of Qadisiyah. The researcher relied on evaluating the snatch lift technical performance of the student. The researcher has appointed the same conditions and the manner in which the tests were conducted in order to achieve the same conditions when carrying out the remote tests. Performance was recorded in accordance with the specifications and conditions specified for the tests and were presented to the experts.
The work was commenced by dividing the sample into five experimental groups. The first group (D) acts as a sample of the reinforcement strategy. Through the educational activities and the students’ standing before the subject teacher as well as assuring the students’ understanding of the technical aspects of the performance. Further, the teacher’s performing for the initial position of the snatch lifting. Through the applied activity, the initial position will be applied correctly and the cooperation among the group members to implement the skill specified by the teacher as well as working on enhancing the correct performance through verbal or physical reinforcements\textsuperscript{[3]}.

The second group (e) represents the strategy of punishment. Through the educational activity and the students’ standing before the subject teacher as well as assuring the students’ understanding of the technical aspects of the performance.

The third group (f) represents the strategy of exclusion. Through the educational activity and the students’ standing before the subject teacher as well as assuring the students’ understanding of the technical aspects of the performance. Further, the teacher’s performing for the stage of the second withdraw and the full extension of the snatch. In the applied activity, the student will apply the second withdraw and the full extension correctly and the cooperation among the group members to implement the skill specified by the teacher as well as working on excluding the individual from the supporting environment. That will be by excluding the student away from the colleagues or by applying the performance and then excluding the student from the tool used (shift) and making him/her performing of the training by a stick, or by giving his colleagues a certain weight while the student’s having a weight less than colleagues.

The fourth group (C) represents the formation strategy. Through the educational activity and the students’ standing before the subject teacher as well as assuring the students’ understanding of the technical aspects of the performance.

The fifth group (g) represents the strategy of controlling the troublemaker. Through the educational activity and the students’ standing before the subject teacher as well as assuring the students’ understanding of the technical aspects of the performance. The cooperation among the group members to implement the skill specified by the teacher as well as working on giving the students a week before the lecture and an instructional booklet containing an explanation of all the technical performance of the snatch lift. In addition, using of the pictures contained inside the booklet before giving the lecture in accordance with the curriculum prepared and the methodology followed by the subject teacher\textsuperscript{[4]}.

Research Results

Table 3: It shows the value of the calculated F for the performance evaluation of the snatch for the post-test among the five experimental groups

<table>
<thead>
<tr>
<th>Sr.</th>
<th>Variable</th>
<th>Variance source</th>
<th>Standard Deviation</th>
<th>degree of freedom (df)</th>
<th>Mean square</th>
<th>F-calculated</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Performance</td>
<td>Among the groups</td>
<td>24.633</td>
<td>4.000</td>
<td>6.158</td>
<td>4.454</td>
<td>0.004</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Within the groups</td>
<td>62.212</td>
<td>45.000</td>
<td>1.382</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>86.845</td>
<td>49.000</td>
<td></td>
<td>4.454</td>
<td>0.004</td>
</tr>
</tbody>
</table>

Table (4) shows statistically significant differences between the results of the performance evaluation of the snatch among the five experimental groups in the post-tests by calculating the value of (F) of (4.454) at the freedom level of (4-45) and the level of significance of (0.04). To find out the trend of the difference in favor of any group, the researcher sought to use the least significant difference (L.S.D) among the five groups.
Table 4: It shows L.S.D comparisons in the performance evaluation of the snatch lift among the five experimental test groups

<table>
<thead>
<tr>
<th>Sr.</th>
<th>Variable</th>
<th>Mean Tests</th>
<th>Mean</th>
<th>Means differences</th>
<th>Standard Error</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Performance evaluation of the snatch</td>
<td>T1 T2</td>
<td>5.475</td>
<td>5.250</td>
<td>0.225</td>
<td>0.558</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T1 T3</td>
<td>5.475</td>
<td>5.256</td>
<td>0.219</td>
<td>0.571</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T1 T4</td>
<td>5.475</td>
<td>5.525</td>
<td>-0.050</td>
<td>0.537</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T1 T5</td>
<td>5.475</td>
<td>7.055</td>
<td>-1.580</td>
<td>0.546</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T2 T3</td>
<td>5.250</td>
<td>5.256</td>
<td>-0.006</td>
<td>0.540</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T2 T4</td>
<td>5.250</td>
<td>5.525</td>
<td>-0.275</td>
<td>0.503</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T2 T5</td>
<td>5.250</td>
<td>7.055</td>
<td>-1.805</td>
<td>0.514</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T3 T4</td>
<td>5.256</td>
<td>5.525</td>
<td>-0.269</td>
<td>0.518</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T3 T5</td>
<td>5.256</td>
<td>7.055</td>
<td>-1.799</td>
<td>0.528</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T4 T5</td>
<td>5.525</td>
<td>7.055</td>
<td>-1.530</td>
<td>0.491</td>
</tr>
</tbody>
</table>

Table (5) shows that the fifth experimental group (control of the troublemaker) exceeds other experimental groups.

Discussion

The researcher explains that the reason for the success of the fifth experimental group (control of the troublemaker) on the rest of the other experimental groups in this skill is due to the type of skill given. This means that there is a set of skills can be divided in learning. Among these skills is the high skill of snatch; as it is a difficult skill in terms of technical performance, in particular, it cannot be learned only after fragmentation into parts easier for the student method of performance. After learning each part of them, they are linked to complete the technical performance or skill in all parts and the difficulty of this skill. This has been done in this strategy (Controlling the trouble maker), which requires the division of the skill parts, the technical performance of the snatch and distribution to each individual within the experimental group. In this strategy, the student is responsible for learning each stage of the technical performance of the snatch and then move to the other part until the skill is taught entirely.

The researcher also believes that one of the reasons for the excellence of this group in the level of technical performance of the snatch of the students (control of the trouble maker) is represented in the use of a worksheet for each student through the knowledge material and illustrations of the technical stages of the snatch for each student for the part given by the teacher about the skill. In addition, helping to improve the performance of good students and high-level students are vulnerable.

Conclusions

1. The strategy adopted by the subject teacher in the development of the skilled performance level of the students in the effectiveness of weightlifting (snatch)
2. Behavioral modification strategies have positively contributed to post-tests in developing the skill performance level of weightlifting (snatch).
3. The strategy of controlling the troublemaker has helped educating the students better than other strategies.

Recommendations

1. The necessity of using the behavioral modification strategies to help develop the skill performance of an effectiveness of weightlifting (snatch) and other games to raise the level of skill performance of students.
2. Teachers should be encouraged to use behavior modification strategies and adopt them in teaching different subjects.
3. Setting up workshops and holding courses for teachers and students to train on the concept of behavior modification strategies.

Conflict of Interest: Nil

Source of Funding: Self

Ethical Clearance: Not required
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Evaluation of Serum Lysyl oxidase and Calreticulin as Biomarkers in patients with Chronic Kidney Disease

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ABSTRACT

This study was carried out to determine the level of lysyl oxidase and calreticulin in CKD patients and correlate the serum level of those markers with routine markers such as urea, creatinine, phosphorus, albumin, duration, stages and causes of disease. A total 65 patient with chronic kidney disease were studied among them (32) female and (33) male patients and (26) healthy as control of them were (13 females, 11 males). Their ages (patients and controls) were ranged from (18 – 70). Blood samples were collected from patients and control to evaluate serum levels of (serum Urea, Creatinine, calcium, ionized calcium, phosphorus, albumin, lysyl oxidase and calreticulin). The level of lysyl oxidase in patients and control was (19.82 ± 12.96 ng/mL and 27.73 ± 9.48 ng/mL respectively with a significant difference (p=0.013) and the level of calreticulin in patients showed higher serum level of CRT (8.64 ± 7.43 µg/L) than controls (3.46 ± 2.68 µg/L) with highly significant difference (p=0.003). Serum urea, Creatinine and phosphorus level was highly significantly increased p value <0.001 in patient CKD as compared to the controls. Where calcium and ionized calcium normal in both groups. The significant decrease of Lysyl oxidase enzyme level in patients with chronic kidney disease and the significant increase of serum calreticulin in patient with chronic kidney disease in advance stages (stage 4 and stage 5). Lysyl oxidase have significant correlation with urea and have no significant correlation with other routine biomarkers used in present study also have no significant relation with duration of dialysis. Calreticulin have significant correlation with phosphorus and have no significant correlation with other routine biomarkers used in present study also have no significant relation with duration of dialysis. Phosphorus have significant negative correlation with albumin and creatinine.

Keywords: Chronic kidney disease, Lysyl oxidase, Calreticulin

Introduction

Chronic kidney disease (CKD) has become a public health problem. The definition of CKD was introduced by the National Kidney Foundation (NFK/KDOQI) in 2002 and later adopted by the international group Kidney Disease Improving Global Outcomes (KDIGO) in 2004. The definition of CKD requires a decrease in kidney function with a glomerular filtration rate (GFR) of less than 60 mL/min per 1.73 m2 and/or kidney damage for 3 month or more. Kidney damage refers to pathologic abnormalities documented by biopsy or imaging, alterations in urinary sediment or proteinuria (proteinuria/creatinuria > 200 mg/g, albuminuria/ creatininur > 30 mg/g)1.

Lysyl oxidase (LOX): LOX plays a key role in promoting fibroblast-to myofibroblast activation in skin, heart, liver, kidney, and lung fibrosis. The conversion of fibroblast-secreted collagen into insoluble fibers by LOX contributes to the accumulation of stiff extracellular matrix ECM and thereby contributes to the progression/persistence of fibrosis. In addition to elastin and collagen, LOX can oxidize lysine within a variety of cationic proteins, suggesting that its functions extend beyond its role in the stabilization of the extracellular matrix. Indeed, recent findings reveal that LOX markedly influence cell behavior including chemotactic responses, proliferation, and shifts between the normal and malignant phenotypes2. Recent investigations demonstrated that the biological role of LOX has already extended beyond the oxidation of ECM proteins. Indeed, several reports describe its influence on cell proliferation, intracellular signal responses, cell migration, and tissue development and reveal that it may act as an antagonist or a protagonist of malignant processes3. In chronic renal injury the biological consequences of Hypoxia induce
factor (HIF) activation are different, and negatively impact clinical outcome, that is, promote fibrosis, ultimately leading to the development of end stage renal disease. This may occur through increased expression of ECM-modifying genes, such as LOX and Plasminogen activator inhibitor (PAI-1), functional co-operation with transforming growth factor (TGF)-β1, promotion of epithelial to Mesenchymal transition (EMT), and Through modulation of renal inflammation. Present study provide a basis for modulating tissue fibrosis, possibly by pharmacological modulation of the enzyme lysyl oxidase or suppression of peripheral TGFβ. The results of the present study provide a basis for modulating tissue fibrosis, possibly by pharmacological modulation of the enzyme lysyl oxidase or suppression of peripheral TGFβ. Also, a link between LOX disturbance and disease has been reported in fibrotic processes, connective tissue disorders, neurodegenerative pathologies, tumor progression and metastasis and cardiovascular diseases, making it an attractive pharmacological target.

On other side our data suggest that uric acid may exert its profibrotic effects through upregulation of LOX. This notion is based on the observations that uric acid increased fibronectin protein in cultured rat renal proximal tubule cells in a LOX-dependent manner and RNA interference of LOX attenuated the effects of uric acid on ECM formation in vitro, which was associated with a substantial reduction in fibronectin protein synthesis. Moreover, we found that LOX was significantly increased in fibronectin deposited in the kidneys of hyperuricemic mice, which substantiates the notion that lysyl oxidase may play a role in the development and progression of hyperuricemia induced renal injury. Although initially identified by their ability to cross-link ECM protein, LOX has also been shown to carry out intracellular functions and display an extended range of biological activities including the regulation of ras and NF-B signaling. Recent reports indicate that LOX interaction with the transcriptional repressor Snail induces renal fibrosis. It is plausible that a uric acid-induced increase in the expression of lysyl oxidase in tubular epithelial cells enables promotion of ECM assembly. However, the molecular events underlying ECM cross-linkage are complex, and because of the recently limited understanding of LOX protein maturation, localization, and function, its role in fibronectin synthesis via modulation of other molecular pathways, such as the Notch or TGF-β signaling pathways, awaits further investigation.

Calreticulin (CRT): Calreticulin and also called Calregulin is a highly conserved endoplasmic reticulum chaperone protein which participates in various cellular processes. It was first identified as a Ca²⁺-binding protein in 1974.

Calreticulin (CRT) is a 46 KDA multifunctional protein predominantly located in endoplasmic reticulum (ER) and highly conserved in diverse species. Physiologically, CRT was first described as an endoplasmic reticulum protein responsible for Ca²⁺ homeostasis and glycoprotein folding; currently, CRT is recognized as a multifunctional chaperone detected in other cellular compartments, as well as extracellularly, where it is involved in cell proliferation, phagocytosis, apoptosis, adhesion, and innate and adaptive immune processes including cancer cell elimination by immunogenic cell death and fibrosis. CRT overexpression is linked to various pathological conditions including chronic inflammatory diseases, autoimmunity, fibrosis-related disorders, and malignant evolution. The role of calreticulin outside of the endoplasmic reticulum is also extensive, including functions in wound healing and immunity. Therefore, calreticulin has important implications in health and disease. The calreticulin concentrations were 400 ± 200 ng/mL (95% CI: 350–600 ng/mL) for healthy participants. ER is an important organelle for synthesis, folding, and transportation of secretory proteins. These functions are carried out by molecular chaperones which facilitate correctly protein folding and assembly. CRT is one of the well-characterized lectin-like ER chaperons for many proteins. Recent evidences indicated that CRT is involved in quality control process during protein synthesis, including integrins, surface receptors, and transporters. The concept that CRT might be involved in cell adhesion is based on the regulation of focal contact via multiple mechanisms. It is clear that the extracellular matrix (ECM) molecules are important for focal contact formation. Several studies elucidated that alteration of CRT levels affects cell adhesion on various ECM. Papp et al. implicated that CRT plays a role in the control of cell...
adhesiveness through regulation of fibronectin expressions and matrix deposition. These studies provided evidences that CRT plays a critical role in cellular adhesiveness. ER stress refers to physiological or pathological states that result in accumulation of misfolded proteins in the ER\textsuperscript{19}. ER stress plays a pathogenic role in diseases associated with the accumulation of misfolded proteins, such as conformational diseases like Alzheimer’s, Parkinson’s, and Huntington’s diseases. Further, ER stress is also associated with a wide range of other conditions, including ischemia/reperfusion injury, diabetes, and atherosclerosis\textsuperscript{19,20,21}. Accumulating evidence suggests a pathophysiological role of ER stress in the kidney. Calreticulin (CRT) overexpression in tubular epithelial cells (TECs) induces endoplasmic reticulum (ER) stress and cellular apoptosis mechanisms\textsuperscript{22}. In human kidney biopsies, markers of ER stress in glomeruli have been identified in various noninflammatory and inflammatory glomerulopathies\textsuperscript{18}. Folding-competent states are maintained by classical chaperones, for example, the glucose-regulated proteins (GRP94) and (GRP78), and lectin-like chaperones, for example calreticulin\textsuperscript{18}. Renal fibrosis is the common anatomical denominator underlying the progression of CKD of various causes. There are studies indicated that calreticulin (CRT) is among the proteins that are consistently up-regulated from the earliest stages of the process of renal fibrosis(CKD is the end result of several renal and systemic diseases, its common anatomical feature is progressive development of fibrosis.), even before the extracellular matrix (ECM) begins to accumulate\textsuperscript{23}. Up-regulation was confirmed at the protein and mRNA levels and was localized exclusively in tubular epithelial cells (TECs)\textsuperscript{23}. The ability of CRT to affect so many aspects of fibrosis indicates that decreasing CRT levels may represent a novel targeted and effective treatment against fibrosis and CKD. The mechanisms of fibrosis development in various organs may have pathways shared in common or differing in a tissue specific manner. It is therefore possible that in organs other than the kidney the fibrotic process could be also targeted by reduction of the levels of CRT\textsuperscript{22}.

Subjects, Materials and Method

Subjects and Study Design: This case control study was carried out on a 76 patients age ranged from 18 to 70 years, consist of patients diagnosed as CKD, all patients are under hemodialysis compare to 26 healthy persons as controls were enrolled serially in the study. The control subjects were taken from the same socioeconomic population who matched for their age and body mass index (BMI) with the cases. All persons in control group were have normal kidney function. All patients were attended from the Imamian Al-Khadhemian Medical City (dialysis unit) in Baghdad and Al Sader Teaching Hospital in Mysan. Patients and controls were with a comparable age.

Exclusion Criteria: patients with

- Heart failure
- Liver disease
- Elderly patient above 70 years

Sample Collection: 5ml of blood were taken from each patient and control, serum was centrifuged at 2000 rpm for 5-10 minutes.

The basal levels of serum Calreticulin, Lysyl oxidase, Urea, Creatinine, eGFR, total calcium, Phosphorus, ionized calcium and serum albumin measured.

Material

Measurement of Calreticulin CRT: Serum calreticulin was measured by Elisa kit supplied by Kono Company which intended for quantitative determination of calreticulin in serum.

Measurement of Lysyl Oxidase LOX: Serum lysyl oxidase was measured by Elisa kit from Elabscience Company.

Discussion

This study showed that CKD patient have lower value of LOX (19.82 ± 12.96 ng/mL) than that for control group (27.73 ± 9.48 ng/mL), (P value =0.001) Highly significant this is shown in figure (1-1).

In present study there is a significant difference in patients CRT (8.64 ± 7.43 µg/L) and control (3.46 ± 2.68 µg/L) (p=0.003) as show in figure (1-2) this results agreement with finding of\textsuperscript{22} that showed substantial (50%) reduction in the expression of CRT reduced the development of tubulointerstitial fibrosis at a comparable level through regulation of inflammation, transcriptional activation, transforming growth factor β1–associated effects, and apoptosis and establish that CRT is critically involved in the molecular mechanisms
that drive renal fibrosis progression and indicate that inhibition of CRT expression might be a therapeutic target for reduction of fibrosis and chronic kidney disease development. CRT is a calcium binding protein which is present in the endoplasmic reticulum of the cell, and also may have a nuclear function. It regulates gene transcription via its ability to bind a protein motif in the DNA-binding domain of nuclear hormone receptors of sterol hormones that is may be the cause increasing the CRT up regulate\(^2\text{4}\) the same study suggest that CRT have role in the expression of parathyroid hormone in the molecular level this my express the positive correlation between the CRT and the phosphorus as figure (1-3). In addition the renal cell destruction may lead to leak of the intracellular CRT. CRT have no significant difference between the duration of dialysis table (1-1) (\(p > 0.706\)).

![Figure 1: Mean serum level of Lysyl oxidase in CKD patients and controls](image1)

![Figure 2: Serum levels of Calreticulin in CKD patients and controls.](image2)

<table>
<thead>
<tr>
<th>Biomarkers</th>
<th>Duration/months</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOX(ng/mL)</td>
<td>3-6 (n = 19)</td>
<td>22.74 ± 12.96(^{ab})</td>
</tr>
<tr>
<td>CRT(µg/L)</td>
<td>7-12 (n = 34)</td>
<td>23.48 ± 11.39(^{c})</td>
</tr>
<tr>
<td>LOX(ng/mL)</td>
<td>&gt; 12 (n = 12)</td>
<td>7.36 ± 4.66</td>
</tr>
<tr>
<td>CRT(µg/L)</td>
<td>9.62 ± 6.83</td>
<td>7.84 ± 5.33</td>
</tr>
</tbody>
</table>

\(\text{Lox: Lysyl oxidase, CRT: Calreticulin, different small litters indicate significant difference}\)
Figure 3: Regression line between CRT and phosphorus

Conclusion

The significant decrease of Lysyl oxidase enzyme level in patients with chronic kidney disease and the significant increase of serum calreticulin in patient with chronic kidney disease in advance stages (stage 4 and stage 5) suggest that these two markers have association with pathology and can use them as a biomarkers in diagnosis of late stages in patients with chronic kidney disease.

Lysyl oxidase have significant correlation with urea so may can use it as early diagnostic biomarker in chronic kidney disease.

Calreticulin have significant correlation with phosphorus suggest a relationship of it with change in the parathyroid hormone during chronic kidney disease.

There is no relation between lysyl oxidase and calreticulin with duration of dialysis suggest that they have no relation with disease progression.

Conflict of Interest: None

Source of Funding: Self

Ethical Clearance: Not required.

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Differences in Consumption of Flavonoid Phytochemicals Toward Total Cholesterol and Ldl-Cholesterol Levels in Dyslipidemia and Non-Dyslipidemia Groups of Minangkabau Ethnic Women

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ABSTRACT

Introduction: Dyslipidemia is the primary risk factor for cardiovascular disease. Prevalence of dyslipidemia in Indonesia is still high, which is related to lifestyles such as unhealthy diet. Flavonoids are one type of phytochemical that is abundant in fruits, vegetables, nuts, and flavors that have a preventive effect on degenerative diseases.

Purpose: To determine differences in flavonoid phytochemical consumption of total cholesterol (TC) and low-density lipoprotein cholesterol (LDL-C) in dyslipidemia and non-dyslipidemia groups of Minangkabau ethnic women.

Method: The study design was comparative cross-sectional, examination of lipid levels of TC and LDL-C was carried out to determine dyslipidemia status. Subjects consisted of 72 women with dyslipidemia and 74 women with non-dyslipidemia. Interviews on food consumption used a food consumption frequency questionnaire (semi-quantitative food frequency questionnaire).

Results: The mean TC and LDL-C were higher in the dyslipidemia group, there was an inverse correlation between flavan 3-ols, flavones, flavonols, antocyanidins and isoflavones with TC and LDL-C. There were significant differences in flavonols and antocyanidin consumptions among the dyslipidemia and non-dyslipidemia groups (p < 0.05).

Conclusion: The flavonoid consumption can improve dyslipidemia status (TC and LDL-C).

Keywords: Dyslipidemia, flavonoid, total cholesterol, low-density lipoprotein cholesterol

Introduction

Dyslipidemia is a disorder of lipid metabolism which is characterized by an increase or decrease in lipid fraction in plasma, which is the primary risk factor for cardiovascular diseases such as coronary heart disease.¹,² The prevalence of dyslipidemia in Indonesia is still high, based on the 2013 National Basic Health Research survey results, that prevalence of dyslipidemia in people over 15 years old obtained total cholesterol (TC) above normal at 35.9%. Low-density lipoprotein (LDL) is not optimal at 60.3%. Based on sex, LDL cholesterol (LDL-C) in females is higher than in males.³

The cause of dyslipidemia consists of factors that cannot be modified such as age, sex, family records, and modifiable risk factors including food intake. Unhealthy diet is associated with abnormal lipid profiles such as increases in LDL-C and TC which can be at risk for cardiovascular disease. From various studies, a high-fiber consumption from vegetables, fruits, nuts, and seeds⁴-⁹, consumption of antioxidant vitamins and flavonoids are related to the reduced risk of cardiovascular disease.¹⁰-¹³
Food phytochemicals are commonly found in plant foods such as fruits, vegetables, grains, and tea. Consumption of flavonoids is consistently associated with protection from chronic diseases, including cardiovascular disease, cancer, and neurodegenerative diseases. A large group of phytochemicals is polyphenols, mostly consisting of flavonoids which are secondary metabolites of plants found in cereals, vegetables, fruits, flavors, and spices.14-17

In recent years, flavonoids have been recognized as compounds with a strong biological activity which also play a role in the prevention of chronic diseases including cardiovascular diseases.18 Food flavonoids have biological effects, such as anti-oxidant and anti-inflammatory properties. Flavonoid types such as flavan-3-ols and proanthocyanidins have been associated with a reduced risk of cardiovascular disease by increasing the release of endothelial nitric oxide and inducing vasodilation.17 Several epidemiological studies have found a relationship between flavonoid intake and lower risk of cardiovascular disease. Flavonoids can also prevent damage and oxidation of LDL.18 This study aims to determine the differences in flavonoid phytochemical consumption toward TC and LDL-C levels in the dyslipidemia and non-dyslipidemia groups of Minangkabau ethnic women.

Materials and Method

The design of this study was a comparative cross-sectional study, which compared phytochemical consumption between groups with dyslipidemia and non-dyslipidemia. The study was conducted on Minangkabau ethnic women in Koto Tangah District, Padang City, West Sumatra Province, Indonesia. Prior to the study, screening lipid levels (TC and LDL-C) was carried out to determine dyslipidemia status. The number of samples in each group were 72 women with dyslipidemia and 74 women with non-dyslipidemia. The inclusion criteria consisted of women aged 20-44 years who came from Minangkabau ethnic based on the ethnicity of their parents coming from the Minangkabau tribe without any mixed marriages with other ethnic groups; exclusion criteria were women who were pregnant, suffering from chronic diseases (heart disease, diabetes mellitus, and kidney disorders), and those taking anti-cholesterol medicines regularly.

Data collection included interviews, and laboratory tests, namely examination of TC and LDL-C levels. Interviews on food phytochemical consumption used a semi-quantitative food frequency questionnaire (FFQ) in the last three months. The dyslipidemia status was determined based on the National Cholesterol Education Program (NCEP) Adult Treatment Panel III classification guide, which is a total cholesterol level of > 200 mg/dl and/or an LDL cholesterol of > 130 mg/dl. A database for Indonesian food composition was in accordance with the Indonesian Food Composition Table in 2017, while a flavonoid database was added from USDA. Data processing of consumption patterns applied the modified Minang cuisine FFQ program and the 2007 Nutri Survey program. The independent t-test and Mann Whitney were taken to determine differences in the average consumption of flavonoid phytochemicals in the dyslipidemia and non-dyslipidemia groups. Pearson’s and Spearman’s correlation tests were used to determine the relationship between phytochemical consumption with TC and LDL-C. The results were stated statistically significant if the two-way test got p-value ≤ 0.05.

Results

Of the number, the total of those who met the inclusion criteria and were willing to voluntarily participate in the study were 146 people consisting of 72 people as the dyslipidemia group and 74 people as the non-dyslipidemia group. The normality test showed that TC and LDL-C levels were normally distributed. The mean TC and LDL-C levels in both groups can be seen in Table 1.

<table>
<thead>
<tr>
<th>Group</th>
<th>The Mean Cholesterol Level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TC (mg/dl)</td>
</tr>
<tr>
<td>Dyslipidemia</td>
<td>213.38 ± 33.63</td>
</tr>
<tr>
<td>Non-dyslipidemia</td>
<td>167.68 ± 19.77</td>
</tr>
</tbody>
</table>

Based on the lipid fraction in Table 1, the mean TC and LDL-C levels in the dyslipidemia group were higher than the non-dyslipidemia group.

Table 2 shows the average consumption of flavonoids in the non-dyslipidemia group was higher (117.7 mg) than the dyslipidemia group (107.27 mg),
except in the flavanones class. Statistically, there were significant differences in the average consumptions of flavonols and antocyanidin between the two groups (p-value < 0.05). However, overall, there was no difference in flavonoid consumption between the two groups.

Table 2: Differences in Flavonoid Phytochemical Consumption in Dyslipidemia and Non-dyslipidemia Groups of Minangkabau Ethnic Women

<table>
<thead>
<tr>
<th>Flavonoid Phytochemical</th>
<th>Dyslipidemia (mg)</th>
<th>Non-dyslipidemia (mg)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flavan 3-ols</td>
<td>19.7</td>
<td>20.0</td>
<td>NS</td>
</tr>
<tr>
<td>Flavones</td>
<td>1.7</td>
<td>1.9</td>
<td>NS</td>
</tr>
<tr>
<td>Flavanols</td>
<td>9.5</td>
<td>12.7</td>
<td>0.000 *</td>
</tr>
<tr>
<td>Flavanones</td>
<td>35.9</td>
<td>34.9</td>
<td>NS</td>
</tr>
<tr>
<td>Antocyanidin</td>
<td>10.4</td>
<td>14.6</td>
<td>0.001*</td>
</tr>
<tr>
<td>Isoflavon</td>
<td>29.9</td>
<td>33.6</td>
<td>NS</td>
</tr>
<tr>
<td>Total of flavonoid (mg)</td>
<td>107.27</td>
<td>117.7</td>
<td>NS</td>
</tr>
</tbody>
</table>

*significant at p-value < 0.05

Table 3 shows that there is a match between the theory and the results of the study, namely an inverse correlation between the consumption of phytochemical flavonoids with TC and LDL-C, except for flavanones. Statistically, there is a significant relationship between flavonols with TC and LDL-C, while flavones are associated with LDL-C.

Table 3: Relationship of Flavonoid Consumption with TC and LDL-C

<table>
<thead>
<tr>
<th>Flavonoid Phytochemical</th>
<th>TC (r)</th>
<th>p-value</th>
<th>LDL-C (r)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flavan 3-ols</td>
<td>-0.042</td>
<td>NS</td>
<td>-0.042</td>
<td>NS</td>
</tr>
<tr>
<td>Flavones</td>
<td>-0.131</td>
<td>NS</td>
<td>-0.168</td>
<td>0.043*</td>
</tr>
<tr>
<td>Flavanols</td>
<td>-0.197</td>
<td>0.017</td>
<td>-0.288</td>
<td>0.000*</td>
</tr>
<tr>
<td>Flavanones</td>
<td>0.073</td>
<td>NS</td>
<td>0.379</td>
<td>NS</td>
</tr>
<tr>
<td>Antocyanidin</td>
<td>-0.113</td>
<td>NS</td>
<td>-0.143</td>
<td>NS</td>
</tr>
<tr>
<td>Isoflavon</td>
<td>-0.005</td>
<td>NS</td>
<td>-0.156</td>
<td>NS</td>
</tr>
<tr>
<td>Total of flavonoid (mg)</td>
<td>107.27</td>
<td>117.7</td>
<td>NS</td>
<td></td>
</tr>
</tbody>
</table>

*significant at p-value < 0.05

Discussion

A study conducted on four ethnic groups in Indonesia found that the prevalence of dyslipidemia in the Minangkabau ethnic group was higher than that of the other. Another study stated that consumption pattern of Minangkabau ethnic likely uses coconut milk as a source of saturated fat, but also uses various flavors and spices which are a source of antioxidants.

Antioxidants can be obtained from various food phytochemical sources, one of which is from abundant flavonoids found in vegetables, fruits, flavors, and spices. Based on its chemical structure, food flavonoids are generally categorized into the main subclasses: flavonols, flavones, flavanones, flavan-3-ols, anthocyanidins and isoflavones. Many epidemiological studies show that food flavonoids are associated with lower incidence of degenerative diseases such as cardiovascular disease. Flavonols shows a protective effect against type-2 diabetes in the Framingham Offspring cohort study, and anthocyanidins, flavan-3-ols, flavones and flavanones individually are associated with lower mortality caused by cardiovascular disease in the Cancer Prevention Study II Nutrition Cohort.

In this study, the mean TC and LDL-C was higher in the dyslipidemia group. Flavonoid consumption in the non-dyslipidemia group was higher than the dyslipidemia group, except for flavanones whose consumption was...
almost the same between the two groups. The types of flavonoids with the highest average consumption in both groups were flavanones whose main source in this study was citrus fruit. Most types of Hesperetin and Naringenin flavanones are found in citrus fruit. The mean isoflavones are also high in the non-dyslipidemia group, which in this study the main source is mainly from tofu and tempeh. Isoflavonoids are a very distinct subgroup of flavonoids. Isoflavonoids are mostly found in soybeans and other leguminous plants.

Table 2 shows that, statistically, there are differences in the consumption of flavonoids in the flavonols and antocyanidin groups in both groups (p-value < 0.05). In this study, the flavonols group with the highest average was from quercetin flavonoids found in lettuce, and from the onion, garlic, and turmeric flavors; while, kaempferol flavonoids are obtained from spinach. Flavonol intake is found to be associated with a variety of health benefits that include antioxidant potential and a reduction in the risk of vascular disease. Quercetin and its derivatives can prevent oxidative damage in various systems, including those with clear relevance to atherosclerosis.

The most consumed group of antocyanidin is delphinidin flavonoids obtained from eggplant. Qui et al. reported that anthocyanidin supplements (160 mg) compared to the placebo group given for 12 weeks improved LDL and HDL levels from 120 subjects with hypercholesterolemia.

Overall, the average consumption of flavonoids was 112.56 ± 37.16 mg, which results are higher compared to other studies on antioxidants in Minang cuisines with an average consumption of flavonoids at 105.0 ± 48.0 mg. In this study, there was no difference in total flavonoid consumption in both groups, which were also supported by previous studies.

In this study, there were significant differences in phytochemical consumption in the flavonols and antocyanidin groups with dyslipidemia. From the fraction of the lipid profile, there was an inverse correlation between consumption of flavonoids with TC and LDL-C levels, meaning that increased consumption of flavonoids was associated with lower TC and LDL-C levels.

A study conducted between Mediterranean and non-Mediterranean groups found no significant difference in the average total flavonoid intake between non-MED countries (373.7 mg/day) and MED countries (370.2 mg/day) observed. In non-MED areas, the main contributors were proanthocyanidins (48.2%) and flan-3-ol monomers (24.9%) and the main food sources were tea (25.7%) and fruits (32.8%). In the MED region, proanthocyanidins (59.0%) are by far the most abundant contributors and fruits (55.1%), grapes (16.7%) and tea (6.8%) are the main food sources. This study showed similar results for total food flavonoids intake, but a significant difference in the intake of flavonoids, food sources and some characteristics between MED and non-MED countries.

A study conducted on Japanese women found that total flavonoid intake was inversely correlated with plasma TC concentration (TC) (r = -0.236, P < 0.05) and plasma LDL-C concentration (LDL-C) (r = -0.220, P < 0.05), the main source of flavonoid is onion and the isoflavone is tofu. A population study in Australia also show an association between consumption of flavonoids and the risk of coronary heart disease.

At the molecular level, flavonoids can contribute to the reduction of the risk of coronary heart disease by affecting oxidation of LDL, fat plaque, and hypercholesterolemia. Studies in Haitian-American and African-American ethnic groups show that increased consumption of flavan-3-ols and flavanone is associated with lower LDL in the group with no diabetes. Flavonoids from old garlic extract flavor can reduce TC and LDL-C by 5-10% in hypercholesterolemic patients.

A meta-analysis study shows that turmeric and curcumin which contain a high level of flavonoids have an effect on decreasing LDL-C and TC levels. A study shows that orange juice (750 mL/day), which was also high in flavonoid level, improved blood lipid profile in hypercholesterolemic subjects. Naringenin-type flavonoids given in supplement form during the 8-week trial were found to reduce LDL concentrations by 17% in the hypercholesterolemic group compared with the healthy control.

**Conclusion**

There are differences in the consumption of flavonoids for the flavonols and antocyanidin groups in the dyslipidemia and non-dyslipidemia groups of Minangkabau ethnic women. The consumption of flavonoids is inversely correlated with TC and LDL-C levels, then it can be concluded that consumption of

flavonoids can improve the status of dyslipidemia (TC and LDL-C). The next researcher is suggested to analyze the flavonoid phytochemical consumption directly through blood test.

Acknowledgment

The author would like to thank all the subjects involved in this study, cadres, the Government of Padang City, West Sumatra Province. Thanks also to the enumerators who have helped collect data in conducting the study.

Ethical Clearance: Ethical clearance was received from The Ethical Committee for Research and Community Development, Faculty of Public Health Universitas Indonesia No.660/UN2.F10/PPM.00.02/2018.

Conflict of Interest: We declare that we have no conflict of interest.

Source of Funding: Ministry of Health of the Republic of Indonesia

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Dental Caries and Treatment Needs in Relation to Nutritional Status among Kindergartens Children in Tikrit City, Iraq

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1Department of Preventive Dentistry, College of Dentistry, University of Baghdad, Iraq

ABSTRACT

Background: Dental caries is the most common infectious and widely spread disease affecting children in early age. Nutrition may be one of the important factors affecting dental caries. The aim of this study was to estimate the prevalence and severity of dental caries and treatment need in relation to nutritional status among kindergartens children in Tikrit city.

Materials and Method: The sample consisted of 580 kindergarten children aged (4-5) years old (329 boys and 251 girls) from Tikrit city. Dental caries was recorded by using dmfs/dmft indices, while dental treatment need was recorded according to criteria of (WHO). The assessment of nutritional status was achieved using anthropometrics measurement (height and weight) according to body mass index indicator.

Results: The prevalence of dental caries was 86.03 %. Caries experience was higher among 5 years than 4 years and higher among boys than girls, with statistically no significant difference between age and gender. The higher percentage of examined children were in need of one surface filling. According to nutritional status (BMI indicator), the mean value of ds and dmfs were higher among children with undernutrition than among other children, with no significant difference (P >0.05).

Conclusion: A study reported a high prevalence of dental caries among kindergartens children, thus there is an increase need of a preventive program among preschool children in Tikrit city in Iraq.

Keywords: Dental caries, treatment need, nutritional status, kindergarten children, Tikrit city.

Introduction

Dental caries is “a multifactorial, transmissible, infectious oral disease caused primarily by the complex interaction of cariogenic oral flora with fermentable dietary carbohydrates on the tooth surface over time” (1). It is the most prevalent infectious chronic disease affecting all ages in both genders and all races (2). The process of dental caries develop as soon as the tooth erupt in the oral cavity (3). Dental caries develop in the oral cavity at any site where a biofilm develops and remains for a period of time (4). Epidemiological studies in different geographical location in Iraq reported high prevalence of dental caries among children (5,6). Treatment of dental caries has been considered as one of the important factor for both general and oral health (7). The type of dental treatment become more complicated as well as increases with age (8-16). The oral cavity is the mirror of nutritional status of the body (17), so nutrition is considered as integral component of the oral health. Good nutrition is important to avoid many common health problems (18). There is a continuous synergy between nutrition and the integrity of the oral cavity in health and disease, this independent relationship revealed that good oral health promoting good nutritional health and vice versa (19). In Iraq, several epidemiological studies among kindergarten children has been conducted in different geographical location, regarding the dental caries and treatment need in relation to nutritional status. Yet, no previous study conducting among kindergarten children in Tikrit city. Therefore, this study was designed and conducted.

Material and Method

This cross sectional study was conducted among kindergarten children aged (4–5) years old, 580 child (329 boys and 251 girls) in Tikrit city in Iraq. Examination started at the 1st of December 2018 till the end of February 2019. Prior to data collection, permission was obtained from the Ministry of Education,
the purpose of the study was explained to kindergarten authority to ensure full cooperation, also a special consent has been distributed to the parents to obtain permission for including their children in the study. A representative sample was taken, they were randomly selected from kindergarten. Eleven kindergartens had been examined in Tikrit city. Children with systemic disease and uncooperative children were excluded. The age of the child was taken according to the last birthday by WHO (1987) (20). Dental caries and dental treatment needs were recorded according to criteria of WHO (21,20). The assessment of the nutritional status was performed using anthropometrics measurement according to body mass index indicator (BMI) (22).

**Result**

Table (1) revealed the total sample distribution by age and gender. The prevalence of dental caries was (86.03%), total girls recorded higher prevalence of dental caries compared to total boys. Children at 5 years old found to have higher percentage of dental caries than 4 years children, Table (2). Dental caries severity represented by dmfs and its component (ds, ms, fs) was illustrated in the Table (3). Mean value of dmfs was higher among 5 years than 4 years children, and was higher among girls than boys, with statistically no significant differences for both age and gender (P > 0.05). Decays component (ds) represented the highest percentage followed by missing component (ms) and then filled component (fs). Mean value of (ds) among 5 years was higher than among 4 years, and in girls was higher than boys, these differences found to be statistically not significant. The higher percentage of examined children were in need of one surface filling followed by two or more surface filling, pulp care and then fissure sealants as revealed in Table (4). Regarding nutritional status, mean value of decay component (ds) and dmfs were higher in children with under nutrition than among other children, with no significant difference, this was illustrated in Table (5). No significant inverse correlation was found between ds, dmfs and nutritional status, Table (6).

**Table 1: Descriptive statistics of the total sample**

<table>
<thead>
<tr>
<th></th>
<th>4 years</th>
<th></th>
<th>5 years</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>165</td>
<td>28.45</td>
<td>129</td>
<td>22.24</td>
<td></td>
</tr>
<tr>
<td>164</td>
<td>28.27</td>
<td>122</td>
<td>21.03</td>
<td></td>
</tr>
</tbody>
</table>

**Table 2: Caries prevalence by age and gender**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Age</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4</td>
<td>249</td>
<td>84.69</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>250</td>
<td>87.41</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gender</th>
<th>Male</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>278</td>
<td>84.50</td>
<td></td>
</tr>
<tr>
<td></td>
<td>221</td>
<td>88.05</td>
<td></td>
</tr>
</tbody>
</table>

**Table 3: Caries experience by age and gender**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Categories</th>
<th>4 Years</th>
<th>5 Years</th>
<th>T-test</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ds</td>
<td>8.88 ± 0.60</td>
<td>9.10 ± 0.51</td>
<td>0.278</td>
<td>0.781</td>
</tr>
<tr>
<td></td>
<td>ms</td>
<td>0.43 ± 0.13</td>
<td>1.66 ± 0.28</td>
<td>4.039</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>fs</td>
<td>0.02 ± 0.01</td>
<td>0.13 ± 0.05</td>
<td>2.301</td>
<td>0.022</td>
</tr>
<tr>
<td></td>
<td>dmfs</td>
<td>9.33 ± 0.65</td>
<td>10.90 ± 0.64</td>
<td>1.714</td>
<td>0.087</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td></td>
<td>Female</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ds</td>
<td>8.71 ± 0.48</td>
<td>9.21 ± 0.60</td>
<td>0.655</td>
<td>0.513</td>
</tr>
<tr>
<td></td>
<td>ms</td>
<td>1.05 ± 0.22</td>
<td>1.02 ± 0.21</td>
<td>0.105</td>
<td>0.916</td>
</tr>
<tr>
<td></td>
<td>fs</td>
<td>0.04 ± 0.01</td>
<td>0.13 ± 0.05</td>
<td>1.802</td>
<td>0.073</td>
</tr>
<tr>
<td></td>
<td>dmfs</td>
<td>9.86 ± 0.56</td>
<td>10.29 ± 0.68</td>
<td>0.495</td>
<td>0.621</td>
</tr>
</tbody>
</table>
Table 4: Treatment needs by gender

<table>
<thead>
<tr>
<th>Treatment needs</th>
<th>Male</th>
<th></th>
<th>Female</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Fissure sealant</td>
<td>7.12</td>
<td>%</td>
<td>7.26</td>
<td>%</td>
</tr>
<tr>
<td>One surface filling</td>
<td>31</td>
<td>%</td>
<td>34.18</td>
<td>%</td>
</tr>
<tr>
<td>Two or more surface filling</td>
<td>28.78%</td>
<td></td>
<td>29.46%</td>
<td></td>
</tr>
<tr>
<td>Crown</td>
<td>0.00</td>
<td>%</td>
<td>0.19</td>
<td>%</td>
</tr>
<tr>
<td>Veneer</td>
<td>5.3</td>
<td>%</td>
<td>4.32</td>
<td>%</td>
</tr>
<tr>
<td>Pulp care</td>
<td>18.78%</td>
<td></td>
<td>15.91%</td>
<td></td>
</tr>
<tr>
<td>Extraction</td>
<td>6</td>
<td>%</td>
<td>4.51</td>
<td>%</td>
</tr>
<tr>
<td>Others care</td>
<td>2.87</td>
<td>%</td>
<td>4.12</td>
<td>%</td>
</tr>
</tbody>
</table>

Table 5: Caries experience in relation to nutritional status

<table>
<thead>
<tr>
<th>Variables</th>
<th>Under weight</th>
<th>Normal weight</th>
<th>Over weight</th>
<th>Obese</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean ± SE</td>
<td>Mean ± SE</td>
<td>Mean ± SE</td>
<td>Mean ± SE</td>
<td></td>
</tr>
<tr>
<td>ds</td>
<td>(10.17 ± 1.66)</td>
<td>(9.27 ± 0.55)</td>
<td>(8.01 ± 0.78)</td>
<td>(8.35 ± 0.75)</td>
<td>0.425</td>
</tr>
<tr>
<td>dmfs</td>
<td>(10.30 ± 1.66)</td>
<td>(9.49 ± 0.65)</td>
<td>(8.55 ± 0.84)</td>
<td>(10.18 ± 0.98)</td>
<td>0.539</td>
</tr>
<tr>
<td>dmft</td>
<td>(5.23 ± 0.51)</td>
<td>(5.14 ± 0.23)</td>
<td>(4.72 ± 0.36)</td>
<td>(4.69 ± 0.34)</td>
<td>0.606</td>
</tr>
</tbody>
</table>

Table 6: Coefficient correlation between ds, dmfs and nutritional status

<table>
<thead>
<tr>
<th>Variables</th>
<th>r</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ds</td>
<td>-0.064</td>
<td>0.125</td>
</tr>
<tr>
<td>dmfs</td>
<td>-0.027</td>
<td>0.517</td>
</tr>
</tbody>
</table>

Discussion

This oral health survey was designed to evaluate dental caries and treatment needs in relation to nutritional status among kindergarten children in Tikrit city in Iraq. There was no previous epidemiological studies concerning this age group in Tikrit city, the collected data was intended to use as a base line data for a comparison with other Iraqi studies in other governorates and in different parts of the world, and could be used in evaluating possible future oral health preventive program for preschool children in Tikrit city.

The prevalence of dental caries was found to be 86.03 % for kindergartens children, this percentage was higher than that reported by some studies (5,11,27,28), while it was lower than that reported by others (25,26). Considering age, caries experience found to be higher among 5 years than among 4 years children, this finding is in agreement with the other studies (5,6,11,15,16,27,30,31,32). This result attributed to accumulative and irreversible nature of dental caries (33).

In present study girls showed higher caries percentage than boys with no significant difference between them, this result in agreement with some studies (5,11,32,34,35). This finding may be attributed to earlier deciduous teeth eruption in females than males of the same age group, so females deciduous teeth exposed to cariogenic factors earlier. While this finding comes in disagreement with other studies (6,15,24,30,36,37,38).

The results of this study showed that (ds) fraction was higher than (ms) and (fs) component of dmfs index, this is an indication for poor dental treatment, and (ms) fraction was higher than (fs) , this indicated that even if treatment is present it was directed toward extraction rather than restoration, this result is in agreement with result of other studies (5,6,10,14,24).

Most of the children of this studies were in need of one surface filling, that is to say in need for restorative
treatment to prevent progression of dental caries, followed by two surface filling, pulp care and fissure sealants. This finding agree with results reported by (6,8,39,40), in which one surface filling was higher percentage needed by the samples. Caries experience (dmfs) and decay component (ds) were higher among children with under nutrition than other children. No significant inverse correlation was found between ds, dmfs and nutritional status. Increase in the prevalence of dental caries attributed to nutritional deficiency which increase tooth susceptibility to caries development by changing in the tooth formation or in the hard tissues quality of the tooth that can be affected by nutrition (34). Numerous studies reported that there is no association between malnutrition and dental caries (38,41). While many other Iraqi studies reported direct association between malnutrition and dental caries on the same age group(6,14,30).

Conclusion
This study reported a high prevalence of dental caries among kindergartens children in Tikrit city. Caries experience in deciduous dentition increasing as increase in the age, thus there is an increase need of a preventive program among preschool children in Tikrit city in Iraq.

Conflict of Interest: None

Source of Funding: Self

Ethical Clearance: Not required.

REFERENCES


22. CDC growth Charts. Unit state. National Center for health statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion, 30 may 2000.


Evaluation of Implant Stability in Three Implants Supported Milled Bar Mandibular Overdenture Cases: A 1-Year Follow-up Clinical Trial

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¹Prosthodontics Department, Faculty of Dentistry, Minia University, Minia, Egypt

ABSTRACT

Purpose: The aim of this study was to investigate the stability of three implants supported by a milled bar, which carries two different attachment systems and submitted to immediate loading.

Methodology: The current research was a prospective study conducted according to split-mouth design with random allocation of the tested attachments. Two types of attachments were used, OT Equator and OT Cap attachment. A total of 8 completely edentulous patients were divided into 2 Groups according to OT Equator position. CBCT was used for the planning and construction of the surgical stent. A milled bar with the attachments was fabricated prior to implant placement. Each patient received three implants in the interforaminal region, connected with a milled bar. On one side of the bar; OT Equator attachment was used, while the other side was supplied with OT Cap attachment. Overdenture was delivered at an average time of 10 to 15 days after implantation. Follow-up period was 12-months after loading. Implant stability was evaluated using Osstel™.

Results: The results revealed that; there were no significant differences between all groups at implant placement time and at 12-months period for all implants and through different time intervals until the follow-up period was finished.

Conclusion: The results of the current study indicated an increase in implant stability and due to splinting of the implants by using immediate loading protocol. Splinting of the implants using a rigid bar appears to be a successful treatment option that could be considered for treating the completely edentulous patient.

Keywords: three implants, rigid bar, milled bar, OT equator, implant stability, supported overdenture.

Introduction

The reduced stability is the most critical problem that faces Complete denture. In the last decades, using implants for improving denture stability and retention has become a common and useful protocol.¹

Using two implants or more in the interforaminal region to support mandibular overdenture has been proved to be a successful treatment modality for edentulous patients.² ³ ⁴

In the case of using three-implant to support overdentures, the anterior implant may act as an indirect retainer by preventing the movement of the anterior portion of the denture towards the tissues.⁵

However, in general; splinting implants with a bar, are usually increase the amount of support, stability, and retention.⁶ A custom-made bar could be milled to develop guide planes which provide resistance against denture rotation and lateral forces.⁷ Custom-made bars are also allowed to follow the ridge shape as well as adding attachments above.⁸

Therefore; the purpose of this study is to investigate the implant stability in 3 implants supported milled bar mandibular overdenture submitted to immediate loading.
Material and Method

Study Protocol: The current research was a prospective study conducted according to split-mouth design with random allocation of the attachments. A total of 8 completely edentulous patients in the mean age of 58 years were selected with problems in the retention and stability of mandibular dentures.

Each patient received three implants in interferaminal region. These implants were connected with a milled bar. OT Equator attachment was found on one side of the jaw while the other side was supplied with OT Cap attachment.

The eight patients were randomly divided into two groups based on the location both types of attachments to Group A and Group B. Additional randomization was carried out regarding the site of the third implant either right (Group 1) or left (Group 2) central incisor area. These randomization steps aimed to eliminate the effect of preferred chewing side and or muscular power differences that may affect the amount or frequency of load falling to the implant.

Radiographic Procedures: For each participant, the existing mandibular denture was used as a Radiographic stent. Ten gutta-percha markers of 2mm diameter each were attached to the labial and buccal region.

A CBCT scan was done using the dual scan technique. The patient’s position was adjusted using the Frankfort plane and the office floor as a reference point. The denture was positioned on a pad of cotton to ensure scanning fitting surface without artifact.

Planning for implant placement: Dicom files were imported in the software. Virtual denture was merged with the patient data using gutta-percha markers in the 3D virtual model extracted from CBCT. These data were used to plan the insertion of the three implants.

A prosthetically driven Planning using the denture fitting surface as a guide was made and implants were virtually inserted, so abutments emerge in a good position. Three implant positions were selected; the canine region bilaterally and central incisor position of one side of the mandible with random allocation of the middle implant.

A 3D model of the cast with holes compatible with the implant analogue was printed. The analogues were secured in their position into the cast using a thin film of cyanoacrylate adhesive material. (Figure 1)

Figure 1: Showing the position of the implant analogue in relation to surgical stent.

Prosthetic procedures before surgery: The connection between bar and implant was made using OT Equator Passive Bar System® - “Elastic Seeger” made by Rhein83® (Rhein83 SRL, Bologna, Italy). The purpose of the Elastic Seeger is to create a passive connection between implants and bar. The Elastic Seeger will correct small imperfections created by the 3D printing process, surgical placement of the implant or laboratory casting process, which reduces the risk of the implant bar not seating passively.

The titanium equator abutments were screwed into the analogues. The Milled cantilever bar (with 8 mm cantilever length) was constructed using castable connectors and connected to a plastic connection which placed above each titanium abutment. Then the waxed-up bar was milled to ensure parallelism.

This study was used two attachment systems, one of them was (OT Cap Castable and OT Equator Castable). Each patient received 2 OT Equator Castable and 2 OT Cap Castable (one attachment between the implants and the other distally at the cantilever area).

Surgical Procedures: The surgical protocol for implant placement was the same for all patients according to the flapless technique to minimize post-surgical edema.

For each patient; three implants (Dentium®, Implant System) was used. These implants had a standard size (3.6 mm × 12 mm). A minimum of 35 N/cm torque was determined to be satisfactory at implant insertion to ensure primary stability.
Prosthetic procedures after the surgery: The primary resonance frequency (RF) was measured before screwing the abutment. The further measurements were made using the (OsstellTM, Model 6.0, Gothenburg, Sweden) at 1 week, 1-3-6 and 12-months periods after the installation of the implants. The Magnetic transducer (Smartpeg, Type 7) was screwed using a plastic screwdriver, and the ISQ value was recorded. The plastic probe of the OsstellTM device was placed proximal to the labial side of the transducer without contacting the peg until the machine registered the ISQ value. Two additional ISQ values were obtained, with the transducer loosened and retightened each time to improve precision. A single representative implant stability value was computed by averaging the three ISQ values. (Figure 2)

Equator titanium abutments were screwed to the implants immediately after implant placement. The verification of the bar position was checked and adjusted. The milled bar attachment complex was screwed to the equator abutments. (Figure 3)

The new constructed mandibular overdentures were delivered to the patients after an average time of 10 to 15 days after implantation. The same dental technician made all dentures for standardization. The nylon inserts selected for the present study were of pink color for both systems and with nearly similar retention strengths (Ball: 9.31 N (950 gr.); (Equator: 11.76 N “1200 gr.). The riders were picked up intra-orally.
The recall visits and follow-up procedures were carried out with a mean of 12 months after prosthesis delivery. In these visits, the denture, bar and equator titanium abutment also were removed.

Results

For each implant position, the results revealed that; there were no statistically significant differences between two groups at T0 and at T5 period for the right and left implants and through different time intervals. The same results were found by comparing right and left implants at the same group.

The mean stability for right and left implants decreased during the first month from 7-15.7% for the right implant and 1.5-16.9% for the left implant in comparing with implant insertion time. After that, implant stability was increased up to twelve months follow-up.

There was a tendency of higher ISQ values for Group B than Group A during follow-up, however, with no significant differences. There were no significant differences between different time intervals of follow up for all groups. (Table 1)

Another comparison was made regards to the para-symphyseal implant. The results revealed that; there were no statistically significant differences between two groups at T0 and at T5 for the para-symphyseal implants and through different time intervals. Therefore, implant stability was increased up to twelve months follow-up. High primary stability had been achieved for all implants at the para-symphysis position for different groups at insertion times. (Table 2)

Discussion

It was observed that the implant stability and ISQ values were decreased at implant insertion, one week, and one-month follow-up times for the para-symphyseal implants in comparing with the right and left implants.

Table 1: Results from RFA measurements to the implants at different times

<table>
<thead>
<tr>
<th>Resonance frequency</th>
<th>Group A</th>
<th></th>
<th></th>
<th>Group B</th>
<th></th>
<th></th>
<th>Para-symphyseal implants</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RT side</td>
<td>LT side</td>
<td>P value</td>
<td>RT side</td>
<td>LT side</td>
<td>P value</td>
<td>Group 1</td>
</tr>
<tr>
<td>Implantation (T0)</td>
<td>Mean ± SD</td>
<td>66.3 ± 3.2</td>
<td>65 ± 4.1</td>
<td>0.561</td>
<td>63.8 ± 5.9</td>
<td>65 ± 5.4</td>
<td>0.559</td>
</tr>
<tr>
<td>1 Week (T1)</td>
<td>Mean ± SD</td>
<td>57.3 ± 2.2</td>
<td>55.3 ± 7.6</td>
<td>0.770</td>
<td>53.3 ± 6.8</td>
<td>54 ± 4.2</td>
<td>0.885</td>
</tr>
<tr>
<td>1 month (T2)</td>
<td>Mean ± SD</td>
<td>61.8 ± 2.8</td>
<td>63 ± 5.4</td>
<td>0.663</td>
<td>64.5 ± 6.4</td>
<td>64 ± 5.4</td>
<td>0.772</td>
</tr>
<tr>
<td>3 months (T3)</td>
<td>Mean ± SD</td>
<td>67.3 ± 4.6</td>
<td>70.8 ± 8.3</td>
<td>0.468</td>
<td>69.3 ± 7.5</td>
<td>67.3 ± 4</td>
<td>0.564</td>
</tr>
<tr>
<td>6 months (T4)</td>
<td>Mean ± SD</td>
<td>71.4 ± 2.2</td>
<td>71.3 ± 5.9</td>
<td>0.663</td>
<td>74.8 ± 5.4</td>
<td>73.5 ± 3.7</td>
<td>0.559</td>
</tr>
<tr>
<td>12 months (T5)</td>
<td>Mean ± SD</td>
<td>75.8 ± 5.1</td>
<td>76 ± 7.5</td>
<td>1</td>
<td>83 ± 5.3</td>
<td>83 ± 4.2</td>
<td>1</td>
</tr>
</tbody>
</table>

It was observed that the implant stability and ISQ values were decreased at implant insertion, one week, and one-month follow-up times for the para-symphyseal implants in comparing with the right and left implants.

Discussion

It is important to consider using three implants with a rigid bar. Using a rigid bar may decrease follow-up and maintenance efforts than a prosthesis with solitary implants and increases the amount of support, stability, and retention. 12,13

Some authors recommended the splinting of implants with a rigid bar for better stress distribution. 14,15 However, other authors postulated that solitary implants to reduce axial stresses around implants and supporting structures. 16 This controversy was solved partly by the work of
several authors who found a better distribution of stress around splinted implants than solitary implants. 17,18

In addition to choosing adequate implant number, the splinting the dental implants immediately after surgery using a rigid bar is mandatory for obtaining success with immediate loading. 10 This treatment option also may decrease bone loss in comparing with solitary implants. 19,20

The mechanism behind the decrease of ISQ value during the first three months and the further increase of ISQ (3–12 months) in the present study are probably related to the process of bone formation. 21 The justifications for this fact may be related to the bone adaptation after lateral compression during implant insertion, the process of bone remodeling and the marginal bone reabsorption. 10

After twelve months, the average ISQ values were increased. The probable justification is that a well-developed, mineralized, and dense bone was formed during the remodeling period. However, it was assisted by other factors such as the splinting with a rigid bar, the distribution of occlusal overload and proper maintenance of the retention nylon cap. This is coinciding with the finding of da Silva et al, (2012). 10

Conclusion

Within the limitations of this study; the results of the current study indicated a positive effect of splinting on implant survival and implant stability using immediate loading protocol. However, types of attachment over the bar has no effect on implant stability. Splinting implants immediately loaded using a rigid bar appears to be a viable treatment modality that could be considered for the rehabilitation of edentulous patients.

Study Limitation: Future clinical research with long-term follow-up is recommended to evaluate implant stability using different attachments and bars designs.

The most obvious limitations of this study were the small sample size and short follow up period. Fewer participants than intended were included because the strict inclusion and exclusion criteria restricted recruitment. Longer follow-up time and larger groups are suggested for future research.

The present study had insufficient power to measure survival differences between immediate and conventional loading protocols. It also had inadequate power to compare between splinting and solitary situations.

Source of Funding: Self-funding

Ethical Clearance: The protocol was structured by following the Declaration of Helsinki 22 and was approved by the Ethical Committee of the Faculty of Dentistry – Minia University (Egypt). The study steps benefit and risks were explained to each patient, and informed consent was obtained from all participants.

Conflict of Interest: The authors declare that there is no conflict of interest regarding the publication of this paper.

REFERENCES


Comparison between Anterior Colporrhaphy with Kelly’s Plication and Tension Free Vaginal Tape–Transobturator Approach (TVT-O) in the Treatment of Mild Stress Urinary Incontinence

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ABSTRACT

Background: Stress urinary incontinence is the prevalent type of urinary incontinence among women. The Tension Free Vaginal Tape – transobturator (TVT-O) and anterior colporrhaphy with Kelly’s plication procedures are the public surgical options by Gynecologists for treatment of stress urinary incontinence.

Aim of Study: To evaluate the outcome of Tension Free Vaginal Tape- transobturator (TVT-O) surgical procedure in comparison to anterior colporrhaphy with Kelley’s plication surgical procedure in treatment of stress urinary incontinence among adult women.

Patients and Method: A comparative prospective interventional study conducted in a period of 11 months; Feb, 2016 – Jan, 2017 on convenient sample of 20 women with stress urinary incontinence which categorized into two groups (Kelly’s group: 10 women surgically operated with anterior colporrhaphy with Kelly’s plication) and (TVT-O group: 10 women surgically operated with a Tension Free Vaginal Tape trans-obturator approach). The patients in both groups compared regarding to age, parity, severity of stress incontinence, presence of cystocele and its grade according to certain classifications and complications. The patients were followed up for six months.

Results: There was a significantly higher cure rate for women underwent Tension Free Vaginal Tape-transobturator surgical operation than the cure rate of women underwent anterior colporrhaphy with kelly’s plication after one month (P= 0.009) and after six months (P=0.005).

Conclusions: The outcome of trans-obturator tape procedure in treatment of stress urinary incontinence among women was better than outcome of anterior colporrhaphy with Kelly’s plication after one and six months of follow up.

Keywords: Stress urinary incontinence, Kelly's, TVT-O, anterior colporrhaphy, Iraq

Introduction

Stress urinary incontinence (SUI) is a major health problem that affects millions of women throughout the world. It is estimated to affect 15% to 35% of women in the general population⁴. However, the prevalence may be higher as many females with SUI do not seek help for fear of embarrassment⁵. SUI as defined as a ‘complaint of involuntary loss of urine on effort or physical exertion (e.g. sporting activities), or on sneezing or coughing’⁶. It is usually caused by weakness or damage to muscles and connective tissues of the pelvic floor, compromising urethral support, or by weakness of the urethral sphincter itself⁷. Overall, 30% of women develop SUI within five years after their first vaginal delivery. SUI impairs the quality of life (QOL) in women suffering from it and is associated with significant social and financial costs and depression⁸. The staggering number of procedures to treat SUI reflects a lack of consensus on an appropriate intervention for this problem⁹. Anterior/posterior colporrhaphy with Kelly’s plication (CA-KP) is one of the conventional methods performed in the treatment of...
SUI. Although it is an old method and the success rate is lower in the long term, it has been a popular method in some clinics among gynecologists and urologists. However, in today’s surgical practice, it is well-established that performing an anterior repair or Kelly plication for the treatment of SUI is substandard care. The failure rates are high and recurrence is common. In 2001, Delorme described a new route of inserting the tape, which the author called transobturator taping (TOT), in which the tape was inserted through the obturator foramina (8).

In 2003, de Leval introduced a modified technique called TVT-O, in which the tape is inserted in a reverse route, in through a vaginal incision and out through the obturator foramen (inside out) (9).

The transobturator route may be associated with damage to the obturator nerve and vessels in an anatomical dissection model, the tape passes 3.4 cm and 4.8 cm from the anterior and posterior branches of the obturator nerve, respectively, and 1.1 cm from the most medial branch of the obturator vessels. Consequently, nerve and vessel injury in addition to bladder injury and vaginal erosion remain a potential complication of the procedure. Studies have reported cure and improved rates of 80.5% and 7.5% respectively at 17 months (10). The aim of this study is to evaluate the outcome of Tension Free Vaginal Tape- transobturator (TVT-O) surgical procedure in comparison to anterior colporrhaphy with Kelley’s plication surgical procedure in treatment of SUI among adult women.

Patients and Method

Study Design and Setting: A comparative prospective interventional study, conducted in Al-Elwiya Maternity Teaching Hospital during a period of 11 months; Feb, 2016 – Jan, 2017.

Study Population and sample size: The included patients were adult non pregnant female patients complained from genuine stress incontinence (history of urine leak with increase intra-abdominal pressure such as coughing sneezing laughing - positive cough stress test), complete their family, with failed of conservative treatment, body mass index < 30 kg/m², and cystocele of grade 0, I, II (according to Baden - walker Halfway system) (11). Patients with history of chronic lung disease, psychological disease or neurological disease, with organomegally, hysterectomy, history of previous surgery for urinary incontinence, and history consumption of some drugs such as benzodiazepine anticholinergic were excluded from this study. Each patient after evaluation by history, examination was sent to urodynamic study in Ibn-kuff hospital to confirm the diagnosis of genuine stress incontinence and exclude other type of incontinence.

A total of 20 patients were enrolled during this period. The patients were also sent full investigation including GUE, RFT, RBS. Urinary tract infection was treated. Fitness for anesthesia was confirmed and informed consent was taken from patients. As for treatment, the patients were assigned into two groups

- **Kelly’s Group:** Included 10 patients underwent Anterior colporrhaphy with Kelly’s plication.
- **TVT-O Group:** Included 10 patients underwent Tension Free Vaginal Tape –transobturator approach TVT-O. No cystocele repair was done in TVT-O group.

In TVT-O group, the tape was of Boston scientific obturyx type which Has license from ministry of health.

Patients in both groups compared preoperatively in term of stress incontinence severity according to stamey classifications as the following (12):

- **G0:** Continent
- **G1:** Loss of urine occur with sudden increase in intra-abdominal pressure (Coughing, sneezing, laughing).
- **G2:** Leak of urine occur with lesser degree of physical activity (Walking, standing erect from sitting position or sitting up in bed).
- **G3:** Urine is lost without any relation to physical activity or position.

Surgical procedures were performed by the same experienced surgeon. Seventeen patients received spinal anesthesia and three patients received general anesthesia. Spinal and general anesthesia was used according to the patient and anesthesiologist’s preference. There was no difference between general and spinal anesthesia except the ability to ask the patient to cough after tape insertion to insure continence in some patients.

Postoperatively, patients were evaluated subjectively by Jacobs and Blaivas classification (Table 1) and objectively by cough test one month and six months after operation and also for complications including intra operative complications, short term voiding difficulty, denovo urgency, denovo dyspareunia, infection.
Table 1: Jacobs and Blaivas(5)

<table>
<thead>
<tr>
<th>Classification</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Cured - absence of incontinence.</td>
</tr>
<tr>
<td>B</td>
<td>Improved - frequency of incontinence episode less than once every two weeks.</td>
</tr>
<tr>
<td>C</td>
<td>Failure – frequency of incontinence more than once a week.</td>
</tr>
</tbody>
</table>

**Statistical Analysis**

The data analyzed using Statistical Package for Social Sciences version 25. Outcomes of analysis were arranged in scales variables in categorical variables.

Chi square test was used for comparison between categorical data (Fishers exact test applied when expected variable was less than 20% of total). The level of significance (p value) was set as ≤ 0.05.

**Results**

In this study, there was no statistical significant differences (P ≥ 0.05) in age, parity, mode of delivery, menopausal history, Stamey classification and Cystocele Grade between study groups. All patients in kelly’s group were overweight compared to 60% of patients in TVT-O group and this difference was statistically significant (P= 0.025) as shown in table (2).

**Table 2: Distribution of socio-demographic and clinical characteristics of patients by groups**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Study Group</th>
<th></th>
<th></th>
<th></th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Kelly’s (%)</td>
<td>TVT-O (%)</td>
<td>Total (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>n = 10</td>
<td>n = 10</td>
<td>n = 20</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Age group (Years)</strong>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 - 39</td>
<td>4 (40.0)</td>
<td>3 (30.0)</td>
<td>7 (35.0)</td>
<td>0.29</td>
<td></td>
</tr>
<tr>
<td>40 - 49</td>
<td>5 (50.0)</td>
<td>3 (30.0)</td>
<td>8 (40.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥ 50</td>
<td>1 (10.0)</td>
<td>4 (40.0)</td>
<td>5 (25.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>BMI</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>0 (0)</td>
<td>4 (40.0)</td>
<td>4 (20.0)</td>
<td>0.025</td>
<td></td>
</tr>
<tr>
<td>Overweight</td>
<td>10 (100.0)</td>
<td>6 (60.0)</td>
<td>16 (80.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Parity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 - 5</td>
<td>8 (80.0)</td>
<td>8 (80.0)</td>
<td>16 (80.0)</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>6 - 7</td>
<td>2 (20.0)</td>
<td>2 (20.0)</td>
<td>4 (20.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Mode of delivery</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NVD</td>
<td>8 (80.0)</td>
<td>8 (80.0)</td>
<td>16 (80.0)</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>NVD + CS</td>
<td>2 (20.0)</td>
<td>2 (20.0)</td>
<td>4 (20.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Menopausal history</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Premenopausal</td>
<td>10 (100.0)</td>
<td>9 (90.0)</td>
<td>19 (95.0)</td>
<td>0.3</td>
<td></td>
</tr>
<tr>
<td>Postmenopausal</td>
<td>0 (0)</td>
<td>1 (10.0)</td>
<td>1 (5.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Stamey Classification</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G I</td>
<td>10 (100.0)</td>
<td>8 (80.0)</td>
<td>18 (90.0)</td>
<td>0.136</td>
<td></td>
</tr>
<tr>
<td>G II</td>
<td>0 (0)</td>
<td>2 (20.0)</td>
<td>2 (10.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cystocele Grade</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No cystocele</td>
<td>0 (0)</td>
<td>1 (10.0)</td>
<td>1 (5.0)</td>
<td>0.3</td>
<td></td>
</tr>
<tr>
<td>Grade I</td>
<td>8 (80.0)</td>
<td>9 (90.0)</td>
<td>17 (85.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade II</td>
<td>2 (20.0)</td>
<td>0 (0)</td>
<td>2 (10.0)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

No statistical significant differences (P ≥ 0.05) in postoperative complication between study groups as shown in table (3).
Table 3: Distribution of postoperative complication of patients by groups

<table>
<thead>
<tr>
<th>Postoperative complication</th>
<th>Study Group</th>
<th>Total (%) n = 20</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Kelly’s (%) n = 10</td>
<td>TVT-O (%) n = 10</td>
<td></td>
</tr>
<tr>
<td>Denovo Dyspareunia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>2 (20.0)</td>
<td>1 (10.0)</td>
<td>3 (15.0)</td>
</tr>
<tr>
<td>No</td>
<td>8 (80.0)</td>
<td>9 (90.0)</td>
<td>17 (85.0)</td>
</tr>
<tr>
<td>Short term voiding difficulty</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>0 (0)</td>
<td>1 (10.0)</td>
<td>1 (5.0)</td>
</tr>
<tr>
<td>No</td>
<td>10 (100.0)</td>
<td>9 (90.0)</td>
<td>19 (95.0)</td>
</tr>
</tbody>
</table>

Subjectively, half of Kelly’s group women were cured while the other half were improved one month after Kelly’s surgery. For TVT–O group, all the women (100%) have cured one month after TVT-O surgical operation. All these findings were shown in table (4).

Table 4: Distribution of subjective outcome according to study groups

<table>
<thead>
<tr>
<th>Subjective outcome</th>
<th>Study Group</th>
<th>Total (%) n = 20</th>
<th>P - Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Kelly’s (%) n = 10</td>
<td>TVT-O (%) n = 10</td>
<td></td>
</tr>
<tr>
<td>Outcome one month after surgical operation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cured</td>
<td>5 (50.0)</td>
<td>10 (100.0)</td>
<td>15 (75.0)</td>
</tr>
<tr>
<td>Improved</td>
<td>5 (50.0)</td>
<td>0 (0)</td>
<td>5 (25.0)</td>
</tr>
<tr>
<td>Outcome six months after surgical operation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cured</td>
<td>3 (30.0)</td>
<td>10 (100.0)</td>
<td>13 (65.0)</td>
</tr>
<tr>
<td>Improved</td>
<td>4 (40.0)</td>
<td>0 (0)</td>
<td>4 (20.0)</td>
</tr>
<tr>
<td>Failed</td>
<td>3 (30.0)</td>
<td>0 (0)</td>
<td>3 (15.0)</td>
</tr>
</tbody>
</table>

One month postoperatively, three (30%) women of Kelly’s group had positive cough stress test while in TVT-O group, all the women (100%) had negative cough stress test one month after surgical operation. (Table 5).

Table 5: Distribution of objective outcome according to study groups

<table>
<thead>
<tr>
<th>Objective outcome</th>
<th>Study Group</th>
<th>Total (%) n = 20</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Kelly’s (%) n = 10</td>
<td>TVT-O (%) n = 10</td>
<td></td>
</tr>
<tr>
<td>Cough stress test one month after surgical operation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>3 (30.0)</td>
<td>0 (0)</td>
<td>3 (15.0)</td>
</tr>
<tr>
<td>Negative</td>
<td>7 (70.0)</td>
<td>10 (100.0)</td>
<td>17 (85.0)</td>
</tr>
<tr>
<td>Cough stress test one month after surgical operation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>5 (50.0)</td>
<td>0 (0)</td>
<td>5 (25.0)</td>
</tr>
<tr>
<td>Negative</td>
<td>5 (50.0)</td>
<td>10 (100.0)</td>
<td>15 (75.0)</td>
</tr>
</tbody>
</table>

Discussion

Testing the quality evidence of surgical procedures in treatment of stress urinary incontinence in females which is dependable on outcome, satisfaction of surgeons and patients, those are the golden standard used as base in selection of an appropriate surgery (13).

Present study showed that after one and six months follow up, the outcome of TVT-O procedure was significantly better than anterior colporrhaphy with Kelly’s plication procedure in surgical treatment of SUI of women. These findings are similar to results of Azab et al (14) study in Egypt which found that TVT-O procedure is significantly better than anterior colporrhaphy with
Kelly’s plication procedure in treatment of SUI in women, but they reported no significant difference between two surgical procedures regarding complications. However, the findings of the current are inconsistent with results of Sohbati et al study in Iran which was reported no significant difference in outcome between two procedures (5).

The cure rates of TVT-O procedure of SUI for women after one and six months follow up in present study was (100%). This finding is in agreement with results of Al-Taweel et al (15) study in Canada which stated that the TVT-O procedure is safe and effective surgical management procedure for SUI among women.

The current study cure rate of anterior colporrhaphy with Kelly’s plication procedure after one months was (50%) and after 6 months was (30 %) subjectively. While objectively, cure rate was after one month was (70%) and after six months (50%). These findings are inconsistent with results of Pelusi et al study in Italy which found that cure rate of Kelly’s plication procedure in women with SUI 88.5% after period of 6 – 12 months (16). This inconsistency might be due to difference in women characteristics and difference in methodology and sample size between different studies. In Iran, Zargham et al reported that cure rates of Kelly’s plication procedure after three days and 12 months were 62% and 54% respectively (17). It was obvious that in the current study and other studies, that cure rate of anterior colporrhaphy with Kelly’s plication procedure drop down in evaluation after long time. The success rate of surgical operations used for women with urinary incontinence is related to lower complications, ability to control urine and improved quality of life of the women (18) (19)(20) (21).

The clinical significance of the current study is the helping of Surgeons and Gynecologists to choose the appropriate surgical option for treatment of SUI among women and adding more information on outcome of TVT-O procedure and anterior colporrhaphy with Kelly’s plication procedure. In conclusion, the subjective and objective outcome of tension free vaginal tape – transobturator procedure (TVT-O) in treatment of SUI among women was better than the outcome of anterior colporrhaphy with Kelly’s plication after one and six months of follow up.

**Ethical Clearance:** Taken from AL-Elwiya Maternity Teaching Hospital, Baghdad, Iraq committee

**Source of Funding:** Self

**Conflict of Interest:** None

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Evaluation of Some Enzymes, Hormones, Other Related Biochemical Parameters in Sera and Follow up of Women after Treatment of Breast Cancer

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¹Medical Technology Institute in AL-Mansour, Middle Technical University, Baghdad, Iraq; ²Department of Chemistry, College of Science, Tikrit University, Baghdad, Iraq

ABSTRACT

Carbohydrate Antigen (CA 15-3) is a carbohydrate called mucin containing protein antigen. The pregnancy hormone of human chorionic gonadotropin (HCG) is a complex glycoprotein, the glycoprotein-type α-subunit and the β-subunit. This biochemical marker may be elevated in patients with breast cancer. For programmed cell death, caspases are cysteiny1 aspartate-specific proteases. To study the relationship between CA 15-3, β-HCG, caspase-3, serum IgG, IgM, ferritin and alkaline phosphatase in patients with various stages of breast cancer.

Key words: Carbohydrate Antigen (CA 15-3), β human chorionic gonadotropin (β-HCG), Immunoglobulins IgG, IgM, Caspase-3, Ferritin and Alkaline phosphatase (ALP).

Introduction

A great deal of attention has also been given to the prognostic value of CA15-3 level in breast cancer. Levels of CA15 -3 may provide useful information for breast cancer diagnosis and therapy.¹ There is a significant increase in CA 15 -3 production in many people with cancerous breast tumors.² Serum CA 15 -3 levels with clinicopathological parameters in women with metastatic breast cancer and tumor marker elevation were correlated with increased several metastatic sites.³ Serum nucleosomes have been reported to give a positive correlation with CA 15-3 in patients with breast cancer.⁴ Caspases play a central role in this apoptotic process by activating DNases to stimulate nucleosomal DNA fragmentation.⁵

(β-HCG) has been implicated in breast tumorigenesis.⁶ Human breast cancer cells and tissues contain HCG/ luteinizing hormone receptors, which are very important for apoptosis and activation of these receptors, leading to increased cell differentiation and apoptosis.⁷ It has been shown that HCG’s apoptotic effect on breast cancer cells is mediated by activation of the apoptotic mitochondrial pathway going to lead to the cleavage of caspases-3 and -9.⁸ Apoptosis occurs when intrinsic or extrinsic caspase pathways are activated in cell death programs, so that most of the signaling pathways activated by anticancer drugs eventually lead to caspase activation.⁹ The growth of tumors is the end result between cell proliferation and cell lack by apoptosis. Several death-inducing signals that can activate caspase-3, including chemotherapeutic agents and radiation. Due to its location in the cascade pathway of protease, caspase-3 was considered to be directly correlated with apoptosis.¹⁰ Caspase-3 are used not just as an indicator for treatment response prediction, but as a therapeutic target whether directly or from other proteins connected to apoptosis.¹¹

After an immune challenge, the first immunoglobulin (Ig) produced is adaptive IgM, which was considered an early diagnostic tool for cancer detection.¹² For early diagnosis, the level of serum immunoglobulin was important. IgG and IgM have been increased in breast cancer women from stage I to IV.¹³ Natural IgM has a direct cytotoxic effect on tumor cells, recognizes tumor - modified cell surfaces that develop during tumorigenesis,
and it activates complement to destroy nascent transformed cells. The silencing of IgG1 reduced the formation of colony, survival, progression of the cell cycle, migration and invasion in cells of prostate cancer. The silencing of IgG1 also reduced the amount of the proliferation marker and induced apoptotic caspase-3 marker formation.

The gradual increase in breast cancer serum ALP activity is an indicator of metastasis. Women with breast cancer generally have ALP activities higher than normal healthy women. Bone is perhaps the most frequent site of distant breast cancer metastasis. Early detection and diagnosis of bone metastasis is therefore helpful for treatment in patients with breast cancer. The most accurate biomarkers for predicting bone metastasis in breast cancer were elevation of ALP and CA15-3 with reduced hemoglobin.

Increases in serum ferritin levels in malignancy and high serum ferritin levels in various cancers are associated with poor survival. The connection between ferritin and many cancer-related pathways, either directly or indirectly, such as cell proliferation, evasion of growth suppressors, inhibition of cell death, angiogenesis, invasion and metastasis. In cancer cells, increased ferritin might be correlated with development of cancer. Downregulation of ferritin resulted in an increase in caspase-3 activity as an apoptosis marker.

Several forms of cancer can associate with iron overload. Estrogen (E2) disrupts homeostasis of the iron intracellular. E2 changes the intracellular iron status and the potential for cell growth in breast cancer that has been treated with an increase in E2.

**Materials & Method**

Fifty four women with newly diagnosed breast cancer were divided into 34 (stage I) and 20 (stage II) patients with age range (25 -59) years, other 54 women with benign breast mass (pathological control) with age range (19 -60) years, other fifteen patients selected from fifty four patients with breast cancer after the end of the six cycles of therapy were seen at center of breast cancer in Al - Amal National Cancer Hospital in Baghdad/Iraq from January, 2018 till September, 2018. Other 54 women were considered as a normal healthy control. The final diagnosis was checked for cytology, histopathological study (biopsy) and mammograph, according to the classification of the Union for International Cancer Control (UICC 1997). The cases were classified according to Tumor Node Metastasis (TNM) classification and tumors were diagnosed in most cases as invasive ductal and invasive lobular and are presented in Table 1 according to (American Cancer Society, 2017).

**Table 1: General characteristics of breast cancer patients**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>No. of Patients</th>
<th>Characteristic</th>
<th>No. of Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total No. of subjects</td>
<td>54</td>
<td>T1N1M0, T2N0M0, T2N1M0, T3NOMO stage II, (20)</td>
<td></td>
</tr>
<tr>
<td>Left breast</td>
<td>38</td>
<td>No malignant disease in family</td>
<td>22</td>
</tr>
<tr>
<td>Right breast</td>
<td>16</td>
<td>Malignant disease in family</td>
<td>32</td>
</tr>
<tr>
<td>Ductal cancer</td>
<td>36</td>
<td>Address Urban</td>
<td>35</td>
</tr>
<tr>
<td>Papillary cancer</td>
<td>18</td>
<td>Rural</td>
<td>19</td>
</tr>
<tr>
<td>T1N0M0</td>
<td>Stage 1,(34)</td>
<td>Marital status Married Single</td>
<td>48 6</td>
</tr>
</tbody>
</table>

Blood samples were withdrawn from all patients and allowed to coagulate at room temperature then centrifuged at 3000 rpm for 10 min. The resulting sera were separated and manually assay have been done. (CA 15-3), (β-HCG), Caspase-3 IgG, IgM, ALP and Ferritin. have been detected. CA15-3 ELISA kit is a solid phase enzyme-linked immunosorbent assay. The HCG quantitative test is based by (ELISA). Determination of human caspase-3 by ELISA Kit. Determination of serum IgG, IgM, the procedure consists in an immune precipitation in agarose between an antigen and its homologous antibody. Colorimetric determination of ALP. While the method of ferritin measurement was by (ELISA).

**Statistical Analysis:** Students’ t-test was used to determine the mean value for parameters whether it
was significantly different in women with breast cancer, pathological control and normal healthy control p<0.05 was considered significant.

**Ethical Aspects:** According to Iraq’s ethical guidelines, the informed consent was obtained from all patients included with the study protocols.

**Results**

The prevalence of breast cancer is found to increase with age, approximately 25.9% of females between 40-49 years and 44.4% of females between 50-59 years. Table (2) shows that serum (CA 15-3), (β-HCG), caspase-3, IgG, IgM, ALP and ferritin level of women with breast cancer was significantly increased in comparison with normal healthy control (p<0.0001, respectively). Serum (CA 15-3), IgG, ALP and ferritin were no significance in comparison normal healthy control with pathological control (p<0.234, <0.503, <0.684, <0.90 respectively), but serum β-HCG, caspase-3 was significantly increased and significant decrease of IgM level in comparison normal healthy control with pathological control (p<0.05, <0.0001, <0.05, respectively). In post-therapeutic study, the results were decreased in the serum (CA 15-3), (β-HCG), IgG, IgM, ALP and ferritin level after treatment when compared to their level before treatment in women with breast cancer (<0.05, <0.001, <0.0001, <0.001, <0.0001, <0.05, respectively), while there was a significant increase in the (CASP3) level of these parameters before and after treatment with (P< 0.0001). (Figure 1,2,3).

**Table 2:** Showed, CA 15-3, (β-HCG), caspase-3, IgG, IgM, ALP and ferritin values for sera of normal healthy control, pathological control and women with breast cancer (stage I and stage II) before and after treatment with (mean ± SD)

<table>
<thead>
<tr>
<th>Group(n)</th>
<th>CA 15-3 (U/ml)</th>
<th>β-HCG (mIU/ml)</th>
<th>Caspase-3 (ng/ml)</th>
<th>IgG (mg/dl)</th>
<th>IgM (mg/dl)</th>
<th>ALP (U/L)</th>
<th>Ferritin (ng/ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal healthy control(54)</td>
<td>6.71 ± 4.33</td>
<td>1.47 ± 1.12</td>
<td>2.12 ± 0.05</td>
<td>1311.9 ± 355.1</td>
<td>197.3 ± 55.6</td>
<td>59.7 ± 21.7</td>
<td>34.7 ± 20.05</td>
</tr>
<tr>
<td>Pathological control(54)</td>
<td>8.34 ± 9.04</td>
<td>6.19 ± 11.93</td>
<td>2.34 ± 0.09</td>
<td>1358.3 ± 361.5</td>
<td>161.5 ± 63.2</td>
<td>61.37 ± 19.5</td>
<td>34.2 ± 20.52</td>
</tr>
<tr>
<td>Newly breast cancer(54)</td>
<td>31.20 ± 40.77</td>
<td>22.34 ± 18.22</td>
<td>2.42 ± 0.06</td>
<td>2363.8 ± 971.8</td>
<td>259.3 ± 51.11</td>
<td>93.64 ± 32.8</td>
<td>98.5 ± 59.94</td>
</tr>
<tr>
<td>Stage I (34)</td>
<td>15.18 ± 17.9</td>
<td>28.8 ± 17.3</td>
<td>2.36 ± 0.04</td>
<td>2193.8 ± 105.4</td>
<td>273.3 ± 54.3</td>
<td>92.72 ± 30.2</td>
<td>99.4 ± 64.2</td>
</tr>
<tr>
<td>Stage II (20)</td>
<td>59.07 ± 51.21</td>
<td>12.27 ± 13.3</td>
<td>2.59 ± 0.08</td>
<td>2501.7 ± 732.6</td>
<td>246.7 ± 66.1</td>
<td>93.74 ± 36.0</td>
<td>96.9 ± 53.7</td>
</tr>
<tr>
<td>Treated breast cancer(15)</td>
<td>7.15 ± 2.29</td>
<td>3.2 ± 1.06</td>
<td>3.62 ± 0.025</td>
<td>1145.3 ± 315.2</td>
<td>159.63 ± 70.8</td>
<td>59.11 ± 16.8</td>
<td>43.3 ± 22.1</td>
</tr>
</tbody>
</table>

*Significant using student t-test between two independent means at 0.05 level of significance.
**Discussion**

The CA 15-3 is a tumor marker that is often expressed in people with breast cancer. It is play a crucial role in diagnosis, monitoring response to therapy, early detection of metastasis. There is significant an increased production of CA 15-3. Results were consistent with that reported by [Wu SG, et al. 2014]. A great deal of attention has also been given to the prognostic value of CA15-3 level in breast cancer. Levels of CA15-3 may provide useful information for breast cancer diagnosis and therapy. The deregulation of caspases associated in the regulated apoptotic cascade, resulting in the release of DNA or nucleosomes into the circulation of the blood, an essential aspect of the development and progression of cancer. Serum nucleosomes have been reported to give a positive correlation with CA 15-3 in patients with breast cancer. It is been concluded from this study that serum nucleosomes showed a positive correlation with CA 15-3 in breast cancer patients.

Hormone (β-hCG) has been implicated in breast tumorigenesis. Results indicate it to be protumorigenic or stimulate the growth of cancer cells. In breast cancer, there was a significant increased in production of β-HCG. Results were consistent with that reported by [S K Sengadan, et al. 2017]. (β-hCG) has been implicated in breast tumorigenesis. Luteinizing hormone (LH)/HCG receptor expression, it has been recorded to also be higher in normal breast tissue than those in breast cancer. Human breast cancer cells and tissues contain HCG/luteinizing hormone receptors, which are very important for apoptosis and activation of these receptors, leading to increased cell differentiation and apoptosis.

It is been concluded from this study that serum IgG and IgM increased therefore, detected serum immunoglobulin level was important for early diagnosis breast cancer. Results consistent with that reported by [Matsumoto H, et al. 2015]. For early diagnosis, the level of serum immunoglobulin was important. IgG and IgM have been increased in breast cancer women from stage I to IV. IgM can eliminate breast cancer tumors through different mechanisms such as apoptosis. These results were consistent with the results by [Mariana Di, et al 2015]. Natural and adaptive IgM can eliminate tumors of breast cancer in cancer patients through different mechanisms, such as apoptosis. The silencing of IgG1 reduced the proliferation marker and formation of the apoptotic marker such as caspase-3. Results were compatible with that reported by [Yawen Xu, et al. 2016]. The silencing of IgG1 reduced the formation of colony, survival, progression of the cell cycle, migration and invasion in cells of prostate cancer and formation caspase-3 as apoptotic marker.

Results indicated that women with breast cancer have ALP activities generally higher than normal healthy women. The gradual increase in serum ALP activity with breast cancer is an indicator of metastasis. Results were compatible with that reported by [A. K. Singh, et al. 2013]. The gradual increase in breast cancer serum ALP activity is an indicator of metastasis. Women with breast cancer generally have ALP activities higher than normal healthy women. The most accurate biomarkers for predicting bone metastasis in breast cancer were elevation of ALP and CA15-3 with reduced hemoglobin.

There are relationship between ferritin and many pathways related with cancer and elevated ferritin in cancer cells may be related with cancer progression. Results were compatible with that reported by [Min P. BS and James R C. 2015]. The connection between ferritin and many cancer-related pathways, either directly or indirectly. In cancer cells, increased ferritin might be correlated with development of cancer. This study can be concluded that elevated ferritin in cancer cells may be related to cancer progression. Several forms of cancer can associate with iron overload. Estrogen (E2) disrupts homeostasis of the iron intracellular. E2 changes the intracellular iron status and the potential for cell growth in breast cancer that has been treated with an increase in E2. Ferritin low regulation led to an increase in caspase-3 activity as an apoptosis marker.

**Conclusion**

It is been concluded from this study that levels of CA 15-3, β-HCG, IgG, IgM, alkaline phosphatase and ferritin may provide useful information for breast cancer diagnosis and therapy. There are a significant increase in CA 15-3, β-HCG, Caspase-3 IgG, IgM, ALP and ferritin production in many people with with breast cancer. Patients with breast cancer increased the deregulation of caspase-3 and elevated CA15-3. Hormone (β-hCG) has been implicated in breast tumorigenesis. HCG/luteinizing hormone receptors, which are very important for apoptosis and activation of these receptors, leading
to increased apoptosis. The link between ferritin and many cancer-related pathways, such as cell proliferation and inhibition of cell death.

**Source of Funding:** Self.

**Conflict of Interest:** It as nil.

**REFERENCES**


2. “Cancer Antigen 15-3” This article was last modified on (2018). AACC Lab Tests Onlins.


Arthroscopic Coblation for Temporomandibular Joint Disc Release

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ABSTRACT

Temporomandibular joint diseases are common and one of the most important methods of modern treatment are arthroscopy, which many scientists since the use and until now go to develop in the techniques used for it. The aim of this study is to confuse the results of the use of coblation devices in the operations of TMJ disc release. The study was conducted on the number of 12 patients who were diagnosed by research diagnostic criteria for TMJ and arthroscopic surgery to release disc and place in proper anatomic position then follow up for 2 months. Our results show that highly success rate 91.6% with increase in jaw function. We conclude that coblation give an effective results for arthroscopic joint surgery

Keywords: Temporomandibular joint, Arthroscopy, coblation, disc release

Introduction

Temporomandibular joint (TMJ) internal derangement (ID) is the most common forms of temporomandibular disorder. Patients with TMD may present with a cluster of joint and muscle disorders characterized primarily by pain, joint sounds, and improper jaw function.[¹] The first treatment modality of those patients is conservative methods such medical treatments, physiotherapy & splint therapy. In the past when conservative method fail surgical methods is performed through open joint surgery techniques such as arthrotomy, disk repositioning, disectomy and condylotomy that are invasive and have many complications and their outcomes or success rate still not satisfactory.[²] So that many efforts continued to replace these invasive techniques with another treatment modalities that are less invasive and probably more effective such as arthroscopy(ARSCOPY) which had proved reliable and encouraging results.

Accordingly different ways has been discovered with excellent results, such as arthroscopic disk release with disc-repositioning or suture techniques (disccopexy), [³, ⁴] synovial coagulation, chondroplasty, discoplasty, fibrous debridement and eminectomy.[⁵] McCain, [⁴] was first one described TMJ anteriorly disc release to move the frontal and medium correlation in the region of the frontal and medium capsule and pterygoid muscle, release the displaced disc then the disc is placed in a position posterior and subsequently in a favorable connection with the condyle. Disc release could be accomplished to various with the hand tools and monopolar or bipolar electrocautery (diathermy) probe, radiofrequency coblation and laser systems while the others with rotary mechanical shavers.[⁶-⁹] In past the most common technique used for disc release act on using electrocautery diathermy for generating electric stream from the dynamo which is through the tissue among two electrodes, that finding from great temperature (400º-600ºC) play role in cutting the tissue and simultaneously seals the blood vessels. The characteristic of this proceedings in comparison to conventional manual manners is the lowest danger of intra-operative bleeding and smaller period of surgery. [¹⁰] Meanwhile, this process is connected with addition post-operative suffering referred to the spread of thermal injury caused to great temperatures utilized.[¹¹]
In 1995 the arthroscopic coblation instrument triggered a revolution in the development of arthroscopic devices for orthopedic arthroscopic surgery, radiofrequency electrical freightage throwing through saline solution produces a plasma with enough power to destroy great bonds necessitate in soft tissue molecules than that induced using electrocautery,\[12\] treatment theoretically decreasing risk to healthy tissue and reduction suffering.\[10\] The significant characteristic of the coblation an established is the reduce temperature (lower than 40ºC) recognized to the all around tissues, with the lower potential of topical damages when compared with others and without inadvertent damage to adjacent tissues. Many researchers\[13, 14, 15\] observed that the coblation was additional appropriate, extra careful, supplementary influenced, and lower harmful than conventional hand tools, revolving mechanical shavers, and electrocautery and they reported improved results and prevention of recurrence by using arthroscopic Coblation. Also they found that there was no apparent bleeding or cauterization injury after arthroscopy, and reappearance of a soft surface happened. From all the previously mentioned in this prospective study; we would like to compare usage two cutting techniques for anterior disc release they are monopolar electrocautery and radiofrequency ablation system.

**Aim of the study:** The target of this research was to estimate the influences of Coblation in the temporomandibular joint (TMJ) arthroscopy disc release surgeries.

**Equipment:** The arthroscopic system includes KARL STRORZ, Germany, 1.9 mm rod lens type, 30° angle, and camera console (LEMEKE vision, Germany)

The Coblation device uses bipolar radiofrequency energy (Stryker SERFAS Energy RF Ablation System).

**Surgical Technique:** All arthroscopic procedures were performed with the patient under general anesthesia by the same arthroscopists. The arthroscopic technique done according to McCain.\[16\] The lateral anterior channels used for adhesion ablation and anterior release. The arthroscopy lens usually was introduced through the cannula in the posterior recess of the superior joint space, and the Coblation probe introduced through the cannula in the anterior recess.

The Coblation probe was used to release the anterior attachment of the disc and a portion of the lateral pterygoid muscle. This allows the disc to reduce easily and effectively. The incision line was located approximately 2 to 3 mm anterior to the anterior band of the disc, along the entire medial- to-lateral breadth of the anterior recess. The depth is between 2 and 5 mm. bleeding was coagulated by the Coblation tip until muscle fibers can be seen clearly. A blunt probe was introduced through the anterior cannula to release the muscle further and to reposition the disc.

**Patients and Method**

**Patients:** Arthroscopic surgery was done on twelve temporomandibular joints of patients suffering from ID of TMJ. Who had been referred to the department of oral and maxillofacial surgery at Minia University Dental Hospital (MUDH) from May 2017 to January 2019. Selection was based on the clinical examination using the Research Diagnostic Criteria/Temporomandibular joint Derangements systems RDC/TMD of Internal Derangement (ID) anterior disc displacement (ADD) and radiographic by MRI. The patients consisted of three males and nine females mean age 34.5 years and they were previously treated by conservative ways but have not been improved, however any patients with history of previous surgical treatment or systemic bone diseases were excluded from the study. Written informed consents after explanation of the nature and the purpose of the study were obtained from them.

**Figure 1: Arthroscopic release. A, area insertion for disc release and muscle shadow B. The anterior release was carried out using the arthroscopic coblation. C, The view after arthroscopic coblation**
Evaluation: All patients were examined in predefined follow up appointments; at 1, 2 weeks, 1 & 2 months according to RDC/TMD for evaluation of joint function (assisted and unassisted mouth opening) and disability after treatment.

Results

All TMJs disc were reduced correctly by performing anterior release with Coblation and patients were followed up for 2 months. Our results show 83.3% (10/12) had excellent results and 8.3% (1/12) had good results. The success rate was 91.6%. All patients showed increase in mean non-assisted mouth opening (MO) through all periods and assisted mouth opening that denoting increase proper joint function, the mouth opening increased from preoperative (27.54 ± 1.93 mm) to postoperative (37.48 ± 1.2 mm).

![Figure 2: Mouth opening preoperatively and during all periods of follow-up.](image)

Discussion

TMDs signs and symptoms are very common and the diagnosis of particular case is not an easy task due to the complex anatomy, biology of TMJ and the complicated pathophysiology of the disorders. Treatment of TMD has always presented a therapeutic challenge to the oral and maxillofacial surgeon; there is a wide spectrum of different interventions which may help in treating TMD. It ranges from simplest method to more extensive and aggressive one. It was a successful use of arthroscopic lysis and lavage for the management of TMDs that subsequently lead to introduction of the technique of ARSCOPY.

Most studies had utilized electrocautery or laser techniques for disc release in cases of anteriorly disc displacement to reduce disc in its proper anatomic position, However Chen et al.\(^7\) were the first one who described a technique of arthroscopic disc release using coblation system but his study not use standardized method for clinical examination or to correlate data. In this study the clinical results of using arthroscopic disc release had been assessed by means of well-designed clinical trials using RDC/TMD; and to find if there is any effect in the success of the technique. Our results revealed statistically significant decrease in pain score at 2-month follow-up postoperatively versus preoperative data (P=0.026), also we found that there was absence of sound which was statistically significant (p=0.025), while for mouth opening there was significant increase at the end of 2 month follow-up but statistically non-significant (p= 0.055).

Our results are consistent with the study of Chen et al and \(^7\) Zhang et al.\(17\)

Our present study revealed that coblation system has relative advantages over electrocautery in term of being an easier technique and sharp clean cut. these findings are in general agreements with the work made by Chen et al.\(^7\)

Conclusion

We found in this research that the use of the coblation system in arthroscopic TMJ disc release showed good results and we see the need to make a valid randomized controlled trial.

Source of Funding: Self-funding

Ethical Clearance: Cleared by the ethical committee of faculty of dentistry Minia University

Conflict of Interest: No Conflict of Interest

REFERENCES


The Influence of Halloysite Nanotube Addition on Some Properties of Room Temperature Vulcanized Maxillofacial Silicone before and after Simulated Aging

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ABSTRACT

Although silicone is the most commonly used material in face and neck prostheses, but there are some drawbacks concerning its mechanical performance and durability. Therefore, this study was carried out to investigate the impact of halloysite nanotube (HNTs) on selected properties of VST-50F silicone before and after simulated weathering. A pilot study was conducted to determine the most suitable weight percentage of HNTs to be incorporated into VST-50F silicone. Accordingly, 1% and 1.5% weight percentage were chosen to be the experimental groups and compared with control. The main study involved the preparation of 240 samples divided equally into two groups: group 1 (before weathering) and group 2 (after weathering). Group 2 samples were subjected to simulated aging for 200 hour. After that, all sample were subjected to five mechanical tests, namely tear strength, tensile strength, elongation percentage, surface roughness and hardness. The research readings were collected and statistically analyzed using ANOVA, post-hoc and paired t-test tests. Additional tests were also performed including Fourier transform infrared spectroscopy (FTIR) and scanning electron microscope (SEM) that test revealed a well dispersion fashion of HNTs within VST-50F silicone, while FTIR didn’t exhibit any chemical reaction between the silicone and HNTs. However, mechanical tests results before aging showed significant rise in all tests readings except for roughness, where the change was non-significant. Meanwhile, the study results after weathering revealed a significant decline in tear strength, tensile strength and elongation percentages, yet roughness didn’t change significantly, but hardness increased remarkably. Reinforcing VST-50F with HNTs improved some of its mechanical properties but didn’t protect it from aging consequences.

Keywords: maxillofacial silicone, halloysite nanotube, fillers, simulated weathering.

Introduction

Maxillofacial anomalies (inherited or acquired) have a negative impact on normal living both physiologically and psychologically (1). The available choices to reconstruct the defective parts include: surgery or prosthesis, the former is desirable and should be performed whenever possible, while prosthesis is considered a substitute to surgery when the latter is contraindicated (2,3).

Regarding maxillofacial prostheses, the scientist utilized different materials in these appliances till the innovation of silicone, where great shift was made in this industry. This is owning to many favorable properties of silicone such as; biocompatibility, durability, ease of manufacturing and chemical stability (4). Nevertheless, Some properties, like tear and tensile, are not optimum and require improvements. Furthermore, noticeable physical and chemical changes might be encountered during silicone aging, where the cumulative effect of sunlight and oxygen (photo-oxidative attack) are considered as major causative factors for deterioration (5).

Consequently, different methods have been carried out to improve silicone, among them was the addition of fillers which would increase the elasticity of the material and improve its properties both physically and
mechanically (6). HNTs was chosen as filler material in this research because of their brilliant properties including; biocompatibility, availability, low cost and ease of processing (7,8). Therefore, the goal of this study is to explore the impact of HNTs on silicone mechanical behavior before and after simulated aging.

**Materials and Method**

Materials used in this research involved VST-50F silicone (Factor II, Inc., USA) and HNTs (Nano shel., USA).

1. **Pilot Study:** different weight percentages (0.5%, 1%, 1.5% and 2%) of HNTs were added to VST-50F and a comparison were conducted regarding tear strength and surface hardness. Consequently 1% and 1.5% weight percentages were selected as they showed the best outcomes.

2. **Specimens Grouping:** Two hundreds forty specimens had been prepared and divided into 2 main groups; group 1 (before weathering) and group 2 (after weathering), with 120 sample for each. These two groups were further subdivided into 3 subgroups; control, 1% HNTs and 1.5% HNTs, and each subgroup contain 40 specimens; 10 for each test (tear, tensile, hardness and roughness), while elongation percentage test was measured concurrently with tensile strength.

3. **Mold Fabrication:** A lase engraving machine had been used to cut acrylic sheets of variable thicknesses (2 - 6 mm), and this cutting was performed according to specifications determined for each test. The mold consist of base, matrix and cover, secured together by bolts and nuts. G-clamp were also used at the margins for additional tightening (Figure 1).

4. **Mixing Procedure:** Mixing followed manufacturer’s instructions which reveal that; for each 10 parts of base : 1 part of catalyst (by weight) should be added. For control group samples; the base and catalyst were weighed properly using electronic balance and mixed in vacuum mixer (Multivac 3, Germany) at 360 rpm speed under pressure of 10 bar for 5 minute so as to obtain bubble free mix. While for the other experimental groups (1% and 1.5% HNTs) the chosen concentrations of HNTs firstly weighed in the mixing bowel and the base then added in the desired weight, then the base and the HNTs mixed together for 3 minute without air evacuation (to avoid HNTs suctioning) followed by 7 minute of vacuum mixing. After that the catalyst was added and vacuum mixing was repeated for 5 minutes (9).

5. **Sample Preparation and Storage:** Silicone was applied to fill the mold gradually with the aid of wax knife, when the mold became completely filled, the cover was placed carefully and hand pressure was applied at the center of the mold. then the mold parts secured together using screws and nuts at the corners and tightened by G-clamp at the margins. The prepared sample were stored in a cooling box to keep them within the recommended conditions (temperature of 23 ± 2°C and relative humidity of 50 ± 10%) (10).

6. **Accelerated Artificial Aging of Specimens:** One hundred twenty sample had been placed in accelerated artificial aging tester (model QUV/spray, Q-Lab corp., USA) for 200 hours (Figure 3), where they submitted to alternative periods of darkness, ultraviolet light, high temperature and filtered water (11).

7. **Testing Procedures:**

   **A. Tear strength:** The sample design and testing procedure were based on ISO 34-1:2010 (12) specification. The sample has one apex and two tap ends, with thickness of 2 ± 0.2mm. Universal testing machine (Laryee Technology Co., Ltd., China) had been utilized to perform this test. The speed was adjusted at 500mm/min, and the maximum force at rupture was recorded. Tear strength=F/D, where F is the maximum force required for sample breaking in newtons, and D is the median thickness of each sample in millimeter.

   **B. Tensile strength and elongation percentages:**

   The design of samples and testing procedure were in accordance to ISO 37:2011 (13) specification. Digital caliper was utilized to calculate the cross sectional area of the testing length. These tests had also been performed using universal testing machine, which run at 500mm/min speed. The maximum force and elongation at break were recorded and the tensile strength was calculated using the following formula: Ts=F/W×T, Where F represents the maximum force in Newton, and W is the width of narrow portion of the sample in millimeters, while T refers to the
thickness of narrow portion of the sample in millimeters. Meanwhile elongation percentage was calculated from the following equation: E\%=(L_b–L_o)/L_o \times 100, where L_b is the length after rupturing, while L_o is the original length

C. Shore A hardness: Sample design and testing procedure were based on ISO 7619-1:2010 (14), where the dimensions were dictated to be 25mm×25mm×6mm (width, length and thickness respectively). Shore A durometer(HS, Ezitown, China) was used to take five readings from each sample, with at least 6 mm distance should separate each reading from sample center and from the other readings. The mean of these readings represents hardness value.

D. Surface Roughness: The sample were fabricated according to the directions of ISO 7619-1:2010 (14). Prolifrometer of 0.001 µm accuracy (Pocket Surf Mahr, Germany) was used to take three readings from each sample and the mean of them represent the roughness value.

E. SEM Test: Two samples were tested, one for the non-reinforced VST-50F and the other for 1.5% HNTs reinforced VST-50F using SEM (Angstrom Advanced Inc, USA).

F. FTIR Spectroscopy: This test was conducted for HNTs powder, reinforced and non-reinforced VST-50F silicone before and after weathering using FTIR spectroscope (Bruker, Germany).

G. Statistical Analysis: The data had been collected and analyzed by conducting descriptive and statistical tests including; ANOVA test, post-hoc test and paired t-test. the Significance level set to (P ≤ 0.05)

Results

A. SEM Result: SEM reveals a well dispersed fashion of HNTs within silicone polymeric matrix (Figure 2).

B. FTIR Results: The results show no impact on the spectra range of VST-50F silicone neither by the addition of HNTs nor by the artificial weathering(Figure 3).

C. Mechanical Tests Results: The two experimental groups showed higher mean values than control group in all tested properties within group 1 (before weathering) and group 2 (after weathering). One way-ANOVA test revealed a highly significant difference among study groups results of all tested properties within group 1 and group 2, except for roughness results. Accordingly post-hoc test had been conducted and its results showed significant difference between control and the two experimental groups in all tested properties within group 1 and group 2. Paired t-test was also performed, and its outcomes referred to significant differences between group1 and group 2 in all categories of all tested properties, excepting roughness test which showed a non-significant increase (Table 1 and 2).
Figure 3: FTIR spectroscopy of VST-50F silicone before (A) and after (B) HNTs incorporation

Table 1: ANOVA test with paired t-test, where A represented values before weathering and B represents values after weathering

<table>
<thead>
<tr>
<th>Groups</th>
<th>Tests</th>
<th>Control</th>
<th>1%HNTs</th>
<th>1.5%HNTs</th>
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<tr>
<td></td>
<td></td>
<td>Mean A</td>
<td>Mean B</td>
<td>Mean A</td>
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<tr>
<td></td>
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<td>Paired</td>
<td>Paired</td>
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<td></td>
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<td>tensile (MPa)</td>
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</table>

Table 2: Post-hoc test, where A represents values before weathering while B represents values after weathering

<table>
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<th>J group</th>
<th>Mean difference (I-J)</th>
<th>Significance</th>
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<td>Tukey HSD</td>
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<td>1%HNTs</td>
<td>-2.21</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>Dunnet T3</td>
<td>control</td>
<td>1.5%HNTs</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>Tukey HSD</td>
<td>control</td>
<td>1%HNTs</td>
<td>-0.69</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>Tukey HSD</td>
<td>control</td>
<td>1.5%HNTs</td>
<td>-1.029</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>Tukey HSD</td>
<td>control</td>
<td>1%HNTs</td>
<td>-0.78</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>Tukey HSD</td>
<td>control</td>
<td>1.5%HNTs</td>
<td>-1.22</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>Tukey HSD</td>
<td>control</td>
<td>1%HNTs</td>
<td>-53.19</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>Tukey HSD</td>
<td>control</td>
<td>1.5%HNTs</td>
<td>-97.31</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>Tukey HSD</td>
<td>control</td>
<td>1%HNTs</td>
<td>-30.04</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>Tukey HSD</td>
<td>control</td>
<td>1.5%HNTs</td>
<td>-79.89</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>Tukey HSD</td>
<td>control</td>
<td>1%HNTs</td>
<td>-2.34</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>Tukey HSD</td>
<td>control</td>
<td>1.5%HNTs</td>
<td>-3.43</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>Tukey HSD</td>
<td>control</td>
<td>1%HNTs</td>
<td>-3.54</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>Tukey HSD</td>
<td>control</td>
<td>1.5%HNTs</td>
<td>-3.79</td>
</tr>
</tbody>
</table>
Discussion

It has been assumed that; none of the commercially available silicone can meet the ideal characteristics (4). Therefore, researches are being established continuously aiming to improve silicone materials either by modifying their formulas or by adding fillers (15).

Tear strength was significantly raised after reinforcement. Such improvement might be owning to well dispersion of HNTs (as shown in SEM), and the physical interaction between HNTs and VST-50F matrix. Physically, nanoparticle have the ability to form three-dimensional meshes inside silicone polymer matrix and trapping some of its chains within such mesh. This interaction is supposed to have a role in prohibiting the movement not only of the trapped polymer chains but also of the other polymer segments. Consequently, the matrix density might be changed leading to higher tear resistance (16,17). However, tear strength was decreased after weathering, and this decline may be attributed to photo-oxidation caused by weathering, accompanied by release of free radicals which in turn react with each other leading to continuous cross-linking. Beside that, they react with oxygen to form what called (peroxyradicals) that make the elastomer brittle and inelastic (18,19).

Regarding tensile strength and elongation percentage, there was also significant increase in their readings after reinforcement. These findings can be explained as follow; when tensile stress applied to reinforced silicone polymer, the polymer chains and the reinforcing fillers would undergo sliding movement over each other, thus the chains would be protected from breakage with the aid of fillers. Additionally, polymer matrix has the ability to dissipate the applied force energy to heat, hence the remaining energy is less than what required to break polymer chains. Reinforcing fillers play a role in the dispersal of such energy (20). Anyhow, the results of these two properties after weathering revealed a significant decline in all categories. This decrease probably due to continual cross-linking that caused by accelerated ultraviolet light which is accompanied by volatile byproducts release, rendering the material inelastic and more susceptible to deformation under lighter force (15).

Hardness result before weathering exhibited highly significant increase in both experimental groups compared with control readings. Such results could be explained as follow; the nano fillers are well dispersed within the polymer (as revealed by SEM test) and capable of forming networks inside polymer, reducing the inter-aggregate space, making the material stiffer and increasing its hardness (20). Moreover, hardness readings further increased in all study groups after weathering. This finding might happened as a result of continual polymerization which is attributed to the ultraviolet light exposure during simulated weathering period. UV light absorption make the polymer network unstable, and the excess energy will be transmuted between the neighboring molecules. This will lead to degradation of these molecules as a result of photo-chemical reactions, leading to increased hardness (22).

Meanwhile, surface roughness test shows a non-significant changes not only between study groups before weathering, but also with their counterparts after weathering. Such results might be due to the small concentrations of HNTs that had been incorporated within VST-50F silicone. Beside that, HNTs are nanosized and well distributed within polymer matrix (Figure 2B). All the aforementioned facts together make the effect of HNTs on the material surface insignificant, hence surface roughness readings didn’t change significantly as such test concern with outer surface irregularities.

Conclusion

The incorporation of HNTs into VST-50F in 1% and 1.5% weight percentage enhanced tear strength, tensile strength and elongation percentage without significant effect on roughness, while hardness increased but still within the acceptable range. However, such reinforcement didn’t protect the silicone from the consequences of 200 hour of simulated aging.

Conflict of Interest: All authors hereby declare no conflict of interest.

Source of Funding: Entirely self-funded.

Ethical Clearance: In vitro study.

REFERENCES


2. Guiotti AM, Goiato MC, dos Santos DM. Evaluation of the shore a hardness of silicone for


Effect of Computer Related Ergonomics Intervention on Knowledge and Practice of Primary School Children

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ABSTRACT
Improper use of computers results in a variety of health disorders. The cumulative effect of this technology-induced, sedentary lifestyle leads to poor posture, pain, repetitive strain injury and dysfunctional movement patterns. Aim: assess the effect of computer ergonomics educational intervention on knowledge and practice of primary school children. Design: Quasi – experimental design. Sample: A total of 100 primary school children were randomly selected. Data were collected using Children Knowledge Assessment Questionnaire, Computer Workstation Assessment Checklist, Children Ergonomics Observational Checklist. Results: This study revealed an increase in knowledge and practice mean scores in immediate and follow up post intervention scores compared to pre intervention mean scores. As well, statistically significant differences were found between total knowledge and total practice scores regarding computer ergonomics in pre, immediate post and follow up the intervention. Conclusion: The educational intervention is effective in improving the children knowledge and practice. Therefore, it is recommended to replicate the research on a large sample and in different settings to achieve more generalization.

Keywords: Ergonomics, Computer use, knowledge and practices, Primary school children.

Introduction
The use of computers in schools is now well established worldwide and strategies to increase the level of use of computers by children are ongoing. However, there continues to be little thought given to ergonomic factors during the setting up of computer workstations in schools or to the subsequent use of the computers by the children. On the other hand, long periods of using a computer can increase chance of developing musculoskeletal problems. Inappropriate posture during computer use can cause muscle and joint pain, overuse injuries of the shoulder, arm, wrist or hand, and eyestrain.

The effect of improper ergonomics manifests even before students reach graduation, hence the need for commencing educational and ergonomic interventions from undergraduate years or even earlier. So, building up of school children knowledge and skills regarding ergonomics must be emphasized during these years. Proper educational intervention is expected to improve the knowledge and practice of ergonomic principles, which is assumed to reduce the associated health risks.

Hypotheses:
H1: The posttest- mean knowledge scores of children who were exposed to ergonomics educational intervention will be higher than pretest – mean knowledge scores.

H2: The posttest - mean practice scores of children who were exposed to ergonomics educational intervention will be higher than pretest – mean practice scores.

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Materials and Method

After the random selection of a three primary governmental school from the available educational governmental sectors in Cairo governorate, one classes from every school was randomly selected from the list of 4th grade classes. The sample size as calculated by power analysis was 100 children. Fourth grade children were selected in particular as preadolescence was an appropriate age for the implementation of educational program to avoid musculoskeletal problems which are more prevalent during adolescence.

Exclusion Criteria: Students with previous surgeries, deformities in the musculoskeletal system or rheumatoid arthritis were excluded.

Data Collection Tools:

I: Children Ergonomics Knowledge Questionnaire: It was used to assess children knowledge regarding computer use ergonomics. For each yes or no question, a correct answer was scored 1 and 0 score for the incorrect one.

II: Computer Workstation Assessment Checklist: It was used to assess computer workstation and related ergonomic risks. The checklist had a total score of 40. A score of 40 indicated the best score as each item fulfilling the standards was given 1 score and if not was given zero.

III: Children Ergonomics Observational Checklist: It was used to assess children practices of ergonomics while using computer in the computer workstation. For each item, children were scored 2 if they adopted proper ergonomics and 1 if they did not.

Content validity was done and tools were tested for internal consistency (Cronbach’s alpha was 0.87).

Procedure: An approval was obtained from Research Ethics Committee at Faculty of Nursing, Cairo University. Official permissions were obtained from the related administrations of schools to conduct the proposed study.

Children were asked to participate in the study and the researcher explained the aim of the study to all students. Also, written consent was obtained from the parents before children were enrolled in the study. Oral consent was obtained from the children to participate in the study.

The study was carried out on four phases: assessment phase, planning, implementation and evaluation phases.

1. Assessment Phase: In this phase, assessment of children ergonomics knowledge was done using tool I. Also, assessment of computer workstation by using tool II. As well, the researcher observed the children in the computer lab using tool III.

2. Planning Phase: The researcher designed the educational intervention. The aim of this educational intervention was to provide children with knowledge and skills of ergonomics principles and to promote behaviors that encourage a healthy musculoskeletal system. The program included knowledge about anatomy and structure of spine; ergonomic science, human body mechanics, solution of obstacles of following ergonomics principles, and stretch exercises for prevention of musculoskeletal health problem.

3. Implementation Phase: The designed intervention was presented in simple Arabic language. The designed intervention was carried out on five sessions, each session was given in the form of teaching class through pre – designed training materials.

Pamphlets, flyers, and a compact disc with a short documentary video was used. Demonstration on the proper ergonomics principles, as well, stretching and strengthening exercises were done. Handouts were given for the children. Feedback was given at the end of each session.

4. Evaluation Phase: Immediate evaluation of the educational program was done using tool I and tool III to assess the achievement of intervention objectives and three months later to ensure stability of knowledge and practice.

Results

Concerning knowledge of children regarding computer use ergonomics table (1) shows that, it was improved in immediate and follow up post tests compared to pre test.
Table 1: Percentage distribution of pre, post and follow up knowledge of children regarding computer use ergonomics (N = 100)

<table>
<thead>
<tr>
<th>Knowledge of computer use ergonomics</th>
<th>Pre-test</th>
<th>Immediate post-test</th>
<th>Follow up post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours per day</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 - 2 hours (correct answer)</td>
<td>51</td>
<td>74</td>
<td>60</td>
</tr>
<tr>
<td>3- 4 hours</td>
<td>21</td>
<td>7</td>
<td>15</td>
</tr>
<tr>
<td>5 - 6 hours</td>
<td>19</td>
<td>8</td>
<td>11</td>
</tr>
<tr>
<td>6 + hour</td>
<td>9</td>
<td>11</td>
<td>14</td>
</tr>
<tr>
<td>Distance between monitor and children eye</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correct</td>
<td>39</td>
<td>86</td>
<td>82</td>
</tr>
<tr>
<td>Incorrect</td>
<td>61</td>
<td>14</td>
<td>18</td>
</tr>
<tr>
<td>Rest period after prolonged sitting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Every two minutes</td>
<td>27</td>
<td>15</td>
<td>25</td>
</tr>
<tr>
<td>Every twenty minutes (correct answer)</td>
<td>20</td>
<td>73</td>
<td>55</td>
</tr>
<tr>
<td>Every hour</td>
<td>23</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>Feeling a need for rest</td>
<td>30</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>Body part needs support while sitting on computer chair</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shoulder and neck</td>
<td>31</td>
<td>10</td>
<td>32</td>
</tr>
<tr>
<td>Lower back (correct answer)</td>
<td>45</td>
<td>47</td>
<td>22</td>
</tr>
<tr>
<td>Middle of the back</td>
<td>24</td>
<td>43</td>
<td>46</td>
</tr>
<tr>
<td>The correct body posture</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correct</td>
<td>24</td>
<td>71</td>
<td>65</td>
</tr>
<tr>
<td>Incorrect</td>
<td>76</td>
<td>29</td>
<td>35</td>
</tr>
<tr>
<td>Proper elbow position when keying</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correct</td>
<td>58</td>
<td>92</td>
<td>79</td>
</tr>
<tr>
<td>Incorrect</td>
<td>42</td>
<td>8</td>
<td>21</td>
</tr>
</tbody>
</table>

Concerning knowledge of children regarding methods of preventing computer ergonomics risk factors table (2) shows that, it was improved in immediate and follow up post tests. The percentage of correct responses in the pre test ranged between 10% - 57% increased to 63% - 72% in immediate post test and 51% - 69% in follow up post test.

Table 2: Percentage distribution of pre, post and follow up knowledge of children regarding methods of preventing computer ergonomics risk factors (N = 100)

<table>
<thead>
<tr>
<th>Preventing computer ergonomics risk factors</th>
<th>Pre-test</th>
<th>Immediate post-test</th>
<th>Follow up post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>After prolonged sitting put a pillow</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Above shoulder</td>
<td>32</td>
<td>12</td>
<td>21</td>
</tr>
<tr>
<td>Below lower back</td>
<td>57</td>
<td>72</td>
<td>69</td>
</tr>
<tr>
<td>Under feet</td>
<td>11</td>
<td>16</td>
<td>10</td>
</tr>
<tr>
<td>To prevent eye discomfort:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increase the brightness of the room</td>
<td>40</td>
<td>14</td>
<td>15</td>
</tr>
<tr>
<td>Increase the brightness of display screen</td>
<td>31</td>
<td>23</td>
<td>26</td>
</tr>
<tr>
<td>Maintain arm distance between monitor and body (correct answer)</td>
<td>29</td>
<td>63</td>
<td>59</td>
</tr>
</tbody>
</table>
Conted…

<table>
<thead>
<tr>
<th>To reduce glare on computer screen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Don’t look at the screen</td>
</tr>
<tr>
<td>Do not use the computer</td>
</tr>
<tr>
<td>Adjust the screen brightness on your computer to low</td>
</tr>
<tr>
<td>Close the curtains (Correct answer)</td>
</tr>
</tbody>
</table>

Table (3) shows that, body posture ergonomics practice for computer use improved in immediate and follow up post tests compared to pre test.

Table 3: Percentage distribution of pre, post and follow up practice of children regarding ergonomics of body posture during computer use (N = 100)

<table>
<thead>
<tr>
<th>Body posture during computer use</th>
<th>Pre test</th>
<th>Immediate post-test</th>
<th>Follow up post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>The back is straight and well supported by chair</td>
<td>12</td>
<td>88</td>
<td>74</td>
</tr>
<tr>
<td>The feet is flat on the floor</td>
<td>20</td>
<td>80</td>
<td>59</td>
</tr>
<tr>
<td>The knees and hips are at 90 degrees when sitting</td>
<td>12</td>
<td>88</td>
<td>84</td>
</tr>
<tr>
<td>The elbows are at 90 degrees to the body while typing</td>
<td>16</td>
<td>84</td>
<td>94</td>
</tr>
<tr>
<td>Wrist are straight (not bent up or down) when typing</td>
<td>27</td>
<td>73</td>
<td>92</td>
</tr>
</tbody>
</table>

Table 4: Difference between the mean scores of knowledge and practice in pre, post and follow up tests (N = 100)

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>Max</th>
<th>Pre-test</th>
<th>Immediate post-test</th>
<th>Follow up post-test</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean Std.</td>
<td>Mean Std.</td>
<td>Mean Std.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total knowledge</td>
<td>55</td>
<td>27.281 4.74312</td>
<td>42.1300 7.51383</td>
<td>40.420 8.29407</td>
<td>95.514</td>
<td>.000*</td>
</tr>
<tr>
<td>Total practice</td>
<td>110</td>
<td>69.960 6.1839</td>
<td>101.600 5.73488</td>
<td>97.260 6.67215</td>
<td>83.790</td>
<td>.000*</td>
</tr>
</tbody>
</table>

*The mean difference is significant at the 0.05 level

Table (5) indicates highly statistically significant positive correlations between children’s total computer knowledge score and total computer practice scores in pre test and follow up post tests (p = .000 & p = .002 respectively).

Table 5: Correlation between children’s total computer ergonomics knowledge and practice scores in pre, immediate and follow up post tests (N = 100)

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>Computer ergonomics</th>
<th>Pre computer use knowledge score</th>
<th>Post computer use knowledge score</th>
<th>Follow up computer use knowledge score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>R</td>
<td>P</td>
<td>R</td>
<td>P</td>
</tr>
<tr>
<td>Pre computer use knowledge score</td>
<td>.598**</td>
<td>.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post computer use knowledge score</td>
<td>.051</td>
<td>.613</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Follow up computer use knowledge score</td>
<td>.300**</td>
<td>.002</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table (6) shows that, the three schools didn’t have the acceptable level for computer workstation designs.

<table>
<thead>
<tr>
<th>Computer workstations in studied schools</th>
<th>School (A)</th>
<th>School (B)</th>
<th>School (C)</th>
<th>Min score</th>
<th>Max score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>14 (35%)</td>
<td>25 (62.5%)</td>
<td>19 (47.5%)</td>
<td>0 (0%)</td>
<td>40</td>
</tr>
</tbody>
</table>

Discussion

Regarding children’s knowledge of computer use ergonomics the current study revealed that, the correct responses were increased in immediate and follow up post tests. These results were in harmony with a study done to investigate the awareness and practice of computer ergonomics among students in Ajman and found that, students who were exposed to ergonomics intervention identified the correct viewing distance, used ergonomic key boards and also take frequent breaks when compared to students who were not exposed to ergonomics intervention ⁸. These results highlighted the importance of integrating ergonomics educational program in schools as proper educational intervention is expected to improve the knowledge and practice of ergonomic principles, which is assumed to reduce the associated health risks.

Also, the study results were consistent with a study conducted to assess knowledge of computer ergonomics and incidence of musculoskeletal disorders among 120 students in India and indicated that more than half of children considered that an elbow angle of 90 is essential. As well, three quarter of children mentioned use of backrest to support lower back and feet should rest comfortably on the floor or on a footrest ⁹. These results may be due to effect of ergonomics educational intervention that enhanced knowledge regarding the proper use of computers, especially when the focus of these interventions has been on overall postural health, environmental ergonomics and body mechanics.

Concerning children’s knowledge about methods of preventing computer ergonomics risk factors the current study showed, improvement in immediate and follow up post tests. These results were supported by the results of a study conducted by Bisht & Bakhshi ⁹. Students of their study stating that arm rests, back support and using antiglare screen of computer were very important. Also, distance of arm length from screen is essential. This improvement may be due to ergonomic educational intervention that helped the student remember the ergonomic information presented in the educational intervention and easily answer questions correctly at the first and second assessment.

Regarding body posture ergonomics during computer use, the current study revealed that it was improved in immediate and follow up post tests. Theses results were contradicted with the study conducted to assess computer-related posture and musculoskeletal discomfort in schoolchildren and revealed that no student was found to have an acceptable posture while working at the computer. The majority of student’s postures were inappropriate indicating that further investigation and intervention is required¹. The positive effect of educational sessions in the current study could have played role in promoting changes in computer use ergonomics and it reflected adherence to the intervention program.

Regarding computer workstation assessment for the three governmental schools and its related ergonomic risks, the study showed that, the three schools didn’t have the acceptable level for computer workstation. This result was consistent with a study conducted to investigate how computers are being used in schools of Mumbai, computer workstations and the posture adopted by students ¹⁰. The study showed mismatch between the students’ dimensions and furniture dimensions in computer labs and computer workstation were inadequate for majority of the students. That result reflected lack of ergonomics consideration while designing computer labs may be due to financial difficulties of the educational facilities at governmental schools.

The current study indicated, highly statistically significant positive correlations between children’s total computer knowledge score and total computer practice scores in pre test and follow up post tests (p = ,000 & p = ,002 respectively). These results contradicted with a study conducted by Shantakumari et al ⁹ who found that attendees of ergonomics training workshop didn’t put the principles learned into practice before and after the workshop.
According to learning theories, access to information and knowledge is the starting point in learning process and retention of knowledge thus enhance behavior. According to this logic, improvement in students’ knowledge lead also to improvement in their practices.

Conclusion

The ergonomics educational intervention had significant positive effect on children’ knowledge and practices which were evident by statistical increase in their knowledge and practice mean scores in immediate and follow up post intervention compared to pre intervention mean scores. So the research hypotheses were accepted.

The study recommended the following:
• Replication of the research on a large probability sample to achieve more generalization.
• Endorse ergonomics educational intervention in the school curriculum.
• Health instructional program that encourage healthful postural habits for school children should be intensified at schools.
• Reinforcement of ergonomics consideration while designing computer workstations at schools tools or equipment used by children.
• Ergonomics intervention in form of students education and computer workstation adjustment may provide solutions to ergonomics risk factor presented in governmental schools.

Ethical Clearance: A written approval was obtained from the Research Ethics Committee of the Faculty of Nursing - Cairo University. Written informed consent was obtained from each participant after explaining the nature & purpose of the study. Participants were informed that participation in the study was entirely voluntary, anonymity and confidentiality of the data were assured.

Source of Funding: Self-funding.

Conflict of Interest: The authors declare that there is no conflict of interest.

REFERENCES


Plasma Leptin and Insulin Resistance Correlation with Obesity in Pre Pubertal Children

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ABSTRACT

Background: Insulin resistance correlates with obesity through a neural mechanism that is represented by an increase in leptin levels.

Objective: The aim of the study was to analyze the correlation between plasma leptin levels and insulin resistance with obesity in pre-pubertal age children.

Method: Observational analytic study with a cross sectional design was used for this research. There are 60 elementary school students aged 6-9 years involved in this study, 30 obese students and 30 students with normal nutritional status. Fasting insulin, fasting blood glucose and HOMA IR index were carried out in Parahita Laboratory at Sidoarjo and leptin at Institute of Tropical Disease Airlangga University. Statistical analysis using independent t-test and pearson correlation with significance value < 0.05. ROC curve was used to determined leptin cut off.

Result: There was correlation between obesity with insulin resistance (BMI(0,000;0,748); Z score BMI for age (0,000;0,738)). There was no correlation between obesity with leptin plasma (BMI(0,175;-0,178); Z score BMI for age (0,147;-0,189). Leptin cut-off against insulin resistance in pre-puberty children was 0.589 ng/ml with a sensitivity value of 0.412 and specificity of 0.581.

Conclusion: There was positive correlation between obesity by BMI and Z score BMI for age with insulin resistance in pre pubertal children.

Keywords: leptin, insulin resistance, obesity, pre pubertal children

Introduction

The incidence of insulin resistance in early age is increasing along with the increasing prevalence of childhood obesity in the world. Insulin resistance is a complication of obesity that is often found in children and adolescents who are obese. Ramualdo et al (2014) evaluated the conditions of insulin resistance in children and adolescents 5-14 years old, 33.2% diagnosed with insulin resistance. Izabel et al (2016) on 7 selected articles, recommending cut-off for HOMA IR 2.5 for both boys and girl.

Obesity correlates with leptin production and high plasma leptin levels. Some studies say that hyperleptinemia or leptin resistance plays an important role in conditions of insulin resistance. In experimental animal studies, leptin also affects the regulation of energy balance and insulin sensitivity. Leptin resistance correlates with the reduction of JAK-STAT signaling, leptin mediators, and induction of Suppressor of Cytokine Signaling-3 (SOCS-3). Imbalance of leptin transport crosses the blood brain barrier, reduces the signal of leptin-mediated JAK-STAT, and induces suppressor of cytokine signaling 3 (SOCS-3). Decreased leptin sensitivity in the brain increases the accumulation of triglycerides in adipose tissue, muscle, liver and...
pancreas resulting in an imbalance of insulin secretion and sensitivity. (5)

Madeira et al (2017) also mentioned in the results of his research that leptin could be one indicator of metabolic syndrome in cardiovascular and cardiovascular disease in pre-pubertal children, where insulin resistance often occurs in the early stages of CVD, with leptin cut-off values > 13.4 ng/dL (6). At present, several studies in different countries have different conclusions. This study is expected to provide an analysis of the relationship between plasma leptin levels and insulin resistance and obesity in pre-pubertal age children in Indonesia. We focus on pre-pubertal children with obesity as a risk factor for metabolic syndrome in the future.

Method

The study involved 60 elementary school children aged 6-9 years who were obese and non obese, and had not entered puberty stage. Sampling was done randomly with regard to the predetermined inclusion criteria. Obese criteria were determined based on BMI/U > +3 SD values and non obese BMI ± mean 2 SD using the WHO 2005 standard. Whereas, puberty criteria were assessed based on Tanner’s scale on a scale of 0 or pre pubertal scale. This research was conducted in 3 Sidoarjo Regency Elementary Schools, Pucang 1 Sidoarjo Elementary School, Pucang 2 Sidoarjo Elementary School and MI Ma’arif NU Pucang Sidoarjo, East Java Province, Indonesia.

Anthropometry Assessment: Anthropometry assessment was using WHO Procedure standard. Weight measurement was using digital scale (GEA type eb 9350) to the nearest 0.01 kg, wearing light clothing and without shoes. Height was measured without shoes and at/with head accessories, to the nearest 0.1 cm, by using Microtoice.(GEA).

The results of anthropometric measurements were used to determine obesity by calculating Z score BMI for age. BMI value is obtained by calculating the body weight in Kg squared divided by the value of height in meters. The Z score BMI for age is calculated based on the formula using the WHO 2005 standard.

\[
\frac{\text{BMI} - \text{Median Standard}}{+1\text{SD} - \text{Median Standard}}
\]

Laboratory assessment: After 8 hours overnight fast, all participants were gotten venous blood sample 5 cc in Parahita Laboratory Sidoarjo, East Java. Insulin resistance was assessed by HOMA index.

\[
\text{HOMA index} = \frac{\text{fasting insulin} \ (\mu\text{U/mL}) \times \text{fasting glucose} \ (\text{mg/dL})}{405}
\]

Fasting insulin assessment was using ECLIA (Electro Chemiluminiscence Immuno Assay) method (µU/mL). Fasting glucose was assessed by Hexokinase (mg/dL). Plasma leptin levels were measured using the ELISA method with a sensitivity value of 1.02 ng/ml, intraassay <8% and interassay and <10%.

All subject and parents signed an informed consent for participation in the study. The study protocol was approved by the local ethics committee of Public Health Faculty, Airlangga University. This work has been carried out in accordance with the code of ethics of the WHO-CIOMS 2016 for experiments involving human.

The data were analyzed by SPSS statistical software. Data was analyzed by using independent t test and Pearson correlation to analyze correlation between variables. For all tests a probability (p) less than 0.05 was considered significant.

Result

Subject Characteristic: Descriptive description of subject age showed that many obese groups occurred at the age of 7-8 years (76.6%) while the non obese group (normal nutritional status) occurred at a younger age of 6-7 years (73.3%). The sex of the subject was mostly male (80%).

The average value of the obese group BMI showed a very high BMI rate of 26.05; while the non obese group ranged in BMI value of 16.03. The calculation of Z score BMI for age showed that the obese group has an average Z score BMI for age reaching 5.73. The minimum Z score BMI for age makes it clear that all children in the obese group in the obesity category are in accordance with WHO 2005 standards. While the normal group the average Z score BMI of age is 0.25.

Profil Leptin dan Resistensi Insulin Obese and Non Obese Pre Pubertal Children: Descriptively the measurement results of the average HOMA index between obese children and non obese showed a significant
difference, with an average value of 2.75 for the obese group and 1.01 for non-obese children. Izabel et al (2016) mentioned in a review of 7 selected articles, recommending a cut off for HOMA IR 2.5 for both boys and girls.\(^{(3)}\)

Fasting blood glucose levels in both the obese and non-obese groups tended to be the same, the average obese fasting blood glucose level was 86.36 ± 6.3 mg/dL, while the non-obese group was 85.27 ± 7.2 mg/dL. Fasting blood glucose levels in the obese and non-obese groups were all in the normal category (< 100 mg/dL).

Obese fasting insulin levels tended to be higher than the non-obese group, the average obese group fasting insulin level was 13 ± 6.29 μU/mL, while the non-obese group was 4.74 ± 2.5 μU/mL. The normal limit of fasting insulin was 2.6 -24.9 μU/mL.

The obese group leptin levels tended to be lower than the non-obese group, on average the obese group leptin levels were 0.795 ± 0.843 ng/ml, while the non-obese group was 1.549 ± 2.447 ng/ml. Normal leptin limit <13.4 ng/dl.\(^{(6)}\)

### Table 1: Profile Leptin and Insulin Resistance in Obese dan Non Obese Pre Pubertal Children

<table>
<thead>
<tr>
<th>Variable</th>
<th>Obese</th>
<th>Non obese</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean ± SD</td>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>Fasting Glucose (mg/dL)</td>
<td>86.36 ± 6.3</td>
<td>75</td>
<td>98</td>
</tr>
<tr>
<td>Fasting Insulin (μU/mL)</td>
<td>13 ± 6.29</td>
<td>1.49</td>
<td>25.57</td>
</tr>
<tr>
<td>HOMA Index</td>
<td>2.75 ± 1.3</td>
<td>0.3</td>
<td>5.4</td>
</tr>
<tr>
<td>Leptin (ng/ml)</td>
<td>0.795 ± 0.843</td>
<td>0.260</td>
<td>3.555</td>
</tr>
</tbody>
</table>

The insulin resistance condition represented by the HOMA index value in the obese group was higher than the non-obese group was also supported by independent t test results which showed a significant difference between obese and non-obese groups with a value of \(p = 0.000\) (\(\alpha <0.05\)) There were significant differences in fasting insulin levels between obese and non-obese groups (\(p = 0.000\)), but fasting blood glucose levels between obese and non-obese groups had no significant difference (\(p = 0.534\)). These means that between the obese and non-obese groups have different abilities in the insulin response at the same blood glucose level, with a higher HOMA index value in obese group.

### Table 2: Correlation between Obesity with Fasting Insulin, Index HOMA and Leptin in Pre Pubertal Children

<table>
<thead>
<tr>
<th>Obesity</th>
<th>Fasting Insulin</th>
<th>HOMA Index</th>
<th>Plasma Leptin</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(P)</td>
<td>(r)</td>
<td>(p)</td>
</tr>
<tr>
<td>BMI</td>
<td>0.000</td>
<td>0.758</td>
<td>0.000</td>
</tr>
<tr>
<td>Z score BMI for Age</td>
<td>0.000</td>
<td>0.748</td>
<td>0.000</td>
</tr>
</tbody>
</table>

\(p = \) significant \(p\) value (< 0.05); \(r\) = coefficient pearson correlation

Obesity in pre-pubertal children has a significant correlation with insulin resistance (IR HOMA). Obesity correlation with insulin resistance is indicated by BMI and z score BMI for age, Pearson correlation test results show a significant good correlation with BMI parameters (0.000; 0.758), Z score BMI for age (0.000; 0.748). BMI that has the highest \(r\) value of insulin resistance is 0.748, then the value of \(r^2\) is 0.559. This means that the high and low HOMA IR as an indicator of insulin resistance is only 55.9% which can be explained by BMI. So the BMI parameter is the parameter with the highest correlation value in the event of insulin resistance.

Obesity correlations in pre-pubertal age children with leptin showed a non-significant relationship, both with BMI parameters (0.175; -0.178) and Z score BMI for age (0.147; -0.189). The correlation between obesity and leptin showed a negative correlation, the higher the BMI and Z BMI scores for age, the lower the value of leptin.
ROC curve analysis showed leptin cut-off values for insulin resistance in pre-puberty children of 0.589 ng/ml with a sensitivity value of 0.412 and specificity of 0.581. Low values of sensitivity and specificity indicate that the cut-off value cannot be used as a cut off to identify insulin resistance.

**Discussion**

Accumulation of fat mass during obesity is characterized by hyperplasia and hypertrophy of adipose cells; its correlates with increased angiogenesis, macrophage infiltration, production of extracellular matrix components, endothelial cell activation and production and release of several inflammatory mediators. Disregulation of functions and the production of pro and anti-inflammatory cytokines in obese individuals, will lead to low levels of chronic inflammatory conditions and can increase the correlation of obesity to metabolic and cardiovascular disorders such as insulin resistance, metabolic syndrome and atherosclerosis. (7)

The results showed there was a correlation between obesity and HOMA index as an indicator of insulin resistance. Positive correlation between obesity and insulin resistance showed that the higher the IMT value, the higher the HOMA index. Likewise, the BMI for age z score also shows a positive correlation. BMI average of obese group is higher than non obese group, also with z score BMI for age. The higher the BMI value and e z score BMI for age indicate the higher the scale of obesity. Higgins and Donahoo (2008) mentioned that several retrospective studies on a large scale showed a correlation between adiposity and insulin resistance and metabolic syndrome, including Martin et al’s study showed BMI at 2-14 years of age having a negative correlation with insulin sensitivity in lean adults at the age of 70 years. Body Mass Index when children become strong predictors of metabolic syndrome events as adults. (2)

Leptin is one of the adipocytokines produced by adipose tissue. Leptin as a mediator of Janus Kinase-Signal Transducer and Activator of Transcription (JAK-STAT) signaling, plays a role in regulating food intake and weight loss by giving signals to the central nervous system to reduce food intake and increase energy expenditure. In muscles, leptin stimulates oxidation of free fatty acids by activating adenosine monophosphatase kinase. Leptin also reduces fat from non-adipose tissue, prevents lipotoxicity, which is possible because of its ability to block stearoyl-coenzyme A desaturase and inhibit the formation of liver triglycerides by activating phosphatidylinositol 3 Kinase (PI3 kinase). (5,6)

Decreased leptin sensitivity in the brain increases the accumulation of triglycerides in adipose tissue, muscle, liver and pancreas resulting in an imbalance of insulin secretion and sensitivity.

Wang et al (2010) study in China in adults showed that leptin levels were positively related to IR (insulin resistance), leptin levels increased the risk of prediabetes by OR 2.6, even without obesity. Research in Hispanic overweight shows that leptin levels affect insulin sensitivity. (8) In another study showing the same thing, leptin was positively correlated with insulin resistance in pre pubertal children with regard to gender, age and Z score BMI and leptin could be potential modulators of glucose metabolism and insulin resistance, although in cases of obesity and non-obesity. (9) Madeira et al., 2017 also mentioned in the results of his research that leptin could be one indicator of metabolic syndrome and cardiovascular disease in pre-pubertal children, where insulin resistance often occurs in the early stages of CVD, with leptin cut-off values> 13.4 ng/dl. (6)

Pearson correlation test results showed no correlation between obesity and plasma leptin. Leptin levels in pre-pubertal children in both the obese and non-obese groups have the same average values, even in the obese group, they tend to be lower. Low leptin
levels (reduced leptin receptors) cause hyperphagia and obese conditions. If the energy intake exceeds what is needed, then adipose tissue increases accompanied by increased levels of leptin in the bloodstream. Then, in obese patients there was leptin resistance, so that high levels of leptin do not cause appetite decreasing. Leptin level in pre-pubertal obesity are still low, which allows for hungry stimulation. Increasing hunger stimulation will stimulate hyperplasia adipose cell. The cut off value of leptin against insulin resistance in pre-pubertal children has a low value of sensitivity and specificity, so it is not recommended as a standard for assessing the risk of insulin resistance.

Conclusions

There was a positive correlation between obesity and insulin resistance in pre pubertal children. The higher the IMT value, the higher the IR HOMA index value. Leptin levels in pre-pubertal age tend to be the same between obese and non-obese groups, still normal. Obesity in pre-pubertal children is still in the early stages of obesity, where the condition of insulin resistance is still reversible. Therefore, it is recommended to make efforts to reduce the condition of insulin resistance by regulating diet and increasing physical exercise.

Source of Funding: We gratefully acknowledge Indonesian Ministry of Research, Technology and Higher Education for funding support to complete our research.

Conflict of Interest: Nil

Ethical Clearance: The study protocol was approved by the local ethics committee of Public Health Faculty, Airlangga University. No 531/EA/KEPK/2018.

REFERENCES


Safe Concentration of Lead in Community Drinking Water in the Tapak River Area, Tugu City District, Semarang

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ABSTRACT

Lead (Pb) is one type of heavy metal that has a low melting point, is easily formed, and has active chemical properties. Lead is usually used to coat the metal to prevent rusting. It is highly dangerous for living things as it has carcinogenic properties, can cause mutations, and relatively takes long time to decay and its toxicity does not change for long time period. This study aimed to determine the safe concentration of lead in the water that consumed by people in Tugurejo Village, Tugu Kota Subdistrict, Semarang City, Central Java Province. This study was an observational study with non reactive research using reference dose (RfD) calculation and LOAEL. The sample was 35 people from the Tugurejo Village, Tugu Kota Subdistrict, Semarang City, Central Java Province.

The measurement results show that the concentration of Lead (Pb) is 0.003 mg/L. This concentration is the same as the quality standard of 0.003 mg/L according to Government Regulation No. 82 of 2001 concerning Management of Water Quality and Water Pollution Control. This means that the concentration of lead in river water is still relatively safe. The manual calculation of safe concentration of lead in Tapak river water for drinking water produced a result of 0.00055 mg/L. It is below the maximum Pb limit for drinking water as stated in the Republic of Indonesia Minister of Health Regulation Number 492/MENKES/PER/IV/2010 of 0.01 mg/L. This calculation can be used to predict safe concentrations of toxins in water for the manufacture of safe drinking water for the people of Tugurejo Village, Tugu City, Semarang, Central Java Province. Therefore, the environmental conditions of the Tapak river must be maintained so that the Lead (Pb) levels in the Tapak river water will not increase.

Keywords: Lead (Pb), safe concentration, Tapak river water

Introduction

Lead (Pb) is one type of heavy metal that has a low melting point, is easily formed, and has active chemical properties. Lead is usually used to coat the metal to prevent rusting. It is a bluish gray soft metal and has a +2 oxidation number (Sunarya, 2007).¹

It is highly dangerous for living things as it has carcinogenic properties, can cause mutations, and relatively takes long time to decay and its toxicity does not change for long time period (Brass, 1981).² According to Palar (1994), Pb can pollute air, water, soil,
Lead (Pb) is one of the environmental pollutants. The pollution of the Pb has increased in recent years. The environmental impact has also increased, especially regarding water pollution. The pollution became serious threats to water quality in Indonesia. Most of them came from waste from both industrial and human activities. Basically, the river is one of the water sources commonly used by humans for various activities in their daily life. It has a very important role in human life and all of living things, so that river will affect and be affected by other conditions or components.4

Rivers provide many benefits for humans through irrigation, drinking water, agriculture and industry. One of the areas where its river has polluted water by Pb is Java. This is due to the concentration of industry in the area of these rivers. The Tapak River is one of the rivers polluted by Lead (Pb). Geographically, the Tapak River is located in Tugurejo Village, Tugu District, Semarang City, Central Java Province, more precisely on the west side of Semarang City, which is around 12 km from the city center.5

Tugu Sub-district is one of the sub-districts in Semarang City. This sub-district is the place where large number of industries situated, from small, medium and large industries. Lead (Pb), the source of pollutants in the Tapak River, comes from residential areas and industrial areas. Most of wastes disposed in the Tapak river are waste from the Tambakaji Industrial Zone and other industries around the Tuguruejo Village near the Tapak River.5

In terms of water quality requirements, water must comply with the provisions contained in several regulations, one of which is Government Regulation No. 82 of 2001 which stated that Lead content in drinking water should not exceed the standard of 0.03 mg/L.6 This is slightly different with other regulation. Regulation of the Head of Drug and Food Control Agency (BPOM) of the Republic of Indonesia Number 23 of 2017 concerning the maximum limit of heavy metal contamination in processed food stated that the maximum limit of Pb for the natural mineral water category and its source is 0.01 mg/kg.7 This maximum limit is the same as the limit stated in the Regulation of the Minister of Health of the Republic of Indonesia Number 492/MENKES/PER/IV/2010, which is equal to 0.01 mg/L.8

According to the results of the Puspito Raharjo’s study (2018), it was found that lead content was 4.462 mg/L in Tapak river water and 0.623 mg/kg in mangrove oyster meat. A preliminary survey of 20 people in the area found that they consumed 250 gr mangrove oysters per day with a frequency of 2-3 times/week. It also found that the average concentration of lead in river water at each station was 0.03 mg/L. Based on the explanation above, it is necessary to measure the safe concentration of Lead in water for consumption by the people of Tugurejo Village, Tugu City, Semarang, Central Java Province.

Materials and Method

This study aimed to determine the safe concentration of lead in the water that consumed by people in Tugurejo Village, Tugu Kota Subdistrict, Semarang City, Central Java Province. This study was an observational study with non reactive research using safe concentration (c safe) calculation and LOAEL. The sample was 35 people from the Tugurejo Village, precisely in RW 4. The sample of water was taken from 4 different stations in the Tapak River, 2 liters for each station.

This study began by conducting a literature study on the calculation formula of Dose Reference (RfD) and safe concentration (c safe). The variables of this study were Lowest Observed Adverse Effect Level (LOAEL) of Pb dan Reference Dose (RfD). This study used manual quantitative data analysis to determine the safe concentration (c safe) of Pb.

In Saridewi and Tualeka (2017)9, it is shown that the calculation of safe (C safe) concentration can be calculated using a formula obtained from William (1985), Davis (1991) and Soemirat (2003) as follows:

\[
C_{safe} = \frac{Rf \times D \times Wb}{\alpha \times R}
\]

[Annotation:

- C safe: safe concentration (mg/L)
- RfD: Reference Dose
- Wb: body weight
- \(\alpha\): % substance absorbed by ingestion]

Result

A. Lowest Observed Adverse Effect Level (LOAEL) of Lead: Before determining the safe limits of concentrating chemicals, it is necessary
to determine the Lowest Observed Adverse Effect Level (LOAEL). The process to achieve the safe threshold limit value begins by determine the Lowest dose at which there was an observed toxic or adverse effect (LOAEL)\(^{10}\). So the Lowest Observed Adverse Effect Level (LOAEL) value must be known in advance way of literatur study by searching the literatur that has been available on the internet, books or other scientific source. However, the literature used must be reliable and there is evidence of scientific studies. Below is Lowest Observed Adverse Effect Level (LOAEL) value based on ATSDR 1990 in Chemical Safety Information from Intergovernmental Organizations, the value of the Lowest Observed Adverse Effect Level (LOAEL) of Lead (Pb) is 3.2 \(\mu g/m^3\).\(^{11}\) So that:

\[
LOAEL = \frac{n \times \text{molecular weight}}{24.45} \times 1000
\]

\[
3.2 \mu g/m^3 = \frac{n \times 207.2}{24.45} \times 1000
\]

\[
n = 0.00038 \text{ mg/kg/day}
\]

Based on the above calculations it was found that the value of Lowest Observed Adverse Effect Level (LOAEL) of Lead (Pb) was 0.00038 mg/kg/day.

B. Reference Dose (RfD) of Lead (Pb): Tualeka (2013) states that the Reference Dose (RfD) of a toxin exposure can be calculated using the following formula\(^{12}\):

\[
RfD = \frac{\text{LOAEL}}{100}
\]

Using the above formula, the obtained Reference Dose (RfD) for Lead (Pb) was 0.0000038mg/kg.

\[
RfD = \frac{0.00038}{100} = 0.0000038 \text{ mg/kg}
\]

Based on the above calculations it was found that the value Reference Dose (RfD) of Lead (Pb) was 0.0000038 mg/kg.

C. Safe concentration (c safe) of Lead (Pb) in Drinking Water: To determine the safe concentration of Lead in drinking water, the following formula (Tualeka, 2013) was used.

\[
C_{\text{Safe}} = \frac{RfD \times Wb}{\alpha \times R}
\]

Using the above formula and the ingestion absorption percentage of 20% (ATSDR, 2010)\(^{13}\), the safe concentration of Lead in water in Tapak River was 0.00055 mg/L. The calculation is shown below:

\[
C_{\text{Safe}} = \frac{0.0000038 \times 58}{20\% \times 2} = 0.00055 \text{ mg/L}
\]

The result of the calculation above is still below the threshold limit value (TLV) of Pb in drinking water as stated in the Regulation of the Minister of Health of the Republic of Indonesia Number 492/MENKES/PER/IV/2010 of 0.01 mg/L. Thus, this result can be used to predict toxins in water for the manufacture of drinking water for the people of Tugurejo Sub-District, Tugu District, Semarang, Central Java Province. It can also be used as a comparison value for the TLV set by various institutions such as the Ministry of Manpower and Transmigration, the National Standardization Agency, OSHA and so on.

**Discussion**

Measurements of Lead (Pb) concentration in Tapak river water in Tugurejo Village, Tugu District, Semarang City, Central Java Province, were carried out in 4 different stations and 2 liters of samples were taken from each stations.

The measurement results show that the concentration of Lead (Pb) is 0.003 mg/L. This concentration is the same as the quality standard of 0.003 mg/L set by Government Regulation No. 82 of 2001 concerning Management of Water Quality and Water Pollution Control. It means that the concentration of Lead in Tapak river water is still relatively safe.

The manual calculation of safe concentration in the water of the Tapak River, Tugurejo Village produced a figure of 0.00055 mg/L. It is below the threshold limit value of Pb for drinking water as stated in the Regulation of the Minister of Health of the Republic of Indonesia Number 492/MENKES/PER/IV/2010 of 0.01 mg/L. Thus, the calculation can be used to predict toxins in water for the manufacture of drinking water for the people of Tugurejo Village, Tugu City, Semarang, Central Java Province. The calculation of safe concentration of Lead
(Pb) in drinking water is based on the calculation of the Reference (RfD) and the Lowest Observed Adverse Effect Level (LOAEL). To calculate LOAEL, testing used experimental animals. The calculation result of the Lowest Observed Adverse Effect Level (LOAEL) for Lead (Pb) is 0.00038 mg/kg/day.

Reference Dose (RfD) is obtained from the LOAEL value calculation. The calculation result of the Reference Reference (RfD) was 0.0000038 mg/kg. The safe concentration of Lead (Pb) is obtained from the calculation of the Reference Dose (RfD), the average body weight, Lead (Pb) absorption through ingestion, consumption rate and time. The safe concentration (c safe) result was 0.00055 mg/L. This value is above is still below the threshold limit value (TLV) set in the Regulation of the Minister of Health of the Republic of Indonesia Number 492/MENKES/PER/IV/2010 of 0.01 mg/L. Thus, this concentration value can be used as an additional reference to measure the next safe concentration.

**Conclusion**

The measurement results of the average concentration of Lead (Pb) in the waters in the Tapak River, Tugurejo Village, Tugu District, Semarang, Central Java Province, was 0.03 mg/L. This value is equal to the quality standard of 0.03 mg/L according to Government Regulation No. 8 of 2001 concerning Management of Water Quality and Water Pollution Control. The result of the manual calculation for safe concentration of Lead in drinking water was equal to 0.00055 mg/L. This is below the TLV set in the Regulation of the Minister of Health of the Republic of Indonesia Number 492/MENKES/PER/ IV/2010 of 0.01 mg/L. Therefore, it can be concluded that the water in the Tapak River is still safe to consume.

However, the effort to maintain the concentration is need to be carried out. Some of them are to always control Lead concentration by regular laboratory check and dissemination to the community around Tugu River not to consume river water. In addition, all communities together with the government must participate in maintaining and supervising all human activities that can increase concentration of heavy metals in river water. This is aimed to conserve the river water, so that it is free of harmful heavy metals and the community can use river water for their daily needs without worrying of the negative effects of using the river water.14

**Conflict of Interest:** All authors have no conflicts of interest to declare

**Source of Funding:** This in an article “Safe Concentration of Lead in Community Drinking Water in the Tapak River Area, Tugu City District, Semarang” of Environmental Health Departement that was supported by Indonesian Environmental Health Journal 2019.

**Ethical Clearance:** The study was Approved by the institutional Ethical Board of the Public Health, Diponegoro University

**REFERENCE**

7. BADAN PENGAWAS OBAT DAN MAKANAN REPUBLIK INDONESIA.


Finding of *Helicobacter Pylori* through Biopsy Trials to Gastro-intestinal Region Infections in Iraq Patients

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ABSTRACT

This research work focuses on the determination of the infection rates of *Helicobacter pylori* (*H. pylori*) in Baghdad Iraq. This work was achieved in 2017 from February to December 2017, a 100 samples were involved in this research, the age of patients in this study were ranged from 15 to 65 years. Biopsy Gastric tissue were collected from one hundred patients suffering symptoms of severe gastrointestinal tract diseases (GITD), All patients were subject to the tests included in the current study and done gastro-endoscopy in the Gastrointestinal-tract and Liver Disease Hospital, and Al-Yarmouk Hospital, Baghdad, Iraq. Direct examination of *H. pylori* from biopsy Gastric tissue using the Rapid Urease Test (RUT), samples were cultured and PCR was achieved after that in sequence. The outcome data shows that 42% of the samples in study were respond positively to PCR while 32% of them were positively to RUT and 24% were positively to culture. Molecular analysis was used to detect each sample and it was found that the positive percent in males is much higher than females and the (25-45) year’s group has the highest rate in positive cases. According to type of GITD and *H. pylori* diagnostic gene (ureC), showed that 15(41.7%) 18(46.2%), 8(40%), 1(20%) cases of Gastritis, Gastritis & doudenitis, Gastropath ulcer, oseophagas tumor respectively.

**Keywords:** *Helicobacter pylori, severe gastro-intestinal tract diseases, Biopsy.*

Introduction

*Helicobacter pylori* (*H. pylori*) is anaerobic rods and consider as one of the pathogenic bacterium type Gram negative facultative which reside in mucosa superimposing the epithelium of the gastric antrum. Infection with *H. pylori* was found to activate indications of stomach illnesses. More than three millions of human beings each year died because of the gastric problems and ulcer diseases (¹). Furthermore, *H. pylori* infection used to be consider as a main danger to gastric adenocarcinoma development as well as mucosa which accompanied to lump tissues (MALT). Investigative approaches were alienated interested in offensive and noninvasive classes. Offensive approaches that need endoscopy contain; culture, direct gram stain, campylobacter like creature assessment (CLO), histology, fluorescence in situ hyperdization (FISH) and PCR. Whereas methods that are noninvasive which do not necessitate endoscopy were contain; *H. pylori* stool antigen test (Hp sAg) and serology, urea breath test (UBT) (²).

Biopsy specimens were identified in *H. pylori* lab to detect the presence of gastric bacteria. Diagnosis can be determined with ammonia as well. The antigen test of fecal monoclonal consider of great sensitive, accuracy and specific and can be achieved to all range of ages (³).

PCR can be accomplished fast it laso could be useful in identification of diverse types of pathogenic bacteria as well as epidemiological researches (⁴).

The aim of current work which was achieved in Baghdad city is to study the incidence of *H. pylori* in diverse age groups, the incidence of *H. pylori* throughout the year among patients who suffers from gastrointestinal disorders. Many techniques were used to detect the infection and to evaluate the presence of *H. pylori* infected areas.

Materials and Method

This work was carried on in 2017 from February to December 2017. The research was taken a place at Gastroenterology and Hepatology Center at Baghdad governorate, various hospitals and health centers and Special Clinic in Baghdad.
Sample

Biopsy Samples: 100 cases of mixes females and male patients (57 males and 43 females) their ages ranged from 15 to 65 years old, those patients were gathered from special restricted hospitals. All gathered groups were suffers as of GITD and were identified clinically by specialized physicians. All groups of patients filled questioner forms and were asked for their approval to proceed with this research, biopsy from gastric tissues (three from each patient) were gathered from the study groups stomachs. The biopsies were gathered and prepared for molecular and bacteriology study and were send to the lab to examine RUT, GS (Gram Staining) as well as the sensitivity, TSB (Tryptical Soy Broth) was used as medium to protect the biopsy during transportation to the lab.

Statistical Analysis: SPSS was used as a program to compute and analyze the gathered data.

Culture Method: Different media was involved in culture of the *H. Pylori* like BHI agar (Brain Hear Infusion), HBAP Human Blood Agar Plates as well as BA (Brucella Agar). Three types of antibiotic were used as supplement. The incubation to all cultures was achieved between three to ten days at regular incubation temperature (37 Celsius), and under nine percent (9%) of carbon dioxide (CO$_2$) (5). The colonies of bacteria were easily recognized by vision clearly (has a grey colour).

Microscopic Examination: A swab was taken from the stain of the bacteria and inspected by the microscope light. The examination to the samples indicates the presence of spiral and S shape of *H. pylori* (6).

Biochemical Tests: Subsequently, a samples were taken from the primary growth and a biochemical test was achieved together with (catalase, urease and oxidase). The propagation to single colony was done using blood agar for extra 48 hours (7). The urease was inspected in “HelicotecUT®Plus” test. [15-16], while the oxidase activity was tested by oxidase test strip, the catalase was test by slide drop method using hydrogen peroxide (3%).

Molecular Techniques: DNA was extracted from specimens using buffer solution contain (100 mM NaCl, 10 mM Tris-HCl (pH 8.0) 0.5% SDS) while the bacterial Genomic DNA Extraction was extracted with kit (Geneaid. USA).

Assessments of the DNA Purity: Assessments of the pure DNA and Concentration of DNA extracted of all sample in this study using Nano drop, concentration of Extracted DNA (≥40 ng/μl)and purity between (1.8-2) were enrolled for farther estimations.

Agarose Electrophoresis: DNA extraction was successfully observed from samples by agarose electrophoresis (2%). This DNA was used as a template for RT-PCR assay.

Real Time PCR: The test was achieved according to the protocol of the Korean company that produced the kit (“AccuPrep® 2X Greenstar RT-PCR Master Mix kit, Bioneer. Korea”). All the collected data were listed in Table 1 below.

### Table 1: PCR product size and primers sequence

<table>
<thead>
<tr>
<th>Amplified Gene</th>
<th>Primer Sequence (5'-3')</th>
<th>PCR Product Size (bp)</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>UreC –FR</td>
<td>AGCTTTTAGGGGTGGAGGGGTTT AAGCTTACTTTTCTAACAACGCG</td>
<td>294</td>
<td>22</td>
</tr>
</tbody>
</table>

Result

All biopsy gastric tissue taken from effected patients (n=100) were examined by culture, RUT and real time pcr to identified existence of *Helicobacter Pylori with the uses of* specific primer set which revealed that 24/100(24%) 32/100(32%),42/100(42%)of samples were *H.pylori* positive respectively (Figure 1 and Table 2).

### Table 2: Comparative analysis of various methods to detect H.pylori in studied groups

<table>
<thead>
<tr>
<th>Method</th>
<th>No. Positive %</th>
<th>X$^2$</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCR</td>
<td>42(42%)</td>
<td>RUT &amp; Culture</td>
<td>1.587</td>
</tr>
<tr>
<td>RUT</td>
<td>32(32)</td>
<td>PCR &amp; Culture</td>
<td>2.145</td>
</tr>
<tr>
<td>Culture</td>
<td>24(24)</td>
<td>PCR &amp; RUT</td>
<td>7.327</td>
</tr>
</tbody>
</table>

*Significant
According to type of GITD and *H. pylori* diagnostic gene (*ureC*), showed that 15(41.7%)18(46.2%), 8(40%), 1(20%)cases of Gastritis, Gastritis & doudenitis, Gastropath ulcer, oseophagas tumor respectively (Table 3).

Table 3: The numeral of the tested samples with positively to *H. Pylori*

<table>
<thead>
<tr>
<th>Type of disease</th>
<th>Number of CASES</th>
<th>POSITIVE CASES (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gastritis</td>
<td>36</td>
<td>15(41.7%)</td>
</tr>
<tr>
<td>Gastritis &amp; doudenitis</td>
<td>39</td>
<td>18(46.2%)</td>
</tr>
<tr>
<td>Gastropath ulcer</td>
<td>20</td>
<td>8(40%)</td>
</tr>
<tr>
<td>oseophagas tumor</td>
<td>5</td>
<td>1(20%)</td>
</tr>
<tr>
<td>Total</td>
<td>100(%)</td>
<td>42(42%)</td>
</tr>
</tbody>
</table>

The age of majority 17(56.67%), 16(41.03%) were in the age group of (25-45) years and from 100 patients 29(50.88%) males and 13(30.23%) females, were enrolled in the study (Table 4). identification of H. pylori were used three methods in the biopsy gastric tissue samples: RUT, culture, conventional PCR for the detection of *ureC* (Tables 4).

Table 4: *H. pylori* cases classified in age and gender

<table>
<thead>
<tr>
<th>Variable factors</th>
<th>Total</th>
<th>Positive %</th>
<th>P-value</th>
<th>OR</th>
<th>CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;20</td>
<td>10</td>
<td>3(30%)</td>
<td>0.186**</td>
<td>1.071</td>
<td>0.205 to 5.584</td>
</tr>
<tr>
<td>21-35</td>
<td>30</td>
<td>17(56.67%)</td>
<td></td>
<td>3.269</td>
<td>0.993 to 10.754</td>
</tr>
<tr>
<td>36-50</td>
<td>39</td>
<td>16(41.03%)</td>
<td></td>
<td>1.739</td>
<td>0.555 to 5.447</td>
</tr>
<tr>
<td>51-65</td>
<td>21</td>
<td>6(28.57%)</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>SEX</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>57</td>
<td>29(50.88%)</td>
<td>0.038*</td>
<td>2.390</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>43</td>
<td>13(30.23%)</td>
<td></td>
<td>1</td>
<td>1.039 to 5.495</td>
</tr>
</tbody>
</table>

Figure 1: Amplifying the PCR time the log was plotted against the genes factors in *H. pylori* from genomic DNA of studied groups which plotted in green: *ureC* gene.
The high sensitivity and specificity rate of real time PCR method, it were used standard test to compared with other tests used in this study the rate estimate sensitivity and specificity with significant value of \( P = 0.006 \), as mentioned in Table 5.

### Table 5: The specificity and sensitivity of RT-PCR, RUT and culture for diagnosis of H. pylori in (100) BGT samples from patients group

<table>
<thead>
<tr>
<th>Methods</th>
<th>Positive</th>
<th>Sensitivity</th>
<th>Specificity</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCR</td>
<td>42</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>RUT</td>
<td>32</td>
<td>76.19%</td>
<td>100%</td>
</tr>
<tr>
<td>Culture</td>
<td>24</td>
<td>57.14%</td>
<td>100%</td>
</tr>
</tbody>
</table>

### Discussion

Gastroenteritis with ("H. Pyloyi is the most common infectious disease among humans; an estimated 50% of the infection occurs with humans\(^7\)). These bacteria can cause persistent gastritis, peptic ulcer disease, adenocarcinoma and cancer of the lymph nodes associated with gastric mucosa. Individuals living in countries with low socio-economic conditions have high rates of H. pylori acquired at an early age\(^8\).

"The result of this study, showed the rate infection with H. pylori in males (50.88%) higher than in females (30.23 %). This result was agreement with Yemen Bin Mohanna et al (2014)\(^9\). The current study found that infection caused by H. pylori was significantly higher in studied age group. WHO found that the majority of infections occurred in young and middle age groups (25–50 years) more than in other age groups and the factors that predispose the higher colonization rates included poor socioeconomic status and less education in addition to genetic factors. This finding was in agreement with many other studies that showed a similar age incidence of H. pylori, Hamid and Eldaif (2014)\(^4\).

The explanations for the present study is agreement with approved other results studies which were mainly due to socioeconomic status and the sample size of the population studied, type of patients, location of the study as well as the mode of transmission where by spread infection was acquired from person to person or by oral-oral or feco-oral routes. This result indicated that the infection was affected by education level which was reflected in the degree of personal hygiene.

The current study indicates no significant difference between both sexes regarding the incidence of infection with \( H. pylori \), a result which is in agreement with many other studies\(^10\). The RUT results was showed 32 sample from 100 were positive (32%) (Table 4). Rapid urease test depends essentially upon the number of the bacteria in the biopsies\(^11\). More than one biopsy may give a highly significant RUT results. The size of the biopsy itself may be implicated the number of the bacteria within these biopsies. It has been suggested that 104 colony forming unit (CFU) are required to exhibit positive RUT result\(^12\).

It was suggested that uses of RUT for biopsies in the unit theorizing be sensitive enough for the detection of specific urease formation bacteria, however this test might be less effective for detection if the patient taking antibiotics\(^13\).

A positive variation results of H. pylori infection by using RUT in different studies due to the sensitivity of this test, which depends on the type of urea, urea concentration, incubation temperature, biopsy size, buffering, bacterial load and administration of the drug\(^14\). Twenty four cases from 100 samples were positive (24%) for H. pylori culture (Table 3). Previous studies were also showed difficulty and low percentage for H. pylori isolation. Primary isolation of H. pylori is a difficult process for routine laboratories. However, many laboratories have found the primary isolation of H. pylori from gastric biopsies is still problematic. Few percentages attributed to isolate the bacteria H. pylori to the many factors that affect significantly the bacteria, including patient intake of antibiotics or proton pump inhibitors before taking the sample, leading to the small number of bacteria in biopsies\(^15\).

Several factors are implicated in directing the success of H. pylori cultivation. They include the method, time, procedure for tissue processing, composition of culture media, patchy distribution of the organism on the gastric mucosa, contamination of biopsy forceps, and the loss of viability of the organisms during transportation, the presence of oropharyngeal flora may be also responsible for a negative predictive value associated with culture of H. pylori. Real time PCR was widely used to identify H. pylori from gastric biopsy, saliva, stool and archival samples\(^16\). PCR also has been found useful in detecting the organism when normal culture is difficult, as is the case with environmental specimens such as drinking water\(^17\).
The isolated *H. pylori* appeared on petri dish as small colonies convex, transparent, and similar to a drop of water, which is supported by previous studies (18). Forty two cases from 100 samples were positive (42%) for *H. pylori* PCR technique (Table 3). It depends on the target gene used in the analysis. The first targets recruited were urease *glmM*, formerly named *ureC*. Our results of RT PCR demonstrated wide range of detection rate for *UreC* gene as well as samples underwent the analysis. The *ureC* is considered a “housekeeping” gene, which participates directly in cell wall synthesis. It is well-established that the principal ecological niche for *H. pylori* is the gastric mucosa (19). Other study reported that among patients with gastric ulcer, gastritis, and duodenal ulcer (20).

**Conclusion**

*H. pylori* was directly detected from biopsy samples of gastritis patients using RT_PCR. The study was showed a various relationship between gastropathological cases and (*glmM*) *ureC*.

**Conflict of Interests:** The authors declare that they have no conflict of interest

**Source of Funding:** Self–funding

**Ethical Clearance:** The researchers already have ethical clearance from college of Medicine, University of Baghdad and Ministry of Health, Baghdad-Iraq

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Analysis of Maternal Deaths Trends in Bojonegoro, Indonesia

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¹Master Program of Public Health, ²Department of Public Health, Faculty of Public Health, Universitas Airlangga, Surabaya, Indonesia

ABSTRACT

Maternal Mortality Rate (MMR) could indicate the welfare of a nation. In ASEAN, Indonesia ranks as the highest number of MMR. Furthermore, in Bojonegoro Regency, the MMR ranked 4th in East Java Province after Surabaya, Jember, and Sidoarjo. Indirect causes of maternal deaths consisted of three delays: 1) maternal referral delay; 2) delay in recognizing problems and making decisions; and 3) delay in reaching health facilities and getting services. These three delays are the leading causes of the increase in maternal mortality in Bojonegoro Regency. This study aims to analyze the trends in the number of maternal deaths and predict the occurrence of death in the following year. The data consist of maternal mortality cases for the period 2008-2017, and it analyzed by four trend analysis and compared by the MAPE, MAD, and MSD values for each method. The results show that the two categories use the Quadratic Trend Model precisely. Forecasting results in 2018 are estimated to have decreased maternal mortality by 11.76% from 2017, and in 2019 it is estimated to increase by 33.33%. These results indicate that maternal mortality in Bojonegoro still needs to be anticipated.

Keywords: Bojonegoro, maternal mortality, three delays, tren analysis

Introduction

One statistical tool that can be used to estimate a future event based on past data is the trend. The trend consists of a variable in the periodic series (hours, daily, annual, annual) and tends to go in one direction, namely rising horizontally and decreasing¹. Forecasting is a connection of trend lines over time from the last observation to the time for forecasting made. Several methods can be used to create trends, namely linear trend methods, quadratic trends, and exponential trends². A linear trend is a trend that increases and decreases in value can be predicted up or down linearly. A quadratic trend is a trend in which the value of an independent variable rises or falls linearly, or a parabola occurs when the data is made scatter diagram. The exponential trend is a trend where the value of the dependent variable increases in multiples.

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Arsyad³ states that the quantification of forecasting errors required to choose the right forecasting techniques. Some measures of accuracy for selecting forecasting methods use Mean Absolute Deviation (MAD), Mean Square Deviation (MSD), and Mean Absolute Percentage Error (MAPE). The smaller the error values, the more accurate the method (MAPE). The data used in this study are secondary data sourced from the Maternal Perinatal Audit (AMP) report, Bojonegoro District Health Office. The description of the welfare of the Indonesian people can be seen from the indicators of Maternal Mortality Rate (MMR)⁴. In Indonesia, the maternal mortality rate is highest compared to other ASEAN countries⁵. In 2015 the Maternal Mortality Rate decreased compared to 2012 as many as 305 per 100,000 live births of the Intercensal Population Survey⁶. However, it is not significant compared to the Millennium Development Goals (MDGs) target; the maternal mortality rate must be reduced by 102,000 per live birth⁷.

Efforts to reduce maternal mortality are the third indicator of the program (Sustainable Development Goals (SDGs). 2016 is the first year of implementation of the 2015 MDGs development agenda (SDGs). The target set by SDGs reaches a global reduction in MMR of 70
per 100,000 live births by 2030, but this situation is not easy to do where it requires cooperation in various parties with related sectors\textsuperscript{6}. The Bojonegoro Regency Maternal Mortality Rate is ranked 4th out of all East Java Provinces after Surabaya, Jember and Sidoarjo\textsuperscript{8} can be seen in Figure 1. The Maternal Mortality Rate in Bonegoro has increased in the past two years but still tends to decline below the MDG target\textsuperscript{9} will decline if compared to the 2015 MDGs target of 102/100,000 KH (live birth) and SDGs year 2016 which is 40/100,000 KH.

![Figure 1: Maternal Mortality Rate (MMR) of cities in East Java Province in 2016](image1)

The MMR in Bojonegoro Regency in 2015 amounted to 23 people at 128.2 per 100,000 live births (Figure 2). In 2016 there were 23 people 129.23 per 100,000 live births spread across 19 health centers. In 2017 as many as 17 people spread 100.93 per 100,000 live births in 12 health centers. A total of 30 people spread out 30 health centers from 36 health centers in both urban and rural areas. The direct cause of maternal death in 2017 is heart disease, the accompanying cause, preeclampsia, bleeding, and infection (Figure 3).

![Figure 2: Maternal mortality trend in Bojonegoro Regency](image2)
Indirect causes of maternal deaths from the 2017 health service profile are due to three delays; in making maternal referrals, being late to recognize danger signs and making a decision of 8 people as much as 47.05% and being late and getting adequate services in health care facilities in 3 people at 17.64%. This indirect cause is one of the factors that increases the number of maternal deaths in Bojonegoro district, which has increased. Maternal mortality in the Prenatal period was 5.88%, intranatal was 23.58%, and most of the majority occurred in the postnatal period of 70.59%.

Implementing the P4K (Maternity Planning and Complication Prevention Program) is an effort to reduce MMR. Bojonegoro Regency has 430 alert villages which have village P4K that implement 100% P4K are 28 Puskesmas and 8 The Puskesmas with the village and which are still below the target) 376 villages with working groups are active, and 54 Pokja villages are not running, but the maternal mortality rate is still high.

Method

This research was conducted using secondary data on the number of maternal deaths from 2008-2017 for ten years in Bojonegoro Regency for the period of January-December, every year periodic records are carried out every month to one year from 2008-2017. Variable Dependent in this study is the case of maternal death (Y). The collected data was analyzed using the help of a computer program. The stages in the analysis of this study were data exploration, trend analysis stages, and comparing the smallest error values between trend analysis methods by calculating the MAPE, MAD, MSD values.

This trend analysis stage consists of several stages, namely (a) plotting data, using line diagrams to determine the pattern of the number of deaths each month (b). The parameter estimation stage in several trend analysis methods (C) compares the error values between analysis methods by looking MAPE, MAD, MSD values (d) Forecasting/application stage: carried out if the smallest value and error is obtained from the trend analysis method used.

Results

According to Table 1 from Maternal Perinatal Audit data, the number of maternal deaths has fluctuated, but maternal mortality tends to increase.

Table 1: Number of maternal deaths in Bojonegoro Regency in 2008-2017

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of maternal deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>19</td>
</tr>
<tr>
<td>2009</td>
<td>13</td>
</tr>
<tr>
<td>2010</td>
<td>19</td>
</tr>
<tr>
<td>2011</td>
<td>24</td>
</tr>
<tr>
<td>2012</td>
<td>27</td>
</tr>
<tr>
<td>2013</td>
<td>30</td>
</tr>
<tr>
<td>2014</td>
<td>19</td>
</tr>
<tr>
<td>2015</td>
<td>23</td>
</tr>
<tr>
<td>2016</td>
<td>23</td>
</tr>
<tr>
<td>2017</td>
<td>17</td>
</tr>
</tbody>
</table>


Trend Analysis: The results of the trend analysis above indicate that the smallest MAPE value model is the Quadratic Trend Model (Table 2). The Trend Equation obtained is:
\[ (Y_t) = 10.15 + 4.99t - (0.42t^2) \]

After obtaining the best model and the same form. The equation is used to predict the number of maternal deaths; then Figure 4 show the results of the forecasting.

**Table 2: Comparison of Trend Analysis Results**

<table>
<thead>
<tr>
<th>Trend Model</th>
<th>MAPE</th>
<th>MAD</th>
<th>MSD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linear Trend Model</td>
<td>18.47</td>
<td>3.67</td>
<td>21.35</td>
</tr>
<tr>
<td>Quadratic Trend Model</td>
<td>14.91</td>
<td>2.88</td>
<td>12.01</td>
</tr>
<tr>
<td>Growth Curve Model</td>
<td>17.78</td>
<td>3.64</td>
<td>21.83</td>
</tr>
</tbody>
</table>

**Figure 4: Results of the 2018 and 2019 forecast**

The forecasting results of the number of cases of maternal deaths in 2018 decreased by 11.76%, calculated from 2017 and in 2019 an increase of 33.33% in Bojonegoro Regency.

**Discussion**

Aligned with the results of the study other than the direct cause of obstetric complications, maternal mortality in Bojonegoro Regency was due to 56.6% of maternal deaths due to three maternal referral delays from 116 cases of mothers referred to the hospital, which supported the increase in the number mother’s death in Bojonegoro. The results were found to be late in recognizing danger signs and making the decision that most of the maternal deaths were 62.1% of events compared to mothers who were not late in referring to the incidence of dead mothers in the amount of 13.8%.

According to the Ministry of Health4, obstetric complications should be prevented and handled optimally, promptly so that there is no delay in the handling and death of the mother. Delays in the referral process in cases of maternal deaths in Bojonegoro Regency are indirect causes of maternal deaths. The proportion of indirect maternal deaths in Indonesia is 22%11, so prevention before further complications must occur. This study is in line with Biswas et al.12 that the detection of pregnancy complications by trained professionals and timely referral to a health care facility is useful to save a portion of the baby and the mother’s life. Detecting complications during timely pregnancy and referral is not too late referral will guarantee the safety of the mother and baby.

Every pregnant woman has a life-threatening risk even though her pregnancy is healthy, referral to the hospital is a mother who has an obstetrics case that can cause complications directly from the consequences of her pregnancy because 15% of pregnancies and deliveries will be estimated to experience obstetric complications that result in death.

In cases of maternal death, pregnant women are found, including high-risk pregnancies. Mothers with high-risk pregnancies have a higher risk of infant and maternal death and giving birth with congenital abnormalities and other obstetric complications13. According to Triana et al.,11 the Principles for Prevention of maternal deaths are mostly preventable if obstetric complications can be immediately identified and handled, at least three conditions that need to be observed include: 1) Every pregnant woman has a risk of life-threatening obstetric complications because she cannot predict, 2) Access to a risky pregnancy must have adequate access to midwifery services, 3) Maternal mortality occurs mostly during the puerperium or the first 24 hours after delivery. By looking at this statement, the condition of all pregnant women must be adequately monitored, so that there is no delay in recognizing the danger and making decisions to take referral actions.

The local Health Office has made various efforts due to the continuing increase in maternal mortality, starting to mobilize the participation of the community through village alert activities and the implementation of the P4K (Maternity Planning and Complication program) in all Puskesmas districts in Bojonegoro Regency. Throughout Indonesia, by implementing P4K, it is hoped that it can be useful to reduce the incidence of Maternal and Infant Mortality, with the P4K running it will help accelerate village alert functions10. However, in this case, it can be seen from the profile of Bojonegoro District Health Office 430 villages were 100% active standby villages.
and carried out P4K as much as 87.44% carrying out P4K. In the working group activities in P4K through data collection, it is hoped that efforts to improve early detection of complications can be appropriately handled, through integrated ANC, mentoring by pregnant women cadres, delivery planning according to risk factors, all pregnant women with score more than 6 must be sent at PONED (Emergency Neonatal Obstetric Services Basics) or to the Puskesmas.

**Conclusion**

The results of the analysis found that maternal mortality trends increased and even the most in the postnatal period by 70.59% and the forecast results were expected to decline in 2018 calculated from 2017 at 11.76% and in 2019 an increase of 33.33% calculated from 2018. In addition to the direct causes of pregnancy, especially indirect factors, three being late in referral is one of the factors that increases the number of maternal deaths.

**Acknowledgment**

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Psychophysiological Aspects of the Development of Alcoholism

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ABSTRACT

To overcome these problems, we use the author’s approach to the concept of a statistical relationship (nonlinear, linear) in psychological and sociological research. In addition to the method of studying relationships, we offer a software implemented method for classifying dependencies. The study of nonlinear connections according to the author’s method was tested in various psychological studies representing diverse areas of psychological science: psychology of preschoolers and adolescents, ethnopsychology, psychology of professions, psychology of trust, psychology of stress, theory of personality, psychology of parenthood, psychology of learning, measurement of value relationships of personality others”, the study of family education as a factor in the formation of the semantic sphere of the child, the dynamics of the motivational and semantic formations of the personality of Dent, the study of dependencies in psychophysiological research, psychological typology of students, political psychology. On the basis of investigation of alcoholism, the problem of lack of linear correlations in the presence of the simplest non-linear connections, which leads to systemic errors at interpretation of results, is discussed. Specific results demonstrating errors of the 1st type, when the linear correlation shows values close to zero, are presented. These connections are simply not taken in consideration, but in fact there is a real strong non-linear connection (maximum, minimum) that changes the picture of the phenomenon under study completely.

Keywords: Alcohol; Alcoholism; Alcohol consumption motives; Psychology.

Introduction

Individual human development is always accompanied by a complex interaction of its genetic program¹,² and various environmental influences³,⁴, often negatively affecting many adaptation processes in the body⁵,⁶. Upcoming changes in the body manifest themselves at different levels of its self-regulation⁷ very often in the form of various dysfunctions⁸,⁹ in the somatic¹⁰ and often in the mental¹¹ spheres. Research in the field of the second group of disorders deals with psychology.

Psychologists always underline a complicated character of their field of investigation – society, psychics, human being, but at that, with very rare exclusions (for example, psychophysiology), they consider in their studies interpretations of connections (dependencies) based on results of the correlation analysis, meaning mechanical approach – the methodology of the late 18th century¹². At that, sciences investigating “simpler” objects for examination (according to statements of those dealing with humanitarian sciences), for example physics, passed in their methodological development both non-classical (the beginning of the 20th century) and post-non-classical (the end of the 20th century) stages of development. To find a way out of this methodological deadlock, it is necessary to accept the fact that psychologists in their examinations, along with linear connections, should also pay attention to the simplest connections that are meaningful and give explanations of many investigated phenomena¹³.
Objective

To study the hedonic motives of alcohol use as an object of nonlinear psychology.

Materials and Method

The study was approved by the local ethics committee of the Russian State Social University on September 15, 2017 (protocol №11).

To overcome these problems we apply an author’s approach to the concept of statistical connection (non-linear, linear) in psychological and sociological studies14.

For the analysis of causative relations, data on the following methods were selected:


The study involved 30 people with a diagnosis of alcoholism.

The results obtained are processed with a standard statistical software package.

Results and Discussion

1. Dependence of the parameter “Hedonistic motives for alcohol use (the intention to get pleasure from alcohol)” (X05) on the parameter “Hangover motives for alcohol use (the intention to get rid of physical discomfort)” (X08) in the form of comparative weights of parameter X05 for triads on the scale X08 (Table 1).

<table>
<thead>
<tr>
<th>Triads on scale X08</th>
<th>Comparative weight of parameter X05 for triads</th>
</tr>
</thead>
<tbody>
<tr>
<td>X08-3</td>
<td>+235</td>
</tr>
<tr>
<td>X08-2</td>
<td>-442</td>
</tr>
<tr>
<td>X08-1</td>
<td>+79</td>
</tr>
</tbody>
</table>

Strength of connection coefficient = 0.72 (0.25)
Correlation coefficient = 0.29

Values on the scale “Hedonistic motives for alcohol use” (the intention to get pleasure from alcohol) decrease abruptly from +79 to -442 on the comparative weight at the first stage of growth (from low to medium) on the scale “Hangover motives for alcohol use (the intention to get rid of physical discomfort)”. However, the further growth on the scale “Hangover motives for alcohol use” (from medium to high) gives already the opposite effect and the intention to get pleasure from alcohol increases (from -442 to +235) to values significantly exceeding (+235) the original ones (+79).

Thus, the pathological motive “Hangover motives for alcohol use” (the intention to get rid of physical discomfort) provokes in people suffering from alcoholism personal motives “Hedonistic motives for alcohol use” (the intention to get pleasure from alcohol). But only a high level of hangover motives for alcohol use promotes the rather high (+235) level of hedonistic motives for alcohol use exceeding the results of the 1st triad of the independent variable (+79). However, it cannot be concluded that the linear connection of these two parameters being implied relative is observed, otherwise their summing up is not purely correct (general motivation for alcohol use). The linear correlation in this case equals to 0.29 (zero threshold at traditional approach equals to 0.36 (p=0.05) and 0.46 (p=0.01), it is not just weak, but is not interesting even within the frame of zero correlation. Thus, the two considered parameters are not equally changeable within the sample frame. It is connected with the fact that for the medium level of the parameter “Hangover motives for alcohol use” the lowest minimal value of the parameter “Hedonistic motives for alcohol use” is observed.

2. Dependence of the parameter “Hedonistic motives for alcohol use (the intention to get pleasure from alcohol)” (X05) on the parameter “Addictive motives for alcohol use (subjective fixation on alcohol, perception of it by a person as a sedative)” (X09) in the form of comparative weights of parameter X05 for triads on the scale X09 (table 2).
Table 2: Dependence of parameter “Hedonistic motives for alcohol use” on parameter “Addictive motives for alcohol use”

<table>
<thead>
<tr>
<th>Triads on scale X09</th>
<th>Comparative weight of parameter X05 for triads</th>
</tr>
</thead>
<tbody>
<tr>
<td>X09-3</td>
<td>+247</td>
</tr>
<tr>
<td>X09-2</td>
<td>-597</td>
</tr>
<tr>
<td>X09-1</td>
<td>+92</td>
</tr>
</tbody>
</table>

Strength of connection coefficient = 0.92 (0.28)
Correlation coefficient = 0.29

Values on the scale “Hedonistic motives for alcohol use” (the intention to get pleasure from alcohol) decrease abruptly on the comparative weight from +92 to -597 at the first stage of growth (from low to medium) on the scale “Addictive motives for alcohol use” (subjective fixation on alcohol, perception of it by a person as a sedative). However, the further growth on the scale “Addictive motives for alcohol use” (from medium to high) gives already the opposite effect and the intention to get pleasure from alcohol increases (from -597 to +247) to values significantly exceeding (+247) the original ones (+92).

Thus, the pathological motive “Addictive motives for alcohol use” (subjective fixation on alcohol, perception of it by a person as a sedative) provokes in people suffering from alcoholism personal motives “Hedonistic motives for alcohol use” (the intention to get pleasure from alcohol). But only a high level of hangover motives for alcohol use promotes the rather high (+247) level of hedonistic motives for alcohol use exceeding the results of the 1st triad of the independent variable (+92). However, it is not possible to state that the linear connection of these two parameters being implied relative is observed, otherwise their summing up is not purely correct (general motivation for alcohol use), the linear correlation for which equals to 0.29. Thus, the two considered parameters are not equally changeable within the sample frame. It is connected with the fact that for the medium level of the parameter “Addictive motives for alcohol use” the lowest minimal value of the parameter “Hedonistic motives for alcohol use” is observed.

3. Dependence of the parameter “Hedonistic motives for alcohol use” (the intention to get pleasure from alcohol) (X05) on the parameter “General motivation for alcohol use” (X11) in the form of comparative weights of parameter X05 for triads on the scale X11 (table 3).

Table 3: Dependence of parameter “Hedonistic motives for alcohol use” on parameter “General motivation for alcohol use”

<table>
<thead>
<tr>
<th>Triads on scale X11</th>
<th>Comparative weight of parameter X05 for triads</th>
</tr>
</thead>
<tbody>
<tr>
<td>X11-3</td>
<td>+29</td>
</tr>
<tr>
<td>X11-2</td>
<td>-624</td>
</tr>
<tr>
<td>X11-1</td>
<td>+387</td>
</tr>
</tbody>
</table>

Strength of connection coefficient = 0.99 (0.36)
Correlation coefficient = -0.21

Values on the scale “Hedonistic motives for alcohol use” (the intention to get pleasure from alcohol) decrease very abruptly at the first stage of growth (from low to medium) on the scale “General motivation for alcohol use” (from +387 to -624 on the comparative weight). However, the further growth on the scale “General motivation for alcohol use” (from medium to high) gives already the opposite effect and the intention to get pleasure from alcohol increases (from -624 to +29), though to values significantly lower (+29) than the original ones (+387).

Thus, “General motivation for alcohol use” in the context of statistics analogously (dependence with the minimum) influences the parameter “Hedonistic motives for alcohol use” chosen by us as a primary one. However, the dynamics at the expense of other parameters not manifesting apparently as strong simplest nonlinear dependencies, in the general context is negative, when the high level of general motivation for alcohol use promotes significantly lower (+29) level of hedonistic motives for alcohol use, than results of the 1st triad (low level) of the independent variable (+387).

4. Dependence of the parameter “Hedonistic motives for alcohol use (the intention to get pleasure from alcohol)” (X05) on the parameter “The personal growth initiative scale by K. Robitschek” (X12) in the form of comparative weights of parameter X05 for triads on the scale X12 (table 4).
Table 4: Dependence of parameter “Hedonistic motives for alcohol use” on parameter “The personal growth initiative scale”

<table>
<thead>
<tr>
<th>Triads on scale X12</th>
<th>Comparative weight of parameter X05 for triads</th>
</tr>
</thead>
<tbody>
<tr>
<td>X12-3</td>
<td>+88</td>
</tr>
<tr>
<td>X12-2</td>
<td>-397</td>
</tr>
<tr>
<td>X12-1</td>
<td>+223</td>
</tr>
</tbody>
</table>

Strength of connection coefficient = 0.66 (0.23)
Correlation coefficient = 0.18

Values on the scale “Hedonistic motives for alcohol use” (the intention to get pleasure from alcohol) decrease abruptly at the first stage of growth (from low to medium) on “The personal growth initiative scale by K. Robitschek” (from +223 to -397 on the comparative weight). However, the further growth of personal growth initiative (from medium to high) gives already the opposite effect and the intention to get pleasure from alcohol increases (from -397 to +88) to values close to the original ones, but somewhat lower.

The opposite dependence for the considered pair of parameters, i.e. dependence of the parameter “The personal growth initiative scale by K. Robitschek” on the parameter “Hedonistic motives for alcohol use” at comparison of coefficients of connection strength is significantly weaker (0.23 vs. 0.66). It means that the dependence is mostly one-sided. The correlation is also not interesting.

Thus, the process of formation of personal growth initiative in people suffering from alcoholism requires restriction as only medium values on this scale give the positive effect, specifically, minimization of hedonistic motives (the intention to get pleasure from alcohol). At the same time, coming out of the “normal range” (high level) in the process of development of personal growth initiative will more probably give the opposite effect, and the result on the scale “Hedonistic motives for alcohol use” (the intention to get pleasure from alcohol) will move closer to the original one.

Conclusion

Five types of dependence considered here clearly demonstrate that models in the study of relation to alcohol obviously do not correspond to linear models19,20. The results on the linear correlation even do not match the criteria of zero hypothesis (“significant” correlation), which also is not a sign of strong correlation at all21,22. Besides, it is possible to see obvious one-sidedness of the represented types of dependence; it indicates that the reason and consequence are determined already at the level of quantitative analysis23,24. It means that problems of hedonistic motives for alcohol use do not correspond to linear models at all, and attempts of linear approximation will lead to fundamental errors at study and interpretation of this phenomenon, when with increase of one parameter another one obligatory demonstrates either only increase or decrease.

Conflict of Interest: No conflict of interest is declared.

Sources of Funding: The study was conducted at the expense of the authors.

Ethical Clearance: The study was approved by the local ethics committee of the Russian State Social University on September 15, 2017 (protocol №11).

REFERENCES


The Process of Finding the Meaning of Life as an Important Component of the Pathogenesis of Alcoholism

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ABSTRACT

On the basis of investigation of alcoholism, the problem of lack of linear correlations in the presence of the simplest non-linear connections, which leads to systemic errors at interpretation of results, is discussed. Specific results demonstrating errors of the 1st type, when the linear correlation shows values close to zero, are presented. These connections are simply not taken in consideration, but in fact there is a real strong non-linear connection (maximum, minimum) that changes the picture of the phenomenon under study completely. Five types of dependence considered here clearly demonstrate that models of presence and search of life meaningfulness in people suffering from alcoholism obviously do not correspond to linear models. The results on the linear correlation even do not match the criteria of zero hypothesis (“significant” correlation), which also is not a sign of strong correlation at all. Besides, it is possible to see obvious one-sidedness of the represented types of dependences; it indicates that the reason and consequence are determined already at the level of quantitative analysis. It means that problems of life meaning do not correspond to linear models at all, and attempts of linear approximation will lead to fundamental errors at study and interpretation of this phenomenon, when with increase of one parameter another one obligatory demonstrates either only increase or decrease.

Keywords: Alcoholism; Psychology; Psychological process; The meaning of life; The study of the psyche.

Introduction

The functioning of the human body is very complex and well regulated process1,2. However, despite the clarity of this regulation in the human body for many reasons you may experience various failures in the form of dysregulation3,4 and the formation of pathology5,6. Has repeatedly made attempts to study these disorders from different perspectives7,8. In their development, recognizes great importance to environmental influences9 and the characteristics of the response of the organism10, including in the psychological sphere11. In this regard, studies of disorders of behavior in terms of different changes in the body are not only doctors, but also psychologists. Psychologists always underline a complicated character of their field of investigation – society, psychics, human being, but at that, with very rare exclusions (for example, psychophysiology), they consider in their studies interpretations of connections (dependencies) based on results of the correlation analysis, meaning mechanical approach – the methodology of the late 18th century12. At that, sciences investigating “simpler” objects for examination (according to statements of those dealing with humanitarian sciences), for example physics, passed in their methodological development both non-classical (the beginning of the 20th century) and post-non-classical (the end of the 20th century) stages of development. To find a way out of this methodological deadlock, it is necessary to accept the fact that psychologists in their examinations, along with linear connections, should also pay attention to the simplest connections that are meaningful and give explanations of many investigated phenomena13.
The aim of the study was to examine aspects of the search for meaning of life in people suffering from alcoholism.

**Materials and Method**

The study was approved by the local ethics committee of the Russian State Social University on September 15, 2017 (protocol №11).

To overcome these problems we apply an author’s approach to the concept of statistical connection (non-linear, linear) in psychological and sociological studies. In addition to the method of investigation of connections we propose a method of classification of dependencies realized in the form of software.

For the analysis of causative relations, data on the following methods were selected:

4. “The meaning in life scale”.

30 people participated in the study, for whom alcoholism is a clinical diagnosis. The obtained results were processed by standard statistical software package.

**Results and Discussion**

1. Dependence of the parameter “The subscale of meaning in life (Search)” (X17) on the parameter “General motivation for alcohol use” (X11) in the form of comparative weights of parameter X17 for triads on the scale X11 (Table 1).

<table>
<thead>
<tr>
<th>Triads on scale X11</th>
<th>Comparative weight of parameter X17 for triads</th>
</tr>
</thead>
<tbody>
<tr>
<td>X11-3</td>
<td>-161</td>
</tr>
<tr>
<td>X11-2</td>
<td>+513</td>
</tr>
<tr>
<td>X11-1</td>
<td>-98</td>
</tr>
</tbody>
</table>

Strength of connection coefficient = 0.77 (0.17)
Correlation coefficient = -0.19

Values on “The scale of meaning in life (Search)” reach maximal values for the average level on the parameter “General motivation for alcohol use” (comparative weight = +513). Thus, the original increase (transition from low to medium level) of general motivation for alcohol use promotes a sharp increase (from -98 to +513) on “The scale of meaning in life (Search)”. However, the further growth of general motivation for alcohol use (from medium to high level) leads already to the opposite effect (from +513 to -161) and the search of life meaning seems to disappear decreasing to values even somewhat lower than the original ones.

Thus, the search of life meaning in people suffering from alcoholism is not possible without moderate (medium level within the frame of their sample) general motivation for alcohol use. However, sudden weakening of general motivation for alcohol use can, more probably, lead to the loss of sense of life meaningfulness (-98), as it also occurs at the high level of general motivation for alcohol use (-161).

It should be also noted that this dependence is a striking example of the one-sided dependence, and the opposite dependence – the dependence of general motivation for alcohol use on the life meaningfulness search – is very weak with the strength of connection coefficient equal to 0.17. Thus, the search of life meaning for this pair of variables is definitely a consequence, and the general motivation for alcohol use is a reason.

Considering separately constituents of general motivation for alcohol use, an analogous dependence was revealed only for one from 9 scales: “Hangover motives for alcohol use”, which within the frame of the method suggested by V.Yu. Zavyalov, are referred to the third group of motives determined as pathological.

2. Dependence of the parameter “The subscale of meaning in life (Search)” (X17) on the parameter “Hangover motives for alcohol use (the intention to get rid of physical discomfort)” (X08) in the form of comparative weights of parameter X17 for triads on the scale X08 (Table 2).
Table 2: Dependence of parameter “The meaning in life search” on parameter “Hangover motives for alcohol use”

<table>
<thead>
<tr>
<th>Triads on scale X08</th>
<th>Comparative weight of parameter X17 for triads</th>
</tr>
</thead>
<tbody>
<tr>
<td>X08-3</td>
<td>-366</td>
</tr>
<tr>
<td>X08-2</td>
<td>+420</td>
</tr>
<tr>
<td>X08-1</td>
<td>-92</td>
</tr>
</tbody>
</table>

Strength of connection coefficient = 0.77 (0.21)
Correlation coefficient = -0.33

Values on “The scale of meaning in life (Search)” reach maximal values for the average level on the parameter “Hangover motives for alcohol use” (comparative weight = +420). Thus, the original increase (transition from low to medium level) of hangover motives for alcohol use promotes a sharp increase (from -92 to +420) on “The scale of meaning in life (Search)”. However, the further growth of hangover motives (from medium to high level) leads already to the opposite effect (from +420 to -366) and the search of life meaning seems to disappear decreasing to values significantly lower (-366) than the original ones (-92).

Thus, the search of life meaning in people suffering from alcoholism is not possible without moderate (medium level within the frame of their sample) motivation of alcohol use, which is determined as hangover motives for alcohol use, intention to get rid of physical discomfort. At the same time, abrupt alleviation of hangover motives for alcohol use can, more probably, lead to the loss of sense of life meaningfulness (-92), which happens also in case of the high level of hangover motives for alcohol use (-366).

The following three dependences (3-5) described in the article are already of principally different type – these are dependences with the minimum.

3. Dependence of the parameter “Motives for self-injury (alcohol use contrary to everybody and himself/herself)” (X10) on the parameter “The subscale of meaning in life (Search)” (X17) in the form of comparative weights of parameter X10 for triads on the scale X17 (Table 3).

Table 3: Dependence of parameter “Motives for self-injury” on parameter “The meaning in life search”

<table>
<thead>
<tr>
<th>Triads on scale X17</th>
<th>Comparative weight of parameter X10 for triads</th>
</tr>
</thead>
<tbody>
<tr>
<td>X17-3</td>
<td>+119</td>
</tr>
<tr>
<td>X17-2</td>
<td>-491</td>
</tr>
<tr>
<td>X17-1</td>
<td>+184</td>
</tr>
</tbody>
</table>

Strength of connection coefficient = 0.77 (0.35)
Correlation coefficient = 0.16

Values on the scale “Motives for self-injury” (alcohol use contrary to everybody and himself/herself) decrease abruptly at the first stage of growth (from low to medium) of the parameter “The subscale of meaning in life search” (from +184 to -491 on the comparative weight). However, the further growth of search of life meaningfulness (from medium to high) gives already the opposite effect and motives for self-injury surge (from -491 to +119) to values close to the original ones.

Thus, in people suffering from alcoholism the process of search of life meaningfulness gives a positive effect only in the beginning: motives for self-injury (alcohol use contrary to everybody and himself/herself) plummet. Only medium values on the subscale of life meaning search give the positive effect – minimization of motives for self-injury.

4. Dependence of the parameter “The general scale of life meaningfulness” (X18) on the parameter “Submissive motives for alcohol use (reflecting submission under the pressure of other people)” (X03) in the form of comparative weights of parameter X18 for triads on the scale X03 (Fig.1).

Values on the scale “The general scale of life meaningfulness” (the sum of two subscales - “Presence” and “Meaning in life search”) decrease abruptly at the first stage of growth (from low to medium) of the parameter “Submissive motives for alcohol use” (from +270 to -302 on the comparative weight), and they demonstrate submission under the pressure of other people at alcohol use. However, the further growth of submissive motives (from medium to high) gives already the opposite effect and the meaning of life (its presence and search) sharply increases (from -302 to +79) to values, significantly lower than the original ones (+79 vs. +270).
The mean values on the scale “The submissive motivation for alcohol use”, when the influence of other people is not strong enough, cause internal struggle strongly affecting the assessment on the scale of the meaning of life decreasing it to the minimal values. However, when the influence of other people is strong enough, the meaning of life is compensated, but its values are significantly lower for the 1st triad (low level) on the scale “The submissive motivation for alcohol use”.

5. Dependence of the parameter “The general scale of life meaningfulness” (X18) on the parameter “The subscale of meaning in life (Search)” (X17) in the form of comparative weights of parameter X18 for triads on the scale X17(Fig.2).

Values on the scale “The general scale of life meaningfulness” (the sum of two subscales of presence and search of life meaningfulness) surge at the first stage of growth (from low to medium) on the subscale “The meaning in life search” (from -365 to +299 on the comparative weight), as a constituent of the general scale of life meaningfulness. However, the further growth on the subscale “The meaning in life search” (from medium to high) gives, which is quite paradoxical, the opposite effect, and the meaning of life on the general scales sharply decreases (from +299 to -1), but to values, significantly higher than the original ones (-1 vs. -365).

This dependence demonstrates a weak linear connection of two parameters forming the general scale of life meaningfulness: the presence of life meaningfulness and search of life meaning, which is also reflected by the values of correlation coefficient (0.20).

Conclusion

Five types of dependence considered here clearly demonstrate that models of presence and search of life meaningfulness in people suffering from alcoholism obviously do not correspond to linear models19,20. The results on the linear correlation even do not match the criteria of zero hypothesis (“significant” correlation), which also is not a sign of strong correlation at all21,22. Besides, it is possible to see obvious one-sidedness of the represented types of dependences; it indicates that the reason and consequence are determined already at the level of quantitative analysis. It means that problems of life meaning do not correspond to linear models at all, and attempts of linear approximation will lead to fundamental errors at study and interpretation of this phenomenon, when with increase of one parameter another one obligatory demonstrates either only increase or decrease.

Conflict of Interest: No conflict of interest is declared.

Sources of Funding: The study was conducted at the expense of the authors.
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REFERENCES


Rehabilitation Potential of Physical Activity Complex with Elements of Sports and Health Tourism in Case of Dysfunction of the Cardiovascular System in Adolescence

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ABSTRACT

It is known that the harmonious combination of work and rest, regular physical training, proper nutrition, hardening of the body is very effective in terms of overall recovery and preservation of the health of its cardiovascular system. Prolonged lack of motor activity leads to a persistent deterioration of health and often contributes to the occurrence of heart and vascular diseases. Regular physical activities with elements of sports and health tourism in both groups of young people with dysfunction of the cardiovascular system ensured a stable optimum heart rate and blood pressure. At the same time, their values reached a more preferable level in the experimental group. In addition, against the background of metered physical loads with elements of sports and health tourism, the examinees succeeded in physiologically advantageous increase in the volume of vital capacity of the lungs. This occurred against the background of a very pronounced growth in the examined level of physical fitness. At the same time, the indicators of speed-strength qualities and general endurance have very strongly increased. Thus, sports and health tourism is one of the very effective health technologies for the beginning dysfunctions of the cardiovascular system in adolescence.

Keywords: physical culture, sports and health tourism, motor activity, prevention, cardiovascular diseases, adolescence.

Introduction

The way of life of a modern person starts to differ more and more from the way of life of many generations of our ancestors. In previous times, the movement of a person, the procuring of food and other types of vital activity required a constant pronounced muscular load from a person¹. Now more and more often the lack of active muscular activity is registered due to the lack of daily need for it². This has a pronounced negative effect on the whole organism of a modern person. Moreover, at the current stage of development of modern society, 80-90% of people of working age lack physical activity³. This deficiency has a very negative effect on the adaptive abilities of the cardiovascular and nervous systems⁴. In economically developed countries, this situation is accompanied by the development of neuro-emotional tension in the majority of the population, which additionally contributes to the increase in the prevalence of diseases of the main life-support systems⁵.

The lack of a sufficient amount of motor activity primarily worsens the condition of the heart and blood...
vessels, contributing to the emergence of various dysfunctions of the cardiovascular system already at a young age. The situation is aggravated by the majority of the population living in cities with a progressively deteriorating environment, which leads to a decrease in the natural immunity of a significant mass of the population. It becomes clear that to overcome the current difficult situation, one should actively use the healing potential of the natural environment, which is able to significantly restore human health. It has long been noted that with frequent contacts with the natural environment, it is possible to successfully combine life and work in the city and frequent episodes of active leisure. A very successful solution to this problem is sports and health tourism, which has shown its potential in the prevention of cardiovascular diseases. Its great advantage is the possibility of increasing motor activity without significant financial investments in the presence of bright sports, spiritual and cognitive components.

The pronounced health potential of sports tourism is associated with the “inclusion” of an optimizing effect on the body’s walking, as well as the positive influence of the natural forces of nature. Traditions, excursions, walks, tourist gatherings, competitions, local history and nature conservation activities are traditionally variants of sports and health tourism. Especially successfully it is possible to carry out in conditions of sanatorium stay. At the same time, for all variants of sports and health tourism, physical activity should increase gradually, reaching a peak by the middle of the activity period, taking into account the terrain, weight of equipment and speed of movement. The great health value of tourist recreation is also associated with a powerful positive effect on the body of weather-climatic conditions and landscape. Given the pronounced health potential of sports tourism, it was decided to evaluate its impact on the state of the cardiovascular system in adolescents with signs of dysfunctions developing in it.

The purpose of the study is to evaluate the effectiveness of enhancing physical activity with elements of sports and health tourism in overcoming the dysfunctions of the cardiovascular system in adolescents.

**Materials and Method of Research**

The study was conducted on the basis of the Russian State Social University (Moscow, Russia). All surveyed were students of this school.

In the experimental group were taken 23 people of adolescence (19.1 ± 1.1 years) with a diagnosis of vegetative-vascular dystonia in a hypertensive type (12 boys and 11 girls) in a medical institution. All of them had burdened heredity for hypertensive illness (one or two parents suffered for at least 5 years at the time of taking young men and women in the study of hypertension). The control group is represented by 21 clinically healthy people of adolescence (19.8 ± 0.9 years, 10 boys and 11 girls) who did not have a hereditary predisposition to any diseases.

Both groups had a similar level of physical fitness, provided by regular attendance of classes in physical culture during their studies at the university.

In the experimental and control groups used the same set of physical activity with elements of sports and health tourism. Within the framework of the tested complex, daily dosed walking was used (its duration gradually increased from 30 minutes to 90 minutes during the month). Also, running was practiced three times a week (duration from 15 minutes to 20 minutes at a free pace). Gradually after 1 month, training was a transition from running on a horizontal plane to running on a surface with an ascending slope of no more than 30°. Once a week after 2 months, until the end of the observations, group sessions were held on sports and health tourism. In winter, it was conducted in the Moscow region in the form of ski trips at a temperature not lower than –18°C for a distance of at least 10 km. During the absence of snow cover, one-day walking tours through the territory of the Moscow Region with a total length of 12–15 km were carried out. During a skiing or hiking trip, a rest interval was observed every 40-60 minutes on a rugged terrain and every 20-30 minutes on hikes in hilly terrain.

The condition of the individuals who formed the experimental group and the control group was assessed daily. Their examination was carried out according to the methods given below two times - during the taking under observation and at its end. All patients examined measured lung capacity, heart rate, blood pressure level. In both groups of observation, the level of physical fitness was assessed according to the following exercise pattern. Tests for 12-minute run (Cooper test), 20-meter run, a test for flexion and extension of arms in an emphasis on a bench for 10 seconds and a test for throwing a ball weighing 1 kg from a sitting position were applied.

Statistical processing of the results obtained in the course of the study was carried out using Student’s t-test.
Research Results and Discussion

Surveyed by both groups in the course of employment by the applied complex of physical loads noted an improvement in overall well-being. At the same time, their fatigue decreased, their headaches stopped bothering, emotional irritability decreased, and sleep returned to normal. The episodes of blood pressure destabilization in the experimental group that ended up by the end of the observation stopped worrying. In addition, in both groups of observation, the incidence of acute respiratory diseases significantly decreased compared with baseline data in the experimental group by 33.6%, and in the control group by 29.8%.

The results of the research are presented in table 1.

### Table 1: The results of the survey of persons of adolescence taken under observation

<table>
<thead>
<tr>
<th>Indicators</th>
<th>At the beginning of the observation, M ± m</th>
<th>At the end of the observation, M ± m</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control group, n = 21</td>
<td>Experimental group, n = 23</td>
</tr>
<tr>
<td>Heart rate, beats/minute</td>
<td>78.5 ± 0.34</td>
<td>79.1 ± 0.28</td>
</tr>
<tr>
<td></td>
<td>66.2 ± 0.37</td>
<td>64.6 ± 0.25</td>
</tr>
<tr>
<td>Systolic blood pressure, mm Hg</td>
<td>126.3 ± 0.92</td>
<td>135.5 ± 1.16</td>
</tr>
<tr>
<td></td>
<td>122.0 ± 0.52</td>
<td>121.3 ± 0.72</td>
</tr>
<tr>
<td>Blood pressure is diastolic, mm Hg.</td>
<td>82.1 ± 0.39</td>
<td>90.2 ± 0.52</td>
</tr>
<tr>
<td></td>
<td>80.0 ± 0.42</td>
<td>79.5 ± 0.36</td>
</tr>
<tr>
<td>Lung capacity, l</td>
<td>2.95 ± 0.22</td>
<td>2.83 ± 0.12</td>
</tr>
<tr>
<td></td>
<td>3.42 ± 0.15</td>
<td>3.54 ± 0.10</td>
</tr>
<tr>
<td>Running 20 m (s)</td>
<td>4.3 ± 0.07</td>
<td>4.2 ± 0.05</td>
</tr>
<tr>
<td></td>
<td>3.3 ± 0.08</td>
<td>3.2 ± 0.08</td>
</tr>
<tr>
<td>Bending and extending the arms in the support lying down for 10 seconds, number of times</td>
<td>4.9 ± 0.41</td>
<td>5.1 ± 0.38</td>
</tr>
<tr>
<td></td>
<td>6.9 ± 0.31</td>
<td>7.1 ± 0.2</td>
</tr>
<tr>
<td>Throwing a ball from a sitting position, weighing 1 kg, cm</td>
<td>346.3 ± 2.14</td>
<td>345.5 ± 3.25</td>
</tr>
<tr>
<td></td>
<td>436.9 ± 1.74</td>
<td>440.8 ± 2.08</td>
</tr>
<tr>
<td>Test Cooper, m</td>
<td>1367.6 ± 3.16</td>
<td>1371.8 ± 2.18</td>
</tr>
<tr>
<td></td>
<td>1938.3 ± 3.45</td>
<td>1929.7 ± 29.8</td>
</tr>
</tbody>
</table>

Regular physical exertion with elements of sports and health tourism in both groups of patients examined ensured a stable optimum heart rate for them. During the observation period, this indicator in the control group decreased by 18.5%, in the experimental group by 22.4%. The systolic blood pressure decreased in the control group by 3.5%, in the experimental group by 11.7%. A decrease was also registered for the diastolic blood pressure indicator - by 2.6% and 13.4%, respectively. The achieved results made it possible to consider that as a result of the carried out recreational measures, the signs of vegetative-vascular dystonia in the experimental group were completely stopped by the end of the observation.

Against the background of physical exertion with elements of sports and health tourism, the examined people managed to increase the volume of vital capacity of the lungs - in the control group by 15.9%, in the experimental group by 25.1%. Against this background, the examined showed an increase in the level of physical fitness for all the indicators taken into account. Very significantly increased rates of speed-strength and overall endurance. In the control group, the results in the 20 m sprint improved by 30.3%, the number of flexions and extension of the arms lying flat for 10 seconds increased by 40.8%, the distance of throwing the ball from a sitting position weighing 1 kg increased by 26.1%, Cooper’s test score increased by 41.7 m. At the same time, physical fitness indicators of the examined experimental group improved to a comparable degree and were comparable to those in the control group. Thus, in the experimental group, the reduction of the running time by 20 m was 31.2%; the number of flexions and extensions of the arms in the rest position for 10 seconds increased in this group by 39.2%; the distance of a throw of a ball at these examined increased by 27.6%, and value of an indicator of the test of Cooper increased by 40.7%.

The achieved results testify to the high health potential of the tested exercise pattern with elements of sports and health tourism for people of youthful age, including those with vegetative-vascular dystonia. It can be considered that they successfully stabilize the work of the heart, tone up the vessels against the background of the general growth of the indicator of physical fitness18. The somewhat more preferable values of the recorded indicators in the experimental group for
a number of indicators are largely related to the more conscious approach of these individuals to physical training in order to overcome their dysfunctions in the cardiovascular system\textsuperscript{19,20}. In this regard, the tested scheme of physical activity elements of sports tourism can be considered an effective means of stabilizing the work of the cardiovascular system in adolescents with functional disorders in it.

**Conclusion**

Regular physical activities with elements of sports and health tourism in both groups of young people with dysfunction of the cardiovascular system ensured a stable optimum heart rate and blood pressure. At the same time, their values reached a more preferable level in the experimental group. In addition, against the background of metered physical loads with elements of sports and health tourism, the examinees succeeded in physiologically advantageous increase in the volume of vital capacity of the lungs. This occurred against the background of a very pronounced growth in the examined level of physical fitness. At the same time, the indicators of speed-strength qualities and general endurance have very strongly increased. The results obtained suggest a high recreational potential of the tested scheme of physical exertion with elements of sports and health tourism in respect of people of juvenile age with vegetative-vascular dystonia. Their action is able to stabilize the work of the heart, tone up the blood vessels, improve physical fitness. In this regard, the tested scheme of physical loads elements of sports tourism there is reason to believe an effective means of stabilizing the work of the cardiovascular system in adolescence in the presence of functional disorders in it.

**Conflict of Interest:** No conflict of interest is declared.

**Sources of Funding:** The study was conducted at the expense of the authors.

**Ethical Clearance:** The study was approved by the local ethics committee of the Russian State Social University on September 15, 2017 (protocol №11).

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The Effectiveness of Consuming Fruit and Vegetable on Potassium and Blood Pressure in Overweight Youth

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¹Lecturer, Ministry of Health Polytechnic Semarang, Indonesia

ABSTRACT

Background: Treatment of hypertension requires a long period so that it can affect patient compliance and cause toxic effects. Therefore an alternative treatment is needed to reduce the dose of the drug in preventing and treating hypertension by utilizing various kinds of nutrients in fruits and vegetables.

Objective: This study aims to determine the effectiveness of consuming five servings of fruits and vegetables to improve potassium and blood pressure levels in overweight teenagers.

Method: This study was an experimental randomized controlled trial with a pretest-posttest control group design. Subjects were an overweight teenager with a total of 17 people for the treatment group and 17 for controls. The intervention was given three servings of fruit and two servings of vegetables a day for two weeks.

Results: Giving 3 servings of fruit and 2 servings of vegetables for 2 weeks showed a significant change in weight loss of 0.79 kg (p<0.01) or 1.12% (p<0.01) and increased blood potassium by 0.34 mmol/L (p<0.01) or 9.37% (p<0.01). Giving fruit and vegetables can reduce systolic blood pressure by 5.62 mmHg and diastolic 3.52 mmHg clinically even though it is not statistically significant (p= 0.36, and p= 0.37).

Conclusion: Giving fruit and vegetables for two weeks can reduce weight, increase blood potassium levels significantly, and reduce blood pressure clinically even though it is not statistically significant.

Keywords: fruits and vegetables, blood potassium, blood pressure, overweight.

Introduction

Treatment of hypertension takes a long time so that it can cause toxic effects such as gastrointestinal disorders, dizziness, coughing, palpitations, and insomnia. Therefore an alternative treatment is needed to reduce drug dosage and prevent hypertension by increasing the intake of fruits and vegetables.

Fruits and vegetables generally contain antioxidants, potassium, omega three fatty acids, and fiber (¹). The recommended antioxidants as antihypertensive are vitamin A (α carotene, β carotene, γ carotene, and crypt xanthine), C, E, Co-enzyme Q10 (CoQ 10), L-arginine, and flavonoids.

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WHO recommends increasing consumption of vegetables and fruits at least 400 grams or 5 servings of fruit vegetables per day to help maintain health and potassium from food to reduce blood pressure, avoid cardiovascular disease, stroke and coronary heart disease by 90 mmol/day (3510 mg/day) (¹). Addition of a minimum potassium intake of 60 mmol (2340 mg) per day can reduce systolic blood pressure 4.4 mmHg and diastolic 2.5 mmHg in hypertensive subjects (²). Fruits and vegetables that contain potassium and are suitable for people with hypertension include watermelons, avocados, melons, bananas, apples, oranges, bitter melon, squash, pumpkin, cucumber, aloe vera, celery, and shallots and garlic (²).

The majority of the Indonesian population (93.6%) is still in less category. The level of consumption of vegetables and fruit is said to be enough if you consume vegetables and fruit at least five servings every day. Given the importance of fruits and vegetables in maintaining blood pressure, it is essential to conduct this research to determine the effectiveness of consuming five servings
of fruits and vegetables to improve potassium and blood pressure levels in overweight teenagers.

Method

This research was conducted from September to October 2018. The location of research for preparation and processing of fruits and vegetables was carried out at the Food Technology Laboratory of the Department of Nutrition, Ministry of Health, Semarang. Blood pressure measurement was carried out by nurses and measuring blood potassium was done in the Health Laboratory.

The research subjects were healthy adult groups of women and men with the following criteria: Index of Body Mass \( \geq 23 \text{ kg/m}^2 \) aged \( \geq 18-21 \) years, liked vegetables and fruit and not taking blood pressure-lowering drugs that can affect blood pressure. The sample size of each group of 17 people was added as a reserve of 1 person, so the total sample was 36 people.

This study used a randomized controlled trial using a pre-experimental design “pretest-posttest control group design.” The subjects included in the treatment group will be taken initial measurements which are measured in body weight, potassium, and blood pressure. The next step is to intervene by giving three servings of fruit, which is given in whole form or 2 servings of juice and vegetables given in processed form every day for two weeks. The final step is to measure the change in the subject’s potassium and blood pressure. In the control group, the same initial and final measurements were carried out, but without being treated. The instruments used in this study included: questionnaires, sphygmomanometer, blood potassium measuring instruments, fruit, and vegetable consumption monitoring forms and food scales.

To determine the effectiveness of consumption of 5 servings of fruits and vegetables for weight loss and increase in potassium levels using the independent t-test while to test for systolic and diastolic blood pressure using ANOVA test at \( \alpha = 0.05 \).

Results

Fruits and vegetables are rich sources of a wide range of beneficial nutrients and non-nutrients including fiber, vitamins (particularly A, B and C), minerals (selenium and potassium), antioxidants (carotenoids and tocopherols) and phytochemicals including flavonoids, glucosinolates, and isothiocyanates. Low fruit and vegetable consumption is not confined to high-income countries but is prevalent across many nations. In a recent study, 77.6% of men and 78.4% of women sampled from 52 low- and middle-income countries reported consuming less than 400 g of fruit and vegetables per day, the minimum recommended by the World Health Organisation (WHO) panel on a diet, nutrition and prevention of chronic disease (8).

Based on the results of the screening by weighing body weight and height for 221 teenagers in one of the universities in Semarang there were 57 people (25.79%) with a Body Mass Index (BMI) \( \geq 23 \text{ kg/m}^2 \), while based on blood pressure measurements there were 63 people (28.51%) with blood pressure \( \geq 120/80 \text{ mmHg} \). The population that meets the sample criteria is 45 people, while 36 people were taken as research subjects consisting of 18 treatment groups and 18 control groups. The research subjects who followed the research process to the end in the treatment group were 17 people and control group 17 with reasons for being sick and afraid of taking blood samples.

Subjects in this study were the age group of healthy teenagers, two men of male sex and 32 of women and aged between 18 and 20 years. The physical activity of subjects in the treatment group averaged only 1.24 times a week, while in the control group only one time a week. Based on vegetable consumption before treatment in the two groups was almost the same is less than two servings in a day, while after intervention in the group the average consumption of vegetables was 3.12 servings per day, while the control group was 1.29 servings a day. Based on fruit consumption before treatment in the two groups was almost the same, namely less than two servings in a day, while after intervention in the group average vegetable consumption was 3.82 servings per day, while the control group was 1.47 servings a day. The results of the analysis can be seen in table 1.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Treatment= 17</td>
<td>Controls = 17</td>
</tr>
<tr>
<td>Age</td>
<td>18.4 ± 71</td>
<td>18.8 ± 85</td>
</tr>
<tr>
<td>BMI</td>
<td>26.16 ± 3.61</td>
<td>27.07 ± 39</td>
</tr>
</tbody>
</table>
Based on the results of the mass index measurement, the body shows most of the subjects included in the category of obesity, namely in the treatment group of 42% and the control group 71%. The habit of consuming fruits and vegetables most of the subjects only consumed one portion of vegetables and fruits both in the treatment and control groups. While sports habits there are subjects who never exercise, namely 35% in the treatment group and 30% in the control group.

Table 2: Characteristics of Research Subjects According To Nutritional Status Categories, Vegetable Consumption, Fruit And Exercise Habits Before Intervention

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>Treatment = 17</th>
<th>Controls = 17</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nutritional Status (BMI)</td>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Overweight</td>
<td></td>
<td>10</td>
<td>52</td>
</tr>
<tr>
<td>Obesity</td>
<td></td>
<td>7</td>
<td>42</td>
</tr>
<tr>
<td>Consumption of Vegetables (portion)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One portion</td>
<td></td>
<td>15</td>
<td>88</td>
</tr>
<tr>
<td>≥ Two Servings</td>
<td></td>
<td>2</td>
<td>12</td>
</tr>
<tr>
<td>Consumption of fruit (portion)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One portion</td>
<td></td>
<td>9</td>
<td>53</td>
</tr>
<tr>
<td>≥ Two Servings</td>
<td></td>
<td>8</td>
<td>47</td>
</tr>
<tr>
<td>Sports habits (per week)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td></td>
<td>6</td>
<td>35</td>
</tr>
<tr>
<td>1 time</td>
<td></td>
<td>6</td>
<td>35</td>
</tr>
<tr>
<td>≥ Two times</td>
<td></td>
<td>5</td>
<td>30</td>
</tr>
</tbody>
</table>

Table 3 shows that giving three servings of fruit and two servings of vegetables every day for two weeks can significantly reduce body weight, which is 0.79 kg, compared to the control group, up 0.23 kg (p = 0.00). The effect on blood electrolytes only affects blood potassium, which is in the treatment group, up 0.32 mmol/L, compared to the control group, up 0.001 mmol/L (p = 0.01), while the sodium and chlorine changes are not significant (p = 0, 93 and p = 0.77). The results of the analysis can be seen in table 3.

Table 3: Changes In Body Weight, Blood Na, Blood K, Blood Cl, Cytosolic And Diastolic Pressure

<table>
<thead>
<tr>
<th>Variables</th>
<th>Group</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (kg)</td>
<td>Treatment (n = 17)</td>
<td>Control (n = 17)</td>
</tr>
<tr>
<td>Before Intervention</td>
<td>± 14.03</td>
<td>67.1464.91 ± 5.52</td>
</tr>
<tr>
<td>After Intervention (2 minutes)</td>
<td>66.35 ± 13.68</td>
<td>65.14 ± 5.57</td>
</tr>
<tr>
<td>Change</td>
<td>-0.79 ± 1.18</td>
<td>0.23 ± 0.97</td>
</tr>
<tr>
<td>Change (%)</td>
<td>-1.12 ± 1.86</td>
<td>0.37 ± 1.46</td>
</tr>
</tbody>
</table>
Conted…

<table>
<thead>
<tr>
<th>Levels of blood Na (mmol/L)</th>
<th>Before Intervention (2)</th>
<th>139.52 ± 1.23</th>
<th>138.41 ± 1.41</th>
</tr>
</thead>
<tbody>
<tr>
<td>After Intervention</td>
<td>138.29 ± 2.05</td>
<td>137.11 ± 1.69</td>
<td></td>
</tr>
<tr>
<td>Change</td>
<td>1.56</td>
<td>-1.23 ± 1.29</td>
<td>2.33 ± 0.93</td>
</tr>
<tr>
<td>Change (%)</td>
<td>-0.88 ± 1.11</td>
<td>-0.92 ± 1.66</td>
<td>0.93</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Blood K level (mmol/L)</th>
<th>Before Intervention</th>
<th>4.08 ± 0.28</th>
<th>4.29 ± 0.37</th>
</tr>
</thead>
<tbody>
<tr>
<td>After Intervention (2 minutes)</td>
<td>4.46 ± 0.57</td>
<td>4.30 ± 0.25</td>
<td></td>
</tr>
<tr>
<td>Changes</td>
<td>0.32 ± 0.47</td>
<td>0.00 ± 0.39</td>
<td>0.01</td>
</tr>
<tr>
<td>Change (%)</td>
<td>9.37 ± 11.59</td>
<td>0.66 ± 8.45</td>
<td>0.01</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Blood Cl (mmol/L)</th>
<th>Before Intervention</th>
<th>102.94 ± 1.24</th>
<th>103.11 ± 1.86</th>
</tr>
</thead>
<tbody>
<tr>
<td>After Intervention (2 minutes)</td>
<td>103.23 ± 1.25</td>
<td>103.23 ± 2.33</td>
<td></td>
</tr>
<tr>
<td>Change</td>
<td>0.29 ± 1.49</td>
<td>0.11 ± 2.02</td>
<td>0.77</td>
</tr>
<tr>
<td>Change (%)</td>
<td>0.29 ± 1.44</td>
<td>0.12 ± 1.98</td>
<td>0.77</td>
</tr>
</tbody>
</table>

Multivariate analysis using ANOVA Test included confounding variables (nutritional status, activity, consumption of vegetables, and fruits). Based on the mean comparison between before and after the intervention, there was a difference in the decrease in systolic and diastolic blood pressure after two weeks of intervention. The effect on systolic blood pressure in the first week of intervention in the treatment group decreased by 2.63 mmHg and in the last week to 5.62 mmHg, while in the control group the first week increased 0.15 mmHg and the last week decreased 0.9 mmHg. The effect on diastolic blood pressure in the first week of intervention in the treatment group decreased by 2.31 mmHg and in the last week to 3.52 mmHg, whereas in the first week the control group decreased 0.03 mmHg and the last week decreased 0.29 mmHg. However, the decrease in blood pressure, both systolic and diastolic was not statistically significant (p = 0.36, and p = 0.37 (3)).

Discussion

Giving 3 servings of fruit and 2 servings of vegetables for 2 weeks increased vegetable intake to an average of 3.12 servings a day compared to previously it was only 1.12 servings, as well as fruit intake which increased to 3.82 portions from 1.53 portions previously consumed usually, this amount is in accordance with the recommendation of consuming 3-4 servings of vegetables and 2-3 servings of fruit (4). Increased intake of vegetables and fruit to a decrease in systolic blood pressure of 5.62 mmHg and diastolic 3.52 mmHg after 2 weeks of intervention These results are in line with previous studies that higher fruit and vegetable intake from previous dietary patterns had a beneficial effect on blood pressure control (5), this is because fruits and vegetables can reduce blood pressure and inhibition of ACE-inhibitor enzymes and in the long term You reduce the risk of developing hypertension (4).

The decrease in blood pressure is caused by an increase in blood potassium levels in the treatment group of 0.32 mmol/L or an increase of 9.32% from before. The results of previous studies showed that potassium could reduce systolic and diastolic blood pressure, by suppressing renin secretion and smooth muscle relaxation through the production of nitric oxide (6). Increased intake of vegetables and fruit has the potential to change the status of NO (Nitric Oxide) (7). NO function in the body dilates blood vessels to prevent blockages in blood vessels and reduce blood pressure.

Another substance is lycopene, an antioxidant that has an active role in preventing oxidative stress, improving blood vessel function, and preventing cardiovascular disease (8). A study showed supplementation of lycopene could regulate blood pressure, supplementation of lycopene in the form of extract or juice orally at 4.5 mg/day for four weeks, can significantly reduce systolic blood pressure. Vegetables and fruits such as tomatoes contain gamma-aminobutyric acid (GABA), lycopene, beta carotene, and vitamin E, which are antioxidants (deactivate free radicals), lower blood pressure (9).
Increased intake of vegetables and fruit for body weight showed a decrease of 0.79 kg (p = 0.04). Dietary fiber can lose weight with various mechanisms. Vegetables and fruits generally have high fiber content and relatively lower energy. Fiber-rich foods need time to chew and give a feeling of fullness longer (10). It is also important to note that the effect of dietary fiber consumption on body weight may be related to different intestinal hormones that regulate satiety. In another study with middle-aged female subjects, found an inverse relationship between increased fruit and vegetable intake to the risk of obesity or weight gain (11). Previous studies show an increase in the intake of fruits and vegetables as much as 100 gr/day can slow weight gain, which is lowering 14 grams in a year (13). Fruits and vegetables are also sources of antioxidants that can affect leptin hormones in correlation studies show those serum concentrations of vitamins A and E inversely and significantly with leptin.

**Conclusions**

The results of this study can be concluded that the addition of 3 servings of fruit and two servings of vegetables for two weeks in overweight teenagers can reduce systolic and diastolic blood pressure even though it is not statistically significant and can reduce weight and increase blood potassium levels in teenagers overweight.

**Ethical Clearance:** Ethical clearance was obtained from the Semarang Ministry of Health Polytechnic. We also wish to thank all the participants who contributed to this study.

**Conflict of Interest:** Nil.

**Source of Funding:** Nil.

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Prediction of Crime Risk Behavior among Early Adolescences

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ABSTRACT
Previously, many literatures suggest that low social support (family, peer, school), psychological aspect (low level of resilience, coping skills, empathy, high level of depression and aggression), low level of academic achievement and school involvement activity, and involving in truancy correlate with crime risk behavior. However, only few studies in Malaysia have investigate these constructs simultaneously in a single study involving early adolescence. This study aims to examine which construct in Risky Antecedent (social support and socioeconomic status), Risky Psychology (resilience, coping skill, empathy, depression and aggression) and Marker System (truancy, academic achievement and involvement in school activity) predict involvement in crime risk behavior among early adolescence in Malaysia. Binary logistic regression analysis was conducted involving all variables which were Risky Antecedent, Risky Psychology, Marker System with crime risk behavior in a sample of 1762 early adolescents from six states in Malaysia. Result shows that the most significant factor associated with crime risk behavior were aggression, truancy, involvement in school activity and lastly social support from peer. Finding from this study suggest that intervention targeting early adolescence at risk of crime risk behavior may correlate with greater impact on reduction in crime risk behavior that exclusively targeting the school as the main place to run the prevention program.

Keywords: Social support, socioeconomic status, resilience, coping skills, empathy, depression, aggression, academic achievement, involvement in school activity, truancy, crime risk behavior, adolescent

Introduction
In Malaysia, adolescents make up 28.4 percent of the population of Malaysia [1]. Adolescence encompass a period of development between the ages of 10 to 19 years old [2]. Adolescence stage is one of the most important developmental periods in which person grows and matures physically, mentally, cognitively, socially and emotionally and risky behaviors restrain adolescents to become responsible adults by threatening their well-being [3]. During the transition from childhood to adulthood, adolescents struggle to make lifestyle choices and establish patterns of behavior that affect both their current and future health [4]. Behavior change is based on social cognitive theory and socioecological model of health, which emphasizes a dynamic interaction among cognitive, behavioral, and environmental factor over the life course of individuals, families, and communities contributing to the health of populations [5].

Literature Review of Factor Associated with Crime Risk Behavior: There are association between support, SES, psychological aspect, truancy, academic achievement and involvement in school activity with crime risk behavior [6-8]. However, in Malaysia, knowledge of common antecedents to these behaviors are sometimes limited by studies that often assess construct in Risky Antecedent (social support from family, peer, school and socioeconomic status, SES), Risky Psychology (resilience, coping skill, empathy, depression and aggression) or Marker System (academic achievement, involvement in school activity and truancy) separately in single study [9-16].

A large body of evidence supports an empirical relationship between crime risk behavior with social

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support from family \[^{17}\], social support from peer \[^{18-20}\], social support from school \[^{20,21}\] and socioeconomic status \[^{22,23}\]. In addition to Risky Antecedent, another Risky Psychology that are more likely to influence adolescents getting involved in crime risk behavior are low level of resilience \[^{7,24}\], coping skills \[^{25,26}\] and empathy \[^{27,28}\] and besides, high level of depression \[^{18,29}\] and aggression \[^{6,12}\]. This current research suggests that through Marker System, school counsellor can identify adolescent at risk of crime risk behavior. Past research has found that crime risk behavior has significant relationship with low academic achievement \[^{30-32}\], involvement in school activity \[^{33,34}\] and high involvement in truancy \[^{14,35}\].

**Research Aim:** This study aims to examine which construct in Risky Antecedent (social support and socioeconomic status), Risky Psychology (resilience, coping skill, empathy, depression and aggression) and Marker System (truancy, academic achievement and involvement in school activity) predict involvement in crime risk behavior among early adolescence in Malaysia.

**Methodology**

1762 secondary school students from standard 1 and 2 (13 and 14 years old) were recruited from 18 school from six different states. Also, the schools came from three different areas (urban, suburban and rural). All construct in this study were measured using self-report measured known as Adolescent’s Crime Risk Instrument (ACRI) \[^{36}\] that was adopted from Risky Adolescent Instrument \[^{37}\]. This instrument consists of 89 items in total with 13 constructs and in Malay language.

Face validity analysis have been conducted by appointed 10 experts in the field of measurement and assessment, curriculum, adolescent’s development, psychology, pedagogy, sociology, guidance and counselling. This is to see whether the measures that we use adequately covers all content that it should be. Overall, this measure has face validity. Next, Table 1 shows the internal consistency analysis outcome that is conducted to access the reliability of this measure. The overall Cronbach alpha value is .77 with range between .65 to .90. Ideal Cronbach alpha value according to general rule of thumb are above .70 (good), .80 (better) and .90 (best) \[^{38}\]. But for the construct that have total number of items below 10, it was normal for them to have low reliability value because Cronbach alpha is quite sensitive to the number of items \[^{39}\]. So, she suggests that it would be more appropriate if we report the mean inter-item correlation value. Optimal range for mean inter-item correlation value is between .20 to .40 \[^{51}\]. In this study, mean inter-item correlation for each construct vary between .20 to .38 which shows acceptable values and the average value was .29.

<table>
<thead>
<tr>
<th>Construct</th>
<th>Total item</th>
<th>Cronbach alpha</th>
<th>Mean inter-item correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social support from family</td>
<td>8</td>
<td>.75</td>
<td>.26</td>
</tr>
<tr>
<td>Social support from peer</td>
<td>8</td>
<td>.65</td>
<td>.23</td>
</tr>
<tr>
<td>Social support from school</td>
<td>8</td>
<td>.72</td>
<td>.27</td>
</tr>
<tr>
<td>Socioeconomic status</td>
<td>5</td>
<td>.81</td>
<td>.38</td>
</tr>
<tr>
<td>Resilience</td>
<td>10</td>
<td>.69</td>
<td>.23</td>
</tr>
<tr>
<td>Coping skills</td>
<td>10</td>
<td>.74</td>
<td>.20</td>
</tr>
<tr>
<td>Empathy</td>
<td>6</td>
<td>.66</td>
<td>.21</td>
</tr>
<tr>
<td>Depression</td>
<td>10</td>
<td>.84</td>
<td>.35</td>
</tr>
<tr>
<td>Aggression</td>
<td>8</td>
<td>.82</td>
<td>.32</td>
</tr>
<tr>
<td>Truancy</td>
<td>2</td>
<td>.65</td>
<td>.37</td>
</tr>
<tr>
<td>Academic achievement</td>
<td>5</td>
<td>.86</td>
<td>.36</td>
</tr>
<tr>
<td>Involvement in school activity</td>
<td>3</td>
<td>.90</td>
<td>.31</td>
</tr>
<tr>
<td>Crime risk behavior</td>
<td>6</td>
<td>.90</td>
<td>.29</td>
</tr>
<tr>
<td>Total</td>
<td>89</td>
<td>.77</td>
<td>.29</td>
</tr>
</tbody>
</table>
Results

Sample Description: The final analytic sample of this study included 1762 adolescents who had complete answering measure of this study. Overall, there are more than half of the sample was male (n=900, 51.1%). Table 2 shows the mean score for social support from family (x̄ = 4.00), social support from peer (x̄ = 3.85), social support from school (x̄ = 3.67), SES (x̄ = 2.87), resilience (x̄ = 3.74), coping skills (x̄ = 3.67), empathy (x̄ = 3.88), depression (x̄ = 2.85), aggression (x̄ = 2.34), truancy (x̄ = 2.13), academic achievement (x̄ = 2.94), and involvement in school activity (x̄ = 3.75). For crime risk behavior, total number of adolescents involve in crime risk behavior was 1354 (76.8%).

Table 2: Characteristics of early adolescences

<table>
<thead>
<tr>
<th>Construct</th>
<th>x̄</th>
<th>(SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social support from family</td>
<td>4.00</td>
<td>(.56)</td>
</tr>
<tr>
<td>Social support from peer</td>
<td>3.85</td>
<td>(.64)</td>
</tr>
<tr>
<td>Social support from school</td>
<td>3.67</td>
<td>(.63)</td>
</tr>
<tr>
<td>Socioeconomic status</td>
<td>2.87</td>
<td>(.95)</td>
</tr>
<tr>
<td>Resilience</td>
<td>3.74</td>
<td>(.50)</td>
</tr>
<tr>
<td>Coping skills</td>
<td>3.67</td>
<td>(.55)</td>
</tr>
<tr>
<td>Empathy</td>
<td>3.88</td>
<td>(.61)</td>
</tr>
<tr>
<td>Depression</td>
<td>2.85</td>
<td>(.80)</td>
</tr>
<tr>
<td>Aggression</td>
<td>2.34</td>
<td>(.81)</td>
</tr>
<tr>
<td>Truancy</td>
<td>2.13</td>
<td>(1.16)</td>
</tr>
<tr>
<td>Academic achievement</td>
<td>3.12</td>
<td>(1.16)</td>
</tr>
<tr>
<td>Involvement in school activity</td>
<td>3.75</td>
<td>(1.23)</td>
</tr>
<tr>
<td>Crime risk behavior, n (%)</td>
<td>1354</td>
<td>(76.8)</td>
</tr>
</tbody>
</table>

Logistic Regression Analysis: A binary logistic regression was used to model the binary variable of involving in crime risk behavior among early adolescent in Malaysia. The model contained 13 continuous independents variables. The full model containing all predictors to crime risk behavior was statistically significant χ²(13, N = 1762) = 155.63, p < .001, indicating that the model was able to distinguish between respondent’s who involve and did not involve in crime risk behavior. The model as a whole explained between 15% (Cox & Snell R Square) and 22.6% (Nagelkerke R Square) of the variance in crime risk behavior, and correctly classified 78.3% of cases. As shown in Table 3, only four of the independent variables made a unique statistically significant contribution to the models (social support from peer, aggression, truancy and involvement in school activity).

The strongest predictor to crime risk behavior was aggression which shows that early adolescences with increasing one score of aggression, they have 141% (OR = 2.41) chances to engage in crime risk behavior compare to truancy (52%). This means aggression and truancy are risk factor to crime risk behavior. Besides, social support from peer and involvement in school activity are protective factor to crime risk behavior. Increasing one score of social support from peer reduce the chances to involve in crime risk behavior by 37% (OR = .63). While increasing one score of involvement in school activity, reduce the chances to involve in crime risk behavior by 15% (OR = .85).

Table 3: Logistic Regression Predicting Likelihood of Involving in Crime Risk Behavior

<table>
<thead>
<tr>
<th>Construct</th>
<th>β</th>
<th>SE</th>
<th>p</th>
<th>(OR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social support from family</td>
<td>-.24</td>
<td>.20</td>
<td>.24</td>
<td>.79</td>
</tr>
<tr>
<td>Social support from peer</td>
<td>-.46</td>
<td>.18</td>
<td>.01</td>
<td>.63</td>
</tr>
<tr>
<td>Social support from school</td>
<td>.18</td>
<td>.17</td>
<td>.31</td>
<td>1.19</td>
</tr>
<tr>
<td>Socioeconomic status</td>
<td>-.17</td>
<td>.09</td>
<td>.06</td>
<td>.84</td>
</tr>
<tr>
<td>Resilience</td>
<td>.08</td>
<td>.24</td>
<td>.73</td>
<td>1.09</td>
</tr>
<tr>
<td>Coping skills</td>
<td>-.10</td>
<td>.22</td>
<td>.66</td>
<td>.91</td>
</tr>
<tr>
<td>Empathy</td>
<td>.26</td>
<td>.17</td>
<td>.14</td>
<td>1.29</td>
</tr>
<tr>
<td>Depression</td>
<td>-.17</td>
<td>.12</td>
<td>.18</td>
<td>.85</td>
</tr>
<tr>
<td>Aggression</td>
<td>.88</td>
<td>.13</td>
<td>.00</td>
<td>2.41</td>
</tr>
<tr>
<td>Academic achievement</td>
<td>-.09</td>
<td>.08</td>
<td>.29</td>
<td>.92</td>
</tr>
<tr>
<td>Involvement in school activity</td>
<td>-.17</td>
<td>.08</td>
<td>.03</td>
<td>.85</td>
</tr>
<tr>
<td>Truancy</td>
<td>.42</td>
<td>.09</td>
<td>.00</td>
<td>1.52</td>
</tr>
</tbody>
</table>

*p<.01 (two-tailed)
Discussion, Suggestion And Limitation

Early adolescent who engages in crime risk behavior endure extreme constraints on important resources necessary for healthy adolescents’ development. This study explored three constructs which are Risky Antecedent, Risky Psychology and Marker System that are connected to crime risk behavior. Based on the finding of this study, the following recommendations may be made to school counsellors working with adolescents at schools or other institutions. This study has shown that social support was an important variable in predicting adolescent involvement in crime risk behavior. Practicing school counsellors and psychologists may undertake protective and preventive work to increase the social support that students receive from family, peers and school.

Besides, finding of this study also indicated that social support has a protective effect against the indicators of crime risk behavior. Thus, school counsellors and psychologists working with adolescents may ensure that adolescents have higher perceived social support so that the indicators of crime risk behavior such as aggression is minimized. We focused on Risky Antecedent, Risky Psychology and Marker System as variables that predict adolescents’ crime risk behavior. Future studies may investigate the effects of other predictors on crime risk behavior. Besides, this is cross-sectional study, future study may replicate this study by conducting a longitudinal research.

Ethical Clearance: Ethical procedure of this study was approved by the Educational Planning and Research Division, Ministry of Education Malaysia. Besides, the inform consent was acquired from the participant who agreed to participate in this study.

Conflict of Interest: There is no conflict of interest in this research.

Source of Funding: This study was funded by Ministry of Education Malaysia through the Fundamental Research Grant Scheme (FRGS) with code 2017-0068-106-01 (FRGS/1/2017/SS05/UPSI/02/7).

REFERENCE


The Effectiveness of the (Healthy Physical-Skills) Exercises in the Development of Fitness and Balance as well as the Accuracy of Performing of Both the Skills of Preparing and Receipting of the Volleyball

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ABSTRACT

Achieving good results requires the adoption of appropriate methods of training. The problem of the research was the lack of scientific and training methods related to the development of fitness and balance, which have a negative impact on the accuracy of skill performance. Therefore, researchers decided to study the problem through using the effectiveness of exercises as physical - skill in the development of fitness and balance as well as the accuracy of performing both the skills of preparing and receiving the volleyball. The most important conclusions of the research: 1- Psychological differences among the results of pre- and post-tests of the experimental group in all the research variables and in favor of post-tests. 2. Psychological differences among the results of the post-tests of the two experimental groups in all the research variables and in favor of the experimental group.

Keywords: Exercises (physical- skill)- fitness- balance- preparation- reception.

Introduction

For sports excellence and the world-class levels of excellence, trainers shall take this into consideration. The player who has high physical abilities is able to improve his skill and plan level. The physical abilities are the general rule on which the player can move in the court to achieve outstanding performance in all motor skills. This Performance comes only through hard and continuous training on these skills and strengthening them. Therefore, physical abilities are one of the necessary requirements for the volleyball player and any decrease in the level of those qualities will lead to a decrease in the level motor skill which is the essence Performance in the sport. Physical abilities, according to⁴, are “qualities acquired from the ocean. The training or practice is their basis and they can be developed according to the physical, sensory and cognitive ability of the individual. Fitness often called all-or-not trait of motor qualities.” It is necessary to know the characteristics of motor abilities, which are difficult to be enumerated or defined because they include all aspects. ⁵ emphasized in terms of the “psychological and physical concept and the mathematical readiness to meet the requirements of sports.” This is the basis for the exercise of sports, which is one of the basic components and is the decisive factor in winning matches, especially when the level of performance between teams and work on finding the means to develop these capabilities for the individual, which is the common denominator for the performance of most of the skills in most sports, and physical preparation is one of the basic and important pillars in sports training. This is what ⁴ confirmed “It is one of the most important elements of success in preparing for the skills of motor activities as it aims at developing the ability of the sportsman and improving the level of physical abilities to meet the requirements of sports activity, which lead the training status of the

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individual to reach the high levels of activity.” Fitness and balance are some of the motor abilities that fall within the requirements of the game of volleyball; it is characterized by the varied performance and change between offensive and defensive skills during the performance and according to the situation”. Thus, the training methods improve the physical and skill level as well as it has an interesting nature for practitioners as it helps them improve their incentives. The various levels of sports have developed clearly, especially the volleyball which is one of the popular and mass sports. Therefore, the trainer must direct the player to develop his physical abilities for the purpose of achieving the basic goal which is getting a high achievement. During that competition among the countries of the world began to develop modern methods and methods of training. This is what has referred “fitness in volleyball must be in accordance with the requirements of volleyball, then start training in a specialized manner, especially the activity that requires speed, capacity, and fitness so training must adapt to these requirements. Sports training aims at developing physical and skill qualities as well as the delay of the beginning of fatigue due to its positive feedback. Thus, the training curriculum is measured by the need for the use of the methods of regulation and good as well as the use of the sportsman in the activity he used to practice through the physical, skill and functional level. The researchers attributed this to the lack of use of scientific and training methods related to the development of fitness and balance, which have a negative impact on the accuracy of skill performance. Thus, researchers decided to study the problem through the use of the effectiveness of the physical - skill exercises in the development of fitness and balance as well as the accuracy of performing both the skills of preparing and receipting the volleyball. The research aims at:

- preparing the exercises as physical- skill in the development of fitness and balance as well as the accuracy of performing both the skills of preparing and receipting the volleyball. Recognizing the effectiveness of the exercises (physical- skill) in the development of fitness and balance as well as the accuracy of performing both the skills of preparing and receipting the volleyball.

The research methodology: The researchers used the experimental method by using the approach of the equal groups as its appropriate to solve the problem of research. The experimental method is one of the best and most appropriate methods leading to the best results because it deals with the phenomenon and its causes. This is in line with the opinion of [1], “It is an interpretation process of the consequences of a particular situation and verifying its causes because it deals with the facts.”

Research Sample: The research community was determined using the players of the Dhulwiya Sports Club for volleyball players of the sports season 2018/2019. They were 14 players were chosen by the non-random sampling method. The Libero was excluded for not participating in offensive skills, in addition to 3 players for participating in the exploratory experiment. Thus, the sample of the research was 10 players representing both the control and experimental groups as the sample was randomly divided into two equal groups; 5 players represent the control group and 5 players represent the experimental- group so the percentage of the sample is 78.57%.-The researchers have found homogeneity and equivalence in the sample through using T-test in the variables of the research, as shown in the table 1:

Table 1: The table indicates the arithmetic means, the standard deviations, the calculated (T) value, the degree of freedom and the significance of the pre-tests of the research sample

<table>
<thead>
<tr>
<th>No.</th>
<th>Measurements</th>
<th>unit of measurement</th>
<th>The control-group</th>
<th>The experimental group</th>
<th>(T) calculated</th>
<th>The error rate</th>
<th>The significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Length</td>
<td>Cm.</td>
<td>169.80</td>
<td>10.034</td>
<td>170.60</td>
<td>9.476</td>
<td>0.130</td>
</tr>
<tr>
<td>2.</td>
<td>Weight</td>
<td>Kg.</td>
<td>67.40</td>
<td>7.700</td>
<td>68.20</td>
<td>6.340</td>
<td>0.179</td>
</tr>
<tr>
<td>3.</td>
<td>Age</td>
<td>Year</td>
<td>24.40</td>
<td>0.894</td>
<td>24.00</td>
<td>1.581</td>
<td>0.492</td>
</tr>
<tr>
<td>4.</td>
<td>Fitness</td>
<td>Second</td>
<td>6.44</td>
<td>0.442</td>
<td>6.380</td>
<td>0.280</td>
<td>0.102</td>
</tr>
<tr>
<td>5.</td>
<td>Balance</td>
<td>Second</td>
<td>39.184</td>
<td>4.950</td>
<td>40.712</td>
<td>5.392</td>
<td>0.467</td>
</tr>
<tr>
<td>6.</td>
<td>preparation</td>
<td>degree</td>
<td>10.200</td>
<td>0.836</td>
<td>9.800</td>
<td>1.095</td>
<td>0.649</td>
</tr>
<tr>
<td>7.</td>
<td>Reception</td>
<td>degree</td>
<td>39.20</td>
<td>3.633</td>
<td>37.60</td>
<td>0.708</td>
<td>0.499</td>
</tr>
</tbody>
</table>

Tests used in the research: 1 - Fitness test \(^1\), Annex 1. 2. Balance test \(^2\), Annex 2. 3 - Test the accuracy of the skill of preparation \(^3\), Annex 3. 4 - Test the accuracy of the skill of reception \(^4\), Annex 4.

The Exploratory Experiment: It’s a preliminary experimental study for the purpose of testing the research methods. The exploratory experiment was conducted on a sample of 3 players on 11-12/11/2018 and it was made for finding out what shall be done and testing the most appropriate and the best, so the purpose of the exploratory experiment was: 1. Finding out the understanding of the players for the tests. 2. Finding out the time necessary for explaining and applying tests. 3. Finding out the validity of the devices used in the tests.

The field procedures of the research:

The Pre-test: The researchers conducted pre-tests for the research sample on 14-15/11/2018 and test-related conditions, such as the place, the time and the method of carrying out the tests were established for the purpose of achieving the same or similar purposes as possible during the post-tests.

The training curriculum: The researchers conducted a number of exercises as physical-skill suggested for the special preparation stage in annex 2. This stage aims at the development of the fitness and balance under consideration, the accuracy of performing both the skills of preparing and receiving the volleyball. The training period is 8 weeks on Sunday, Tuesday, Thursday for each week, it starts from Sunday from 18/11/2018 till 15/1/2019 at Al Dhuluia Sports Club with 3 training modules per week. The total number of training 24 modules and the training time is 80-95 minutes at 3:00 O’clock. The experimental group used the suggested training method while the control group used the method followed by the trainer.

Post-test: The pre-test for the research tests was conducted on the sample’s individuals and in the same manner as the physical test for the research group on 16-17/1/2019.

Statistical Method: The statistical spss system was adopted in finding out the results. Percentage- arithmetic mean - standard deviation- law T for matched samples- law T for mismatched samples.

Presentation, Analysis and Discussion of the Results

Presentation and analysis of the results of the arithmetic mean, the standard deviation, the calculated \( T \) value in pre-tests for both the control and experimental groups in the variables of the volleyball’s research. Presentation and analysis of the test results of the variables under study related to the volleyball of the control group, as shown in table 2.

Table 2: The table indicates the arithmetic mean, the standard deviations, the calculated \( T \) value in pre- and post-tests of the control group in the tests of fitness, balance, and the accuracy of preparation and reception of the volleyball

<table>
<thead>
<tr>
<th>No</th>
<th>Measurements</th>
<th>unit of measurement</th>
<th>The pre-tests</th>
<th>The post-tests</th>
<th>( T ) calculated</th>
<th>Error</th>
<th>The significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>S-</td>
<td>A+</td>
<td>S-</td>
<td>A+</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Fitness</td>
<td>Second</td>
<td>6.404</td>
<td>0.442</td>
<td>5.678</td>
<td>0.444</td>
<td>3.335</td>
</tr>
<tr>
<td>2</td>
<td>Balance</td>
<td>Second</td>
<td>5.914</td>
<td>0.536</td>
<td>6.908</td>
<td>0.849</td>
<td>2.426</td>
</tr>
<tr>
<td>3</td>
<td>preparation</td>
<td>degree</td>
<td>10.200</td>
<td>0.836</td>
<td>11.800</td>
<td>1.303</td>
<td>3.138</td>
</tr>
<tr>
<td>4</td>
<td>Reception</td>
<td>degree</td>
<td>39.200</td>
<td>3.633</td>
<td>49.470</td>
<td>3.142</td>
<td>6.757</td>
</tr>
</tbody>
</table>

Presentation and analysis of the test results of the variables under study related to the volleyball of the control group, as shown in table 3
Table 3: The table indicates the arithmetic mean, the standard deviations, the calculated (T) value in pre- and post-tests of the experimental group in the tests of fitness, balance, and the accuracy of preparation and reception of the volleyball

<table>
<thead>
<tr>
<th>S. No</th>
<th>Measurements</th>
<th>unit of measurement</th>
<th>The pre-tests (T)</th>
<th>The post-tests (T)</th>
<th>The error rate</th>
<th>The significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Fitness</td>
<td>Second</td>
<td>6.380 0.280</td>
<td>4.770 0.476</td>
<td>3.118</td>
<td>0.00</td>
</tr>
<tr>
<td>2.</td>
<td>Balance</td>
<td>Second</td>
<td>5.832 0.664</td>
<td>8.884 1.443</td>
<td>3.950</td>
<td>0.017</td>
</tr>
<tr>
<td>3.</td>
<td>preparation</td>
<td>degree</td>
<td>9.800 1.095</td>
<td>13.800 0.447</td>
<td>8.944</td>
<td>0.001</td>
</tr>
<tr>
<td>4.</td>
<td>Reception</td>
<td>degree</td>
<td>37.600 3.507</td>
<td>59.902 7.960</td>
<td>5.300</td>
<td>0.006</td>
</tr>
</tbody>
</table>

Presentation and analysis of the results of the arithmetic mean, the standard deviation, the calculated and tabular T value in pre-tests for both the control and experimental groups in the variables of the volleyball’s research, as shown in table 4.

Table 4: The table indicates the arithmetic mean, the standard deviations, the calculated and tabular (T) value in the pre-tests of both the control and experimental groups in the tests of fitness, balance, and the accuracy of preparation and reception of the volleyball

<table>
<thead>
<tr>
<th>S. No</th>
<th>Measurements</th>
<th>unit of measurement</th>
<th>The pre-tests (T)</th>
<th>The post-tests (T)</th>
<th>The error rate</th>
<th>The significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Fitness</td>
<td>Second</td>
<td>5.678 0.444</td>
<td>4.770 0.478</td>
<td>3.118</td>
<td>0.01</td>
</tr>
<tr>
<td>2.</td>
<td>Balance</td>
<td>Second</td>
<td>6.908 0.380</td>
<td>8.884 0.645</td>
<td>2.638</td>
<td>0.030</td>
</tr>
<tr>
<td>3.</td>
<td>preparation</td>
<td>degree</td>
<td>11.800 1.303</td>
<td>13.800 0.447</td>
<td>3.244</td>
<td>0.012</td>
</tr>
<tr>
<td>4.</td>
<td>Reception</td>
<td>degree</td>
<td>49.470 3.142</td>
<td>59.902 7.960</td>
<td>2.725</td>
<td>0.020</td>
</tr>
</tbody>
</table>

Looking at the table no 4, which indicates the arithmetic mean, the standard deviations, the calculated T value in the pre-tests of both the control and experimental groups in the physical and skill variables. In the fitness test of the control group the arithmetic mean was 5.678 and the standard deviation was 0.444 while the arithmetic mean of the experimental group was 4.770, the standard deviation was 0.478, the calculated T value was 3.118, the error rate was (0.01), below the level of significance was 0.05 and the degree of freedom was 8. This indicates the significant differences between the results of the post-tests for the research sample and in favor of the experimental group.

Discussion

Discussing the results of the post-tests for both the control and experimental groups in relation to the variables under research in volleyball. Through what was presented in table 4 of the test results for the control and experimental groups, the table is shown significant differences in post-tests and in favor of the experimental group in the tests of fitness, balance, the accuracy of preparation and volleyball reception in relation to all the variables under research. The researchers attributed the significant differences to the optimal use of the training curriculum, which was applied to the players of the experimental group. This training curriculum adopted in its application to the repetitions and stresses that were developed to match the level of the sample, giving the appropriate break between exercises and practical exercises as well as the privacy of the volleyball game. This was confirmed by Singer Robert N [2] Motor skill is achieved only with an acceptable level of physical capacity “ this is consistent with what said as “Exercises aimed at preparing the individual for the activity of the exercise and developing the motor abilities necessary for this activity so as to improve the individual’s performance of the motor and schematic aspects of the activity”. This contributed to the development of players as they include exercises characterized by repetitions and based on a proper scientific basis, in addition, they consistent with the level and the ability of players in terms of concentration on the speed of performance, which has a great role in raising the level of players, either physically or skillfully. This is consistent with
The standardized and organized training programs in accordance with the scientific basis working on the development of physical and skill level of the players. As well as the opinion of [6]," The ability to retain a certain position of the body during stability or movement and that the use of adequate time, frequency and stress in exercises with giving rest times adapted to working times will perform the level of performance of players" noted that «The systematic and programmed training and the use of the types of severity prescribed in the training as well as the use of optimum rest between repetitions lead to the development of achievement. The researchers emphasize that the practice of players for more than a repetition help players to achieve excellent performance and accuracy and will be reflected positively during the performance in volleyball and thus get the stability of performance" This is confirmed by [7] noted that “It is a skill that requires a combination of timing, balance, muscular strength, speed of movement and without the right mechanics, all of which is a wasted effort”.

**Conclusions**

Significant differences between the results of the pre- and post-tests of the experimental group in all the research variables and in favor of the post-tests. Significant differences between the results of the post-tests of the two research’ groups in all the search variables and in favor of the experimental group.

**Recommendations**

Emphasize the need of the trainers and volleyball players to take care of the physical and skill abilities of the players. The necessity of the volleyball player to perform physical and skill tests on a continuous basis so as to ensure the effectiveness of the training curricula. The need to conduct studies similar to other physical abilities and other age groups in volleyball.

**Conflict of Interest:** Nil

**Source of Funding:** Self

**Ethical Clearance:** Not required

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Effectiveness of Health Educational Program on Nurses’ Knowledge Concerning of Developmental Hip Dysplasia at Al-Wasiti Teaching Hospital in Baghdad City

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ABSTRACT

Background: Nurses role is crucial for DDH due to their routine part in the healthcare facilities made them the individuals who are capable of the disease recognition, thus it is important for ongoing constructed health-education programs being made to assure knowledge refreshing. Early detection and standardized care for the child with DDH post operatively or care address the need for more knowledgeable, trained, skilled nurses in the field of orthopedic nursing specifically in DDH topics.

Objective: firstly assessing knowledge of the nurses concerning DDH, secondly constructing a health education program for nurses according to the pre-assessed knowledge, thirdly implementing the program to surge nurses’ knowledge about neonatal developmental hip dysplasia, then Finding-out relationship between nurses’ knowledge about DDH with the demographic status (such as age, gender, marital status, academic achievement, years of employment in nursing field, years of practice at Al-Wasiti teaching hospital, having training sessions in nursing as a general, having training sessions about Developmental Dysplasia of the Hip, and reviewing knowledge resources within nurse’s own area of competence), and finally Evaluating the effectiveness of the program.

Methodology: A quasi-experimental design with case and control groups being tested in three periods pre-test, post-test-1, and post-test-2. The case group participants are tested prior implementing the educational program and in twenty-one days after they are tested post-test-1 (in 6th January, 2019) then after same period the post-test-2 had been done (in 27th March, 2019). The control group participants are provided with the questionnaire to answer in same time intervals as in case group but without enrollment in educational program. The study started in 16th December, 2018 to 27th March, 2019.

Non probability sample (Purposive) of (80) nurses. 10 preliminary study, 10 pilot study, 30 cases, and 30 controls. Working in a variety of departments of Al-Wasiti Teaching Hospital.

Data collection material is done by self-administrated questionnaire form and it was given for nurses to answer after acquiring their agreement in verbal and written consent.

Results: the study outcomes include low in assessment of nurses’ knowledge prior the educational program and became high-assessment after participation in the program. This is not applied on control group in which participants remain within low-assessment for three periods of testing each test is separated with 21 days period without participating in educational program lectures.

Conclusion: Nurses’ knowledge concerning neonatal developmental hip dysplasia was improved by the effect of the educational program intervention for the case-group, concluding that effectiveness of the intended program was high advantageous.

Recommendations: the high advantage effect of the educational program on nurses’ knowledge concerning neonatal DDH in Al-Wasiti teaching hospital, thus recommendation for applying educational programs about this topic for all general or orthopedic hospitals in Iraq.

Keywords: Effectiveness, Educational program, Nurses knowledge, Developmental dysplasia of the hip; dysplasia

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Introduction

Developmental dysplasia of the hip (DDH) describes a range of hip-joint abnormalities, varying from dysplasia to subluxation to dislocation, usually these abnormalities originate in the womb or in the neonatal period.[1].

The affected structures in hip dysplasia are acetabulum, femoral head or both, making the cup-like acetabulum being shallow and the femoral head ossification being altered or delayed[2].

Well known Risk factors for DDH are intrauterine breech positioning, female babies, estrogen hormone from maternal and fetal origins, first-born infant, and family history.[1]

Swaddling infant in positions of extension and adduction of the hips increases the risk of getting DDH. [2] [3]

Diagnosis of DDH consists of taking health history of DDH patient, physical examination, and radiographic or ultrasonic imaging.[4][5] History taking emphasize on risk factors such as sex, birth ordination, breech presentation, gestational age and family history of DDH.[1]

Treatments for DDH are based according to clinical examination of the hips and radiologic or ultrasonic imaging evaluation that can identify new-born infants whom at risk for DDH, and it includes the surgical and non-surgical treatments that is usually done by abduction braces. [6] The effective treatment of DDH requires multidisciplinary team effort and the parents of the children are also involved.[7]

Importance of the Study: Nurses play an important role for detecting developmental dysplasia of the hip (DDH) in neonates as they perform the routine assessment and care. [2]

The important roles for nurses caring for the children diagnosed with this condition are to council, educate, and prepare the parents to know how to deal and care for the child with DDH. [8] Continuing education is an essential for healthcare providers who are involved in nurturing of neonates to improve knowledge about DDH by providing health education programs [9].

Objectives of the Study

The study aim to:
1. Assess nurses’ knowledge regarding DDH.
2. Construct a health education program for nurses in response to pre-assessed knowledge about DDH.
3. Implement the education program.
4. Find-out relations between the nurses’ knowledge about DDH with the demographic status.
5. Evaluate the effectiveness of the program.

Materials and Method

The study designed as quasi-experiment for case and control groups being tested in three periods pre-test, post-test-1, and post-test-2. The case group participants is tested prior implementing the educational program (16-20 December 2018) then after period they are tested post-test-1(in 13th January, 2019) then after a while the post-test-2 had been conducted (in 27th March, 2019). The control group participants are provided with the questionnaire to answer in same time intervals as in case group but without enrollment in educational program.

The study started in 11th December, 2018 to 27th March, 2019 including preparations like preliminary and pilot study. Data collection is done by self-administrated questionnaire form and it was given for nurses to answer after taking their agreement in verbal and written consent

Setting of the Study: Al-Wasiti teaching hospital in Baghdad city.

The Sample of the Study: A non - probability sample participant were randomly nominated from (80) nurses. 10 enrolled in preliminary study, 10 pilot study, 30 cases, and 30 controls.

Instrument of the Study: A questionnaire was built through the review of literature and studies, it consist of two parts: first one is demographic status of the nurses (as shown in table 3), and the second part is Nurses’ Knowledge regarding developmental dysplasia of the hip that Contain six domains:

1. Basic information related to DDH (5 items)
2. Risk Factors (5 items)
3. Pathophysiology (6 items)
4. Clinical Diagnosis (8 items)
5. Medical and surgical management of DDH (3 items)
6. Nursing Consideration and Management (10 items)

Each item is a question with four multiple choices one of the choice is a correct (scaled 2) and the three others are wrong (scaled 1) scales within SPSS vr.22.

Validity of the Instrument: The study questionnaire and the program reviewed by panel experts views those experts had more than seven years of experience in their field of specialty.

Reliability of the Instrument: A pilot study was conducted on (10) randomly nominated nurses it was done from (11th of December, 2018 to 16th of December, 2018). Questionnaire reliability determination done with Cronbach’s alpha and it is calculated (0.838) which is considered satisfying according to Nunnally (1978) [10].

Statistical Method: Descriptive statistics and inferential.

Results of the Study

Table 1: Distribution cases and Controls according to their years of employment and training sessions about Developmental Dysplasia of the Hip

<table>
<thead>
<tr>
<th>Items</th>
<th>Classes</th>
<th>Case Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Freq.</td>
<td>%</td>
</tr>
<tr>
<td>Write your years of employment</td>
<td>1-5 years</td>
<td>14</td>
<td>46.7</td>
</tr>
<tr>
<td>in the nursing field</td>
<td>6-10 years</td>
<td>1</td>
<td>3.3</td>
</tr>
<tr>
<td></td>
<td>11-15 years</td>
<td>5</td>
<td>16.7</td>
</tr>
<tr>
<td></td>
<td>16-20 years</td>
<td>4</td>
<td>13.3</td>
</tr>
<tr>
<td></td>
<td>21 And above</td>
<td>6</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>30</td>
<td>100</td>
</tr>
<tr>
<td>Training sessions about DDH</td>
<td>yes</td>
<td>6</td>
<td>20.0</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>24</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>30</td>
<td>100</td>
</tr>
</tbody>
</table>

Ffreq. = frequency, % = percentages, SD = standard deviation, MS= Mean of score

Table 2: Comparison between pre-test with post-test-1, and post-test-2

<table>
<thead>
<tr>
<th>Periods N = 30</th>
<th>Mean</th>
<th>Std. Error</th>
<th>Minimum</th>
<th>Maximum</th>
<th>t</th>
<th>df</th>
<th>Sig</th>
<th>As.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test</td>
<td>42.0333</td>
<td>.75275</td>
<td>37.00</td>
<td>52</td>
<td>23.083</td>
<td>29</td>
<td>.000</td>
<td>S.</td>
</tr>
<tr>
<td>Post1-test</td>
<td>67.1333</td>
<td>.79182</td>
<td>55.00</td>
<td>72</td>
<td>22.071</td>
<td>29</td>
<td>.000</td>
<td>S.</td>
</tr>
<tr>
<td>Pre-test</td>
<td>42.0333</td>
<td>.75275</td>
<td>37.00</td>
<td>52</td>
<td>22.071</td>
<td>29</td>
<td>.000</td>
<td>S.</td>
</tr>
<tr>
<td>Post2-test</td>
<td>67.6000</td>
<td>.86649</td>
<td>60.00</td>
<td>74</td>
<td>22.071</td>
<td>29</td>
<td>.000</td>
<td>S.</td>
</tr>
</tbody>
</table>

As. =assessment

Table 3: Association between Nurses’ knowledge for case group (pretest, post-test-1 and post-test-2 to their demographic status using ANOVA

<table>
<thead>
<tr>
<th>Variable</th>
<th>Test Periods</th>
<th>F</th>
<th>Sig</th>
<th>As.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Pre-test</td>
<td>.410</td>
<td>.747</td>
<td>N.S.</td>
</tr>
<tr>
<td></td>
<td>Post 1</td>
<td>.867</td>
<td>.471</td>
<td>N.S.</td>
</tr>
<tr>
<td></td>
<td>Post 2</td>
<td>.471</td>
<td>.705</td>
<td>N.S.</td>
</tr>
</tbody>
</table>

As.
Discussion of the Study Results

Part I: Discussion of the demographic status

**Age:** The majority of case and control group (46.7%) and (43.3%) are of (18-27 age group) respectively. These outputs are approved with [11] their highest percentage of both groups within the age group of 20 – 29 years old.

**Gender:** The majority of participants in case and control (56.7 %) (53.3%) respectively were females. Agreed with [12].

**Marital Status:** The highest percentage of the study sample are married in (63.3%) case group and (66.7%) in control group. This supported by [13] in which (60%) case and (56.7) control group nurses were married.

**Academic achievement:** The high percentage of the case and control groups are nursing school graduates (46.66%) and (43.3%) respectively. This is accepted with [11] in which majority (50%) secondary-nursing school graduates for both groups.

**Years of experience in nursing field:** The high percentage of both groups are (46.7%) within of (1-5 years) experience in nursing field. This is approved with [14] revealed majority had an experience of 1 – 5 years in the nursing field.

**Years of employment in Al-Wasiti teaching hospital:** the majority1-5 years of employment in the hospital for both case (70.0%) and control (66.7%) groups. Approved[11].

**Training sessions in nursing as a general:** The maximum percentage (73.3%) case and (70.0%) control groups did went for training sessions in general topics of nursing. Those outcomes are agreed with [18] in which majority in case and control groups (84%), (68%) respectively participated in nursing courses.

**Training sessions about DDH:** The most percentage (80%) in both case and control group didn’t participate in training sessions about DDH. This approved with [12] which they stated (70%) of both groups.
Review knowledge resources within nurses’ own area of competence: High percentage of case and control participants (66.7%) (73.3%). respectively were reviewing knowledge resources, the majority of participants review textbooks in both case (70.0%) and control (68.2%) groups. There is no statistical relation of nurses’ knowledge with the reviewing of resources among pre-, post-1, and post-2 tests (p value= 0.577, 0.767, and 0.619) respectively.

Part II:

1. Discussion of the effectiveness of the health educational program on nurses’ knowledge: Among case-group test periods: The knowledge testing of this study reveals low-level before commencing the program and became high-level after the subjects participate in lectures of this study program and underwent the post-test-1 and post-test-2. This lead to conclusion that the program have the effect on nurses’ knowledge. Approved with [15] and [16].

2. Association of nurses knowledge among pre-test, post-test-1, and post-test-2 periods: Shows no statistical relationships. Studies [17], [18], and [19] confirm that there are substantial statistical difference among pre-, post-1, post-2 test periods within the case group, meanwhile, there are no difference among the three periods of the control group.

Part II: Relationship of nurses’ knowledge with the demographic status: There is no statistical significant association among demographic items with knowledge testing, but only with post-test-2 and academic achievement show a relationship. In a study [20] found that there is no significant relation of the age with nurses’ knowledge in pre-test, post1& post-2 within P value <0.05.

Conflict of Interest: The researchers report no conflict of interest.

Source of Funding: This study did not receive any funding from any agency.

Ethical Clearance: A permission to conduct this study was obtained from the ethical committee in the College of Nursing, University of Baghdad.

REFERENCES


ABSTRACT

Based on the ILCI theory, the cause of the direct cause in this case work accident, one of which is job factors. In this study, the job factors studied included K3 supervision and K3 training. This study aims to identify K3 supervision and K3 training available in the company to be further linked to SOP compliance on construction workers in Surabaya bridge infrastructure project.

This study is an observational study and was reviewed from the time of data collection, this study is included in a cross sectional study. The sample taken from this study used a system of random sampling using the Slovin formula to obtain 85 respondents. The variables in this study were K3 training and K3 supervision which were then associated with SOP compliance.

The results showed that there was a relationship between K3 training (0.039) and SOP compliance on construction workers and there was a relationship between K3 supervision (0.0030) and SOP compliance on construction workers.

It is recommended to be more routine in carrying out safety morning talk every morning as well as counseling on the importance of implementing SOP compliance. There needs to be an increase in K3 supervision for construction workers in order to work according to the rules set. There needs to be a reward for obedient workers and a punishment for workers who do not comply. In addition, it is also necessary to regulate working hours so that workers can work effectively and efficiently

Keywords: K3 Training, K3 Supervision, SOP Compliance

Introduction

Work accident is an occurrence that cannot be planned, controlled, which may cause or result in injury to workers, equipment damage, and other losses (1). According to BPJS data in 2016 showed that at least 30% of work accident cases came from the construction sector. 80% of work accidents are caused by unsafe behavior and 20% are caused by unsafe working conditions (2). In the ILCI theory unsafe behavior is one of the indirect causes and indirect causes originate from the underlying causes, one of which is job factors. Job factors are factors that exist in work that can be one of the occurrences of unsafe actions for workers. In this study the job factors identified were K3 training and K3 supervision. Training is a process to help workers to gain effectiveness in their present or future work through developing habits of mind, skills, knowledge, and a decent attitude. K3 training is a training that is held and directed to equip, improve, and develop the capabilities, productivity, and welfare of the workforce. While K3 supervision is a series of supervisory activities of all actions carried out by employees of labor inspectors or companies for the fulfillment of the implementation of legislation on the object of supervision of the work environment.
Standard Operating Procedure (SOP) is a series of written instructions from a job or activity that exists in a company. In 2010, research carried out in PT. BBS Indonesia showed that violations of SOPs carried out by workers were 27 people who did not comply with the SOP, and in 2011 rose to 65 construction workers who did not comply with the SOP. According to research conducted by Dyanita (2017), it shows that 81.8% of workers in PT. Sri Murni have been obedient to the procedure and 18.2% of workers were still not compliant with the SOP. In this study, the study aims to identify job factors found in PT. X in this case K3 training and K3 supervision can subsequently be used as a basis for developing programs or improving programs in the company thus later workers can adhere to the SOP and avoid the occurrence unsafe behavior. This study examined the relationship of K3 training and K3 supervision with SOP compliance on construction workers in Surabaya bridge infrastructure projects.

**Material and Method**

This study is a type of analytic research because it analyzed the relationship between two independent and dependent variables. This study is an observational study because the researcher did not give treatment to the subject under study and only did data collection. Judging from the time the research was conducted in a certain time or the same period of time when carrying out the research later workers can be obedient to the SOP and avoid the occurrence of unsafe behavior. This study examined the relationship of K3 training and K3 supervision with SOP compliance on construction workers in Surabaya bridge infrastructure projects.

The population in this study were 100 workers and sampling was done using system random sampling. The method used to determine the number of samples was using the Slovin formula (1),

\[ n = \frac{N}{1 + Ne^2} \]

**Note:**

\[ n = \text{Total sample} \]
\[ N = \text{population} \]
\[ e = \text{fault tolerance limit (0,05)} \]

Thus the calculation obtained is as follows:

\[ n = \frac{100}{1 + 100(0,05)^2} \]

\[ n = 80 \text{ workers or 80 samples} \]

However, in this study data was collected in 85 samples to avoid data dropping or incomplete.

The variables in this study were K3 training, K3 supervision and SOP compliance. The instruments in this study used a questionnaire. This study used a chi-square test with a confidence level of 95% with a value \( \alpha = 0.05 \).

**Findings**

Respondents in this study were construction workers at PT. X, which were 85 respondents with the following descriptions:

Based on this research, the distribution of respondents’ data is as follows:

<table>
<thead>
<tr>
<th>Table 1: Distribution of Respondents Based on K3 Training and K3 Supervision</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Variable</strong></td>
</tr>
<tr>
<td>K3 Training</td>
</tr>
<tr>
<td>K3 Supervision</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

Based on table 1, it is known that the majority of construction workers in PT. X fall into the trained category, namely as many as 75 respondents or with a percentage of 88.2%. Meanwhile, in PT.X in this case the level of supervision is included in the good category according to construction workers with a frequency of 53 people or with a percentage of 62.4%.

From the research that has been done, it is known that respondents who have been obedient to the SOP are as many as 46 workers or with a percentage of 54.1% and respondents who have not adhered to SOP are as many as 39 people with a percentage of 45.9%. This can be seen in table 2.

<table>
<thead>
<tr>
<th>Table 2: SOP Compliance Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Variable</strong></td>
</tr>
<tr>
<td>SOP Compliance</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>
Bivariate analysis produces data relating the relationship between independent variables consisting of K3 training and K3 supervision which are then associated with the dependent variable, namely SOP compliance. The statistical test used was using the chi-square test.

From the results of the chi-square statistical test between K3 training and SOP compliance it was found that the significance of 0.004 means that it is smaller than alpha, namely 0.05 so it can be concluded that there is a relationship between K3 training and SOP compliance. While the test results of the relationship between K3 supervision and SOP compliance obtained a significance result of 0.003 with an alpha of 0.05 thus there is a relationship between K3 supervision and SOP compliance.

**Discussion**

According to Ekotama (2011) SOP is a system that is structured to facilitate, tidy up, and discipline our work. This system is a sequential process to do work from beginning to end (4). In this study, the working procedure involved is a repetition procedure. Repetition is carried out on rust that occurs in steel and if peeling or wear of paint. The purpose of the repainting activity is that all the steel elements on the bridge can be covered by paint.

In this study it shows that 46 construction workers are compliant with SOP. The results of statistical tests showed that there was a relationship between K3 training and SOP compliance. Training is one form of the Education process, by conducting research learning objectives or Education goals will gain learning experiences that will eventually lead to changes in behavior (5). Research conducted by PT. X is general K3 training conducted before work begins or training carried out when doing safety morning talk. Training conducted once a month or according to company requirements includes training in the use of APD tools, procedures to first aid in accidents and so on. This research is in accordance with the research conducted by Andrea Krisna that there is a relationship between K3 training and safe behavior in construction workers.

K3 supervision is a series of supervisory activities of all actions taken by employees of labor inspectors or originating from the supervision of HSE companies as fulfillment of the implementation of legislation on the object of supervision of the work environment. In this study it was found that the supervision carried out by PT. X had been included in the supervision in a good category thus because the supervision carried out was good, the workers tended to obey the procedure. In this study it was found that there was a relationship between supervision variables and SOP compliance.

This research is in line with the research conducted by Hayati (2004) that there is a relationship between supervision and compliance with the implementation of SOP for welding workers (6). Supervision carried out in the workplace in this study is quite strict, such as giving a warning in the form of seizure of a Driving License or ID card by HSE to workers who are not compliant with the procedure or workers who do not use APD. The importance of supervision carried out by the party most responsible so that supervision can be carried out wisely and can be obeyed by workers.

**Conclusion**

1. Construction workers in PT. X have been trained on average and have attended K3 training. K3 Supervision for construction workers in the company falls into the category of good supervision.

2. The average construction worker is aware of SOP compliance that must be done. However, in this study, the frequency between obedient and disobedient construction workers is not much different.

3. There is a relationship between K3 training and K3 supervision with SOP compliance on construction workers.

**Recommendation**

1. Perform safety morning talk every morning to increase the alertness of construction workers while doing work.

2. Increasing K3 Supervision so that construction workers can work in accordance with established rules

3. Providing rewards to workers who in a certain period of time obey the SOP and the rules set by the company.
Conflict of Interest: All authors have no conflicts of interest to declare

Source of Funding: This is an article “Relationship of Personal factors and job factors with SOP compliance on construction workers (A Case study of PT. X Surabaya infrastructure infrastructure project) of Occupational Health and Safety Departement that was supported by Faculty of Public Health, Airlangga University

Ethical Clearance: The study was approved by the institutional Ethical Board of the Public Health, Airlangga University

REFERENCE


Factors Affecting the Occurrence of Stunting in Indonesia

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ABSTRACT

Stunting is an indicator of children’s welfare and a reflection of social inequality. The stunting prevalence in Indonesia ranks fifth in the world, in 2018 it is still above the national target of 30.8%. The scope of the causes of stunting is wide ranging from toddlers themselves, households to the community. This study aims to determine the factors that influence the occurrence of stunting in Indonesia. This research is a non-reactive study because it only carries out secondary data collection obtained from the 2017 Nutritional Status Monitoring (PSG) and Socio-Economic Survey (Susenas) research data. The analysis shows that the factors that influence stunting are household factors that have access to proper sanitation (p value = 0.037). Exclusive ASI variable, toddler weighing $>4$ times, energy adequacy, protein sufficiency and poverty did not affect stunting. The factors that influence stunting are the percentage of households that have access to proper sanitation, but are only able to explain 37.2% for stunting. The cause of multifactor stunting, the need to involve other causes such as infection, cases of diarrhea in this analysis that can arise due to low access to proper sanitation.

**Keywords:** stunting; toddler; sanitation.

Introduction

Childhood stunting is an indicator of children’s welfare and a reflection of social inequality.\textsuperscript{(1)} Stunting is a condition of failure to thrive in children under five (infants under five years old) due to chronic malnutrition so children are too short for their age. Malnutrition occurs since the baby is in the womb and in the early days after the baby is born but the stunting condition only appears after the baby is 2 years old.\textsuperscript{(2)} Toddlers are short (stunted) and very short (severely stunted) are toddlers with body length (PB/U) or height (TB/U) according to their age compared to WHO-MGRS standard of less than -2 SD.\textsuperscript{(3,4)}

The prevalence of stunting in Indonesia ranks fifth in the world,\textsuperscript{(5)} in addition, the prevalence of stunting is still above the national target (<30%), which in 2013 was 37.2 percent and for 2018 it was 30.8% in addition, the prevalence of stunting is still above the national target (<30%), which in 2013 was 37.2% and for 2018 it was 30.8%.\textsuperscript{(6)} Based on data from the 2014 Global Nutrition Report that Indonesia is included in 17 countries experiencing a double burden of nutritional problems and as many as 159 million stunting children worldwide 9 million of them from Indonesia.\textsuperscript{(2)} The data from the research shows that Indonesia is a country that still has public health problems, in accordance with a statement from WHO to set limits on nutrition problems of no more than 20%.\textsuperscript{(7,8)} Regions with low stunting prevalence (<30%) based on 2018 Riskesdas data is in Bali, while the highest prevalence is in the East Nusa Tenggara Region.\textsuperscript{(6)}

The cause of stunting according to a modified concept of UNICEF’s “Logical framework of the Nutritional Problems” 2013 happens because it is multifactorial, which is the direct, indirect and main problem.\textsuperscript{(9,10)} Direct causes of stunting include breastfeeding factors which are considered very important in addition to supplementary feeding.\textsuperscript{(1)} According to the National
Team for the Acceleration of Poverty Reduction that 60% of children aged 0-6 months do not get breast milk exclusively.\textsuperscript{[5,11]} The results of Anisa’s research that low protein nutrient intake has a chance of stunting 5.775 times compared to toddlers in Kalibaru Sub-district whose protein intake is sufficient.\textsuperscript{[12]}

Parenting factors are an indirect cause of stunting. One form of parenting is to weigh the toddler’s weight regularly (weigh more than 4 times) to be able to monitor growth.\textsuperscript{[13]} Stunting is often not recognized in a community where short stature is so common that it is considered normal. Visual identification is quite difficult and the lack of regular assessment of linear growth in primary health care services contributes to stunting.\textsuperscript{[8]}

The availability of proper sanitation is one of the environmental factors needed to nurture mothers and children because it can be an indirect cause of stunting.\textsuperscript{[8,10]} Poor sanitation facilities can increase the incidence of infectious diseases because the energy for growth is diverted to resistance to infection so that nutrients cannot be absorbed properly and inhibit growth.\textsuperscript{[13]} The lack of fulfillment of nutrient intake in the family itself is also due to lack of food availability in households that are affected by low family income.

The scope of the causes of stunting is wide ranging from toddlers themselves, households to the community. Based on the description of the background, this study aims to determine the factors that influence the occurrence of stunting in Indonesia.

### Method

This research data uses secondary data obtained from research data “Nutritional Status Monitoring (PSG)” in 2017 by the Directorate of Community Nutrition of the Ministry of Health of the Republic of Indonesia\textsuperscript{[4]} and the Central Bureau of Statistics through 2017 socioeconomic survey (Susenas).\textsuperscript{[14,15]} The unit of analysis of this study is the provinces in Indonesia, which number 34 provinces.

Data were analyzed using the multiple linear regression method enter. The multiple linear regression function to determine the effect of independent variables on the dependent variable, besides that it can model the state of the variable that is affected and the variables that influence it. The equation for multiple linear regression models is:

$$ Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_k X_k $$

**Description:** $Y$ = independent variable; $X$ = independent variable (bound) ($i = 1, 2, 3, \ldots, k$); $\beta_0$ = intercept; $\beta_1$ = regression coefficient ($i = 1, 2, 3, \ldots, k$).

### Results

Bali Province is the province with the lowest stunting prevalence of 19.1%, while East Nusa Tenggara Province is the province with the highest stunting prevalence of 40.3%.

![Figure 1: Stunting prevalence by province in Indonesia, 2017](image)  

Table 1 shows the percentage of poverty is the variable with the lowest average value, while the variable with the highest average value is the variable weighing under five more than 4 times (X2).
Table 1: Overview of Stunting and Suspected Affecting Factors

<table>
<thead>
<tr>
<th>Variable</th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stunting (Y)</td>
<td>19,10</td>
<td>40,30</td>
<td>30,29</td>
<td>5,55</td>
</tr>
<tr>
<td>exclusive breastfeeding (X1)</td>
<td>10,70</td>
<td>61,40</td>
<td>33,23</td>
<td>10,41</td>
</tr>
<tr>
<td>Weigh &gt; 4 times (X2)</td>
<td>54,90</td>
<td>88,00</td>
<td>72,97</td>
<td>8,86</td>
</tr>
<tr>
<td>Energy Sufficiency (X3)</td>
<td>17,10</td>
<td>43,50</td>
<td>29,04</td>
<td>6,89</td>
</tr>
<tr>
<td>Protein Adequacy (X4)</td>
<td>36,10</td>
<td>66,20</td>
<td>55,08</td>
<td>6,69</td>
</tr>
<tr>
<td>Poverty (X5)</td>
<td>0,18</td>
<td>1,20</td>
<td>0,48</td>
<td>0,25</td>
</tr>
<tr>
<td>Sanitation Access (x6)</td>
<td>33,06</td>
<td>91,13</td>
<td>65,75</td>
<td>13,65</td>
</tr>
</tbody>
</table>

The results of multiple linear regression analysis in table 2 show that only significant value of sanitation access variables (X6), while exclusive breastfeeding variables, toddler weighing > 4 times, energy adequacy, protein adequacy, and poverty did not affect stunting. As for the T test the regression equation was obtained, namely:

\[ Y = 38,760 - 0,208 \text{ access to proper sanitation} \]

The value of households that have access to proper sanitation of 0,208 means that if a household that has access to proper sanitation increases by 1 point, then the prevalence of stunting will decrease by 0,208.

Table 2: Results of Stunting Regression Analysis on Factors Influence of Stunting in Indonesia

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. error</td>
<td></td>
</tr>
<tr>
<td>Constant (stunting)</td>
<td>38,760</td>
<td>12,149</td>
<td>3,191</td>
</tr>
<tr>
<td>Breastfeeding</td>
<td>-0,057</td>
<td>0,108</td>
<td>-0,533</td>
</tr>
<tr>
<td>Weigh &gt; 4 times</td>
<td>0,045</td>
<td>0,121</td>
<td>0,370</td>
</tr>
<tr>
<td>Energy Sufficiency</td>
<td>-0,136</td>
<td>0,186</td>
<td>-0,729</td>
</tr>
<tr>
<td>Protein Adequacy</td>
<td>0,123</td>
<td>0,212</td>
<td>0,581</td>
</tr>
<tr>
<td>Poverty</td>
<td>2,103</td>
<td>4,347</td>
<td>0,484</td>
</tr>
<tr>
<td>Decent sanitation access</td>
<td>-0,208</td>
<td>0,98</td>
<td>-2,116</td>
</tr>
</tbody>
</table>

Table 3 on the results of the F test shows that the percentage of households that have access to proper sanitation (X6) together (simultaneously) has a positive and significant effect on the occurrence of stunting in Indonesia with a p value = 0,037.

Table 3: Stunting F Test Results

<table>
<thead>
<tr>
<th></th>
<th>Sum of squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>378,789</td>
<td>6</td>
<td>63,132</td>
<td>2,663</td>
<td>0,037</td>
</tr>
<tr>
<td>Residual</td>
<td>640,100</td>
<td>27</td>
<td>23,707</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1018,890</td>
<td>33</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4 shows the R² value of 0,372, which means the ability of independent variables to influence is the percentage of households that have access to proper sanitation to explain the magnitude of variation in the dependent variable, namely the prevalence of stunting is only 37,2%, while the remaining 62,8% is explained by other variables not included in the equation of the variable under study.

Table 4: Stunting Determination Coefficient Test Results

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R² Square</th>
<th>Adjusted R² Square</th>
<th>Std. error</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0,610</td>
<td>0,372</td>
<td>0,232</td>
<td>4,86</td>
</tr>
</tbody>
</table>

Discussion

Provinces that have a stunting prevalence below the national prevalence rate (29,6%) are only one-third of the provinces in Indonesia in 2017. The number of provinces with stunting prevalence is still above the national level making the region included in the category
of experiencing chronic acute health problems. Based on the category of community nutrition problems by WHO in 1997 stated that a region is said to experience acute acute nutritional problems if the prevalence of under-fives is short 20 percent or more and the prevalence of under-fives is thin 5 percent or more.4 WHO set limits on nutritional problems no more than 20%.7,8

The lowest stunting prevalence was in Bali Province (19,10%) while the highest province was the prevalence of stunting in NTT Province (40,30%), the magnitude of the gap that occurred indicated an unequal imbalance and development.16 Handling the problem of stunting seems very slow, globally the percentage of children who are stunted has decreased only 0.6% per year since 1990. WHO proposes a global target of decreasing the incidence of stunting in children under 40 percent by 2025, but predicted only 25-36 countries who are able to meet these targets.17

The results of multiple linear regression analysis indicate that the factors that influence stunting are household factors that have access to proper sanitation (p = 0,037) with the equation model:

\[ Y = 38,760 - 0,208 \text{ access to proper sanitation} \]

Exclusive ASI variable, toddler weighing \( \geq 4 \) times, energy adequacy, protein adequacy and poverty level did not affect the occurrence of stunting in Indonesia. The percentage of households that have access to proper sanitation increases by 1 point, then the prevalence of stunting will decrease by 0.208. This is reinforced by the results of the analysis of \( R^2 \) value of 0.372, which means the percentage of households that have access to proper sanitation is only able to explain the magnitude of variation in stunting by only 37.2%, while the remaining 62.8% is explained by other variables not included in the equation variable studied.

The results of this study are not in line with the research conducted in the Kalibaru Sub-district of Depok that the low intake of protein nutrients has the opportunity to stunting 5,775 times compared to toddlers with sufficient protein intake.12 The results of research conducted by Aridiyah et al (2015) in the Patrang and Mangli Jember Community Health Center work areas that in rural areas protein and calcium adequacy are associated with stunting, but not in urban areas.18 Research conducted by Setiawan, et al (2018) said that the low level of energy intake had an effect on the occurrence of stunting (p = 0,001).19

The results of the research conducted by Setiawan, et al (2018) that exclusive breastfeeding status did not affect stunting (p = 0,464).19 However, it is different from the results of Aridiyah’s research (2015) that exclusive breastfeeding is related to the incidence of stunting in infants in both rural and urban areas (p value <0,05).18

Based on the WHO concept that lack of available water and sanitation infrastructure is one of the factors causing stunting at the community level.15 Lack of access to clean water and sanitation. Data obtained in the field shows that 1 in 5 households in Indonesia still defecate in open spaces, and 1 in 3 households do not yet have access to clean drinking water.5,11 One form of activity that can contribute to stunting reduction through Specific Nutrition Interventions is providing and ensuring access to clean water and access to sanitation.

Olaf Muller (2005) reported that the condition of environmental sanitation in developing countries was in a bad category.20 Poor sanitation conditions increase the incidence of infectious diseases, leading to a high prevalence of malnutrition. Households with the ability to be able to access proper sanitation will certainly be able to minimize the attacks of various diseases such as ARI, diarrhea and other infectious diseases. The results of the research conducted by Mustikaningrum et al (2016) showed that the incidence of diarrhea was a determinant of the incidence of stunting, in which infants with diarrhea were at a risk of 2,14 times stunting compared to those without diarrhea.21 The average prevalence of diarrhea increases with increasing disparity in the prevalence of stunting (p = 0,000).22

The factors that cause stunting are very complex, therefore the intervention efforts undertaken also involve various sectors, both the health sector and the non-health sector. Stunting is caused by multi-dimensional factors and is not only caused by malnutrition factors experienced by pregnant women and children under five. Results of discussions conducted by Aryastami (2017) efforts to reduce nutrition problems must be handled cross-sectorally in all lines, strengthening the system so that the 1000 First Days of Life (HPK) become part of the culture and social life in the community.7
The results of the literature review conducted by Mitra that the reduction in stunting was focused on Scaling Up Nutrition (SUN) or the national nutrition awareness movement carried out on the first 1000 days of life.\(^{(17)}\) The principle of the Scaling Up Nutrition movement is that everyone has the right to good food and nutrition. The results of the research conducted by Kusudaryati, et.al (2017) said that the adequacy of Zn had a significant effect on changes in the Z score of TB/U (\(p = 0.042\)), so that the presence of sufficient Zn intake would help deal with the occurrence of stunting.\(^{(23)}\)

**Conclusion**

Factors that can influence stunting are households that have access to proper sanitation. Whereas, exclusive breastfeeding variable, toddler weighing > 4 times, energy sufficiency, protein sufficiency, insignificant poverty. The percentage of households that have access to proper sanitation is only able to explain 37.2 percent for stunting. So the causes of stunting are 62.8 percent of which are caused by many other factors.

**Suggestion**

The cause of multifactor stunting, the need to involve other causes such as infection, cases of diarrhea in the analysis that can arise due to low access to proper sanitation.

**Acknowledgement**

On this occasion the author would like to thank the Ministry of Health.

**Conflict of Interest:** The author states that there is no conflict of interest regarding the publication of this article.

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**Ethical Clearance:** This study was approved by Ethical Commission of Health Research, number 92/EA/KEPK/2019, Faculty of Public Health, University of Airlangga, Surabaya.

**REFERENCES**

15. Badan Pusat Statistik. Persentase Rumah Tangga menurut Provinsi dan Memiliki Akses terhadap


A Study of Job Burnout among Faculty Teacher at Kirkuk University

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¹Department of Fundamental Nursing, ²Department of Adult Nursing, ³Department of Community Nursing, College of Nursing, ⁴Department of Pharmacology and Toxicology, College of Pharmacy, University of Kirkuk, Kirkuk, Iraq

ABSTRACT

Burnout and stress at work area have undesirable effect on individual and the organization. Among human service workers the teachers have the highest levels of burnout. The main objective of this study was to identify presence burnout among Kirkuk university teachers and relationship with the sample sociodemographic characteristics.

However, quantitative study (Descriptive design) implemented on Kirkuk university teachers, during the period from (10 Jun 2017 up to 1 May 2019). The results show Kirkuk university teachers experienced moderate level on subscales of burnout. Lecturer assistant had higher intensity in emotional exhaustion and depersonalization subscales while professors more lack of Personal accomplishment. In conclusion, generally the teachers at Kirkuk University had a moderate level of burnout. Furthermore, when making policies concerning the welfare of teachers, the management should listen to teachers' opinions and involve them in the policy-making process.

Keywords: Job, Burnout, Teacher, Kirkuk, University

Introduction

Freudenberger was first who used term “Burnout” in 1974(1). Burnout defined as “that what started out as important, meaningful, and challenging work becomes unpleasant, unfulfilling, and meaningless”(2). burnout and stress at work area have undesirable effect on individual and the organization(3). Among human service workers the teachers have the highest levels of burnout(4). Educator burnout has presented itself as an emerging problem in the mental health field over the past 50 years (5). Generally known that burnout has three essential subscales. The first subscale is emotional exhaustion (EE), includes loss of energy and physical debilitation. Cynicism or depersonalization (DP) are the second subscale which is includes loss of idealism and a negative view towards clients. third subscale is known as lack of professional efficacy or lack of personal accomplishment (PA), which includes a negative view toward oneself, inability to adapt and low self-esteem(6). More than 41% of teachers leave the profession within five years of starting, and teacher attrition has risen significantly over the last two decades(7). Almost 66% of the teachers leaving the occupation for careers elsewhere(8).

Methodology

Quantitative study (Descriptive design) implemented on Kirkuk university teachers, during the period from (10 Jun 2017 up to 21 October 2018). To identify presence burnout among Kirkuk university teachers and relationship with the sample sociodemographic characteristics. A probability sampling (Cluster type) used to select 204 teachers from 10 deferent Kirkuk university colleges.
Consisted of two parts: part one was developed by investigators “Socio-demographic characteristics” consist from the (teachers College, Marital Status, Gender, age, Academic qualifications, Teaching Experience, Educational background, Teaching workload, and have chronic disease). Second part of the questionnaire consist of 22 items divided into three subscales first and second subscales Masluch Burnout Inventory, Educator Edition(9) MBI-ES instrument scoring identified according to dimensions, for Emotional Exhaustion (EE) and Depersonalization (DP) high scores indicate a high Burnout level while in Personal Accomplishment (PA) indicate low level of Burnout (10). The instrument was translated into Arabic language and used for data collected through self-report method. Participants respond on a seven-point frequency rating scale, ranging from “never” (0) to “every day” (6). The sensitivity value was 0.875. The data were entered and analysed through the Statistical Package for Social Sciences (SPSS) version 25.

Table 1: The numerical values of the instrument sub-scale

<table>
<thead>
<tr>
<th>Response Category</th>
<th>Emotional Exhaustion</th>
<th>Depersonalization</th>
<th>Personal Accomplishment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Items</td>
<td>1,2,3,6,8,13,14,16,20</td>
<td>5,10,11,15,22</td>
<td>4,7,9,12,17,18,19,21</td>
</tr>
<tr>
<td>High</td>
<td>27 or over</td>
<td>13 or over</td>
<td>0-31</td>
</tr>
<tr>
<td>Moderate</td>
<td>17-26</td>
<td>7-12</td>
<td>32-38</td>
</tr>
<tr>
<td>Low</td>
<td>0-16</td>
<td>0-6</td>
<td>39 or over</td>
</tr>
</tbody>
</table>

Results

Table 2: Teachers Distribution according to their College and Gender

<table>
<thead>
<tr>
<th>Teachers College</th>
<th>Male %</th>
<th>Female %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nursing</td>
<td>8.7</td>
<td>2.2</td>
</tr>
<tr>
<td>Scientific Education</td>
<td>5.4</td>
<td>2.2</td>
</tr>
<tr>
<td>Science</td>
<td>5.4</td>
<td>2.2</td>
</tr>
<tr>
<td>Medicine</td>
<td>5.4</td>
<td>5.4</td>
</tr>
<tr>
<td>Veterinary</td>
<td>5.4</td>
<td>2.2</td>
</tr>
<tr>
<td>Law</td>
<td>10.9</td>
<td>2.2</td>
</tr>
<tr>
<td>Administration and Economic</td>
<td>7.6</td>
<td>2.2</td>
</tr>
<tr>
<td>Engineering</td>
<td>10.9</td>
<td>1.1</td>
</tr>
<tr>
<td>Education for Human Science</td>
<td>3.3</td>
<td>2.2</td>
</tr>
<tr>
<td>Agriculture</td>
<td>6.5</td>
<td>0.0</td>
</tr>
<tr>
<td>Physical Education</td>
<td>6.5</td>
<td>2.2</td>
</tr>
</tbody>
</table>

The above table shows that 13.0% of respondents from college of Law while, only 5.4% from college of Education for Human Science.

Table 2: Distribution of the sample according to the level of Burnout

<table>
<thead>
<tr>
<th>Academic Qualifications</th>
<th>Emotional Exhaustion Burnout Level</th>
<th>Subscales Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low f (%)</td>
<td>High f (%)</td>
</tr>
<tr>
<td>Lecturer Assistant</td>
<td>7 (7.6)</td>
<td>11 (12.0)</td>
</tr>
<tr>
<td>Lecturer</td>
<td>13 (14.1)</td>
<td>19 (20.7)</td>
</tr>
<tr>
<td>Assistant Professor</td>
<td>3 (3.3)</td>
<td>8 (8.7)</td>
</tr>
<tr>
<td>Professor</td>
<td>1 (1.1)</td>
<td>1 (1.1)</td>
</tr>
<tr>
<td>Total</td>
<td>24 (26.1)</td>
<td>39 (42.4)</td>
</tr>
</tbody>
</table>
Conted…

<table>
<thead>
<tr>
<th>Depersonalization Burnout Level</th>
<th>Low</th>
<th>Mid</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecturer Assistant</td>
<td>12</td>
<td>11</td>
<td>5</td>
</tr>
<tr>
<td>Lecturer</td>
<td>17</td>
<td>8</td>
<td>15</td>
</tr>
<tr>
<td>Assistant Professor</td>
<td>10</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Professor</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
<td>26</td>
<td>24</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Personal Accomplishment Burnout Level</th>
<th>Low</th>
<th>Mid</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecturer Assistant</td>
<td>14</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>Lecturer</td>
<td>18</td>
<td>6</td>
<td>16</td>
</tr>
<tr>
<td>Assistant Professor</td>
<td>11</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Professor</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>44</td>
<td>17</td>
<td>31</td>
</tr>
</tbody>
</table>

Table 2 shows Kirkuk university teachers experienced moderate level on subscales of burnout. Lecturer assistant had higher intensity in emotional exhaustion and depersonalization subscales while, professors more lack of Personal accomplishment.

Table 3: Comparison Between Sample MBI means and Sociodemographic Characteristics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Characteristic</th>
<th>N (%)</th>
<th>EE Mean (SD)</th>
<th>DP Mean (SD)</th>
<th>PA Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>College</td>
<td>Nursing</td>
<td>10(10.9)</td>
<td>34.5(13.8)</td>
<td>10.4(5.5)</td>
<td>38.9(6.2)</td>
</tr>
<tr>
<td></td>
<td>Scientific Education</td>
<td>7(7.6)</td>
<td>20.0(9.0)</td>
<td>7.5(6.9)</td>
<td>40.2(8.1)</td>
</tr>
<tr>
<td></td>
<td>Science</td>
<td>7(7.6)</td>
<td>28.7(4.9)</td>
<td>10.4(5.4)</td>
<td>32.5(12.5)</td>
</tr>
<tr>
<td></td>
<td>Medicine</td>
<td>10(10.9)</td>
<td>16.9(7.0)</td>
<td>2.3(1.8)</td>
<td>38.0(10.3)</td>
</tr>
<tr>
<td></td>
<td>Veterinary</td>
<td>7(7.6)</td>
<td>35.0(10.7)</td>
<td>11.0(4.6)</td>
<td>32.8(9.8)</td>
</tr>
<tr>
<td></td>
<td>Law</td>
<td>12(10.0)</td>
<td>24.5(7.3)</td>
<td>9.3(6.6)</td>
<td>36.6(7.0)</td>
</tr>
<tr>
<td></td>
<td>Administration and Economic</td>
<td>9(9.8)</td>
<td>22.3(6.4)</td>
<td>9.0(5.6)</td>
<td>35.0(7.9)</td>
</tr>
<tr>
<td></td>
<td>Engineering</td>
<td>11(12)</td>
<td>27.4(15.9)</td>
<td>8.0(6.7)</td>
<td>32.0(10.7)</td>
</tr>
<tr>
<td></td>
<td>Education for Human Science</td>
<td>5(5.4)</td>
<td>27.6(7.1)</td>
<td>15.4(6.8)</td>
<td>35.8(7.9)</td>
</tr>
<tr>
<td></td>
<td>Agriculture</td>
<td>6(6.5)</td>
<td>16.6(5.5)</td>
<td>7.8(4.7)</td>
<td>32.8(11.5)</td>
</tr>
<tr>
<td></td>
<td>Physical Education</td>
<td>8(8.7)</td>
<td>27.5(10.7)</td>
<td>6.6(7.1)</td>
<td>39.3(5.3)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>b P=.002</td>
<td>b P=.021</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>a P=.198</td>
<td>a P=.744</td>
</tr>
<tr>
<td>Marital Status</td>
<td>Single</td>
<td>14(15.2)</td>
<td>22.0(8.9)</td>
<td>8.0(7.5)</td>
<td>32.5(10.0)</td>
</tr>
<tr>
<td></td>
<td>Married</td>
<td>78(84.8)</td>
<td>26.2(11.4)</td>
<td>8.6(6.0)</td>
<td>36.5(8.6)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>a P=.936</td>
<td>a P=.281</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>70(76.1)</td>
<td>26.0(11.0)</td>
<td>8.9(6.1)</td>
<td>36.1(8.6)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>22(23.9)</td>
<td>24.3(11.5)</td>
<td>7.3(6.51)</td>
<td>35.4(10.0)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>a P=.536</td>
<td>a P=.281</td>
</tr>
<tr>
<td>Age</td>
<td>27-36 yrs.</td>
<td>35(38.0)</td>
<td>27.9(11.6)</td>
<td>9.5(6.1)</td>
<td>36.3(8.5)</td>
</tr>
<tr>
<td></td>
<td>37-46 yrs.</td>
<td>41(44.6)</td>
<td>24.5(11.8)</td>
<td>7.4(6.1)</td>
<td>34.2(9.5)</td>
</tr>
<tr>
<td></td>
<td>47-56 yrs.</td>
<td>12(13.0)</td>
<td>24.0(5.6)</td>
<td>9.7(6.2)</td>
<td>40.4(6.0)</td>
</tr>
<tr>
<td></td>
<td>&gt;56 yrs.</td>
<td>4(4.3)</td>
<td>20.5(10.7)</td>
<td>8.2(8.0)</td>
<td>36.2(11.4)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>b P=.400</td>
<td>b P=.457</td>
</tr>
</tbody>
</table>
Table 3 shows highly significant and significant relationship between teachers College and EE and PA subscales subsequently. Teaching workload had highly significant relationship in comparing with PA subscale finally Having a chronic disease significant relationship in comparing with EE subscale.

Table 2 shows that mean of Kirkuk University teachers a moderate level according to burnout subscales. The finding coincide with study among female teachers in Malaysia by Mukundan and Ahour (2011) (11). Current study finding also congruent with the Luk, et al. (2010) finding regarding to the EE and PA subscales and incongruent with DP subscale(12). University administration must provide appropriate mechanisms to diagnose the stressors that causing strain in university instructors (13) and it is important to provide the basic psychological needs for teachers (14) and linked with better autonomous motivation, job satisfaction, work related well-being and organizational adherence(15).

From Table 2 noted that 42.4% of teachers suffers from high level of EE burnout. Regarding DP subscale 45.7% of teachers had low level of burnout and 47.8% of sample complaining from low level of lack on Personal Accomplishment. Above findings indicates that teachers at Kirkuk University complaining from first subscale which is emotional exhaustion. Emotional Exhaustion burnout among teachers influenced by many factors and the most important factor in predicting emotional exhaustion among teachers is disruptive behaviour(16). Iraq has entered several wars over the past decades and the wars have had a negative effect on health in general in addition to the abuses that have been recorded against human rights(17).
The Iraqi community need an urgent education and provision effective mental health care\textsuperscript{(18)}.

Table 3 illustrate sociodemographic characteristics of the sample in addition to the relationship with burnout subscales. First variable shows the distribution of teacher according to the college and which had a highly significant relationship with EE subscale and significant DP subscale at p value .002 and .021 respectively. on the other hand, non-significant relationship teacher college with PA subscale. Concerning to the highly significant relationship between teacher’s college and emotional exhaustion subscale. Nursing college teachers had highest mean by 34.5 of burnout while, Agriculture and Medicine teachers had lowest mean subsequently by 16.6 and 16.9. There is little literature about this relationship. Ling Qin et al.\textsuperscript{(19)}, find highly significant relationship between burnout and speciality. While study of Al-Mehasi and Al-Sumaili\textsuperscript{(20)} more precisely found that burnout had significant relationship with teachers speciality. These results provide the administrators with useful information in developing policies to overcome or at least decrease teacher’s burnout.

About teacher’s marital Status most of responded were Married and non-significant relationship between teacher’s burnout and marital status. This result like the findings of\textsuperscript{(12, 21, 22)}.

Table 3 demonstrate 76.1\% of sample gender were male and non-significant differences between teacher Gender comparing with burnout subscales. Current result congruent with of Li, 2015\textsuperscript{(23)} Ju et al (2015)\textsuperscript{(24)} Coulter and Abney (2009)\textsuperscript{(25)} Lou and Chen (2016)\textsuperscript{(26)} Kroupis, et al. (2017)\textsuperscript{(27)} On the other hand present study findings incongruent with results of Alfuqaha and Alsharah\textsuperscript{(21)} and Alavinia and Ahmadzadeh\textsuperscript{(22)} and Burke et al (2007)\textsuperscript{(28)} they found statistically significant differences between teacher Gender comparing with total burnout scale. The explain of this result may be due to differences in environment of working, security situation and unpredictable future of the country in Iraq. Leading to both male and female teachers had same reasons and sources of burnout.

Fourth variable in the Table 3 illustrate the age groups of participants the mean of age was 40.23\(\pm\) 8.09. The relationship between age and burnout subscales outcome display that non-significant differences. These result same with findings Coulter and Abney (2009)\textsuperscript{(25)}.

Fifth variable of Table 3 shows that Lecturer account about half of teachers also illustrate non-significant relationship between teacher’s academic qualification and burnout subscales. In comparing with previous results Li (2015) found non-significant relationship between first and third subscales of burnout with academic qualification. while, adversely second subscale highly significant relationship between academic qualification and DP subscale\textsuperscript{(29)}. Lackritz found non-significant burnout relationship with teachers rank (Assistant Professor, Associate Professor and Professor) while significant relationship with teachers Status (Tenured, Probationary and Lecturer)\textsuperscript{(30)} Jackson et al. (1993)\textsuperscript{(31)} they found significant relationship between teachers academic qualification and burnout. Non-significant relationship between teachers in current study may be due to instability of security in addition to environment of working are same for all teachers and most of teachers not acquiring social support from university or society.

Table 3 reveals non-significant between teaching Experience relationship with burnout subscales. In related to the earlier finding Luk\textsuperscript{(12)} found non-significant relationship between both DP and PA sub-scales with teaching Experience. On the other hand, Luk results indicated significant relationship with EE subscale. Contrarily Li (2015) study outcome demonstrate teaching experience had non-significant relationship with first subscale while, teaching experience had a significant relationship with second and third subscales\textsuperscript{(23)}.

Table 3 indicate significant relationship between teaching workload with PA subscale. While non-significant relationship with other two subscales. Skaalvik in (2009)\textsuperscript{(32)} (2011) found that Time pressure positively correlated with EE sub-scale but not with the other sub-scales\textsuperscript{(32), 33}. Lou and Chen (2016) used one-sample t-test to found significant relationship between subscale workload categories 11 - 20 hours/week and Over 21 with both of EE and DP subscales. On the other hand, significant relationship between PA subscale at two categories of workload <10 hours/week and 11 - 20 hours/week. Whereas, significant relationship between workload > 21 hours and personal accomplishment subscale\textsuperscript{(26)}.

Conclusion

Generally the teachers at Kirkuk University had a moderate level of burnout. When making policies concerning the welfare of teachers, the management should listen to teachers’ opinions and involve them in the policy-making process.
REFERENCES


IL-18 -607 Gene Polymorphisms in Iraqi Obese Patients

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ABSTRACT

Obesity is a serious medical illness where excess body fat has stored to the amount that it might have a negative impact on health. In general, people are regarded as obese when their body mass index is more than 30 kg/m². A total of 100 Iraqi subjects from Wasit province were included in this study, 50 of them had normal weight with BMI less than 25 kg/cm² and 50 obese with BMI more than 30kg/cm². The polymorphisms were analyzed using single specific primer-polymerase chain reaction at the position -607 C/A (rs1946518). The genotype frequencies of normal weight group were in agreement with the Hardy-Weinberg equilibrium. While the genotype frequencies of obese group revealed significant variation (P> 0.05). In conclusion, IL-18-607 A alleles, CC, and CA genotypes showed positive association with the obesity in Iraqi Arab population or protection against it.

Keywords: obesity, overweight, IL18 gene polymorphism, BMI, Iraq.

Introduction

Globally, obesity is one of leading avoidable causes of death; significantly, its rates are increased in both adults and children. People are commonly regarded as obese when their body mass index (BMI) exceeds 30 kg/m². Obesity have a negative effect on health and increases the likelihood of various diseases, particularly heart disease, type 2 diabetes, obstructive sleep apnea, certain types of cancer, osteoarthritis, and depression. In 2014, 600 million adults (13%) and 42 million children under the age of five were obese and obesity is more common in women than men. The prevalence of obesity can vary greatly by gender, race/ethnicity, and socioeconomic status. In 2016, the rate of obesity prevalence in Iraqi adult is 30.4%. Xu et al. indicated that the adipose tissue, in addition to energy storage, harboring inflammatory cells which are thought to maintain inflammation and damage adipocyte function. Such consequences might be occurred through cytokines produced in significant amounts from adipocytes, in addition to inflammatory cells employed into adipose tissue. Numerous proinflammatory cytokines (e.g. IL-1 family) have been designated to be raised in overweight and obese individuals. IL-18, as one of IL-1 family, plays a regulatory role through the induction of IFN-γ that applies alterations in a variable range of cell types and is linked with the pathogenesis of many inflammatory diseases such as obesity. The present work aimed to explore possible association of IL-18-607 polymorphisms in the development of obesity in Iraqi subjects from Wasit province.

Materials and Method

Study Subjects: A total of 100 Iraqi subjects from Wasit province were included in this study, 50 of them had normal weight with BMI less than 25 kg/cm² and 50 obese with BMI more than 30kg/cm². All enrolled subjects were non-smokers and with no proof of cancer and free of any metabolic disorders other than obesity. All participants gave informed consent before enrolling in the research, which was approved by the Biology Department, College of Science, Baghdad University ethics committee in accordance with the Helsinki Declaration.

Lipid Profile Analysis: Sera were collected from all subject groups. Lipid profile test were evaluated by using semi-automatic biochemistry analyzer BTS-350...
DNA Extraction: DNA extracted from studied subjects blood sample by using the Wizard® Genomic DNA Purification Kit (Promega/USA) and the purification was done according to kit instructions.

Detection of IL18 - 607 C/A Genotypes: The polymorphisms were analyzed using polymerase chain reaction-single specific primer, at the position -607 C/A (rs1946518) in the promoter of IL18 gene<sup>6</sup> with minor modifications.

Reactions were carried out in a Bio-Rad PCR thermal cycler (T100/USA). PCR reaction was performed in Accupower<sup>®</sup> PCR PreMix tube with a final volume of 20µl consisting of 5 µl of 10-25ng DNA template, 1 µl of each of the reverse primer and sequence-specific forward primers (10 pmol/µl), and 12µl of nuclease-free water.

An IL-18-607 common reverse primer 5’-TAACCTCATTCAGGACTTCC-3’ and two sequence-specific forward primers 5’-GTTGCAGAAAGTGTAAAAATTATTAC-3’ and 5’-GTTGCAGAAAGTGTAAAAATTATTAA-3’ were used in order to detect an amplification product of 196 bp. Reaction conditions consisted of initial denaturation at 94°C for 2 min followed by 7 cycles of denaturation at 94 °C for 20 sec., annealing at 64°C for 40sec. and extension 72°C at 40 sec., then 25 cycles of denaturation at 94 °C for 20 sec., annealing at 57°C for 40 sec. and extension at 72°C at 40sec. Lastly final extension at 72°C at 5 min. PCR products were visualized by 2% agarose gel electrophoresis stained by ethidium bromide.

Statistical Analysis: All statistical analysis was performed using statistical package for social science program version 17 for Windows (SPSS INC., Chicago IL, USA). Results were expressed as mean ± SD. Comparisons between two groups were performed using T-test for categorical data. P value of <0.05 were considered to indicate statistical significance.

Genotypes of IL18 -607 were presented as frequencies percentage, and significant differences between their distributions in subject groups were assessed by two-tailed Fisher’s exact probability (P). Also, odds ratio (OR), etiological fraction (EF) and preventive fraction (PF) were calculated to define the association between a genotype with the disease. These estimations were calculated by using the WINPEPI computer programs for epidemiologists. The latest version of the WINPEPI package (including the programs and their manuals) is available free online at http://www.brixtonhealth.com.

Allele frequencies of IL18 -607 genes were estimated by direct gene counting methods, however, compatibility to Hardy-Weinberg equilibrium (H-WE) was calculated using H-W calculator for two alleles, which is available free online at http://www.had2know.com/academics/hardy-weinbergequilibrium-calculate-3-alleles.html. Significant differences between the expected and observed frequencies are assessed by Pearson’s Chi-square test.

Results and Discussion

Demographic characteristics of the subject groups:

The clinical characteristics of the subject according to their BMI and lipid profile test are listed in Table 1. For best separation among phenotypes, the participants were divided into two BMI groups: normal weight (BMI >25 kg/m<sup>2</sup>) and obese (BMI ≥30 kg/m<sup>2</sup>).

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Normal weight group BMI kg/m&lt;sup&gt;2&lt;/sup&gt;</th>
<th>Obese BMI kg/m&lt;sup&gt;2&lt;/sup&gt;</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age rang years</td>
<td>21-59</td>
<td>20-65</td>
<td>_</td>
</tr>
<tr>
<td>BMI</td>
<td>21.2 ± 2.7</td>
<td>34.6 ± 3.5</td>
<td>P&gt;0.001</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>140 ± 28.3</td>
<td>171.9 ± 84.4</td>
<td>P&gt;0.001</td>
</tr>
<tr>
<td>Triglyceride</td>
<td>113.1 ± 24.5</td>
<td>159.9 ± 57.5</td>
<td>NS</td>
</tr>
<tr>
<td>HDL - cholesterol</td>
<td>57.6 ± 20.7</td>
<td>23.3 ± 14.7</td>
<td>P&gt;0.001</td>
</tr>
<tr>
<td>LDL - cholesterol</td>
<td>87.7 ± 34.5</td>
<td>124 ± 89.5</td>
<td>P&gt;0.001</td>
</tr>
<tr>
<td>VLDL- cholesterol</td>
<td>26.3 ± 7.3</td>
<td>41.4 ± 20.9</td>
<td>NS</td>
</tr>
</tbody>
</table>

HDL: high-density lipoprotein, LDL: low-density lipoprotein, VLDL: Very low-density lipoprotein, NS: non-significant, S: significant difference P < 0.001.
In the present study, there were significantly increased level of cholesterol, Triglyceride, and LDL in the serum of obese group than normal weight group and significantly decreased level of HDL in obese than normal weight. While VLDL showed insignificant increased in obese than normal weight group.

This finding agreed with many previous studies around the world. In Poland, obesity and overweight are accompanied by unfavorable blood lipid patterns. Mean total cholesterol and triglyceride concentrations were higher in obese persons in comparison to normal weight subjects. HDL cholesterol concentration was lower in obese subjects as compared to normal individuals. The mean concentrations of LDL cholesterol showed insignificant variation. In India, obesity is associated with increased serum lipid profile levels except HDL-Cholesterol. And in Pakistan, all the parameters of lipid profile except serum HDL level showed significant increase in obese persons while HDL level was significantly decreased. Aljaffar [10] found that the adult obese has relatively larger changes in serum lipids at any given level of obesity in Karbala/Iraq. Furthermore, he observed a significant increase in levels of serum cholesterol; LDL and a significant decrease HDL level in obese woman and men.

The greater increase in BMI the greater the abnormalities in lipid levels. Approximately 60-70% of patients who are obese are dyslipidemic while 50-60% of patients who are overweight are dyslipidemic. The increased risk for cardiovascular disease in patients with obesity is partially accounted for by this dyslipidemia.  

**Frequency of genotypes and allele in subject groups:**
The genotype and allele frequencies for IL-18 -607 polymorphisms are summarized in Table 2. The genotype frequencies of normal weight group were in agreement with the H-WE. While the genotypes frequencies of obese group showed a significant variation (P>0.05). This variation was observed due to differences between the observed and expected frequencies of CC, CA and AA genotypes.

### Table 2: Observed and expected numbers and frequencies percentage and H-WE of IL-18 -607 genotypes and alleles in subject groups

<table>
<thead>
<tr>
<th>Studied groups</th>
<th>IL-18 607 genotypes or allele</th>
<th>H-W P ≤</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CC</td>
<td>CA</td>
</tr>
<tr>
<td>Normal weight group (control) N: 50 Observed</td>
<td>28</td>
<td>16</td>
</tr>
<tr>
<td>%</td>
<td>56</td>
<td>32</td>
</tr>
<tr>
<td>Expected</td>
<td>25.92</td>
<td>20.16</td>
</tr>
<tr>
<td>%</td>
<td>51.84</td>
<td>40.32</td>
</tr>
<tr>
<td>Obese Group N:50 Observed</td>
<td>9</td>
<td>32</td>
</tr>
<tr>
<td>%</td>
<td>18</td>
<td>64</td>
</tr>
<tr>
<td>Expected</td>
<td>12.5</td>
<td>25</td>
</tr>
<tr>
<td>%</td>
<td>25</td>
<td>50</td>
</tr>
</tbody>
</table>

The results of present study were in agreement with Lin-Kim et al., results in normal weight Korean population but not in obese, as they found that the IL-18 607 genotype frequencies were in agreement with the H-WE in normal weight and obese group. Also, the results of this study did not agree with Fatima et al. who reported that in South Asian population, the IL-18 -607 genotype distributions was compatible with H-WE in total study subjects and in subgroups (Normal Weight, Overweight and Obese). The deviation from H-WE are observed in different populations (ethnicities) because the factors that influence the equilibrium are ethnicity-based.
Table 3: Statistical evaluations of associations between IL-18 -607 genotypes or allele and subject groups

<table>
<thead>
<tr>
<th>IL18-607 Genotypes or Allele</th>
<th>obsesus groups (N:50)</th>
<th>Normal weight group (N:50)</th>
<th>OR</th>
<th>Etiological or Preventive Fraction</th>
<th>Fishers Exact Probability</th>
<th>95%CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Genotypes</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CC</td>
<td>28</td>
<td>56</td>
<td>9</td>
<td>18</td>
<td>5.8</td>
<td>0.46</td>
</tr>
<tr>
<td>CA</td>
<td>16</td>
<td>32</td>
<td>32</td>
<td>64</td>
<td>0.26</td>
<td>0.47</td>
</tr>
<tr>
<td>AA</td>
<td>6</td>
<td>12</td>
<td>9</td>
<td>18</td>
<td>0.62</td>
<td>0.068</td>
</tr>
<tr>
<td>Alleles</td>
<td>(100)</td>
<td>(100)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>72</td>
<td>72</td>
<td>50</td>
<td>50</td>
<td>2.57</td>
<td>0.44</td>
</tr>
<tr>
<td>A</td>
<td>28</td>
<td>28</td>
<td>50</td>
<td>50</td>
<td>0.39</td>
<td>0.30</td>
</tr>
</tbody>
</table>

OR = odds ratio; 95%CI = 95% confidence interval.

The results indicated that IL-18-607 C (OR = 0.44, P=0.002) and A (OR=0.3, P=0.002) alleles and CC (OR = 5.8, P= 0.001) and CA (OR= 0.25, P=0.003) genotypes showed positive association with the obesity in Iraqi Arab population or protection against it, and the recorded OR, EF and PF values are in favor of such conclusion. This result was conflicting with Lin-Kim et al.12 results demonstrated insignificant differences in the genotype distribution and allele frequency among Koreans (overweight and obese subjects) and controls (normal weight). While Fatima et al.13 reported that the percentage of IL-18 -607 A/A genotype was higher in overweight and obese vs. normal weight subjects (P < 0.001), which is also not coincide with the results of this study.

Obesity is marked by low-grade chronic inflammation. On the other hand, IL-18 has various functions in chronic inflammation and autoimmune disorders. Moreover, it has been proposed as an adipogenic cytokine, which is implicated in excess adiposity12. IL-18 is considered as an imperative regulator of both innate and acquired immune responses besides its role in functional cytokine network being an essential player in the homeostasis of the immune response; consequently, any alteration may result in an abnormal immune response. Furthermore, diverse pathological and infectious disorders may lead to an alteration in the cytokine network, and later confuse the pathological events. Henceforth, studies concentrated on genes regulating the cytokine expression; particularly, on gene polymorphisms that may affect the expression levels and thus the whole immune response15.

BMI and lipid profile distribution according to IL-18 607 genotypes: BMI and lipid profile test in obese and normal weight groups distributed by IL-18 607 genotypes are shown in Table 3. There are insignificant variations between IL-18 -607 genotypes in both obese and normal weight groups for cholesterol, triglyceride, LDL and VLDL serum levels. Whereas BMI and HDL showed significant variations between CC, CA and AA genotypes of normal weight group (the higher BMI was observed in CC genotype followed by AA then CA genotypes, however, the higher serum levels of HDL was in CA genotypes followed by AA then CC genotypes). BMI and HDL serum level was insignificant differences between obese group genotypes.

Table 3: BMI and lipid profile test in subject groups distributed by IL-18 607 genotypes

<table>
<thead>
<tr>
<th>IL18-607 Genotypes</th>
<th>Mean ± SD (kg/m²)</th>
<th>Mean ± SD (mg/dl)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BMI</td>
<td>Cholesterol</td>
</tr>
<tr>
<td>Normal weight</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CC</td>
<td>22.4 ± 1.9 a</td>
<td>139.5 ± 29</td>
</tr>
<tr>
<td>CA</td>
<td>18.5 ± 2.5 b</td>
<td>144.1 ± 33</td>
</tr>
<tr>
<td>AA</td>
<td>21.0 ± 2.4 c</td>
<td>134.4 ± 20</td>
</tr>
<tr>
<td>Obese</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CC</td>
<td>35 ± 3.7</td>
<td>170.0 ± 72</td>
</tr>
</tbody>
</table>
Lin-Kim et al. 12 analyzed the polymorphism of the genotype distributions and they found that IL-18 –607C/A associated with an increase in BMI in obese women in the Korean population. However, Fatima et al. 13 reported that subjects with AA genotype had a higher BMI, in south Asian population and they did not find any difference in the lipid profile between the three subgroups. Nevertheless, we did not find significant difference in the BMI and lipid profile test between three genotypes in subject groups except BMI and HDL in normal weight had a significant difference between them.

The mechanism how the IL-18 gene polymorphism may affect obesity is associated with IL-18 synthesis, secretion, and activity. Definitely, an elevated circulating IL-18 concentration has been found in obese and insulin resistant people16,17. Furthermore, serum IL-18 was increased in obese women has been declined when body weight was lost18.

**Conclusion**

According to the results of this study, IL-18-607 C, A alleles and CC, CA genotypes showed positive association with the obesity in Iraqi Arab population or protection against it. BMI or lipid profile test showed insignificant variations between IL-18 –607 genotypes in obese.

**Conflict of Interest:** None

**Source of Funding:** Self

**Ethical Clearance:** Not required.

**REFERENCES**


Correlation between Pain and Cone Beam CT Sialographic Finding in Chronic Inflammatory and Non-Inflammatory Conditions

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¹Assistant Lecture, ²Head, Oral and Maxillofacial Radiology Department, Faculty of Dentistry, Minia University

ABSTRACT

Objective: The aim of this study to evaluate the radiographic finding of CBCT sialography in patients suffering from pain in chronic inflammatory and non-inflammatory lesions of salivary gland.

Patients and Method: Twenty patients of both sexes and varying ages were selected complaining from pain in chronic inflammatory and non-inflammatory salivary gland lesions diagnosed by patient history, clinical examination and were undergone CBCT sialography scanning. Then all images were analyzed and scored, the radiographs had been evaluated by three radiologists independently of each other and the findings were correlated to pain as a clinical symptom.

Results: There was statistically significant difference between the presence of pain and the visualization of the main duct, while there is no statistically significant difference between all cases experienced different degree of pain and all parenchymal finding.

Conclusion: CBCT sialography can detect salivary glands with secondary inflammatory changes, moreover, the presence of pain as clinical symptoms is important in the evaluation of non-tumor lesions of salivary glands, it has no correlation with CBCT sialographic finding

Keywords: pain, sialography, cone beam CT

Introduction

Salivary glands diseases are many but they are broadly categorized into inflammatory conditions, non-inflammatory conditions, and space occupying masses. (1) Symptoms of salivary gland disorders are limited in number and generally nonspecific as Patients usually complain of swelling, pain, xerostomia, foul taste, and sometimes sialorrhea (excessive salivation). (2, 3)

The common clinical indications of salivary gland imaging are pain and swelling which are important in the diagnosis of salivary gland disorders. A comprehensive history and physical examination are the first order for evaluation of salivary gland disorders and there are specific points must be examined such as the onset and duration of symptoms, their frequency, the presence of swelling and pain, and the characteristics of salivary secretion. (4)

A complete history and focused physical examination are crucial in evaluation of patients with obstructive/inflammatory salivary gland disorders. Key points should include the acute onset or long persistence of gland swelling, associated fever or pain, drug exposures, history of malignancy and chronic illnesses such as rheumatologic diseases or sicca syndrome. (5)

Swelling and pain were classified into the 4 categories of normal, swelling, pain, and both swelling and pain. (6)

Sialography is a functional examination of the parotid and submandibular salivary glands that was first performed in 1902. It maps the delicate ductal structures
of the salivary glands following the introduction of an iodinated contrast agent through the orifice of the gland duct. The gland is then imaged with ionizing radiation (plain film, CT, fluoroscopy or cone beam CT) (7), the procedure is indicated to assess the extent and severity of the resultant changes to the gland (8).

Hence, this study aimed to correlate between clinical symptoms (pain) and radiographic finding of CBCT sialography.

**Patients and Method**

Twenty patients (Adults over 18 years of age) were selected into this prospective clinical study over a two-year time period from June, 2016 to July 2018, from the outpatient clinics of Minia University Dental Hospital. This study was approved by the (Research Ethics Committee) (REC) under number 172 in 27/6/2016, Faculty of Dentistry, Minia University before starting the research and all the entire patients had signed a standardized informed consent laid down by REC explaining the nature and the procedures of the study protocol, only those who agreed to sign the consent were included in this study.

Inclusion criteria in this study were patients having signs and symptoms related to a salivary gland disease, based on the presence of the symptoms of pain of the parotid or submandibular salivary gland, while exclusion criteria were the presence of acute stages of inflammation affecting the salivary glands, known or suspected allergy to iodinated contrast agents, or an immediately anticipated thyroid function test had been excluded and neoplastic condition of salivary glands.

Detailed history taking and clinical examination of the patients were performed thorough extra- and intra-oral examinations were performed to determine the presence of a swelling, and pain

Sialography was performed by probing and cannulation of ducts for affected salivary gland and, followed by injection of approximately 1.5-1.7 mL Urografin contrast media until the patient felt fullness. The gland of interest was imaged by CBCT examination was performed using Scanora® 3D with Auto- SwitchTM (Soredex, Helsinki, Finland) with 85 kVp, 15 mA, and a field of view (FOV) of 4 cm for the submandibular gland and 5 cm for the parotid gland. On Demand 3D TM software (Cybermed Inc., Seoul, Korea) was used to manipulate the CBCT images in multiplanar slices as well as three dimensional images to examine the lesions.

Three radiologists evaluated the images separately and scores were given for the interpretation of the images according to the following scoring systems.

A scoring system was performed to evaluate the visualization of the duct:

- Not visualized: 0, Visualization: 1.

The width and contour of Duct system: (main duct, and intra glandular branches): Normal: 0, Narrow with or without irregularity: 1 Dilated with or without irregularity: 2 and, Destroyed: 3.

The sialectasis: based on the accepted criteria proposed by Rubin and Holt According to the size of contrast material collections in the gland: Stage-0: Nosialectasis., Stage-I: Punctate; <1 mmin diameter., Stage-II: Globular; 1–2 mm in diameter.

Stage-III: Cavitary; >2 mm in diameter. Stage-IV: Destructive; severe irregular dilatation of the main duct and destruction of the parenchyma with pooling of contrast medium giving a bizarre pattern

Retention of contrast, absent 0, and Present. 1

The above mentioned scoring system for evaluation was used by each radiologist to assess the interpretation separately.

Data was analyzed using IBM SPSS statistics version 24. Numerical data were expressed as mean and standard deviation. Qualitative data were expressed as frequency and percentage. Chi-square test (kruskal wallis test) was used to examine the relation between qualitative variables, Intraclass correlation coefficient test “cronbach’s alpha” was used to test the inter-rater reliability. p-value < 0.05 was considered significant.

**Results**

Twenty 20 patients in this study 8 cases (40%) were male while the remaining 12 cases (60%) were females. The ages of the patients ranged between 20 to 60 years with a mean age of 40 years, (4 cases, 20%) were healthy with non-contributory medical histories. 10 subjects (50%) reported rheumatoid. Two subjects
had received previous anti-hypertensive treatment. In total, 17 parotid glands and 3 submandibular glands were examined. Referral to clinic for sialography was primarily from oral and maxillofacial radiology, all subjects were symptomatic, and most subjects (80%) reported pain. 14 subjects (80%) reported dull pain and 4 subjects (20.0%) reported sharp pain. 1 another subjects (5%) reported “discomfort”.

In an attempt to correlate the radiographic findings detected by CBCT sialography concerning the duct with pain, results are shown in table (1).

<table>
<thead>
<tr>
<th>Findings</th>
<th>Pain</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mild</td>
<td>Moderate</td>
</tr>
<tr>
<td>Main duct visualization</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Yes</td>
<td>1 (100%)</td>
<td>16 (100%)</td>
</tr>
<tr>
<td>Presence of abnormality</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>0 (0%)</td>
<td>4 (25%)</td>
</tr>
<tr>
<td>Narrow</td>
<td>0 (0%)</td>
<td>3 (18.8%)</td>
</tr>
<tr>
<td>Dilated</td>
<td>1 (100%)</td>
<td>3 (18.8%)</td>
</tr>
<tr>
<td>Intra-glandular duct visualization</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>0 (0%)</td>
<td>2 (12.5%)</td>
</tr>
<tr>
<td>Yes</td>
<td>1 (100%)</td>
<td>14 (87.5%)</td>
</tr>
<tr>
<td>Presence of abnormality in the intra-glandular duct</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>1 (100%)</td>
<td>6 (37.5%)</td>
</tr>
<tr>
<td>Narrow</td>
<td>0 (0%)</td>
<td>4 (25%)</td>
</tr>
<tr>
<td>Dilated</td>
<td>0 (0%)</td>
<td>4 (25%)</td>
</tr>
<tr>
<td>Destroyed</td>
<td>0 (0%)</td>
<td>2 (12.5%)</td>
</tr>
<tr>
<td>No. of strictures</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>0 (0%)</td>
<td>10 (62.5%)</td>
</tr>
<tr>
<td>One</td>
<td>1 (100%)</td>
<td>2 (12.5%)</td>
</tr>
<tr>
<td>Two</td>
<td>0 (0%)</td>
<td>2 (12.5%)</td>
</tr>
<tr>
<td>Three</td>
<td>0 (0%)</td>
<td>2 (12.5%)</td>
</tr>
<tr>
<td>Location of stricture</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main duct</td>
<td>1 (100%)</td>
<td>4 (25%)</td>
</tr>
<tr>
<td>Filling defect</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Absent</td>
<td>0 (0%)</td>
<td>8 (50%)</td>
</tr>
<tr>
<td>Present</td>
<td>1 (100%)</td>
<td>8 (50%)</td>
</tr>
<tr>
<td>Total</td>
<td>1 (100%)</td>
<td>16 (100%)</td>
</tr>
</tbody>
</table>

This table shows that there is no statistically significant difference between all cases experienced different degree of pain and all ductal finding except the visualization of the main duct and all cases with mild pain had dilated duct while narrow or dilated duct was detected in 37% of the cases of moderate pain and this relation was not statistically significant moreover, cases with different degree of pain the CBCT sialography can detect any number of strictures that was located in the main duct.

In an attempt to correlate the radiographic findings detected by CBCT sialography concerning the parenchyma with pain, results are shown in table (2).

<table>
<thead>
<tr>
<th>Findings</th>
<th>Pain</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mild</td>
<td>Moderate</td>
</tr>
<tr>
<td>Presence and pattern of sialectasia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No sialectasia</td>
<td>0 (0%)</td>
<td>8 (50%)</td>
</tr>
<tr>
<td>Punctuate</td>
<td>0 (0%)</td>
<td>2 (12.5%)</td>
</tr>
<tr>
<td>Globular</td>
<td>1 (100%)</td>
<td>2 (12.5%)</td>
</tr>
<tr>
<td>Cavitatory</td>
<td>0 (0%)</td>
<td>1 (6.3%)</td>
</tr>
<tr>
<td>Destructive</td>
<td>0 (0%)</td>
<td>3 (18.8%)</td>
</tr>
</tbody>
</table>
Conted…

<table>
<thead>
<tr>
<th>Degree of sialectasia</th>
<th>No sialectasia</th>
<th>Acinar dilation less than one third of the entire glandular area</th>
<th>more than 2/3 with or without severe dilation of entire glandular area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td></td>
<td>9 (56.3%)</td>
<td>1 (6.3%)</td>
<td>2 (66.7%)</td>
</tr>
<tr>
<td></td>
<td>2 (66.7%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td></td>
<td>0.79</td>
<td>0.79</td>
<td>0.79</td>
</tr>
<tr>
<td>Retention of contrast</td>
<td>Absent</td>
<td>Present</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0 (0%)</td>
<td>1 (100%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td></td>
<td>4 (25%)</td>
<td>12 (75%)</td>
<td>2 (100%)</td>
</tr>
<tr>
<td></td>
<td>0.63</td>
<td>0.63</td>
<td></td>
</tr>
<tr>
<td>Pattern of contrast</td>
<td>Homogenous</td>
<td>Heterogeneous</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0 (0%)</td>
<td>1 (100%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td></td>
<td>5 (31.5%)</td>
<td>11 (68.8%)</td>
<td>2 (66.7%)</td>
</tr>
<tr>
<td></td>
<td>0.8</td>
<td>0.8</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1 (100%)</td>
<td>16 (100%)</td>
<td>3 (100%)</td>
</tr>
</tbody>
</table>

This table shows that there is no statistically significant difference between all cases experienced different degree of pain and all parenchymal finding. However, the presence of different pattern of sialectasia had been detected in 50% of cases with moderate pain, acinar dilatation more than 2/3 with or without severe dilatation of the entire glandular area was differentiated in 25% of cases with moderate pain, in addition the retention of contrast was found in 75% of cases with moderate pain.

The inter observer agreement was very good regarding to CBCT sialographic finding, results are shown in table (3).

Table 3: Intraclass “inter-observer” agreement in CBCT radiographic findings

<table>
<thead>
<tr>
<th>Findings</th>
<th>Cronbach’s Alpha</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main duct visualization</td>
<td>1.000</td>
<td>&lt; 0.001**</td>
</tr>
<tr>
<td>Presence of abnormality</td>
<td>1.000</td>
<td>&lt; 0.001**</td>
</tr>
<tr>
<td>Intra-glandular duct visualization</td>
<td>1.000</td>
<td>&lt; 0.001**</td>
</tr>
<tr>
<td>Presence of abnormality in the intra-glandular duct</td>
<td>1.000</td>
<td>&lt; 0.001**</td>
</tr>
<tr>
<td>No. of strictures</td>
<td>1.000</td>
<td>&lt; 0.001**</td>
</tr>
<tr>
<td>Location of stricture</td>
<td>1.000</td>
<td>&lt; 0.001**</td>
</tr>
<tr>
<td>Filling defect</td>
<td>1.000</td>
<td>&lt; 0.001**</td>
</tr>
<tr>
<td>Presence and pattern of sialectasia</td>
<td>1.000</td>
<td>&lt; 0.001**</td>
</tr>
<tr>
<td>Degree of sialectasia</td>
<td>1.000</td>
<td>&lt; 0.001**</td>
</tr>
<tr>
<td>Retention of contrast</td>
<td>1.000</td>
<td>&lt; 0.001**</td>
</tr>
<tr>
<td>Pattern of contrast</td>
<td>1.000</td>
<td>&lt; 0.001**</td>
</tr>
</tbody>
</table>

** Highly significant

This table shows that there was strong agreement due to very high similarity between raters.

**Discussion**

In this study the cases were diagnosed as non-tumor salivary gland diseases and were suffered from pain as the most common symptom.

Oscar 2010 who revealed that modern sialography is not time-consuming, and the refinement of intravenous catheters has made the procedure painless and easy to perform, the contraindications for the procedure include when the duct is blocked by sialolithiasis or the presence of an internal stricture, in both situations, duct dilation with probes and sialography is not possible.

However, this result in dis agree with a study performed by Weber in 1992 stated that the cannulation of the duct cannot always be achieved even in the absence of duct abnormality, also the orifices of
the submandibular ducts were difficult to identify, and cannulation may be impossible.

In this study, all patients experienced no pain during infusion of the contrast material, and only 5% of the cases reported discomfort and slightly unpleasant, and this result was in disagree with Kalk et al 2001\(^\text{(11)}\) who reported on the morbidity of the procedure as most of their patients included in their study reported discomfort, and slightly unpleasant.

This study didn’t not report any iatrogenic conditions.

There was very strong inter observer agreement in visualization of the normal gland structures and in identifying abnormal findings for CBCT images as the three observers were all certified specialists in oral and maxillofacial radiology with extensive training in sialography and advanced imaging interpretation as CBCT sialography highly sensitive for depicting changes in the delicate ductal anatomy because of its relatively high spatial resolution.

Few reports have been published about correlation between clinical symptoms and the degree of inflammation in major salivary glands, this study studied the correlation between common clinical symptoms (pain) and sialographic diagnostic images finding.

In this study all cases experienced mild and moderate pain had statistically significant relation with the visualization of the main duct as all cases with mild pain had dilated duct and this result was in harmony with UGGA et al in 2017\(^\text{(5)}\) who reported that Patients presented with pain of the concerned salivary gland diseases, their CT finding showed dilated duct from sialolithiasis or stenosis and enlarged intra- or extra-glandular lymph nodes may also be seen but this is non-specific and can occur in other conditions such as malignancy.

In this study there was not statistically significant difference between the severity of the pain and the ductal finding regards to \{ the presence of abnormality of main duct, intra glandular duct and the number of strictures \} as well as all parenchymal radiographic finding as most of cases with moderate pain and severe pain showed normal intra-glandular duct without stricture and most cases with severe pain had no sialectasia, this was may be explained by Acharya et al 2018\(^\text{(12)}\) who concluded that pain usually occurred due to burning sensation of the oral mucosa.

**Conclusion**

Although the presence of pain as clinical symptoms is important in the evaluation of non-tumor lesions of salivary glands, it has no correlation with CBCT sialography finding.

**Case (1):** 52 y old female patient had rheumatoid arthritis and suffered from pain and xerostomia

Fig. 1: Reformatted lateral oblique view of coronal cut show degeneration of the branches of the ductal system due to intra glanular degeneration

(2): Reformatted coronal view show well defined mass degeneration of the parotid gland cause destruction of the ductal system.
Ethical Clearance: This study was approved by the (Research Ethics Committee) (REC) under number 172 in 27/6/2016, Faculty of Dentistry, Minia University before starting the research and all the entire patients had signed a standardized informed consent laid down by REC explaining the nature and the procedures of the study protocol, only those who agreed to sign the consent were included in this study.

Source of Funding: Self-supply

Conflict of Interest: Nil conflict

REFERENCES


Factors Associated with Knowledge, Attitude and Behavior of Condom Use among Women Living with HIV AIDS

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¹Magister Student, ²Professor, ³Lecturer, Faculty of Nursing, Universitas Airlangga, Surabaya, Indonesia

ABSTRACT

Introduction: The transmission of HIV is likely in women lacking information related to the transmission of a husband’s unwillingness to use a condom when having sex. The focus of this study is to understand the knowledge, attitude and behavior in condom use as a way to prevent the transmission of HIV.

Method: This research used cross-sectional research. The population in this study was 60 married housewives aged between 17 and 49 years. Samples were taken by purposive sampling according to inclusion and exclusion criteria. Data were analyzed by using correlation and logistic regression with a significance level of p <0.05.

Results: The results showed their knowledge, attitude, and behavior regarding the use of a condom. The focus of this study is to understand the knowledge, attitude and behavior in condom use as a way to prevent the transmission of HIV; for knowledge r = 0.280; attitude r = 1.000 and behavior r = 0.420. Women living with HIV/AIDS (WLHA) who had good knowledge, attitude, and behavior, impacted on condom use as a prevention effort against HIV/AIDS.

Discussion and Conclusion: From this study, we can conclude that the knowledge, attitude, and behavior had an impact of the use of condoms in women as a precaution against transmission of HIV/AIDS.

Keywords: condom, HIV/AIDS, transmission, women

Introduction

Current developments in the initially high-risk groups of Human Immunodeficiency Virus (HIV) are those with certain sexual behaviors: homosexual groups; heterosexual groups multiple partners; sex workers; and those who use unsterilized needles, such as injecting drug users. Today, HIV & AIDS also infect women, wives or housewives loyal to their husbands or spouses. Thus, the exposure is no longer only in groups that had been stigmatized, or considered “worthy of a bad stamp”, but has also extended to the most vulnerable groups, women and infants [1]. The number of women with AIDS continues to increase globally, especially in those of reproductive age [2]. Findings from a preliminary study of data from the Semi-Public Health Center from 2007 until 2011 show a high prevalence of housewives who suffers from HIV/AIDS. Among the most common attempts to reduce HIV/AIDS prevalence are 100% condom use programs, not having multiple partners during sex, and primary prevention efforts to respond to the high risk of sexual transmission [3]. Unprotected heterosexual transactional sex is one of the major drivers of the HIV epidemic in Indonesia. Indonesia’s efforts have focused on increasing AIDS awareness and access to male condoms among sub-populations at high risk of sexually transmitted HIV infection, such as female sex workers (FSWs) [4]. However, condom use in Indonesia is considered less significant when compared with the large population and the spread of HIV/AIDS [5].

Condom use is a part of global HIV prevention, including Indonesia, and began in Uganda at the end the 80s with slogans such as Abstain, Be Faithful, Condom (ABC) [6]. So, it can be concluded that HIV/AIDS is
something that can harm women, especially \cite{7}. Factors that influence behavior include personal experience and culture while others that are considered important include mass media, institutions such as educational institutions and religious institutions, and emotional factors in the individual \cite{8}. However, until now, factor analysis affecting the behavior of condom use in HIV/AIDS prevention efforts for housewives living in a former prostitution area still cannot be explained. From the results of this study, it can be concluded that knowledge, attitudes and behavior impact on the use of a condom in women as an effort to prevent HIV/AIDS.

**Material and Method**

This research used descriptive-analytic research design with a cross-sectional design, that is research which emphasizes time measurement data observation of independent and dependent variables only once at one time. In this type, independent and dependent variables are assessed simultaneously, so there is no follow-up \cite{9}. The population in this study was 103 married housewives aged between 17 and 49. Samples were taken by purposive sampling according to the inclusion and exclusion criteria of 60 samples. Data were analyzed by using correlation and regression logistic with significance level alpha <0.05.

**Results**

All of the respondents were housewives living in a former prostitution area, semi-district, Surabaya. Overall, of the 60 females most respondents in the age criteria were in the range 35-39 years (31.66%) (Table 1).

**Table 1: Characteristic demographic of the respondents**

<table>
<thead>
<tr>
<th>Respondents’ characteristics</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-24 years</td>
<td>2</td>
<td>3.33%</td>
</tr>
<tr>
<td>25-29 years</td>
<td>9</td>
<td>15%</td>
</tr>
<tr>
<td>30-34 years</td>
<td>8</td>
<td>13.33%</td>
</tr>
<tr>
<td>35-39 years</td>
<td>19</td>
<td>31.66%</td>
</tr>
<tr>
<td>40-44 years</td>
<td>8</td>
<td>13.33%</td>
</tr>
<tr>
<td>45-49 years</td>
<td>14</td>
<td>23.33%</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td>60</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Education Level:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elementary School</td>
<td>18</td>
<td>30%</td>
</tr>
<tr>
<td>Junior High School</td>
<td>20</td>
<td>33.33%</td>
</tr>
</tbody>
</table>

Table 1 shows the characteristic of WLHA in a former-prostitution area in Surabaya. Most of PWHLA were aged 35-39 years with educational level on non-academic. Their husbands mostly worked in the private sector and duration of marital status was more than 20 years.

The result of logistic regression test of the effects of the factors in the use of condoms among housewives with HIV/AIDS are significantly correlated. Knowledge of a housewife is better compared to other factors.

**Discussions**

Based on the results of the study, it shows that respondents, especially women, have good knowledge. Knowledge in increased from the point of view of the attitudes and behavior of women as a precaution against early transmission of HIV/AIDS.

According to Notoadmojo, the factor that influences knowledge is education. Education affects the learning process, the higher a person’s education, the easier the person is to receive information \cite{10}. The more information that comes in, the more the knowledge gained about health. Knowledge is closely related to education whereby it is expected that someone with a higher education will be more knowledgeable. It should be emphasized, however, that a person with a low level of education does not mean an absolute low knowledge. The economic status of a person will also establish the availability of the facility necessary for a particular...
activity, so that this socioeconomic status will affect one’s knowledge. Based on the theory of adaptation, the level of knowledge can at least encourage having a good attitude and behavior as well [11]. Given the knowledge about HIV/AIDS, there is an attitude of awareness and intention to use condoms.

Among the respondents with less knowledge, they can be influenced by education because the average respondent had a high school education level. According to Notoadmojo, someone with low education can also have good knowledge due to experience, age and number of members in the family [10]. Age affects the ability to capture information and the mindset of a person [12]. So, increased age will also increase the ability to capture and the mindset, so that the knowledge gained is better. At middle age, more active individuals will be more active in using time to read. New things are learned by reading. Of the majority of knowledgeable respondents, this had less impact on attitudes. It is viewed from the education taken by the respondents, who were mostly educated to high school graduates. This knowledge of the respondents about the use of condoms as an effort to prevent HIV/AIDS is still lacking; this can be seen when researchers asked respondents whether the use of condoms is good and true because there is still no extension from doctors and nurses Puskesmas Semi and healthcare in ex-prostitution areas on the use of condoms for housewives as an effort to prevent HIV/AIDS.

Good knowledge also obtained results with a good indicator. A factor affecting knowledge is education, which, in turn, affects the learning process, the higher a person’s education, the easier the person is to receive information. So, the more information that is received, the more the knowledge gained about health. It is found that housewives have some understanding about the use of condoms because of the health cadres. The majority of respondents were aged between 35-39 years. This age affects the experience of knowledge about condoms. However, respondents with good knowledge also had a bad behavior.

Based on tabulation of analysis with Spearman’s Rho (r) test shows that there is a correlation between attitude and behavior of condom use as a prevention effort of HIV/AIDS in housewives with value (p) = 0.001 and correlation coefficient (r) = 0.420, which means having a relationship with a moderate correlation power. Azwar (2012) argues that most positive attitudes experience good behavior. In this study, there was more emphasis on the formation of attitudes in the form of personal experience, while we know that, to be the basis for the formation of attitudes, personal experience must leave a strong impression. Therefore, attitudes will be more easily formed when personal experience occurs in situations involving emotional factors. In such situations, appreciation of the experience will be more profound and longer lasting. An attitude is not automatically manifested in an action (overt behavior). For the realization of the attitude to be a real difference, it requires supporting factors or a condition that allows, among others, facilities. In addition to facilities, it also needs a support factor (support) from another party [10].

That is, the absence of any experience with a psychological object tends to form a negative attitude towards the object [13]. Alport (1954) states that attitude is a readiness or willingness to act and not an exercise of a particular motive [12]. In other words, the function of attitude is not yet an action (open reaction) or activity, but is predisposing to behavior (action), or a closed reaction.

Based on the results of the study, it showed that most respondents have poor behavior in the use of condoms when housewives have intercourse with their husbands, while there is a small part of good behavior of housewives in the use of condoms during sexual intercourse with their husbands.

One of the most potent factors for influencing the behavior of a person is the socioeconomic and structural factors. Socioeconomic and structural factors are the level of welfare, level of education and access to health services [4].

In this research, attitude of housewives can influence behavior in condom usage because their mother’s attitude is awkward in talking about and using condoms during sexual intercourse with their husbands. It was seen during research that there were housewives in the group discussion where the mother asked how it feels to wear condoms during sexual intercourse because the housewife and her husband never use condoms during sexual intercourse and rarely discuss about condoms. Then there was one housewife, who was one of the group discussion organizers, who spoke about her experience using condoms when having sex with her husband that it feels different when not using condoms, but to prevent
the spread of HIV/AIDS from husband to wife it would be nice if condoms were used. Based on current research, researchers can conclude that there is still a lack of knowledge among women, especially housewives, about condoms. This affects the lack of condom use behavior. Monitoring programs and evaluation of the HIV/AIDS program by the health office Surabaya have not been performed intensively, especially as related to health cadres’ cross-cutting cooperation, community-based organizations, non-government organizations, community leaders and mass media.

Conclusion

Knowledge, attitude, and behavior to prevent transmission of HIV/AIDS is an important factor in giving purpose and understanding to women living chiefly in the former location of prostitution. This means the need for considerably more information in providing information is maintained, which can at least reduce the rate of the transmission of HIV/AIDS through sexual intercourse. Recommendations of the research are more emphasis on health workers educating and directly involving women in advanced knowledge and well altering their behavior, which may be fostered more positively via regular meetings of leaders and public discussion. Counseling on sustainable health and women’s empowerment in matters of knowledge can bring improvement in increased better behavior in the use of condoms to prevent HIV/AIDS.

Ethical Clearance: Taken from the Ethical Committee of Faculty of Nursing, Airlangga University with the number 1342-KEPK.

Source of Funding: Self

Conflict of Interest: Nil

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The Role of Support Systems on Self-Acceptance in Chronic Kidney Disease Patients Undergoing Hemodialysis in Malang

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¹Master of Nursing Program Student, ²Lecturer, Faculty of Medicine, Universitas Brawijaya, Malang, Indonesia

ABSTRACT

Chronic Kidney Disease (CKD) is a non-communicable disease that is progressive and irreversible for a long time. CKD patients who need hemodialysis (HD) which must be done for life by CKD patients to improve the quality of life. Self-acceptance is one of the essential aspects of CKD patients, which is a trigger factor for adaptive coping strategies to the effects of HD; the support system influences this. This study aims to know the relationship between the support system and self-acceptance of CKD patients undergoing HD. This quantitative research was conducted using observational design with a cross-sectional approach. The sample used was 114 patients with the stratified random sampling method according to the duration of HD. Measurements were made using a questionnaire to measure self-acceptance, family support, and social support. The results were analyzed using a logistic regression test using a confidence level of 95%. The results of the majority of patients experienced negative self-acceptance (52.6%), excellent family support (55.3%), and sufficient social support (5.6%). Results show there was a relationship between family support and social support for self-acceptance of HD patients and the most influential factor for self-acceptance of hemodialysis patients was family support. The results of this study can improve mental health nursing services in the HD unit in overcoming psychological problems experienced by improving the support system for patients.

Keyword: Support system, Self-acceptance, CKD, hemodialysis.

Introduction

Chronic Kidney Disease (CKD) is characterized as a non-communicable disease and is progressive and irreversible, which experienced for a long time. This condition is due to the degradation of the Glomerular Filtration Rate (GFR) less than 60 mL/min/1.73m² for three months². The prevalence of CKD continues to increase globally, estimated around every 1 in 10 individuals experience CKD and has become the 18th leading cause of death in 2010. In Indonesia, CKD is a disease that ranks second in the most significant financing of national health insurance after heart disease². So that CKD is a health problem throughout the world with increasing prevalence, poor prognosis, and high treatment funding.

Patients with CKD need hemodialysis (HD) therapy to maintain their lives. HD is a replacement therapy for kidney function with a dialysis machine, where there is an artificial semi-permeable membrane that functions to filter blood. According to Ignatavicius and Workman (2013), the HD process aims to remove excess fluid and urea or waste nitrogen in the blood and maintain electrolyte homeostasis in the body of CKD patients³. Practically, patients undergoing HD in the hospital only get biological treatment and not focused on psychological aspects. This therapy must be done for life by CKD patients and has side effects on the physical and mental sufferers⁴. Psychological disorders that are often experienced by patients with CKD with HD include depression (15-69%), fatigue (60-97%)³, severe anxiety (23.68%)⁵, and insomnia (54%)⁷. Patients with HD must have kind self-acceptance to be able to adapt to the effects of HD so that they can maintain their quality of life⁷.
Self-acceptance is one of the critical aspects in patients with CKD, which is a trigger factor for an adaptive coping strategy\(^9\). Patients with HD therapy undergo lifelong therapy and are prone to prolonged stress. Self-acceptance in CKD patients varies according to their experience and coping ability. Low self-acceptance causes non-compliance in carrying out treatment and is unable to deal with problems due to the impact of the disease\(^{10}\). There is internal and external factors influence self-acceptance in patients. One of the influencing external factors is the support system, which consists of family support and social support. Such support plays a vital role in increasing the ability to accept and adapt to all changes that occur in CKD patients so that it will improve the quality of life. This study aims to know the correlation of the support system to self-acceptance of CKD patients undergoing HD.

**Method**

This quantitative study was conducted using an observational design with a cross-sectional approach to finding the relationship between self-acceptance and the factors studied. This study conducted on CKD patients undergoing HD at the dr. Soepraoen Army Hospital Malang. The number of samples was 114 people and determined by the stratified random sampling method, which was adjusted using the duration of hemodialysis. Data collection uses a questionnaire adapted from the Unconditional Self-acceptance Questionnaire (USAQ), Social Support Survey Instrument (SSSI), and The Social Support Inventory (SSI). This study was approved to be carried out by the Health Research Ethics Commission of the Faculty of Medicine, Universitas Brawijaya Malang. The multivariate analysis used was logistic regression to determine the influence of family support and social support simultaneously on self-acceptance. The hypothesis rejected if the value is sig. > α (0.05). Data analysis results presented in the table of characteristics of samples, bivariates analysis, and multivariates analysis.

**Result**

1. **Characteristics of the Study Sample**: Specific data will be broken down by age, gender, marital status, formal education, duration of HD, frequency of HD every week, and the caring family. These results described in table 1.

<table>
<thead>
<tr>
<th>No.</th>
<th>Characteristic</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>17-25 years</td>
<td>2</td>
<td>1.8</td>
</tr>
<tr>
<td></td>
<td>26-35 years</td>
<td>11</td>
<td>9.6</td>
</tr>
<tr>
<td></td>
<td>36-45 years</td>
<td>19</td>
<td>16.7</td>
</tr>
<tr>
<td></td>
<td>46-55 years</td>
<td>37</td>
<td>32.5</td>
</tr>
<tr>
<td></td>
<td>56-65 years</td>
<td>31</td>
<td>27.2</td>
</tr>
<tr>
<td></td>
<td>&gt; 65 years</td>
<td>14</td>
<td>12.3</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>114</td>
<td>100</td>
</tr>
<tr>
<td>2.</td>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>61</td>
<td>53.5</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>53</td>
<td>46.5</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>114</td>
<td>100</td>
</tr>
<tr>
<td>3.</td>
<td>Marital Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Single</td>
<td>10</td>
<td>8.8</td>
</tr>
<tr>
<td></td>
<td>Married</td>
<td>94</td>
<td>82.5</td>
</tr>
<tr>
<td></td>
<td>Divorce</td>
<td>10</td>
<td>8.8</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>114</td>
<td>100</td>
</tr>
<tr>
<td>4.</td>
<td>Formal Education Level</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Uneducated</td>
<td>6</td>
<td>5.3</td>
</tr>
<tr>
<td></td>
<td>Elementary school</td>
<td>47</td>
<td>41.2</td>
</tr>
<tr>
<td></td>
<td>Junior High school</td>
<td>17</td>
<td>14.9</td>
</tr>
<tr>
<td></td>
<td>High school</td>
<td>32</td>
<td>28.1</td>
</tr>
<tr>
<td></td>
<td>College</td>
<td>12</td>
<td>10.5</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>114</td>
<td>100</td>
</tr>
<tr>
<td>5.</td>
<td>Duration of HD</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>&lt; 3 months</td>
<td>22</td>
<td>19.3</td>
</tr>
<tr>
<td></td>
<td>3 – 12 months</td>
<td>30</td>
<td>26.3</td>
</tr>
<tr>
<td></td>
<td>12- 2 months</td>
<td>38</td>
<td>33.3</td>
</tr>
<tr>
<td></td>
<td>&gt; 2 months</td>
<td>24</td>
<td>21.1</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>114</td>
<td>100</td>
</tr>
<tr>
<td>6.</td>
<td>Frequency of HD (/week)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>One time</td>
<td>21</td>
<td>18.4</td>
</tr>
<tr>
<td></td>
<td>Two times</td>
<td>92</td>
<td>80.7</td>
</tr>
<tr>
<td></td>
<td>Three times</td>
<td>1</td>
<td>0.9</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>114</td>
<td>100</td>
</tr>
<tr>
<td>7.</td>
<td>The caring family</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Parent</td>
<td>16</td>
<td>14.0</td>
</tr>
<tr>
<td></td>
<td>Spouse (husband/wife)</td>
<td>65</td>
<td>57.0</td>
</tr>
<tr>
<td></td>
<td>Child</td>
<td>30</td>
<td>26.3</td>
</tr>
<tr>
<td></td>
<td>Relation</td>
<td>3</td>
<td>2.6</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>114</td>
<td>100</td>
</tr>
</tbody>
</table>

Based on table 1 found that most of the samples had ages 46-55 years was 37 people (32.5%), the male was 61 people (53.5%), married was 94 people (82.5%), and had elementary school education was 47 people (41.2%). In the process of
HD therapy, the majority of the sample performed HD two times/week as many as 92 people (80.7%) and treated by the spouse of patients (husband/wife) was 65 people (57.0%).

Table 2: Level of self-acceptance, family support, and social support in the study sample

<table>
<thead>
<tr>
<th>Variable</th>
<th>Criteria</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-acceptance</td>
<td>Positive</td>
<td>54</td>
<td>47.4</td>
</tr>
<tr>
<td></td>
<td>Negative</td>
<td>60</td>
<td>52.6</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>114</td>
<td>100</td>
</tr>
<tr>
<td>Family support</td>
<td>Poor</td>
<td>6</td>
<td>5.3</td>
</tr>
<tr>
<td></td>
<td>Sufficient</td>
<td>45</td>
<td>39.5</td>
</tr>
<tr>
<td></td>
<td>Good</td>
<td>63</td>
<td>55.3</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>114</td>
<td>100</td>
</tr>
<tr>
<td>Social support</td>
<td>Poor</td>
<td>30</td>
<td>26.3</td>
</tr>
<tr>
<td></td>
<td>Sufficient</td>
<td>60</td>
<td>52.6</td>
</tr>
<tr>
<td></td>
<td>Good</td>
<td>24</td>
<td>21.1</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>114</td>
<td>100</td>
</tr>
</tbody>
</table>

Based on table 2, most of the sample felt proper family support of 63 people (55.3%) and sufficient social support experienced by 60 samples (52.6%).

2. Analysis of each factor toward self-acceptance

Table 3: Bivariate analysis of family support and social support for self-acceptance

<table>
<thead>
<tr>
<th>Factor</th>
<th>Sig.</th>
<th>R</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Family support</td>
<td>0.001</td>
<td>0.341</td>
</tr>
<tr>
<td>2. Social support</td>
<td>0.027</td>
<td>0.244</td>
</tr>
</tbody>
</table>

Based on table 3, Family support and social support have a significant relationship to self-acceptance (Sig. <0.05) with a weak correlation. Based on the results, both variables fulfilling the criteria were included in the logistic regression test (Sig. <0.25).

3. Analysis of factors that influence simultaneous toward self-acceptance:

Table 4: Multivariate analysis of family support and social support simultaneously toward self-acceptance

<table>
<thead>
<tr>
<th>Factor</th>
<th>Category</th>
<th>B</th>
<th>Sig.</th>
<th>Exp(B)</th>
<th>95% CI</th>
<th>Hosmer &amp; Lemeshow test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family support</td>
<td>Poor</td>
<td>2.385</td>
<td>0.035</td>
<td>11.104</td>
<td>1.185 104.014</td>
<td>0.550</td>
</tr>
<tr>
<td></td>
<td>Sufficient</td>
<td>1.423</td>
<td>0.001</td>
<td>4.148</td>
<td>1.763 9.760</td>
<td></td>
</tr>
<tr>
<td>Social support</td>
<td>Poor</td>
<td>1.496</td>
<td>0.017</td>
<td>4.463</td>
<td>1.312 15.186</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sufficient</td>
<td>0.507</td>
<td>0.351</td>
<td>1.660</td>
<td>0.572 4.813</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Constants</td>
<td>-1.208</td>
<td>0.013</td>
<td>0.299</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on table 4, both factors of family support and social support simultaneously have a close relationship to self-acceptance in CKD patients. The results showed that patients with CKD with a reduced level of family support 11 times more at risk of experiencing negative self-acceptance. Whereas if you feel sufficient, family support will experience four times more risk of experiencing negative self-acceptance. On the factor of social support, if patients think poor social support experience four times more risk of experiencing negative self-acceptance and whereas patients with sufficient social support will be twice as likely to experience negative self-acceptance. When compared, the most related factor is the factor of family support for self-acceptance in CKD patients with HD therapy.

Discussion

1. Family support and self-acceptance of CKD patients with HD: The results show that most of the samples have excellent family support. While the majority of samples have good family support experienced by patients who have HD therapy for 1-2 years. The findings in this study are different from the research conducted by Sari (2016) in HD patients at the dr. Soepraoen Amry Hospital Malang found that the majority of patients with HD therapy received adequate family support\(^{(10)}\). When compared, this study is different because of measurements at different times. And it can be interpreted, family support felt by samples in this study, increases with increasing duration of HD.

In this study, the majority of treating families were spouses (husband/wife) from CKD patients.
undergoing HD. Family care is one form of support. Family support indicated as the most critical support. Family members play a vital role in improving self-care behavior and facilitating patient adjustments to disease. Pair support can be a source of strength, while support from the environment is additional support in HD patients\(^{(11)}\).

The type of support most felt by patients at the research site is informational support. The result showed that patients at the research site receive perceived support in the form of giving advice and essential information needed by patients to improve their health status. This finding is in line with the research conducted by Sukriswati (2016) that informational support enhances the quality of life of patients CKD with HD\(^{(12)}\). While patients who do not receive information support, respondents perceive their quality of life to be less evident that more than those of good quality of life. If it is related to the age of the respondent, stereotypes of elderly who have slowed thinking processes, are forgetful, confused, so the information provided by the family does not have enough influence on the respondent\(^{(13)}\). Family support is a support system that comes from the family members, in providing information to family members with health issues including receiving information relating to their illness, namely to eliminate anxiety due to uncertainty also the patient’s ability to use technology resources effectively.

There is a significant relationship between family support and self-acceptance in patients with CKD undergoing HD. The results of the study conducted by Sari (2016) found that there was a significant relationship between family support and self-acceptance in patients with CKD who is undergoing HD with a weak correlation\(^{(10)}\). Whereas the research conducted by Anggraeni, Sarwono, and Sunarmi (2017), the results showed that there was a correlation between family support and level of depression in patients undergoing HD therapy with a negative correlation value \(^{(14)}\). Support from the family is an essential thing for patients with CKD to experience HD because it can further motivate patients to undergo HD. Patients will feel that there is still someone who gives attention, affection, or someone who cares about him even though he is sick. According to Bomar’s theory (2006), family support is a form of serving behavior carried out by the family, both in the way of emotional support (attention, affection, empathy), appreciation support (respect, feedback), information support (advice, advice, information) or in the form of instrumental support (assistance in energy, funds, and time)\(^{(15)}\). A family is a place for individual growth and development\(^{(14)}\).

2. Social support and self-acceptance of CKD patients with HD: The results showed that the majority of samples had sufficient social support and samples who had adequate social support experienced by samples who had HD therapy for 1-2 years. The findings in this study are different from the research conducted by Purnama (2016) found that patients with HD experienced high social support\(^{(16)}\). In this study, social support is the support felt by patients and comes from friends, neighbors, community, or health worker, which distinguishes them from family support.

This study indicates that there is a significant relationship between social support and self-acceptance in patients with CKD undergoing HD. Research shows that social support is significantly associated with self-acceptance in patients with CKD. The higher social support felt by patients with CKD, the better their self-acceptance will be, or the lower the perceived social support, the worse their acceptance will be.

The study conducted by Gao, Zhou, Guo, and Zhao (2016), found that social support was directly related to distress symptoms, and symptoms of distress mediated the relationship between monthly income, active coping style, passive coping style, social support, and expectations\(^{(17)}\). Whereas the research conducted by Karadag, Ugur, Mert, and Erunal (2019), states that there is a significant and robust relationship found between the scale of social support and the average score of resilience in patients with HD\(^{(18)}\). Patients felt the highest comfort of their friends and personal assistance, apart from family support.

Every individual need support in living patient’s life. Support obtained from anyone who advises making a patient with CKD able to accept reality. This type of social support includes
emotional support, appreciation, and material or instrumental. The explanation strengthened Sari’s opinion (2002), who argued that one of the factors that influenced self-acceptance was social support\(^{(10)}\). Someone who gets help from the environment and social will make the person feel more accepted by his background. The social environment treatment of a person shapes the behavior of that person. A person who gets treatment from a supportive social context will be able to accept himself better\(^{(16)}\).

Social support will reduce risk factors for chronic diseases, including smoking, inactivity, and changes and maintenance of health behaviors. Increasing social support will reduce stress so that there is an increase in the immune response in the body so that health status will increase. People who access more social support can better manage their stress and experience better health outcomes. Besides, a reduction in social support increases the likelihood of death\(^{(19)}\).

**Conclusion**

The results show that there is a relationship between the support system, which consists of family support and social support for self-acceptance in CKD patients with HD. When both factors are measured simultaneously, family support has more influence on self-acceptance compared to social assistance.

Self-acceptance has a vital role in the condition and psychological readiness of patients during HD, and hemodialysis nurses play an essential role in increasing self-acceptance of CKD patients undergoing HD. This study can be used as a reference in mental health nursing services in overcoming psychological problems experienced by improving the support system for patients.

**Conflict of Interest:** None

**Ethical Clearance:** This research was conducted based on the approval of the Health Research Ethics Commission of the Faculty of Medicine, Universitas Brawijaya No. 067/EC/KEP.K - S2/02/2019.

**Source of Funding:** None

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Pathogenic Bacteria Associated with Acute Childhood Diarrhea and Their Susceptibility Profiling in Misan Province

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1Department of Clinical Laboratories Sciences, College of Pharmacy, University of Misan, Misan, Iraq

ABSTRACT

Diarrheal disease is a major health problem causing death among children, especially, under 3-years of age, hence, it is necessary to detect the etiological agent for the active therapy of the disease. Two hundred stool specimens were collected from children with acute diarrhea between 2-60 months of age during April to October in 2018 from two hospitals in Misan Province. Diarrhea was more frequent in children with the age group (13-24 months) and the feeding bottle (64% and 63%, respectively). Pathogenic bacteria were presented in 56% of specimens. Enteropathogenic bacteria were identified by Vitek system. Out of 112 bacterial isolates were identified, E. coli was the common cause with 89 isolates. Nevertheless, the frequencies of Salmonella typhi, Shigella flexneri, Shigella sonnei and Shigella dysenteriae were 8, 5, 4 and 2 respectively, whereas, Salmonella enterica, Salmonella paratyphi A, Pseudomonas aeruginosa and Klebsiella pneumoniae were 1 for each. Antibiotic susceptibility tests accomplished on all identified isolates using the disc diffusion technique. Among the antibiotics tested, imipenem was a very effective drug (98.2%), followed by ciprofloxacin, co-trimoxazole and amikacin (77.6%, 76.7% and 61.6% respectively), while ampicillin and cephalothin were poor activity against the bacterial isolates (2.7% and 0.89%) respectively.

Keywords: Diarrheal disease; children; pathogenic bacteria; antimicrobial susceptibility.

Introduction

Diarrhea is one of the major cause of morbidity and mortality in developing countries. Worldwide, it was estimated to cause 1.5 million deaths, of which over 20% in children under the age of 5-years and 15% above the age of 5-years1 2. Diarrheal infection usually spreads through contaminated food or drinking water, and also from person to person as a result of poor hygiene. Acute diarrhea refers to diarrhea that remain several hours or days, it includes watery and bloody3 4. Bloody diarrhoea (dysentery) is a common disease in developing countries where sanitary facilities may be minimal and the water supply is not clean5. Childhood diarrhea is a globally reported to be associated with a wide range of bacteria, such as Escherichia coli, Salmonella spp., Shigella spp. and Vibrio spp.6. Antibiotic susceptibility testing is an important technique for a primary use to detect which specific antibiotic a particular pathogen is sensitive7. Antimicrobial susceptibility profiles of bacteria are often variable among species and strains, hence, the resistance to antibiotics making it difficult for treating some infection8.

In brief, this study was conducted to determine the etiological bacterial agents of acute childhood diarrhoea in Misan Province and their susceptibility profile to antibiotics.

Materials & Method

Study Design: A descriptive study was carried out in the Microbiology Laboratory, Department of Clinical Laboratory Sciences, College of Pharmacy, University of Misan, Misan city, Iraq. This study was approved by ethical committees of college of pharmacy of Misan University with written consent withdrawn from the parents of children.

Sample Collection: Two hundred stool samples were obtained from children between 2 to 60 month from two
hospitals (111 samples from The Birth & Child Hospital, and 89 samples from Al Zahrawi- Surgical Hospital) in Misan Province during April to October, 2018. Stool specimens were collected in sterile, wide-mouthed plastic containers (Biozek, Turkey) and transferred to the laboratory within one hour to be processed for examination and identification. Questionnaires covered the information pertaining to sex, age and type of milk fed.

Microscopical Examination: A small amount of stool sample was placed in a drop of normal saline on a slide, mixed thoroughly by a wooden stick, then covered with a cover slips and examined by a light microscope for detection red blood cells, pus cells and others.

Stool Culture: All stool specimens with pus cells were cultured by streaking onto MacConkey agar (Lab, UK), Blood agar (Oxoid, UK) and about 3 gram of the same specimen was inoculated into tetraionate broth (Oxoid, UK). The plates and broth were incubated in aerobic conditions at 37°C for 24 h. and 18 h. respectively. Subculture from tetraionate broth was made onto Xylose-Lysine Deoxycholate agar (Oxoid, UK) and incubated aerobically at 37°C for 24 hour⁹. The grown bacterial colonies were identified by using the Vitek-2 system-Gram Negative card (GN card, biomereix, France).

Antibiotics Susceptibility Profiling: Antibiotic susceptibility test was achieved by the disk-diffusion method test onto Muller-Hinton plates (Oxoid,UK) based on the guidelines of Clinical Laboratory Standard Institute⁸ using the following antibiotics disc: amikacin (AK,10 mcg), ampicillin (AM,30 mcg), ceftriaxone (CRO,10 mcg), cephalothin (KF, 30 mcg) ciprofloxacin (CIP, 5 mcg), co-trimoxazole (SXT, 25 mcg), gentamicin (CN, 10 mcg), imipenem (IPM, 10 mcg) and nalidixic acid (NA, 10 mcg) (Bioanalyse, Turkey). The inhibition zones of bacterial isolates for antibiotics were measured in mm by ordinary steel ruler.

Statistical Analysis: Data analysis was performed with the Chi - square test by using Statistical Package for Social Sciences Software (SPSS V.18). P-value less than 0.05 was considered as significant, and P-value less than 0.01 considered as highly significant.

Results

Data analysis of this study reported that the frequency of acute diarrhea was higher in the children with the age group (13-24 month) and with the bottle-fed (64% and 63%, respectively) with a significant differences at P ≤ 0.05, while it was a little high in males (53%) than females (47%), but without signification, as in table 1.

Table 1: Frequency of acute diarrhea among children according to some factors

<table>
<thead>
<tr>
<th>Age group (month)</th>
<th>Sex</th>
<th>Bottle-fed</th>
<th>Total n(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male n(%)</td>
<td>Female n(%)</td>
<td>Yes n(%)</td>
</tr>
<tr>
<td>≤ 12</td>
<td>14(7)</td>
<td>11(5.5)</td>
<td>18(9)</td>
</tr>
<tr>
<td>13-24</td>
<td>72(36)</td>
<td>56(28)</td>
<td>98(49)</td>
</tr>
<tr>
<td>25-36</td>
<td>9(4.5)</td>
<td>13(6.5)</td>
<td>9(4.5)</td>
</tr>
<tr>
<td>37-48</td>
<td>8(4)</td>
<td>9(4.5)</td>
<td>1(0.5)</td>
</tr>
<tr>
<td>49-60</td>
<td>3(1.5)</td>
<td>5(2.5)</td>
<td>0(0)</td>
</tr>
<tr>
<td>Total</td>
<td>106(53)</td>
<td>94(47)</td>
<td>126(63)**</td>
</tr>
</tbody>
</table>

* n: Number of children.
**: P ≤ 0.05.

A total of 200 stool samples were examined, enteropathogens presented in 112 (56%) of samples without a statistically differences. Among the bacterial isolates (n=112), Escherichia coli (89) was the most common cause with 89 isolates, followed by Salmonella typhi (8), Shigella flexeniri (5) and Shigella sonnei (4), as in table 2.

Table 2: Frequency of enteropathogenic bacteria isolated from children with acute diarrhea

<table>
<thead>
<tr>
<th>Pathogenic bacteria</th>
<th>Number of isolates (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Escherichia coli</td>
<td>89(79.45)</td>
</tr>
<tr>
<td>Salmonella typhi</td>
<td>8(7.14)</td>
</tr>
<tr>
<td>Shigella flexneri</td>
<td>5(4.46)</td>
</tr>
<tr>
<td>Shigella sonnei</td>
<td>4(3.57)</td>
</tr>
</tbody>
</table>
Conted…

<table>
<thead>
<tr>
<th>Bacterial species</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shigella dysenteriae</td>
<td>2(1.78)</td>
</tr>
<tr>
<td>Salmonella enterica</td>
<td>1(0.89)</td>
</tr>
<tr>
<td>Salmonella paratyphi A</td>
<td>1(0.89)</td>
</tr>
<tr>
<td>Pseudomonas aeruginosa</td>
<td>1(0.89)</td>
</tr>
<tr>
<td>Klebsiella pneumoniae</td>
<td>1(0.89)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>112(100)</td>
</tr>
</tbody>
</table>

Antimicrobial susceptibility testing of the bacterial isolates (n=112) showed these isolates were highly sensitive to imipenem, ciprofloxacin, co-trimoxazole (98.2%, 77.6% and 76.7%, respectively) with a statistically significance at P≤0.01 and amikacin(60.7%) at P≤0.05. Moreover, they were 50.9%, 48.2% and 47.3% for nalidixic acid, ceftriaxone and gentamicin respectively, but without significance. Meanwhile, they were highly resistance to cephalothin and ampicillin (99.1% and 97.3%, respectively), as in table 3. *E. coli* (89) was sensitive to imipenem, co-trimoxazole, ciprofloxacin and amikacin (97.7%, 78.6%,76.4% and 65.1%, respectively) at P< 0.01. *Salmonella typhi* (8) was sensitive to imipenem(100%), Co-trimoxazole and ciprofloxacin(75%, for each) at P< 0.01. *Shigella flexneri* (5) was 100% sensitive for imipenem and co-trimoxazole, whereas it was 80% to ciprofloxacin at P< 0.01. *Shigella sonnei* (4) was sensitive to imipenem and ciprofloxacin (100% and 75%, respectively) at P< 0.01. *Shigella dysenteriae* (2) was sensitive to imipenem, co-trimoxazole and amikacin (100%, for each). *Salmonella paratyphi* A and *Klebsiella pneumoniae* (1, for each) were sensitive to imipenem, co-trimoxazole and ciprofloxacin (100%, for each). Finally, *Salmonella enterica* (1) and *Pseudomonas aeruginosa* (1) were sensitive to imipenem and ciprofloxacin (100%, for each).

### Table 3: Antibiotic susceptibility profile of enteropathogens among children with diarrhoea

<table>
<thead>
<tr>
<th>Bacterial species</th>
<th>n</th>
<th>IMP</th>
<th>CIP</th>
<th>SXT</th>
<th>AK</th>
<th>NA</th>
<th>CRO</th>
<th>CN</th>
<th>AM</th>
<th>KF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Escherichia coli</td>
<td>89</td>
<td>87(97.7)</td>
<td>68(76.4)</td>
<td>70(78.6)</td>
<td>58(65.1)</td>
<td>50(56.1)</td>
<td>52(58.4)</td>
<td>46(51.7)</td>
<td>0(0)</td>
<td>0(0)</td>
</tr>
<tr>
<td>Salmonella typhi</td>
<td>7</td>
<td>6(75)</td>
<td>6(75)</td>
<td>4(50)</td>
<td>3(37.5)</td>
<td>0(0)</td>
<td>4(50)</td>
<td>2(25)</td>
<td>0(0)</td>
<td></td>
</tr>
<tr>
<td>Shigella flexneri</td>
<td>5</td>
<td>5(100)</td>
<td>4(80)</td>
<td>5(100)</td>
<td>2(40)</td>
<td>1(20)</td>
<td>1(20)</td>
<td>1(20)</td>
<td>1(20)</td>
<td>0(0)</td>
</tr>
<tr>
<td>Shigella sonnei</td>
<td>4</td>
<td>4(100)</td>
<td>3(75)</td>
<td>5(25)</td>
<td>5(25)</td>
<td>1(25)</td>
<td>1(25)</td>
<td>0(0)</td>
<td>0(0)</td>
<td></td>
</tr>
<tr>
<td>Shigella dysenteriae</td>
<td>2</td>
<td>2(100)</td>
<td>1(100)</td>
<td>1(100)</td>
<td>0(0)</td>
<td>0(0)</td>
<td>0(0)</td>
<td>0(0)</td>
<td>0(0)</td>
<td>0(0)</td>
</tr>
<tr>
<td>Salmonella enteritidis</td>
<td>1</td>
<td>1(100)</td>
<td>1(100)</td>
<td>0(0)</td>
<td>0(0)</td>
<td>0(0)</td>
<td>0(0)</td>
<td>0(0)</td>
<td>0(0)</td>
<td>0(0)</td>
</tr>
<tr>
<td>Pseudomonas aeruginosa</td>
<td>1</td>
<td>1(100)</td>
<td>1(100)</td>
<td>0(0)</td>
<td>0(0)</td>
<td>0(0)</td>
<td>0(0)</td>
<td>0(0)</td>
<td>0(0)</td>
<td>0(0)</td>
</tr>
<tr>
<td>Klebsiella pneumoniae</td>
<td>1</td>
<td>1(100)</td>
<td>1(100)</td>
<td>1(100)</td>
<td>0(0)</td>
<td>0(0)</td>
<td>0(0)</td>
<td>0(0)</td>
<td>0(0)</td>
<td>0(0)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>112</td>
<td>110(98.2)*</td>
<td>87(77.6)*</td>
<td>86(76.7)**</td>
<td>68(60.7)**</td>
<td>57(50.9)</td>
<td>54(48.2)</td>
<td>53(47.3)</td>
<td>3(2.7)</td>
<td>1(0.89)</td>
</tr>
</tbody>
</table>

*n: Number of isolates, **: P<0.01, ***: P<0.05.


**Discussion**

The present study showed that the frequency of acute diarrhea was higher in children with the age group (13-24 months) and with the bottle-fed (64% and 63%,respectively). This result in agreement with other studies 5, 11,12. Use of the bottle feeding for long times with inadequate preparation, washing and disinfection of the utensils are primly considered to be risk factors for the microbial contamination13. Furthermore, this study reported that males were more having of diarrhea compared to females, but without significant differences (Table1), in agrees with other previously reported studies11,12,14.

Explanation of this result may be due to that both sexes have the same chance of exposures to the environmental conditions and contaminated sources of infection13.

Among the total bacterial isolates (112) were identified, *E. coli* was the most common enteropathogen with 89 isolates, followed by *Shigella* spp. and *Salmonella* spp. (11 and 10, respectively), as in Table 2. Many researchers reported that *E. coli* was the first causative agent of diarrheal disease, while other species were variably12,15–17. *E.coli* strains causing diarrhoea are extremely common worldwide. Some of its virulence factors play important role in its pathogenicity including.
adhesins (fimbrial, afimbrial adhesins and outer membranous proteins), and toxins (oligopeptides AB and RTX pore-forming toxins)\textsuperscript{18}.

Antibiotic susceptibility pattern of bacteria showed that imipenem was a very effective drug against bacterial isolates (98.2%), followed by ciprofloxacin, co-trimaxazole and amikacin (77.6%, 76.7% and 60.7%, respectively), as in Table 3. Globally, a few studies were tested the enteropathogens sensitivity to imipenem. In Brazil, Daniz-Santos \textit{et al.}\textsuperscript{19} reported that the bacterial isolates were highly sensitive to imipenem and ciprofloxacin (98.8%, for each), whereas only 48% were sensitive to co-trimaxazole. A study by Langendorf \textit{et al.}\textsuperscript{20} in Niger revealed that the enteropathogens were highly sensitive to imipenem, amikacin and ciprofloxacin (100%, 99.4% and 96.3%, respectively), while only 19.2% were sensitive to co-trimaxazole. Moreover, El-Moghazy \textit{et al.}\textsuperscript{21} in a study carried out in Egypt found that the enteric bacterial pathogens were 76.3% sensitive to ciprofloxacin while they were 59.6% and 54.8% for amikacin and co-trimaxazole respectively.

**Conclusion**

Diarrheal disease was more frequent in children with the age group (13-24 month) and the bottle feeding. Improper preparation of the bottle feeding plays an important role in increasing diarrheal rate in children under 3 years. \textit{Escherichia coli} was identified as the predominant pathogenic bacterium of diarrhea in children under 5-years in Misan Province. Imipenem was a very effective drug, followed by ciprofloxacin, co-trimaxazole and amikacin respectively, while ampicillin and cephalothin had poor activity against the bacterial isolates.

**Acknowledgment**

We would like to thank all staff from the college of pharmacy, University of Misan for supporting this work. We also thankful to all staff of the department of laboratories in The Birth & Child Hospital, and Al-Zahrawi Surgical Hospital for assistance us in the collection of samples.

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**REFERENCES**


Effect of Training Program on Unit Managers’ Mentoring Knowledge and Skills at Selected University Hospital–Egypt

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¹Assistant Lecturer, ²Professor, ³Assistant Professor, Nursing Administration, Faculty of Nursing, Cairo University, Egypt

ABSTRACT

The notion of mentoring can be understood as a one-to-one relationship between a mentor and a mentee. Aim; investigate the effect of training program on unit managers’ mentoring knowledge and skills. Research design; Quasi experimental design was utilized. The study sample; composed of all head nurses (n= 27) who were actually in the active workforce during the time of data collection. Was carried out after explanation of the aim of the study, an official administrative approval was obtained, all unit staff were observed for mentoring skills by observational checklist; pre, immediate and follow up the program. Every participant was observed three times at different time’s period at different days. Knowledge assessment questionnaire was concerned with the assessment of the participants’ knowledge regarding to mentoring, negotiation and counseling. Results; this study showed that there was positive correlation between unit managers’ mentoring skills and knowledge in pre, immediate post and follow up the program implementation. Conclusion: based on these findings the training program is effective in improving the unit managers’ mentoring knowledge and skills which were evident by statistical increase in their knowledge and skills mean scores in post program scores compared to pre program mean scores. So the research hypotheses were accepted. Therefore, it is recommended that replication of the research on a large probability sample is recommended to achieve more generalization.

Keywords: Mentoring, unit managers’ knowledge and skills

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Introduction

Mentoring is the most powerful method by which future can be shaped, through most positive change in the life, attitudes, and behavior of the mentee. A mentor is someone who can patiently assist with someone’s growth and development in a given area. This assistance can come in the form of guidance, teaching, counseling to one individual, imparting of wisdom and experience³. Additionally, mentoring is a contributing factor to quality practice environments and also, has fostered healthy relationships among staff and professional development opportunities³.

Mentors play the role of counselor in relation to mentoring when counsel, listen, provide emotional support, act as sounding boards, and help mentees to take responsibility for their own actions. In essence the counselor’s interactions with the mentee are a powerful tool in the helping relationship³.

Unit manager might use negotiation with respect to mentoring to interact with subordinates and supervisors, whether implementing a program, approving a budget or adjusting patient care standards. The mentor has to possess effective negotiation skills such as an interpersonal and communication skills which used together to bring a desired result¹. This study conducted to investigate the effect of training program on unit managers’ mentoring knowledge and skills in a selected university hospital, Egypt.

Hypotheses:

H1: After implementing the mentoring program the unit managers’ knowledge posttest score will be higher than the pretest.
H2: After implementing the mentoring program the unit managers’ skills score will be higher than pre intervention.

Materials and Method

The study sample composed of all available unit managers (n= 27) who were actually in the active workforce during the time of data collection and met the inclusion criteria were selected for the study from a selected university hospital in Cairo, Egypt.

Inclusion Criteria: Baccalaureate nursing degree and a minimum of one year as head nurse.

Data Collection Tools: Tools of data collection were developed by the investigator based on literature review; Mentoring skills observational checklist was used to assess the unit managers’ skills regarding to ‘negotiation and counseling skills ‘and Mentoring knowledge assessment questionnaire were used through the program phases to assess levels of participants’ knowledge.

Tool Validity and Reliability: Tool validity was assured and was also tested for internal consistency by test-retest reliability. Cronbach’s alpha was 0.91.

Procedure: Procedure was carried out after explanation of the aim of the study an official administrative approval was obtained from the General Director of Cairo university Hospitals to collect the study data. The participants’ skills was assessed by the investigator using the observation checklist at three time period at different days and Mentoring knowledge assessment questionnaire was used three times during the study. Which are: pre, immediate, and after three months of the program implementation. After obtaining the ethical consent from the participants.

Results

Table (1) shows that the majority of the study sample (70.4%) was nursing bachelor degree. The highest percent of age (59.3%) was from 30 to less than 40. Regarding years of experience the highest percent was (44.4%) was from 15 to less than 20.

Table 1: Distribution of the head nurses according to their personal data (N = 27)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Values</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educational level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bachelor degree in nursing</td>
<td>19</td>
<td>70.4</td>
<td></td>
</tr>
<tr>
<td>Nursing administration diploma</td>
<td>5</td>
<td>18.5</td>
<td></td>
</tr>
<tr>
<td>Master degree</td>
<td>3</td>
<td>11.1</td>
<td></td>
</tr>
<tr>
<td>Age of head nurses</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>from 20- `&lt; 30</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>30- `&lt;40</td>
<td>16</td>
<td>59.3</td>
<td></td>
</tr>
<tr>
<td>40- `&lt;50</td>
<td>10</td>
<td>37.0</td>
<td></td>
</tr>
<tr>
<td>50 ≥</td>
<td>1</td>
<td>3.7</td>
<td></td>
</tr>
<tr>
<td>Years of experience in current position</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>from 1- `&lt; 5</td>
<td>6</td>
<td>22.2</td>
<td></td>
</tr>
<tr>
<td>5 - `&lt;10</td>
<td>4</td>
<td>14.8</td>
<td></td>
</tr>
<tr>
<td>10 - `&lt;15</td>
<td>5</td>
<td>18.5</td>
<td></td>
</tr>
<tr>
<td>15- 20</td>
<td>12</td>
<td>44.4</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>27</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Table (2) shows that there was significant statistical difference between unit managers’ negotiation and counseling skills in pre, immediate post and follow up the program implementation.

Table 2: Mean score and difference between the unit managers’ mentoring skills in pre, immediate post, and follow up program

<table>
<thead>
<tr>
<th>Mentoring skills</th>
<th>Max Score</th>
<th>Pre (n = 27)</th>
<th>Immediate (n = 20)</th>
<th>Follow up (n = 20)</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Sd</td>
<td>Mean</td>
<td>Sd</td>
<td>Mean</td>
</tr>
<tr>
<td>Negotiation</td>
<td>48</td>
<td>23.37</td>
<td>4.14</td>
<td>43.95</td>
<td>5.19</td>
</tr>
<tr>
<td>Counseling</td>
<td>42</td>
<td>18.37</td>
<td>2.92</td>
<td>39.10</td>
<td>5.09</td>
</tr>
<tr>
<td>Total mentoring skills</td>
<td>90</td>
<td>41.7407</td>
<td>6.7057</td>
<td>83.050</td>
<td>9.9073</td>
</tr>
</tbody>
</table>

* Statistically significant difference at p≤0.05

Table (3) shows that the immediate post and follow up the program mean score of each knowledge dimension were significantly higher than the pre program mean score.
Table 3: Mean score, standard deviation and mean percent between the unit managers’ mentoring knowledge in pre, immediate post, and follow up program

<table>
<thead>
<tr>
<th>Knowledge dimensions</th>
<th>Pre (n = 27)</th>
<th>Immediate post (n = 20)</th>
<th>Follow up (n = 18)</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Sd</td>
<td>Mean</td>
<td>Sd</td>
</tr>
<tr>
<td>Mentoring concept</td>
<td>10.59</td>
<td>3.02</td>
<td>15.61</td>
<td>1.35</td>
</tr>
<tr>
<td>Negotiation skills</td>
<td>6.25</td>
<td>2.39</td>
<td>9.66</td>
<td>1.06</td>
</tr>
<tr>
<td>Counseling skills</td>
<td>5.29</td>
<td>2.78</td>
<td>11.09</td>
<td>.70</td>
</tr>
<tr>
<td>Total</td>
<td>21.55</td>
<td>6.82</td>
<td>36.38</td>
<td>2.35</td>
</tr>
</tbody>
</table>

* Statistically significant difference at p≤0.05

Table (4) shows that the immediate post and follow up knowledge was positively correlated with immediate post and follow up practice program.

Table 4: Correlation between unit managers’ mentoring skills & knowledge in pre, immediate post and follow up the program

<table>
<thead>
<tr>
<th>Time of evaluation</th>
<th>mentoring skills pre</th>
<th>mentoring skills immediate</th>
<th>mentoring skills Follow up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre knowledge</td>
<td>R -.018-</td>
<td>P .928</td>
<td></td>
</tr>
<tr>
<td>Immediate knowledge</td>
<td>R .545**</td>
<td>P .013</td>
<td></td>
</tr>
<tr>
<td>Follow up knowledge</td>
<td>R .562**</td>
<td>P .010</td>
<td></td>
</tr>
</tbody>
</table>

* Statistically significant difference at p≤0.05

Table (5) illustrates that all of unit managers’ mentoring skills (100%) were satisfactory in follow up the program implementation in compared to pre program implementation.

Table 5: Frequency distribution of unit managers’ mentoring skills levels throughout the program

<table>
<thead>
<tr>
<th>Performance</th>
<th>Negotiation</th>
<th>counseling</th>
<th>Total mentoring skills</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Satisfactory</td>
<td>Unsatisfactory</td>
<td>Satisfactory</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Pre</td>
<td>2</td>
<td>7.4</td>
<td>25</td>
</tr>
<tr>
<td>Immediate</td>
<td>19</td>
<td>95.0</td>
<td>1</td>
</tr>
<tr>
<td>Follow up</td>
<td>20</td>
<td>100.0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Discussion**

Regarding to mean scores and difference between the unit managers’ mentoring skills as displayed in table (2), shows that there was significant statistical difference between unit managers’ negotiation and counseling skills in pre, immediate post and follow up the program implementation.

According to Farouk and Hassan conducted a study on “Effect of Education Program about Negotiation Skills for Head Nurses on Their Time Management”, this study revealed that there were highly statistical significant improvements in the head nurses’ negotiation skills after intervention both post and follow up program. And also there was statistically significant difference among program phases.
Kocoglu, Duygulu, Abaan and Akin\textsuperscript{5} conducted study entitled “Problem Solving Training for First Line Nurse Managers”. They concluded that statistically significant improvements were observed in providing counseling and guidance by independent and qualified nurse managers would also positively impact the development of these skills and behaviors.

Regarding to mean scores and difference between the unit managers’ mentoring knowledge, the immediate post and follow up the program mean score of each knowledge dimension were significantly higher than the pre program mean score.

The result of present study was in agreement with Abdullah\textsuperscript{6} conducted study on Mentoring as a Knowledge Translation Intervention to Inform Clinical Practice” they revealed that there were positive effects on knowledge. Levin, Fineout-Overholt, Melnyk, Barnes and Vetter\textsuperscript{7} concluded that there were improvements in knowledge level.

Rhay-Hung, Ching-Yuan, Wen-Chen, Li-Yu, Syr-En and Mei-Ying\textsuperscript{8} conducted a study on “Exploring the impact of mentoring functions on job satisfaction and organizational commitment of new staff nurses” they concluded that improve the mentors’ knowledge and skills, help in resolving task-related problems, and further promote their overall growth.

Regarding to Correlation between unit managers’ mentoring skills & knowledge in pre, immediate post and follow up the program as displayed in table (4), the immediate post and follow up knowledge was positively correlated with immediate post and follow up practice program.

This result is consistent with the study of Sutevski\textsuperscript{9} about managerial skills concluded that head nurses’ performance is based on knowledge that can be learned. Training programs are effective only to the extent that the skills and behaviors learned and practiced during instruction are actually transferred to the workplace\textsuperscript{10}. Farouk and Hassan\textsuperscript{4} and Cascio\textsuperscript{11} concluded that, there was a positive correlation between head nurses’ knowledge and skill.

The results of the current study indicated that near of all of unit managers’ mentoring skills were satisfactory in immediate post and follow up the program implementation in compared to the majority of unit managers’ mentoring skills were unsatisfactory in pre program implementation. This might be due to unit managers’ motivation to apply new competencies resulting in increased the confidence in their capabilities. These findings support the study hypotheses which was the training program has significant impact on unit managers’ skills. So the study hypothesis is accepted.

### Conclusion

The mentoring training program had significant impact on the unit managers’ knowledge and skills which were evident by statistical increase in their knowledge and skills mean scores in post program scores compared to pre program mean scores. So the research hypotheses were accepted.

**The study recommended the following:**

- Replication of the research on a large probability sample is recommended to achieve more generalization.
- Nursing curriculum should emphasis the interpersonal skills required for a mentor role.
- The organization should implement formal and informal mentoring to enhance nursing satisfaction and increase retention.
- Researches are needed to determine the value of mentoring in quality improvement training.
- Availability and supporting the mentoring culture.

### Ethical Clearance:

A written approval was obtained from the ethics and research committee of the Faculty of Nursing - Cairo University. Written informed consent was obtained from each participants after explaining the nature & purpose of the study. Participants were informed that participation in the study was entirely voluntary, anonymity and confidentiality of the data were assured.

### Source of Funding:

Self-funding.

### Conflict of Interest:

The authors declare that there is no conflict of interest.

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Samban/Tutulak and Immunization: The Sick Concept of Dayak Tribes in the Context of Modern Life

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ABSTRACT

Immunization is one of the intervention in health that is widely regarded as the most successful and cost effective intervention. Contrary to that achievement, more than 19 million children in the world still have not received complete basic immunization and current immunization coverage of the world shows no improvement. This fact also happened in the Balangan district where the several Dayak tribes settle.

However, based on the preliminary study the Dayak tribes have traditional illnesses’ prevention i.e. the use of the samban/tutulak for their children. Hence, the aim of this paper is to explore and discuss the concept of samban/tutulak and immunization and the sick concept of Dayak tribes in the context of modern life.

This article is based on the result of ethnographic qualitative research conducted in April to October 2018. Data collected through in-depth interview with 41 informants and participatory observation.

In general the purpose of immunization and the use of samban/tutulak is the same which is to protect children from diseases and make children stay healthy. Both immunization and the samban/tutulak are intended to develop immunity for the children. Immunization develops immunity artificially whereas the use of samban/tutulak develops the immunity naturally.

The use samban/tutulak in protecting the health of children in Dayak is the consequences of the sick concept believed by the Dayak tribe.

Keywords: tutulak, samban, Dayak tribe, immunity, sick concept

Introduction

Immunization is one of the interventions in health that is widely regarded as the most successful and most cost effective interventions. However, according to the WHO in 2015 more than 19 million children in the world still have not received complete basic immunization and current immunization coverage of the world shows no improvement.

In Indonesia, immunization coverage only shows a slight increase, so that by WHO Indonesia is categorized as a stagnant country and is considered not showing the expected growth in efforts to increase coverage of basic immunization. This situation also happened in South Kalimantan Province, with the lowest coverage is in Balangan District, which is 25.5% in the Basic Health Research in 2007 and 20% in the Basic Health Research in 2013.

Based on several in-depth interviews conducted during the preliminary study, it is likely that one of the causes of the low coverage in the Dayak community is due to the people belief in the cause of the illness itself. The cause of the illness that is believed by the community as stated by the informants are as follows:

1. Diseases caused by real or natural causes such as heat, cold, rain, tiredness.

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2. Diseases caused by unreal causes such as ancestral spirits, breaking taboos and witchcraft and other supernatural causes.

The difference in the concept of illness that they believe in the concept of western medicine ill causes to never mention germs as the cause of an illness. This belief then affects their prevention efforts that they believe may protect against the disease. One of the efforts is the use a kind of amulet namely samban/tutulak to protect the children from diseases.

Hence, the aim of this paper is to explore and discuss the concept of samban/tutulak and immunization and the sick concept of the Dayak tribes in the context of modern life.

Materials and Method

This paper is based on the result of an ethnography study. Data for this research was collected through in-depth interviews and observation with total 41 informants i.e. 9 of balians the traditional healers, 15 of the Dayak traditional leaders and other group members and 17 of the mothers of 12 - 35 old age children, conducted from April to October 2018. All the material was recorded as field note, and some were tape recorded and video recorded.

Results

Overview of Research Sites, Population and Demographic: The research location was at Dayak tribe in the Balangan District in the northern part of South Kalimantan Province that stretches at coordinates 2°01’37” to 2°35’58” South Latitude and 114°50’24” up to 115°50’24” East Longitude.

There are 4 sub tribes namely Dayak Uren, Dayak Deyah, Dayak Pitap and Dayak Halong with total population 12,996 settled on 18 villages in sub district of Tebing Tinggi and Halong.

Most of the Dayak tribe still plant rice, supplemented by the sale of the product of planted rubber tapping, vegetables or other field and forest products and some educated citizens working in coal companies and become civil servants. But even though they have other permanent jobs, they still have to go to the field and planting rice because of the obligation to participate in their annual harvest ritual.

Use of Samban/tutulak: Tutulak (figure 1) in the form of bracelets used by Dayak Deyah and Dayak Halong while samban (figure 2) shaped necklace used by Dayak Uren and Dayak Pitap.

Immunization is required for all children, whereas the samban/tutulak is only required for children “requested” by Nining Baharata, the Almighty ancestor spirit. According to balian, the sign of child allegedly asked to use samban/tutulak, among others, is born with a umbilical cord around the neck, often crying or weeping, easy to sick or litter, sprue continuously and the baby does not gain weight. To ascertain whether the marks of a child are really signs given by Nining Baharata to ask children to use samban/tutulak then performed ritual batamung by balian.

The Process on Wearing the Samban/tutulak Ceremony: Preparation for ritual to use samban/tutulak will be performed by all villages’ members. Cakes made mostly of glutinous rice will be prepared as offerings to the ancestors. All guests will be openly accepted even if they are not from the same customary units or even non-Dayak people.
In this ritual, *balian* will recite the spell called *bamamang* and dance called *batandik* accompanied by drum rhythm from 7 pm to 9 am the next day. In this ritual, the spirits believed to have disturbed the health of a baby or child will be transferred to wooden puppets called *impatu*. Then the ritual is continued by putting the *samban*/*tutulak* to the child.

After the ritual completed, parents and children must go through a period of abstinence that make them not allowed to leave the house, forbidden to receive guests and forbidden to defecate. This 24-hour period is believed to be the time span needed to sharpen the power of the *samban*/*tutulak* to protect the child from future illness and also because the spirits that is called on the ritual is still roaming around the house and is feared to be able again interfere with newly given *samban*/*tutulak* children because they do not have the optimum power yet.

To reinforce the ability of *samban*/*tutulak* in protecting child from disease, every year at the harvest ritual, the baby or child wearing *samban*/*tutulak* together with their parents will be given spell again by *balian* and *samban*/*tutulak* will be smeared oil.

The duration of the use of *samban*/*tutulak* ranged from 3 to 8 years and in that period the health of the child becomes the *balian*’s responsibility. If in the span of time the child gets sick, it becomes the responsibility of the *balian* to perform the necessary healing rituals.

### Discussion

#### The History of Vaccine: Immunization in the western biomedical concept firstly known when Edward Jenner is creating the first vaccine, which was taken from a cowpox to protect the human form smallpox (12) but actually this concept was initially created long before it.

Documented in the timeline of vaccination created by The College of Physicians of Philadelphia that ritual inoculation in China and India had been started since 1500 AC. In the late of 1600 AC, Emperor K’ang Hsi, who has been recovered from smallpox in his childhood, conducted inoculation of his children by blowing the milled smallpox scabs into the nostrils. He conducted this ritual because he noticed that everybody that he has known to be recovered from smallpox not infected by this disease twice.

In 1545, when smallpox epidemic stroke India that cause around 8,000 child deaths, the *brahmins*, the traditional healer, also observed the same concept, the basic concept of immune development which is hardly ever a person infected with the same illness twice (14). The *brahmins* done a ritual called buy the disease by making a healthy person infected with smallpox through a dry smallpox scab taken, at that time bought, from smallpox patients who have recovered, through scratches made on the skin. Most people who carry out this ritual will fall ill, but then recover and be protected from infection in the future.

#### Understanding Immunization: Immunization by WHO is defined as “the process whereby a person is made an immune or resistant to an infectious disease, typically by the administration of a vaccine” which can be interpreted as a process in which individuals are immunized or resistant to infectious diseases usually by using a vaccine(9). Vaccines help the formation of immunity by mimicking an infection even though this artificial infection is relatively unlikely to cause a serious illness as a naturally occurring infection. However, this artificial infection can make our immune system produce T-lymphocytes and antibodies and provide our body with a memory of how to fight the infection if in the future the body is attacked by infection from the disease. Some vaccines do require more than one dose to be effective and some require boost or boost to raise the level of immunity (15).

In natural infections when the body is attacked by a germ it takes several days before forming the body resistance system to defeat the infection that often the disease becomes severe and must be hospitalized and even deadly.

#### Value Concept of *Samban*/*Tutulak* for Dayak Tribe in Balangan District: As mentioned earlier, the use of *samban*/*tutulak* is one of the efforts believed by the Dayak people to protect infants/children from diseases caused by the disorder of spirits/supra natural power. What kind of illness is caused by a supernatural disorder and not because of physical illness is not generally known and it is the duty of a *balian* to communicate it with the ancestor to determine it through a *batanung* ritual.

Besides being believed to be a form of disease prevention, the use of *tutulak*samban also symbolizes their faith in the command and their respect for their...
ancestors. These rituals will also keep the social coherent in the community and the kinship between members in one tribe with the other or even an outsider because in the ritual usually run by the whole village even relatives or guests from other villages will come. And since the costs incurred to perform each ritual relatively large, it is possible that this ritual is also a prestige for the family doing it.

In addition, using samban/tutulak can also cause a sense of security because as long as children use samban/tutulak then balian who has paired samban/tutulak will be responsible for performing a healing ritual if the child gets sick.

**Samban/tutulak and Immunization:** In order to fulfill their health need, every community develop a health system, which is consist of prevention and healing activities. A part of this system is the etiology of illness or the cause of illness. The cause of illness will determine the choice activities that their chosen for the prevention and healing.

In general, the purpose of immunization and the use of samban/tutulak are to protect children from disease and make children stay healthy. Specifically immunization aims to protect children from immunized preventable diseases such as tuberculosis, diphtheria, pertussis, hepatitis B, Haemophilus influenza B, Polio and Measles whereas the use of samban/tutulak aims to protect children from disruptive spirits they are causing children sick.

The key concept of immunization is protection against the possibility of disease. This vaccine can be repeated several times with a certain time interval called a booster. This procedure is intended to maintain immune levels against the intended diseases. This concept is actually the same as the concept of samban/tutulak traditionally given by a balian. Even the concept of “booster” is also known by updating or changing samban/tutulak with a new one.

The concept of immunization is actually the development of experience about the occurrence of cowpox disease events where Jenner observed that those who had suffered cowpox turned out to be relatively more immune to not inflict the disease anymore. So cowpox events are like stimulation of antibodies. While in the event of a samban/tutulak giving waiting for the child to be sick, it is actually in the body of the child, there is an antibody. So samban/tutulak is a booster with the hope that the child will not contract a similar disease. But in vaccination programs basically the healthy child is told to be sick by giving a vaccine which is a seed of a disease that has died or is weakened with the hope of antibodies without harmful side effects.

Since ancient times humans have always studied the environment in which they live. They understand that if humans always treat the environment well then the environment will provide comfort act for humans. As illustrated by the quotation of Hippocrates (c. 460–377 B.C.) was familiar with the importance of cultural–environmental interactions more than 2,000 years ago.

**On Airs, Waters, and Places**

Whoever wishes to investigate medicine properly, should proceed thus: in the first place to consider the seasons of the year, and what effects each of them produces (for they are not at all alike, but differ much from themselves in regard to their changes). Then the winds, the hot and the cold, especially such as are common to all countries, and then such as are peculiar to each locality. We must also consider the qualities of the waters, for as they differ from one another in taste and weight, so also do they differ much in their qualities.

—Hippocrates (c. 400 B.C.)

The study of these interactions, which are important to disease etiology, health promotion, and health service provision alike, continues to this day as medical geography. As old diseases, almost forgotten, are reemerging amidst new risks; as the majority of the world’s population becomes urban and moves toward stabilization of numbers; as biotechnology transforms medicine, agriculture, and our understanding of the nature of life; and as climate change, air and water pollution, metastasizing consumption, and parasitic inequalities transform the ecology of disease—so the ancient study about how people, their cultures and societies in different environments, create and spread disease, promote health, and provide care for the ill has never been more relevant.

It is important to understand the interactive processes of cultural and environmental change, as well as the importance of distance and location. By doing this,
medical geography can not only advance knowledge, but be useful for analysis and have applied outcomes (16).

The Dayak Tribes are no different. They believe that disease is due to the act of supernatural power including evil spirits.

Conclusions

This research reveals the phenomenon of belief about the disease causation and its protection using samban/tutulak which in concept is actually similar to the concept of immunization in western medicine. Immunization develops immunity artificially whereas the use of artificially develops the immunity naturally.

Both of them has a role in shaping children’s health in the Dayak tribe in the Balangan district.

Conflict of Interest: There is no conflict of interest for all authors.

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Ethical Clearance: All procedures performed in studies involving human participants were in accordance with the ethical standards of the Health Research Ethics Committee Faculty of Public Health Airlangga University.

Informed Consent: Informed consent was obtained from all individual participants included in the study.

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Predisposing Factors Related to the Contraception Use Plan in Women of Reproductive Age, East Java Indonesia

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ABSTRACT

The planning family acts to help the family to plan the pregnant and natal they want. The target of research: to knowing the factors related to the contraception use plan in women of reproductive age. Method Research: Sample of The Indonesia Demographic and Health Survey (IDHS) 2017 includes 1,970 census blocks covering urban and rural areas. The implementation of the IDHS uses 3 types of questionnaires. Results: the planned use of contraception in women of reproductive age is mostly in rural areas and in women of reproductive age with elementary-high school education. Most women of reproductive age know more about modern contraception. Plans for use of contraception in women of reproductive age in married women. Conclusions: residence, education, knowledge of the types of contraceptive methods and marital status are related to contraception use plans in women of reproductive age.

Keyword: The Choice of Method, Contraception Use Plan, Women of Reproductive Age

Introduction

Indonesia is one of the developing countries with various types of problems. The main problem in Indonesia is the field of a population where population growth is still high. Such a condition of the population has made it difficult for businesses to improve and equalities people’s welfare. The higher the population growth, the more effort is made to maintain people’s welfare. Therefore the Government continues to strive to reduce the rate of growth with the Family Planning Program. Based on the results of the population census in 2010 it was found that Indonesia’s population had reached 237.2 million, with a growth rate of around 3.1% a year and a birth rate of 2.6 per woman. Indonesia’s population is increasing every day, even though the government continues to strive to reach 2.1 children per woman. However, there are still many people who have large numbers of children[1].

Family planning is the act of helping couples to avoid unwanted pregnancies, getting a very desirable birth, arranging intervals between pregnancies, controlling the time of birth in relation to the age of husband and wife and determining the number of children in the family[2]. Family planning service that aims to achieve quality families through the arrangement of the number of families in a planned manner, so expects acceptance of acceptors in the use of contraception is expected to remain a family planning acceptors.

Contraception use has increased in many parts of the world, especially in Asia, America Latin and lowest in Sub-Saharan Africa. Globally, modern contraception users have increased not significantly from 54% in 1990 to 57.4% in 2014. Regionally, the proportion of couples of reproductive age 15-49 years reporting the use of modern contraceptive methods has increased at least in the past 6 years. In Africa, from 23.6% to 27.6%, in Asia, it has increased from 60.9% to 61.6%, while America Latin and the Caribbean up slightly from 66.7% to 67.0%. An estimated 225 million women in developing countries want to delay or stop fertility but do not use any contraceptive method for the following reasons: limited choice of contraceptive methods and experience of side effects. Unmet needs for contraception are still too high. Injustice is driven by population growth[3].
Indonesia will face three mega demographic trends ahead of 2030. First, Indonesia’s large population will continue to increase despite the low Population Growth Rate, in line with the rapid flow of urbanization. Second, demographic advantages have occurred since the late 1980s and will peak in 2030 resulting in a demographic bonus, before the percentage of the working age population declines. Finally, Indonesia will experience a shift in the situation from permanent population mobility to non-permanent population mobility. These three demographic trends will have a large influence on Indonesia’s ability to achieve sustainable development goals (SDGs) by 2030[6].

It is estimated that Indonesia’s population in 2017 will reach 255.5 million. This condition causes Indonesia to occupy the fourth position with the highest population in the world and the first position in Southeast Asia. Indonesia’s population will increase and reach 296.4 million by 2030. In other words, there will be an additional 40.9 million Indonesians between 2015 and 2030. This additional population is greater than the total population of Malaysia and Brunei only 31 million in 2015[5].

The family planning program promoted by the government has become very important as control of the population explosion. Data from the National Population and Family Planning Agency in 2013 received 8,500,247 PUS (fertile age couples) who were new family planning participants, with details of injectable contraceptive users 4,128,115 participants (48.56%), pills 2,261,480 participants (26.60%), implants 784,215 participants (9.23%), condoms 517,638 participants (6.09%), uterine contraception 658,632 participants (7.75%), MOW (male surgery method) 128.79 participants (1.52%), MOP (male surgery method) 21,374 participants (0.25%), from the above data we can see injection contraception method is the most used method[4].

Many women have difficulty in choosing the type of contraception. This is caused not only by the limited methods available but also because of the mother’s ignorance about the requirements and safety of the contraceptive method[6]. In addition, many factors have resulted in not all fertile couples joining the family planning program. According to Hartanto (2003), there are other factors that influence family planning acceptors in choosing contraception, namely age, number of children, education, and knowledge[7]. Whereas according to Glasier and Gebbie (2005), periodic visits to clinics, the role of officers, the frequency of action needed, partner cooperation, privacy, frequency of sexual relations, future fertility plans, and costs are factors that influence a person in choosing contraception[8].

In accordance with Green (1980) theory in Notoatmodjo (2003) that health behaviour including the selection of contraceptives is influenced by three factors namely predisposing factors (Knowledge, attitudes, Education, family economy), supporting factors (availability of medical devices, sources of information) and driving factors (family and community leaders support). The study analyzed predisposing factors related to contraceptive plans in women of childbearing age. The predisposing factor consists of knowledge about family planning, values, community culture about family planning, perceptions, attitudes, education level, type of work[9].

**Material and Method**

We used data from the Indonesia Demographic and Health Survey (IDHS) 2017. The IDHS is a five-year periodic survey used to collect information from ever-married women aged 15-49 years and ever-married men 15-54 years about demographic and health status. Three types of questionnaires used were the Household, Women’s, and Men’s Questionnaire. The Women’s questionnaire included questions about women’s demographic characteristics, their reproductive history, pregnancy, postnatal care, as well as immunization and nutrition. The IDHS sample includes 1,970 census blocks covering urban and rural areas. Respondents of women of childbearing age aged 15-49 were 59,100, 24,625 respondents were unmarried young men aged 15-24 years, and 14,193 married men aged 15-54 years. The IDHS sample frame uses the Master Census Block Sample from the 2017 Population Census data in this study.

**Findings**

Based on the results of the cross tabulation (Appendix 1), it can be seen that contraceptive plans that tend to be chosen by women of reproductive age who live in rural and urban areas are injections every three months with a p-value of 0.000. However, this injection method is mostly chosen by women of reproductive age who live in rural areas compared to urban areas. In addition,
women of reproductive age with elementary-high school level tend to plan to use injectable contraception three months with a p-value of 0.000.

In urban areas, more information media are available than in rural areas, so in urban areas access to information, family planning services related to contraception are easier. In addition, cultural inequality and literacy rates can also influence contraceptive use. This might be one reason women of reproductive age tend to use contraception. Plans for contraceptive use can also be affected by the availability of health facilities. Regions with high availability of facilities will tend to use contraception, whereas if regions with low availability of health facilities, contraceptive use will be low\cite{10}.

Education has a relationship with contraceptive use plans. Research conducted in Kenya shows that the status of higher education increases the probability of contraceptive use two to four times\cite{11}. The higher a person’s education, the higher the use of contraception\cite{12}. Someone who has higher education will be more exposed to information, so they tend to choose modern contraception\cite{12,13}. Someone who is often exposed to information will know more and understand the types of contraception and their side effects so that they can consider the contraception that will be used. Education affects someone to choose injection contraception every three months\cite{14}. Someone with low knowledge is less informed about contraception. Whereas a person with higher education gets more information about contraception so they prefer three-month injection contraception\cite{19}. Education not only improves his status but is also important for achieving reproductive health needs. Thus, someone with a higher education level three times more likely to use contraception compared to people with low levels of education\cite{16}.

Knowledge of contraceptive methods is generally known to women of reproductive age. Knowledge of contraceptive methods can affect the contraceptive use plan. Low knowledge will have an impact on low contraceptive use. A person will accept using contraception if the knowledge of contraception is deep and adequate regarding the side effects of its use\cite{17}. The use of effective contraceptive methods will be chosen in the future. Knowledge of contraceptive methods is also important for planning children’s distance and preventing unwanted events\cite{18}.

Marital status is the main predictor in the research conducted in Ghana\cite{10}. Married women will have higher contraceptive use\cite{17}. Married women will consider contraceptive methods to be used with their husband\cite{13}. It is inversely proportional to the research conducted in Ghana, that unmarried teenagers have a four-fold chance of using contraception\cite{10}.

**Conclusion**

Housing, education, knowledge of the types of contraceptive methods and marital status are related to the planned use of contraception in women of childbearing age.

**Conflicts of Interest:** None declared.

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**Ethical Clearance:** Ethics approval was received from The Demographic and Health Surveys (DHS). DHS Program has collected, analyzed, and disseminated accurate and representative data on population, health, HIV, and nutrition through more than 400 surveys in over 90 countries.

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Effect of the Procedure of the Sweet Lupine Powder as an Alternative to the Camel Meat on the Quality and Sensory Characteristics of the Manufactured Burgers

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ABSTRACT

The experiment included five factors (100% camel meat, 0% sweet lupine powder) (T1), (95% camel meat, 5% sweet lupine powder) (T2), (90% camel meat, 10% sweet lupine powder) (T3), (85% camel meat, 15% sweet lupine powder) (T4), (80% camel meat, 20% sweet lupine powder) (T5). The results showed high protein, fiber and carbohydrate concentrations (T2, T3, T4, T5) compared to the standard treatment (T1), while the ash ratio increased in all treatments except the second treatment (T2) compared to standard treatment (T1), although the moisture and fat ratio of the treatments decreased (T2, T3, T4, T5) compared to standard treatment (T1). The results showed high pH value and water retention for the coefficients (T2, T3, T4, T5) compared to the standard treatment (T1). The value of free fatty acids and the loss of (T2, T3, T4, T5) compared to standard treatment (T1). The percentage of change in the post-cooking characteristics of the Barker tablets decreased the percentage of change in weight, change in thickness and change in diameter of the transactions (T2, T3, T4, T5) compared to the standard transaction (T1), while the price value of transactions (T2, T3, T4, T5) compared to (T1). The results of the sensory evaluation of the studied traits showed a general assessment of Juicer (7.2), The coolness (7.2), Flavor (7.7), Color (7.6), Textures(7.7) And general acceptance (7.9), from (9) degrees indicating that the manufactured product obtained a good rate of all sensory characteristics studied.

Keywords: Sweet Lupine, camel, meat, Burgers

Introduction

The trade in the manufacture of processed meat products, half cooked and ready, the manufacture of Barker. The Iraqi Standard No. 1580¹ states that the components of meat crackers include fresh meat, chilled or frozen meat. Many studies have confirmed that camel meat is like chicken meat with low fat content, high energy, high protein and calcium. It turns into glucose. Plant proteins have been partially used in the manufacture of various types of meat products, The cost of using vegetable protein is much lower than the cost of animal protein with low fat and cholesterol². (Upinus albus) as a source of protein content in the thermos seeds is high and sometimes higher than those found in Bean For soy, ranging from 24 to 48% in different species, with a high content of essential amino acids that meet the nutritional requirements of humans except lysine, cysteine and methionine³. White lupine seeds followed by blue and yellow lupine are more suitable for Production of high protein concentrates for use in food processing and in human and animal nutrition⁴. Several studies manufacture of varicose tablets from various animal meat and the production of beef crackers with the replacement of vegetable proteins Or erase,³ the effect of adding the rehydrated and lipid residue powder on the specific and sensory characteristics of the beef burger cooked in different ways⁶ mentioned the possibility of making the Barker of old chicken meat, substituting beef, and adding soybean protein to the Barker process⁷.
Materials and Method

1. **Meat**: Use local camel meat it was purchased after refrigeration to separate the meat from the bone sliced into small pieces and kept at a temperature of -18 °C.

2. **White thermos (upinus albus)**: thermos seeds are processed and grinded to a 75 - inch size and kept in frozen until use.

3. **Garlic**: garlic was use after peeling, sprayed a good horseradish to be ready to used (1%).

4. **Spices**: A mixture of spices, containing (black pepper, coriander, cumin, desserts, nutmeg) use by 1%.

5. **Salt**: Use Nacl by (1%) of the weight of the product.

6. **Treatment**:
   - T1 100% camel meat 0% sweet lupine seed powder
   - T2 95% camel meat 5% sweet lupine seed powder
   - T3 90% camel meat 10% sweet lupine seed powder
   - T4 85% camel meat 15% sweet lupine seed powder
   - T5 80% camel meat 20% sweet lupine seed powder

   After calculating the required quantities of camel meat, the meat pieces were separated, homogenization and mixed with the prescribed proportions of sweet thermos powder and added spices, garlic and salt. The manufacturing process was done with discs of the meat breaker and refrigerator at a temperature of 4 ° C for 24 hours.

Determination of some chemical and physiological characteristics

A. Moisture, fat, ash and protein were evaluate.

B. The proportion of carbohydrates was calculated.°

C. The price value was estimated by multiplying the percentage of protein and carbohydrates x 4, and multiplying the percentage of fat by x 9.

D. pH Determination by the PH meter°.

E. Water resistance was estimated°.

F. Changes in weight, thickness and diameter.°.

G. Determination of free fatty acid (FFA): Determination of free fatty acid ratio based on the method mentioned°.

The sensory evaluation was conducted by evaluating a questionnaire by the researchers based on the method proposed by°.

Results and Discussion

Table (1) shows chemical composition, The high humidity in treatment (T1) followed by (T5, T4, T3, T2), respectively, may be due to higher humidity of the control treatment than other treatments. The percentage of replacement of plant variant increased when the moisture content was less than°. The percentage of moisture increased by increasing the concentration of plant variant (the remaining powder and soy protein) in the processed turkey burger, the results are consistent with both°. If reduced humidity of the transactions of the manufactured Barker with increasing the replacement of animal proteins with plant proteins. The higher the protein content of the treatment (T5) followed by the treatment (T1, T2, T3 and T4) respectively, the reason for the high protein ratio of the treatments compared to the control treatment is the result of increasing the ratio of the replacement of animal proteins with plant proteins. ° observed low protein content in processed meat products with an increase in the percentage of plant additives, including bran, salmon and flour, indicate high fat in (T1) followed by (T5, T4, T3, T2), respectively. The results are consistent with what reached°. Table (1) also shows the high rate of ash in (T5) followed by (T1, T2, T3, T4), respectively. The reason for the higher ash ratio of the treatments compared to T may be due to the increase in the ratio of total solids with increased replacement of the sweet thermos powder, results are consistent with°. The results were also consistent with°. The high proportion of fiber in the treatment (T5) followed by treatment (T1, T2, T3, T4) respectively. The increase in the fiber ratio of treatments compared to the T1 is due to the increase in the ratio of fiber in the sweet lupine powder, the results are consistent with what reached°, as they observed. Increase in percentage of fiber in the processed Barker transactions with increasing the addition of different percentages of legume proteins (chickpea). Table (1) shows the high proportion of carbohydrates in the treatment (T5) followed by treatment (T1, T2, T3, T4) respectively.
Table 1: Represents the chemical composition of the manufactured bark

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Character</th>
<th>Moisture %</th>
<th>Protein %</th>
<th>Fat %</th>
<th>Ash %</th>
<th>Fiber %</th>
<th>Carbohydrate %</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td></td>
<td>72.10</td>
<td>18.30</td>
<td>7.10</td>
<td>0.901</td>
<td>0.21</td>
<td>1.40</td>
</tr>
<tr>
<td>T2</td>
<td></td>
<td>69.62</td>
<td>19.20</td>
<td>6.87</td>
<td>0.351</td>
<td>0.36</td>
<td>3.60</td>
</tr>
<tr>
<td>T3</td>
<td></td>
<td>66.01</td>
<td>20.01</td>
<td>6.66</td>
<td>1.003</td>
<td>0.52</td>
<td>5.81</td>
</tr>
<tr>
<td>T4</td>
<td></td>
<td>63.01</td>
<td>20.81</td>
<td>6.43</td>
<td>1.054</td>
<td>0.68</td>
<td>8.02</td>
</tr>
<tr>
<td>T5</td>
<td></td>
<td>59.99</td>
<td>21.62</td>
<td>6.22</td>
<td>1.106</td>
<td>0.84</td>
<td>10.23</td>
</tr>
</tbody>
</table>

Table (2) shows some physical properties of the plant. The pH value of the treatment (T5) and the treatment (T1, T2, T3, T4), respectively. The reason for the higher pH value of the coefficients compared to the control treatment may be due to the increase in the replacement ratio of the sweet granules of thermosetrate powder with results similar to the increase in PH values at when adding 20% of the moisturized soybean protein to the cooked meat burger. The effect of base reaction of plant proteins, resulted in a decrease total acidity of transgenic treatments in plant proteins, as well as solubility of plant proteins and spread in water and formation of basic solutions contribute to increase value of PH as this result corresponds. Table (3) shows high value of free fatty acids in (T1) followed (T5, T4, T3, T2), respectively, as found. The lack of free fatty acids (FFA) make product less susceptible to analytical tattoos. Table (3) indicate a high water retention ratio (WHC) in (T5) followed by (T1, T2, T3, T4), respectively, due to the high water retention ratio (WHC) of treatments relative to the pH T1, which results in a high (WHC). From table (3) the high proportion of recipe loss charity (T1) followed by (T5, T4, T3, T2) respectively.

Table 2: Some physical characteristics of the Barker plant

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Character</th>
<th>pH</th>
<th>FFA</th>
<th>%WHC</th>
<th>Loss Balimap %</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td></td>
<td>5.9</td>
<td>2.01</td>
<td>20.81</td>
<td>5.72</td>
</tr>
<tr>
<td>T2</td>
<td></td>
<td>6.1</td>
<td>1.90</td>
<td>23.11</td>
<td>5.33</td>
</tr>
<tr>
<td>T3</td>
<td></td>
<td>6.4</td>
<td>1.72</td>
<td>23.92</td>
<td>4.86</td>
</tr>
<tr>
<td>T4</td>
<td></td>
<td>6.8</td>
<td>1.40</td>
<td>24.34</td>
<td>4.47</td>
</tr>
<tr>
<td>T5</td>
<td></td>
<td>7.1</td>
<td>1.23</td>
<td>24.96</td>
<td>4.18</td>
</tr>
</tbody>
</table>

From table (3) The reduction in the weight for (T5) was observed, followed by (T1, T2, T3, T4), respectively, the reason is the ability of proteins in the plant sources used in the manufacture of the Barker tablets to maintain water and fat during cooking and the increase in the value of the hydrogen, which increases the retention of moisture and decreases the loss during cooking, has already been pointed out and reduce the weight loss ratio by adding some plant proteins. Table 4 shows the low rate of change in the diameter of the tablets in the treatment (T5) followed by the treatments (T1, T2, T3, T4), respectively, the cause of this increase and loss in the vector of treatment (T1) may be due to the occurrence of protein synthesis and the accumulation of meat tissue. The more the replacement of animal bronze with protein production of chicken meat powder added to soy protein by (20%), the percentage of loss in diameter was (20%).The results from Table (4) show the low change in the thickness of the VAR in the treatment (T5) followed by the treatment (T1, T2, T3, T4) respectively. The results are consistent with. The value of the transaction price (T5) and the treatment (T1, T2, T3, T4), respectively, may be due to the higher price values of the transactions compared to T1 because the sweet lupine powder contains Carbohydrate content may reach more than 45% because 1 gram carbohydrate yields 4 calories. The results are consistent with.
Table 3: Changes in some qualities after cooking and price value

<table>
<thead>
<tr>
<th>Treatment</th>
<th>%Weight change</th>
<th>%Change in diameter</th>
<th>%Change in thickness</th>
<th>Price values kcal/100 g</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>26.90</td>
<td>18.30</td>
<td>16.82</td>
<td>142.70</td>
</tr>
<tr>
<td>T2</td>
<td>25.77</td>
<td>17.74</td>
<td>15.74</td>
<td>153.03</td>
</tr>
<tr>
<td>T3</td>
<td>24.92</td>
<td>16.81</td>
<td>15.12</td>
<td>163.22</td>
</tr>
<tr>
<td>T4</td>
<td>24.10</td>
<td>16.24</td>
<td>14.83</td>
<td>170.19</td>
</tr>
<tr>
<td>T5</td>
<td>23.89</td>
<td>15.60</td>
<td>14.44</td>
<td>183.38</td>
</tr>
</tbody>
</table>

Table 4 shows the sensory evaluation of some studied traits. Degree of Juicy where obtained (28.4%) received a very good grade (64.4%) and good (7.2%). The average degree of the cooked qualities of the Barker tablets, ie, a general average (7.2) of nine degrees. The degree of coolness, where obtained (15.2%) excellent score and (20.5%) very good grade and (34.3%) good grade and (30%) degree Average of the cooked qualities of the Berkert tablets, a general average (7.2) of nine degrees. Flavor status obtained (25.5%) excellent grade and (35.7%), very good grade (28.4%), and good (10.4%), average grade of the cooked qualities of the Barker tablets at a general rate (7.7) of nine degrees. color classification was excellent (8.3%), excellent (61.6%), very good grade (21.6%), good grade (8.5%), average grade of the cooked qualities of the Barker tablets at a general rate (7.6) of nine degrees. The status of the textures obtained (14.5%) excellent grade (54.1%), very good grade (21.3%), good grade (10.1%), average grade of the cooked qualities of the Barker tablets at a general rate (7.7) of nine degrees. The general acceptance status reached (24.5%). Excellent grade (50.1%), good grade (18.2%), good grade (7.2%), average grade (7.9) of nine degrees. sensory assessment were 7.2 to 7.9.

Table 4: The degree of sensory evaluation of some studied traits

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S Character</th>
<th>Excellent</th>
<th>Very Good</th>
<th>Good</th>
<th>Average</th>
<th>Acceptable</th>
<th>Overall Average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Juicy</td>
<td>-</td>
<td>28.4</td>
<td>64.4</td>
<td>7.2</td>
<td>—</td>
<td>7.2</td>
</tr>
<tr>
<td></td>
<td>The coolness</td>
<td>15.2</td>
<td>20.5</td>
<td>34.3</td>
<td>30</td>
<td>-</td>
<td>7.2</td>
</tr>
<tr>
<td></td>
<td>Flavor</td>
<td>25.5</td>
<td>35.7</td>
<td>28.4</td>
<td>10.4</td>
<td>—</td>
<td>7.7</td>
</tr>
<tr>
<td></td>
<td>Color</td>
<td>8.3</td>
<td>61.6</td>
<td>21.6</td>
<td>8.5</td>
<td>—</td>
<td>7.6</td>
</tr>
<tr>
<td></td>
<td>Textures</td>
<td>14.5</td>
<td>54.1</td>
<td>21.3</td>
<td>10.1</td>
<td>—</td>
<td>7.7</td>
</tr>
<tr>
<td></td>
<td>General Acceptance</td>
<td>24.5</td>
<td>50.1</td>
<td>18.2</td>
<td>7.2</td>
<td>—</td>
<td>7.9</td>
</tr>
</tbody>
</table>

Conclusion

From the results possibility of replacing the sweet thermos powder with different mixing ratios, which contributes to improving the qualitative and sensory characteristics of the camel burger, while preserving the nutritional value, as well as producing a healthy, economical and cost effective food product.

Conflict of Interest: None

Source of Funding: Self

Ethical Clearance: Not required.

REFERENCES


Climate Factors Improve Accuracy of Time Series Model for Dengue Hemorrhagic Fever Forecasting in Pasuruan Regency, Indonesia

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ABSTRACT

A large number of dengue cases in Indonesia must be followed by vector control, and efforts to terminate the chain of disease transmission with promotive and preventive activity. Pasuruan Regency is one of the regions in East Java, Indonesia that has a large number of dengue cases and exists monthly throughout the year. Accurate forecasting of Dengue Hemorrhagic Fever (DHF) cases before the outbreak in Pasuruan, can help public health practitioners to prioritize public health activities. This study aims to obtain a time series forecasting model for the number of dengue cases with the addition of climate factor predictors as rainfall, air humidity, air temperature and duration of irradiation. Secondary data of DHF and climate factor in 2015-2017 were analyzed by ARIMA and Multi Input Transfer Function. Forecast model was evaluate by actual data in 2018. The Result showed that he addition of the climate predictor factor as rainfall, air humidity and air temperature in Multi Input Transfer Function model succeeded in increasing forecasting accuracy compared to the ARIMA (1,1,1). RMSE Transfer Function model decrease by 9.19%. DHF was significantly affected by DHF in the previous month, rainfall in the previous 1 and 2 months, air humidity 3 and 4 months before and the air temperature 1 and 2 months before and interaction of random effects of rainfall, humidity and air temperature with DHF one month earlier.

Keywords: DHF, Forecasting, ARIMA, Transfer Function, Climate

Introduction

Dengue Hemorrhagic Fever (DHF) has spread across the world in more than 100 countries in WHO’s African, Eastern Mediterranean, South-East Asia and Western Pacific regions; the Americas, South-East Asia and Western Pacific regions are the most seriously affected. Indonesia is a South-East Asia categorical country that ranks first in the highest case of DHF from 1990-2015.(1) According to WHO, the incidence of dengue fever worldwide has increased significantly in the past few decades. Even the actual number of DHF cases is greater because it is often not reported and many cases of misclassification. An estimated around 390 million dengue infections per year (95% CI 284–528 million), of which 96 million (95% CI 67–136 million) manifest clinically (with the severity of the disease). A large number of dengue cases in Indonesia especially in East Java Province which is the second highest number of cases must be followed by vector control, and efforts to terminate the chain of disease transmission with promotive and preventive activity.(3) Pasuruan Regency is one of the regions in East Java that has a large number of dengue cases and exists monthly throughout the year.

DHF is a disease that is widely spread in tropical and sub-tropical regions. The study of the relationship of climate change with DHF in several countries, namely Thailand, Taiwan, India, China, Singapore, Australia, including Indonesia states that global climate change can have an influence on the transmission season, the area of dengue disease spread and increased risk associated
with its emergence in the region Asia-Pacific.\textsuperscript{4,5,6} Dengue is widespread throughout the tropics, with risk factors influenced by local spatial variations of rainfall, temperature, relative humidity, degree of urbanization and quality of vector control services in urban areas.\textsuperscript{1}

Accurate forecasting of Dengue Hemorrhagic Fever (DHF) cases before the outbreak in Pasuruan regency, can help public health practitioners to prioritize public health activities. One forecasting model is time series data modeling. Time series is a series of observations taken sequentially based on time at the same interval. Univariate time series can be done with an autoregressive (AR) approach or combined with moving average (MA) as ARIMA.\textsuperscript{7} The transfer function model is the development of the Box-Jenkins method whose model consists of two or several variables, but each variable has a specific ARIMA model. The transfer function model is a model that illustrates that the future forecast of a time series (output series or \(y_t\)) is based on past values of the time series itself and is based on one or more other time series (input series or \(x_{ht}\)) related to the output of the series.\textsuperscript{7,8} This study aims to obtain time series analysis for DHF forecasting models using the ARIMA and the multi-input transfer function with the addition of climate variables.

**Material and Method**

This study used secondary data. DHF case’s data were from the East Java Provincial Health Office, and climate data as monthly rainfall from Meteorology and Climatology Station Karang Plasoi Malang while air humidity, air temperature, and duration of radiation were taken from Center for Sugar Research and Development, Pasuruan. The population of this study included monthly DHF cases which were recorded in the East Java Provincial Health Office. While the sample of this study were monthly dengue cases of in 2013-2018. DHF data in 2013-2017 were used for developing models that would evaluate using DHF data in 2018. ARIMA and Transfer Function Analysis were carried out using SAS on Demand for Academic data processing application. Model accuracy based on Root Mean Score Error (RMSE) value.

**Autoregressive Integrated Moving Average (ARIMA)** included autoregressive (p), differencing (d) and moving average (q), written with notation ARIMA (p,d,q):\textsuperscript{7,8} \[ \phi_p(B) (1-B)^d Z_t = \theta_q(B) \delta_{rh}(B) x_{ht} + \omega_h(B) B^h + \theta_q(B) a_t + \phi_p(B) a_t \]

\[ y_t = \sum_{h=1}^{H} \omega_h(B) B^h x_{ht} + \theta_q(B) \delta_{rh}(B) + \phi_p(B) a_t \]

with,

- \(y_t\) = stationer output series
- \(x_{ht}\) = stationer input series variable-\(h\)
- \(\omega_h(B)\) = operator with order \(s\), which represents the number of past observations \(x_{ht}\) variables that have an effect on \(y_t\) for \(h\) variable,
- \(\delta_{rh}(B)\) = operator with order \(r\), which represents the number of observations of the past series of outputs that affect the \(y\) for the \(h\)-variable.
- \(\theta_q(B)\) = moving average operator order-\(q\) error series
- \(\phi_p(B)\) = autoregressive operator order-\(p\) error series
- \(a_t\) = white noise residual of error series

The accuracy of Model based on Root mean square error (RMSE) with formula:

\[ \text{RMSE} = \sqrt{\frac{1}{M} \sum_{t=1}^{M} (Z_{n-t} - Z_{n-t})^2} \]

with \(M\) was the number of predictions made, was actual data and was forecast data.\textsuperscript{8}
Result and Discussion

Table 1 showed that there were cases of DHF in every month from 2013 to 2018 with an average of more than 30 cases per month.

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>DHF</td>
<td>72</td>
<td>35.81</td>
<td>27.67</td>
<td>4</td>
<td>107</td>
</tr>
<tr>
<td>Rainfall (mm)</td>
<td>72</td>
<td>175.17</td>
<td>147.78</td>
<td>0.00</td>
<td>515.63</td>
</tr>
<tr>
<td>Air humidity (%)</td>
<td>72</td>
<td>80.08</td>
<td>5.01</td>
<td>74.00</td>
<td>88.00</td>
</tr>
<tr>
<td>Air temperature (°C)</td>
<td>72</td>
<td>30.06</td>
<td>2.01</td>
<td>27.00</td>
<td>37.00</td>
</tr>
<tr>
<td>Radiation Duration (hours)</td>
<td>72</td>
<td>5.62</td>
<td>1.64</td>
<td>2.00</td>
<td>8.00</td>
</tr>
</tbody>
</table>

Data stationarity was the main requirement in conducting time series data analysis. This indicated by constant in mean and variance over time. Figure 1 showed that DHF cases were not stationary in the mean and variance and Box cox value (lambda) not include 1 in its Confident Interval (CI).

Figure 1: Time series and Box cox plot of monthly DHF

Furthermore, the transformation of natural logarithms (ln) and differencing 1 was done to produced stationary data with lambda values to 2.00 (95% CI 0.97-2.72). The ADF tests proved existence of root units in time series data. The p-value ADF for post-transformation and differencing 1 of DHF data is 0.001. This means that the DHF data was stationary.

Figure 2: ACF and PACF plot of stationary DHF post-transformation and differencing 1
Based on the ACF and PACF plot (Figure 2) the ARIMA model formed was ARIMA (1,1,1) with moving average parameter (\( \theta \)) estimate 0.9862 (p-value <0.0001) and autoregressive parameter (\( \Phi \)) estimate 0.7985 (p-value <0.0001). The parameters estimation significant at the 0.05 level, so they could be used in the model. The next step was diagnostic checking to check suitability of the model. The residual autocorrelation’s p-value was greater than 0.05 and normality test is based on the Kolmogorov Smirnov test value 0.0826 (p-value > 0.1500), which meet the assumptions of white noise and normal distribution and feasible for forecasting.

Time series data of rainfall, air humidity, air temperature, and duration of radiation used as input variables on transfer function model and had non stationary mean and variance. Differencing 1 was done to produced stationary data. Univariate time series model for climate factors was ARIMA (7,1,0) for rainfall, ARIMA (0,1,1) for air humidity, ARIMA (1,1,1) for air temperature and ARIMA ((4,6],1,0) for duration of radiation. The climate ARIMA model used to estimate the parameters and did pre-whitening on the input and output series. The ARIMA model formed for input data had a significant parameter. This model was used to pre-whiten the series of input and output series (dengue cases) in Pasuruan Regency that have been stationary. Cross-correlation between input and output variables (DHF) which has an ARIMA (1,1,1) model shown in Figure 3.

![Figure 3: Cross Correlation Function plot between output variable (DHF) and input variable (climate factor)](image)

The impulse response weight for rainfall input data was \( b=1, s=0, r=0 \), air humidity data was \( b=3, s=0, r=0 \), air temperature data was \( b=1, s=0, r=0 \), while radiation data \( b=0, s=0, r=0 \).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Estimate</th>
<th>T-value</th>
<th>P-value</th>
<th>Lag</th>
<th>Variable</th>
<th>Shift</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \Theta )</td>
<td>0.9788</td>
<td>11.67</td>
<td>&lt;0.0001</td>
<td>1</td>
<td>DHF ( (y) )</td>
<td>0</td>
</tr>
<tr>
<td>( \Phi )</td>
<td>0.8768</td>
<td>6.53</td>
<td>&lt;0.0001</td>
<td>1</td>
<td>DHF ( (y) )</td>
<td>0</td>
</tr>
<tr>
<td>( \omega )</td>
<td>0.0018</td>
<td>3.47</td>
<td>0.0011</td>
<td>0</td>
<td>Rainfall ( (x) )</td>
<td>1</td>
</tr>
</tbody>
</table>
The estimation results (Table 2) showed that only duration of radiation variable had p-value more than 0.05 or not significant. Transfer function multi input model results showed that DHF data in Pasuruan Regency was influenced by the number of previous DHF and several climate factors namely rainfall, air humidity, and air temperature. Diagnostic checking on this model result that there was no autocorrelation on white noise of residual testing and had a normal distribution with the Kolmogorov Smirnov Test value of 0.0810 (p-value >0.1500). This means that the modeling residuals had met the assumptions of white noise and fit use.

Forecasting was carried out for January-December 2018 with both model ARIMA and Multi Input Transfer Function (Figure 4). Forecast results trend showed that from January to June these two models have almost the same pattern. But then in the Multi Input Transfer Function model forecast decreased in June to July, this may be due to the influenced of climate factors that changed. These forecast values were compared with actual data and calculated the RMSE value of each model formed. RMSE of ARIMA (1,1,1) model was 0.6312 greater then Multi Input Transfer Function model (0.5732).

![Figure 4: Actual and forecast data of DHF for January-December 2018](image)

Based on the RMSE value, the Multi Input Transfer Function model was better in predicting the number of DHF cases, with equation as \( y_t = 0.8768 y_{t-1} + 0.0018 x_{1,t-1} + 0.0016 x_{1,t-2} + 0.0322 x_{2,t-3} + 0.0282 x_{2,t-4} + 0.0899 x_{3,t-1} + 0.0788 x_{3,t-2} + at - 0.9788 a_{t-1} \) and \( y_t \) was ln transformed. The number of dengue cases in Pasuruan regency was affected by DHF one month before, rainfall 1 and 2 months before, air humidity 3 and 4 months before and air temperature 1 and 2 months earlier. The interaction of the random influence of rainfall, humidity and air temperature with DHF one month earlier also determined the future period. Research with other transfer functions in forecasting DHF also resulted in significant rainfall and humidity variables in the previous month.(9,10)

Addition of climatic factors succeeded in increasing forecasting accuracy by 9.19%. Rainfall conditions affected *Aedes aegypti* life cycle, mainly related to increasing breeding sites. Rainfall was already proven to be related to the number of DHF cases.(11,12) Relative air humidity was more than 60%, so that it could support the growth of *Aedes aegypti* mosquitoes. *Aedes aegypti* could live for up to three months. Experiments at a temperature of 20°C and relative humidity 55% decreased mosquito life to 50 days. Air humidity less than 60% would cause it to be shorter. The longer the lifespan of *Aedes aegypti* mosquitoes, the greater the potential for breeding and possibly to be a vector. In addition, this was related to the possibility of insufficient time to transfer the dengue virus from the stomach to the salivary glands so that the viral breeding cycle is broken in the body of the mosquito which takes 8-12 days.(1,13,14)

Temperatures that are quite high caused the life cycle of mosquitoes to be shorter as well as shortening the incubation period of the dengue virus. The air temperature in Pasuruan was sufficient for mosquito growth. Female mosquitoes respond to increased temperatures by reducing egg production, and laying time. At 25°C and 80% relative humidity, female mosquitoes survived twice longer and produced 40% more eggs than those stored at 35°C and 80% relative humidity.(15) Other study proved that rainfall variables had a positive effect on the incidence of DHF if the intensity of rainfall starts from 1500 mm to 3670 mm in 1 year. Air temperature has a large effect on changes in the incidence of DHF at temperatures between 22°C to 27°C, while humidity has a positive effect on changes in the incidence of DHF when humidity is in the interval of 82% to 87%. DHF events are responsive when changes in temperature and humidity occur.(16,17,18).
Conclusion

Time series model could be used to forecast DHF cases in Pasuruan Regency, East Java Province, Indonesia. ARIMA (1,1,1) was a model that formed from univariate time series. The addition of the climate predictor factor as rainfall, air humidity and air temperature in Multi Input Transfer Function model succeeded in increasing forecasting accuracy compared to the ARIMA (1,1,1). RMSE on Transfer Function model decrease by 9.19%. DHF was significantly affected by DHF in the previous month, rainfall in the previous 1 and 2 months, air humidity 3 and 4 months before and the air temperature 1 and 2 months before and interaction of random effects of rainfall, humidity and air temperature with DHF one month earlier.

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Ethical Clearance: This study was approved by Health Research Ethics Committee, Faculty of Public Health, Airlangga University, Surabaya, number 91/EA/KEPK/2019.

REFERENCES


The aims of the study are determine some immunological aspects namely total IgE, specific IgE, eosinophil count, IFN-γ, IL-10 and CCL-17 in serum of atopic patients and apparently healthy control to determine their relationship to atopic diseases. The age group of 21-40 years seems to be the most affect group with atopic diseases (P =0.0001) and asthmatic and allergic rhinitis patients are at this age group also (P =0.005, P =0.001 respectively). There is a major differences (P < 0.001) in level of total IgE between allergic subjects and controls and among three atopic patients groups (P < 0.001) but Specific IgE is significantly higher in asthmatics than allergic rhinitis and atopic dermatitis patients (P < 0.05). Inhalation of outdoor allergens is significantly affected asthmatic patients and allergic rhinitis patients (P < 0.01). Controversially, indoor allergens are significantly affecting atopic dermatitis (P < 0.01). The mean of IFN-γ serum level in asthma patients was lower than IFN-γ serum level of the control group and atopic dermatitis patients (P < 0.05). The allergic rhinitis patients mean of serum level of IL-10 was significantly low as compared to the mean of the serum level of IL-10 control group (P= 0.020). All of three groups of atopic patients are significantly have high level of CCL-17 compare to mean of serum level of control group (P < 0.01).

**Keywords:** asthma, allergic rhinitis, atopic dermatitis, cytokines.

**Introduction**

Allergy is the immune system reaction to substances that are not familiar to it, this case may cause various symptoms that can appear on the skin, in the sinuses, in the respiratory airways and in the digestive system, sensitivity and severity of allergic reactions vary from person to person can range from mild to even anaphylaxis (1). Allergens are precise substances (protein in nature) in the atmosphere that are transmitted to the human body by breathing that induce IgE responses in humans, and divided into indoor and outdoor allergens (2).

Mast-cells and eosinophils are activated (in the effectors phase of these responses) to rapidly release mediators that cause vasodilation, elevation in the permeability of blood vessels and bronchial and muscle contraction. Rapid immediate reactions occur in minutes of antigen challenge in a previously sensitized individual (3). Asthma can be defined as chronic-disease in respiratory tracts due to the lower-airways, with a several cells that have an important key role in it, due to risk of respiratory system diseases especially asthma, on other hand diabetic patients and asthma also contribute in risk of allergy diseases, these factors contribute in weakening of immune response to corticosteroids therapy (5,6).

Rhinitis is an inflammation of the mucus membrane of the nose in upper respiratory tract, there is a tight connection between AR and asthma, due to “one airway, one disease” concept (7). The encounter and contact between mast cell of dermal tissues and specific-IgE-receptors induce the secretion and making of a rapid series of inflammatory mediators, eosinophils are also contribute pertinent to skin-tissues damage, after their activation and recruitment onto the skin (8).

The aims of this study are determined some immunological aspects namely total IgE, specific IgE, eosinophil count, serum level of IFN-γ, IL-10 and CCL-17 with patients of atopic disease and apparently healthy control to determine their relationship to atopic diseases.

**Methodology**

**Study Groups:** A total of 75 diagnosed atopic patients, as 25 blood samples from atopic asthma, 25 blood samples from allergic rhinitis, 25 blood samples from atopic dermatitis patients, were integrated in this research, and
25 blood samples that were collected from apparently normal people and were considered as controls.

**Serological Tests:** Total serum IgE was determined by Immunoenzymetric Assay by the uses of the total IgE ELISA kit (Euroimmum/Germany). Allergen specific IgE was determined in serum of total subjects was estimated by using Polycheck Allergy kit (Biocheck GmbH, Munster, Germany). The levels of IFN-γ and of IL-10 in serum were estimated by using serum level of serum level of IFN-γ and serum level of IL-10 kits (Diaclone/France) and the serum level of CCL-17 were estimated by CCL-17 kit (Biosource/USA).

**Eosinophil Count:** Eosinophil count determined from complete blood count that was performed (to all study groups) by Beckman Coulter analyser instrument.

**Statistical Analysis:** SPSS program (version 20) was used to elucidate the differences in parameters. ANOVA, chi-square and Duncan tests were used to compare between means of parameters of patients and apparently healthy control.

### Results

Among all studied groups, the age groups were separated into three groups, first one was less than 21 years (childhood and beneath youth), the second group was between 21-40 years (adulthood) and the third group was over 41 years. In control group the frequency of subjects was 24 %, 52% and 24% in the first, second and third group respectively. In asthmatic patients, it was 16 %, 64 % and 20 % in the three groups respectively. The frequency of patients in three groups of allergic rhinitis was 12%, 56 %, and 32 % respectively. In atopic dermatitis, the frequency of patients was 32 %, 40% and 28% in the first, second and group respectively. The distribution of age groups displayed in table 1.

#### Table 1: Distribution of studied groups according to age groups

<table>
<thead>
<tr>
<th>Age groups (Years)</th>
<th>Control (25)</th>
<th>Total patients (75)</th>
<th>Asthma (25)</th>
<th>Allergic Rhinitis (25)</th>
<th>Atopic Dermatitis (25)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Less than 21</td>
<td>6</td>
<td>24.00</td>
<td>13</td>
<td>17.30</td>
<td>4</td>
</tr>
<tr>
<td>Between 21-40</td>
<td>13</td>
<td>52.00</td>
<td>42</td>
<td>56.00</td>
<td>16</td>
</tr>
<tr>
<td>Over 41</td>
<td>6</td>
<td>24.00</td>
<td>20</td>
<td>26.70</td>
<td>5</td>
</tr>
<tr>
<td>( \chi^2 )</td>
<td>3.920</td>
<td>18.320</td>
<td>10.640</td>
<td>7.280</td>
<td>0.560</td>
</tr>
<tr>
<td>P-value</td>
<td>0.141 N.S.</td>
<td>0.0001**</td>
<td>0.005**</td>
<td>0.026*</td>
<td>0.756 N.S.</td>
</tr>
</tbody>
</table>

N.S: Non-significant difference.

The study distributes groups in accordance with gender as shown in table 2. Approximately numerical ratio was found between females and males in all studied groups.

#### Table 2: Distribution of atopic patients and apparently healthy control according to gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>Control N = 25</th>
<th>Asthma N = 25</th>
<th>Allergic Rhinitis N = 25</th>
<th>Atopic Dermatitis N = 25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male no.</td>
<td>12</td>
<td>12</td>
<td>17</td>
<td>17</td>
</tr>
<tr>
<td>%</td>
<td>48.00</td>
<td>48.00</td>
<td>68.00</td>
<td>68.00</td>
</tr>
<tr>
<td>Female no.</td>
<td>13</td>
<td>13</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>%</td>
<td>52.00</td>
<td>52.00</td>
<td>32.00</td>
<td>32.00</td>
</tr>
<tr>
<td>( \chi^2 )</td>
<td>0.040</td>
<td>0.040</td>
<td>3.240</td>
<td>3.240</td>
</tr>
<tr>
<td>P-value</td>
<td>0.841 N.S.</td>
<td>0.841 N.S.</td>
<td>0.072 N.S.</td>
<td>0.072 N.S.</td>
</tr>
</tbody>
</table>

**Immunological Results:** Among all allergic groups, there is a considerable differences between allergic subjects and apparently healthy controls. Table 3 shows the elevation of serum total levels of IgE and the Mean eosinophil count ± S.E.
Table 3: Serum levels of total IgE and eosinophil count in atopic groups and apparently healthy control

<table>
<thead>
<tr>
<th>Eosinophil count (cell/µl)</th>
<th>Control n = 25</th>
<th>Total patients n = 75</th>
<th>Asthma n = 25</th>
<th>Allergic Rhinitis n = 25</th>
<th>Atopic Dermatitis n = 25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean of total IgE ± S.E.</td>
<td>30.16 ± 5.3</td>
<td>217.939 ± 19.5</td>
<td>292.64 ± 34.00 a</td>
<td>227 ± 36.21 A</td>
<td>133.93 ± 23.04 B</td>
</tr>
<tr>
<td>P-value</td>
<td>*H.S. P &lt; 0.001</td>
<td>H.S. P &lt; 0.001</td>
<td>H.S. P &lt; 0.001</td>
<td>H.S. P &lt; 0.001</td>
<td></td>
</tr>
<tr>
<td>Mean eosinophil count ± S.E.</td>
<td>149 ± 26.5</td>
<td>351.5 ± 34.1</td>
<td>450.4 ± 76.2 a</td>
<td>332.8 ± 43.4 Ab</td>
<td>271.2 ± 23.04 b</td>
</tr>
<tr>
<td>P-value</td>
<td>0.001</td>
<td>0.001</td>
<td>0.001</td>
<td>0.034</td>
<td></td>
</tr>
</tbody>
</table>

Specific IgE was positive for 18 out of 25 of asthmatics, 15 out of 25 of allergic rhinitis patients and 14 out of 25 of atopic dermatitis patients (table 4).

Table 4: Specific IgE serum level in atopic patients

<table>
<thead>
<tr>
<th>Atopic Groups</th>
<th>Asthma (n = 25)</th>
<th>Allergic Rhinitis (n = 25)</th>
<th>Atopic Dermatitis (n = 25)</th>
<th>Total patients (n = 75)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific IgE</td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Positive</td>
<td>18</td>
<td>72.00</td>
<td>15</td>
<td>60.00</td>
</tr>
<tr>
<td>Negative</td>
<td>7</td>
<td>28.00</td>
<td>10</td>
<td>40.00</td>
</tr>
<tr>
<td>$\chi^2$</td>
<td>4.840</td>
<td>1.00</td>
<td>0.360</td>
<td>4.813</td>
</tr>
<tr>
<td>P-value</td>
<td>0.028</td>
<td>0.317 N.S.</td>
<td>0.549 N.S.</td>
<td>0.028</td>
</tr>
</tbody>
</table>

N.S.: Non-significant.

The analysis of specific IgE to inhaled allergens among atopic patients, represented in table 5, indicate that specific IgE prevalence in pollen allergens (outdoor) in both asthmatics 75.00% and allergic rhinitis patients 69.33% but in atopic dermatitis, the prevalence of allergens was mostly indoor allergens 73.33% especially in Dermatophytes as shown in table 5.

Table 5: Specific inhaled allergens IgE prevalence in each atopic group

<table>
<thead>
<tr>
<th>Outdoor Allergens</th>
<th>Allergens</th>
<th>Code</th>
<th>Asthma (n = 75)</th>
<th>Allergic Rhinitis (n = 75)</th>
<th>Atopic Dermatitis (n = 75)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Birchen pollen</td>
<td>t3</td>
<td>7</td>
<td>11.11</td>
<td>6</td>
<td>11.53</td>
</tr>
<tr>
<td>Alder pollen</td>
<td>t2</td>
<td>10</td>
<td>15.87</td>
<td>9</td>
<td>17.30</td>
</tr>
<tr>
<td>Hazel pollen</td>
<td>t4</td>
<td>7</td>
<td>11.11</td>
<td>7</td>
<td>13.46</td>
</tr>
<tr>
<td>Oak pollen</td>
<td>t7</td>
<td>6</td>
<td>9.52</td>
<td>8</td>
<td>15.38</td>
</tr>
<tr>
<td>Timothy Grass pollen</td>
<td>g6</td>
<td>8</td>
<td>12.69</td>
<td>6</td>
<td>11.53</td>
</tr>
<tr>
<td>Rye pollen</td>
<td>g12</td>
<td>10</td>
<td>15.87</td>
<td>6</td>
<td>11.53</td>
</tr>
<tr>
<td>Mugwort pollen</td>
<td>w6</td>
<td>5</td>
<td>7.93</td>
<td>5</td>
<td>9.61</td>
</tr>
<tr>
<td>Plantain pollen</td>
<td>w9</td>
<td>8</td>
<td>12.69</td>
<td>5</td>
<td>9.61</td>
</tr>
<tr>
<td>6-Grass-Mix</td>
<td>gx7</td>
<td>2</td>
<td>3.17</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>Total</td>
<td>63</td>
<td>75.00*</td>
<td>52</td>
<td>69.33*</td>
<td>8</td>
</tr>
</tbody>
</table>
Conted…

<table>
<thead>
<tr>
<th>Indoor Allergens</th>
<th>d1</th>
<th>5</th>
<th>23.80</th>
<th>8</th>
<th>34.78</th>
<th>6</th>
<th>27.27</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dermatophyte pteronyssinus</td>
<td>d1</td>
<td>5</td>
<td>23.80</td>
<td>8</td>
<td>34.78</td>
<td>6</td>
<td>27.27</td>
</tr>
<tr>
<td>Dermatophyte farina</td>
<td>d2</td>
<td>6</td>
<td>28.57</td>
<td>7</td>
<td>30.43</td>
<td>7</td>
<td>31.81</td>
</tr>
<tr>
<td>Dog epithelia</td>
<td>e2/e5</td>
<td>3</td>
<td>14.28</td>
<td>3</td>
<td>13.04</td>
<td>3</td>
<td>13.63</td>
</tr>
<tr>
<td>Cat epithelia</td>
<td>e1</td>
<td>5</td>
<td>23.80</td>
<td>2</td>
<td>8.69</td>
<td>3</td>
<td>13.63</td>
</tr>
<tr>
<td>Horse epithelia</td>
<td>e3</td>
<td>2</td>
<td>9.52</td>
<td>1</td>
<td>4.34</td>
<td>3</td>
<td>13.63</td>
</tr>
<tr>
<td>Guinea pig epithelia</td>
<td>e6</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>Hamster epithelia</td>
<td>e84</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>Rabbit epithelia</td>
<td>e82</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>Aspergillus fumigates</td>
<td>m3</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>Cladosporium herbarum</td>
<td>m2</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>Penicillium notatum</td>
<td>m1</td>
<td>----</td>
<td>1</td>
<td>----</td>
<td>4.34</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>Alternaria alternate</td>
<td>m6</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>4.34</td>
<td>----</td>
<td>----</td>
</tr>
</tbody>
</table>

Total 21 25.00 23 30.67 22 73.33**

* specific IgE prevalence of outdoor allergens in both asthmatics and allergic rhinitis patients is significantly higher than in atopic dermatitis patients (P < 0.01).

** specific IgE prevalence of indoor allergens in atopic dermatitis patients is significantly higher than in asthmatics and allergic rhinitis patients (P < 0.01).

In this study the serum levels of IL-10 and Serum levels of CCL-17 were examined and tested, the results were listed in table 6.

**Table 6: Serum levels of IFN-γ, IL-10 and CCL-17 in atopic groups and apparently healthy control**

<table>
<thead>
<tr>
<th>Studied Groups</th>
<th>Control n = 21</th>
<th>Total patients n = 65</th>
<th>Asthma n = 20</th>
<th>Allergic Rhinitis n = 22</th>
<th>Atopic Dermatitis n = 23</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean of IFN-γ ± S.E. (pg/ml)</td>
<td>111.75 ± 11.3</td>
<td>104.307 ± 13.11</td>
<td>85.103 ± 5.7 b</td>
<td>103.864 ± 9.6 ab</td>
<td>121.430 ± 14.1 a</td>
</tr>
<tr>
<td>P-value</td>
<td>0.568 N.S.</td>
<td>0.045*</td>
<td>0.598 N.S.</td>
<td>0.601 N.S.</td>
<td>0.737 N.S.</td>
</tr>
<tr>
<td>Mean of IL-10 ± S.E. (Pg/ml)</td>
<td>40.576 ± 6.4</td>
<td>31.473 ± 3.8</td>
<td>33.025 ± 6.6 a</td>
<td>24.485 ± 2.07 a</td>
<td>36.808 ± 8.8 a</td>
</tr>
<tr>
<td>P-value</td>
<td>0.237 N.S.</td>
<td>0.419 N.S.</td>
<td>0.020*</td>
<td>0.737 N.S.</td>
<td>0.601 N.S.</td>
</tr>
<tr>
<td>Mean of CCL-17 ± S.E. (Pg/ml)</td>
<td>55.977 ± 5.2</td>
<td>148.329 ± 13.11</td>
<td>120.441 ± 17.09 a</td>
<td>153.006 ± 21.2 a</td>
<td>168.107 ± 27.09 a</td>
</tr>
<tr>
<td>P-value</td>
<td>P &lt; 0.001</td>
<td>P &lt; 0.01</td>
<td>P &lt; 0.001</td>
<td>P &lt; 0.001</td>
<td></td>
</tr>
</tbody>
</table>

**Discussion**

The middle age group (21-40 years) is the age at which the asthma and allergic rhinitis are occurred, but not atopic dermatitis, which affect all age group. The current results in agreement with Brakhas et al., (9) who concluded that allergic patients with any age have significant increased level of total IgE compared to healthy controls and explained the immunity responses towards allergens that mediates by IgE antibodies specifically to the allergen, after IgE bindings, mast cells and basophils were activated, opening a series of molecular and cellular actions which leads to the clinical manifestation of allergic diseases.

Indoor allergens are significantly affecting atopic dermatitis as compared with asthmatic patients and allergic rhinitis patients. The current results agreed with Smoldovskaya et al., (10) who concluded that outdoor allergens (pollen) are the most prevalent than indoor.
allergens, specific IgE response to most pollen allergens is associated strongly with asthmatics and allergic rhinitis patients than atopic dermatitis.

The high eosinophil count was seen in patients of atopic subjects than in apparently healthy control but asthmatics have eosinophil counts higher than allergic rhinitis and the last have eosinophil counts higher than atopic dermatitis. Allergen irritation of the airways can produce blood eosinophilia within hours (11), in allergic rhinitis, the recruitment of eosinophils to the nasal mucosa and lumen is driven by Th2 cytokines after the exposure to aeroallergens. Th2 cells are significant for producing key cytokines that includes IL13, IL5, and IL4. These cytokines have a great importance for antibody class switching, rule of local and systemic IgE synthesis, enrolment of inflammatory cells, and survival of eosinophils and also, concluded that eosinophil counts over 80 cells/ml were suggested the atopic aetiology towards the patients that shows symptoms of rhinitis (12).

In patients with asthma a clear changes in the epithelium airway’s, which includes a disruptions of the epithelial cell tight junctions, and impair producing of IFN-β IFN-α, that supports the epithelial damage and increases the susceptibility to viral infections (13), reducing the producing of IFN-γ by T-cells of asthmatic patients which correlated to the disease severity. Also, secretion of exogenous IFN-γ prevents the airway eosinophilia and hyper-responsiveness after allergen exposure (14).

Since Th1/Th2 imbalance can cause disorders in immune response, this reflects the lowest levels of IFN-γ in asthmatic patients; which produced by Th1 due to increase levels of eosinophil count (Table 3-6) which recruited in response to IL-5 and IL-13 produced by Th2, and increased levels of IgE (Table 3) which produced by B-cell in response to IL-4 that produced by Th2, like this imbalance may contribute to disease severity (15).

The key function played by the suppressor cytokines (IL-10) and transforms the growing of factor-β (TGF-β) that produces in functional Treg cells during creation of immunity tolerance to allergens, is very important in allergy. Both, Treg and Breg cells have a unique role in repression of IgE and initiation of IgG4 isotype allergen-specific antibodies mainly mediated by IL-10 (16). In healthy subjects, allergen-specific Tr1 cells are the dominant T-cell type and many researches clarified that these cells are capable to inhibit allergic immune responses to different allergenic sources such as birch pollen or, house dust mite, or related food allergens.

Activation of naïve T cells and their differentiation into Th2 cells are marked by the appearance of CCR4 receptors (CCL17 receptors) and other receptors, these receptors enable Th2 to move down the concentration gradient in response to CCL17 and other chemokines (1) due to increase in Th2 cells subsets and this, in turn, explains the increased levels of their cytokines. In the current study, serum CCL-17 levels were increased in all atopic groups. The current results agreed with Hijnen et al., (17) who concluded that serum TARC levels are specifically elevated in patients characterized with atopic dermatitis were significantly higher than those in allergic respiratory diseases compare to control. Chemokine regulates infiltration and specific migration of lymphocytes and recruitment of inflammatory cells into tissues (18).

As a conclusion, atopic disease can be diagnosed at any age, at both genders. A significant increase of serum IgE levels, eosinophilia, and serum levels of CCL-17 in atopic patients compared to control. Inhalation of outdoor allergens is significantly affected asthmatic patients and allergic rhinitis patients. Controversially, indoor allergens are significantly affecting atopic dermatitis. There is significant decrease in levels of serum IFN-γ in asthmatic patients, and slightly decreases in allergic rhinitis patients and no difference in serum levels of IL-10 in the three atopic groups.

Conflicts of Interest: No conflicts of interest.

Source of Funding: Entirely self-funded

Ethical Clearance: In vitro study

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Visual Capabilities According to RehaCom Cognitive System as a Healthy Significance to Determine the Performance in Tennis

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ABSTRACT

The research focused on several main aspects. The focus was paid to the visual capability measurement of the research sample and its relation to the performance level of the straightforward strike in tennis. Some visual capabilities were measured through the RehaCom Cognitive System. The researchers have prepared a test to measure the performance level of the straightforward strike in tennis as well as deducing the contribution ratios of the visual capabilities and building a predictive equation for the performance level through visual capabilities.

The statistical results that were collected, analyzed and discussed showed that there is a significant correlation between some of the visual capabilities in the skills performance of the straightforward strike in tennis and the highest percentages of the contribution of the visual capabilities in the skill performance were obtained and the predictive equation was based on the skill level.

Keywords: Visual Capabilities, Skill

Introduction

At the present time, tennis has attracted the attention of most of people, which led to its spread throughout the world because of its aesthetic performance and the arts of play. Visual capabilities play an active role in tennis because of the much stimulation exposed to the player such as the speed of the body and tracking the ball. In addition, recognition of all the stimulations to which the player is exposed by the eye and then transferred them to the brain, interpreted and giving appropriate reactions to get the best results.

Research Objectives

1. To identify the relationship between the most important visual capabilities on the one hand and its relationship to the performance of the straightforward strike in tennis on the other hand.

2. To identify the percentage of the contribution of the most important visual capabilities specified for the performance of straightforward strike in tennis.

3. To measure the level of skill performance and build predictive equation.

Research Procedures: The researchers adopted the descriptive methodology by using the method of correlative relationships for its convenience with the nature of the research. The researchers chose the sample from the research society in the simple random way represented by students of the third stage of the College of Physical Education and Sports Sciences – Al-Qadissiya University for the academic year 2018-2019, of (150) students and (30) students were selected as a sample to search.

Test of the Visual Capabilities: The researchers tested the students according to RehaCom Cognitive System in order to conclude to the statistical results of the visual capabilities. Such tests are available in the laboratories of the College of Physical Education and Sports Sciences - Al-Qadissiya University. RehaCom Cognitive System is known as a comprehensive system for containing examination and diagnostic units as well as training programs of high accuracy and objectivity far from bias and intervention. Its programs are described by...
adaptively, as well as the possibility to create motivation and willingness to train independently and under self-control, as well as many other features. The examination units provide results compared to a standard healthy sample of the same sex and age. It is worth mentioning that the system consists of (9) examination units. The visual capabilities included (validity accuracy, selectivity, visual reflex rate of the right eye, visual reflex rate of the left eye, parallel of the visual eye scan, and sequential research of the visual scan).

Results Analysis

Table 1: Statistical results for the vision field and visual scan according to the RehaCom Cognitive System

<table>
<thead>
<tr>
<th>Variables</th>
<th>MU</th>
<th>Arithmetic mean</th>
<th>Mean</th>
<th>Coefficient of variation (CV)</th>
<th>Standard Deviation</th>
<th>Standard Error</th>
<th>Calculated (T)</th>
<th>Level of sig.</th>
<th>Free deg.</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Validity accuracy</td>
<td>%</td>
<td>97.23</td>
<td>96.5</td>
<td>0.992</td>
<td>2.872</td>
<td>0.524</td>
<td>1.39</td>
<td>0.173</td>
<td>29</td>
<td>Insignificant</td>
</tr>
<tr>
<td>Selectivity</td>
<td>%</td>
<td>78.46</td>
<td>60.5</td>
<td>0.781</td>
<td>16.74</td>
<td>3.05</td>
<td>5.55</td>
<td>0.000</td>
<td>29</td>
<td>Insignificant</td>
</tr>
<tr>
<td>Right eye reflex</td>
<td>MS</td>
<td>403</td>
<td>391</td>
<td>0.968</td>
<td>41.85</td>
<td>7.64</td>
<td>1.60</td>
<td>0.118</td>
<td>29</td>
<td>Insignificant</td>
</tr>
<tr>
<td>Left eye reflex</td>
<td>MS</td>
<td>399</td>
<td>394</td>
<td>0.987</td>
<td>39.98</td>
<td>7.30</td>
<td>0.72</td>
<td>0.474</td>
<td>29</td>
<td>Insignificant</td>
</tr>
<tr>
<td>Value T parallel research</td>
<td>Degree</td>
<td>46.73</td>
<td>47</td>
<td>1.006</td>
<td>8.02</td>
<td>1.46</td>
<td>-1.82</td>
<td>0.857</td>
<td>29</td>
<td>Insignificant</td>
</tr>
<tr>
<td>T value of sequential research</td>
<td>Degree</td>
<td>47.86</td>
<td>57</td>
<td>1.180</td>
<td>6.64</td>
<td>1.21</td>
<td>-7.53</td>
<td>0.000</td>
<td>29</td>
<td>Significant</td>
</tr>
</tbody>
</table>

This table shows a comparison between the arithmetic means and hypothesis means to determine the sample levels in each of these variables. The table indicates that (the validity accuracy) when comparing its arithmetic mean to its hypothesis means, which is a benchmark for the comparison within the sample itself. When it is showed that it is insignificant at the significance level of (0.173) indicating that the sample of the research has an average level. The researcher attributed the reason to the slow reaction time of the research sample led to this level\(^1\). In addition, the validity accuracy and good concentration would lead to the use of mental abilities to fulfilling the achievement and having good performance\(^2\). Further, since the validity accuracy is medium, it is reflected in its ability to see goals in a timely and accurate\(^3\).

As for the selectivity variable, which is one of the variables, the higher the value, the more positive it was. Selectivity variable was indicated thru the data analysis and the comparison of the arithmetic means and hypothesis means. The research sample showed a significant level at the significance level of (0.000) and for the arithmetic mean, indicating that the sample has a high level of Selectivity\(^4\). The researcher attributed the reason to the reaction time to peripheral stimuli was at an appropriate level\(^5\).

As for the variable of the eye reaction time (right and left), which is one of the variables that depend on the measurement unit of time, which indicates the less time, the more positive of the examinee performance. Therefore, it is noted that there are significant differences at the significance level of (0.118) and (0.474) respectively. Since the arithmetic mean is higher than the hypothesis mean, it is indicated that the sample has an average level. The researcher attributed the reason behind the sample’s having an average level at the time of the visual reaction to the fact that the sample did not receive exercises or trainings on the visual reaction time, which led the sample to enjoying an average level of reaction time\(^6\). The reaction time depends on the visual and neurological systems and the sensory stimuli of the distances, colors, sizes and angles of vision in the completion of the duty and the extraction of a suitable response and rapid and stimulate nerve centers responsible for movement\(^7\).

The visual scan variable is indicated by the value of (T) for the parallel research and the value of (T) for the sequential research. Further, since it is one of the variables that depend on the measurement unit of the degree, which indicates the higher the score, the more positive of the examinee performance. Such indicates
when comparing the arithmetic mean of parallel research with the hypothesis mean, it is noted that there are no significant differences at the level of significance (0.857). It is indicated that the research sample has an average level of parallel research. When comparing the arithmetic mean of the sequential research with the hypothesis mean, it is found that it has a significance level at (0.000) and for the favor of the hypothesis mean, indicating that the sample has an average level of sequential research. It is also referring that the research sample has an average level of visual scanning by comparing the arithmetic mean of parallel and sequential research \[^{[8]}\]. The researcher attributed the reason for the average achievement in the visual scan to the lack of visual perception and the many stimuli that the examinee receives where he looks for the targeted stimulus. The stimuli are increased with the progress of the (10) test stages \[^{[9]}\]. The color of the stimuli changes between each stage, resulting in the loss of focus and attention on the target stimuli, thus affecting the performance result \[^{[10]}\]. In addition, the visual scan depends on the role of nervous system in tracking the movements or the ball as it moves \[^{[11]}\].

Table 2: Statistical results of skill performance

<table>
<thead>
<tr>
<th>Variables</th>
<th>MU</th>
<th>Arithmetic mean</th>
<th>Mean</th>
<th>Coefficient of variation (CV)</th>
<th>Standard Deviation</th>
<th>Standard Error</th>
<th>Calculated (T)</th>
<th>Level of sig.</th>
<th>Free deg.</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skill performance</td>
<td>Degree</td>
<td>47.86</td>
<td>57</td>
<td>1.180</td>
<td>6.64</td>
<td>1.21</td>
<td>-7.53</td>
<td>0.000</td>
<td>29</td>
<td>Significant</td>
</tr>
</tbody>
</table>

This table shows the level of skill performance by comparing the arithmetic mean with the hypothesis mean, which is a benchmark for the comparison within the same sample, it was found to be significant because the calculated (T) value is greater than the (T) value at the significance level of (0.000). It has been indicated that the research sample has an average or above average level. The researcher attributes the reason for that to the fact that the skill of a front-end strike is one of the front-hitting skills, one of the basic and easy-to-play skills in tennis, familiar and widespread in tennis \[^{[12]}\], but at the same time upon which learning most other skills \[^{[13]}\] are built. The researcher points out that students focus on the accuracy in more than the other aspects so that he tries as much as possible to use the physical and biomechanical variables so that the strike is correct and at the required level.

**Determination of the performance levels of the straightforward strike in tennis:** The results of the skill performance were statistically analyzed and the sample was divided into five levels. The results showed that the arithmetic mean of the research sample of (30) students was (75.43) with a standard deviation of (9.61) and a percentage (40%). This indicates the occurrence of the research sample at the above average level.

Table 3: Levels, number and percentage achieved to test the skill level

<table>
<thead>
<tr>
<th>Sr.</th>
<th>Level Degree</th>
<th>Range</th>
<th>Achieved number</th>
<th>Percentage (%)</th>
<th>Arithmetic mean</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Very low</td>
<td>51.33-42.82</td>
<td>1</td>
<td>3.33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Low</td>
<td>59.84-51.33</td>
<td></td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Average</td>
<td>68.35-59.84</td>
<td>6</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>above average</td>
<td>76.86-68.35</td>
<td>12</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>high</td>
<td>85.37-76.86</td>
<td>7</td>
<td>23.33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>very high</td>
<td>93.90-85.37</td>
<td>4</td>
<td>13.33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>30</td>
<td></td>
<td>100%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 1: Diagram for the sample levels in skill performance
Results of the contribution of visual capabilities and biomechanical variables in skill performance and predictive equation

The researcher has used the regression model to achieve the goal of prediction. For the large number of independent variables by which the dependent variable can be predicted (the skill performance), the researcher used the multiple regression on steps. For this purpose, the adjusted contribution ratio was obtained (the third column of the multiple correlation tables) \[^{[14]}\]. The researcher also used the stepwise method in the regression equation. These multiple correlations were tested by using the F-law, where the value of the value is detected using the significance level. As for the predictive equation, the value of the constant and regression slope parameters and the value of \((T)\), which reflects the difference in the inclination values from zero, were extracted.

Results of the contribution of visual capabilities in skill performance and predictive equation

**Table 4: Coefficient of correlation and percentages of the contribution of visual capabilities in skill performance**

<table>
<thead>
<tr>
<th>Variables</th>
<th>R</th>
<th>R²</th>
<th>Free deg.</th>
<th>F- calculated value</th>
<th>Level of Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>T value for sequential visual scanning</td>
<td>0.619</td>
<td>0.383</td>
<td>28, 1</td>
<td>17.411</td>
<td>0.000</td>
</tr>
<tr>
<td>Validity accuracy</td>
<td>0.695</td>
<td>0.483</td>
<td>27, 1</td>
<td>12.597</td>
<td>0.000</td>
</tr>
</tbody>
</table>

**Table 5: Regression parameters and the predictive equation of visual capabilities and skill performance**

<table>
<thead>
<tr>
<th>Constant</th>
<th>Regression</th>
<th>Variables</th>
<th>((T)) value</th>
<th>Level of Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>-78.246</td>
<td>1.007</td>
<td>(T) value for sequential visual scanning</td>
<td>4.885</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>1.085</td>
<td>Validity accuracy</td>
<td>2.276</td>
<td>0.036</td>
</tr>
<tr>
<td>Predictive equation</td>
<td>Skill performance = -78.246 + 1.007 \times (T) value for sequential visual scan + 1.085 \times validity accuracy</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This table shows that the value of \((F)\) was significant for both variables, indicating their ability and validity to predict the dependent variable by the level of significance that shows the probability of chance at (0.000). This table shows the significance of regression slope by the \((T)\) value as a function at the level of significance (0.000), (0.036), indicating the high probability of predicting skill performance through the two variables above. The sequential search variable in the visual scanning was the first in the correlation of the visual capabilities under study because it makes sense to be the highest correlation because it performs a high degree and control of skill performance \[^{[15]}\]. It is obvious to the mobile targets depends on the search or visual survey and different from the fixed goals, this is shown in the variable accuracy of the installation, as the fixed goals depend on attention and focus at a specific point, depending on the fixed focus system focused on a fixed target center, i.e. selection of stimuli that is in the center of the sight. The visual search depends on the central and peripheral validity accuracy \[^{[16]}\], indicating that the visual scan depends on the accuracy of the installation so that it is a form that is the most highly correlated with the skill performance and capable of predicting the dependent variable.

**Conclusions and Recommendations**

The validity accuracy and the visual scanning is the proportion of the contribution of the correlation with the performance of the skilled tennis players in general and for the straightforward strike in tennis in particular. We can also predict the skill level of the players through the above variables to compensate for the values of the two variables equation prediction.

The researchers recommend the trainers and teachers to develop the visual capabilities of tennis players through training for the visual capabilities and strengthen the trainee, which is reflected positively in the performance of skilled players.

**Conflict of Interest:** Nil

**Source of Funding:** Self

**Ethical Clearance:** Not required
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6. Mustafa Taha Mahmoud. The impact of visual exercises on the development of speed and accuracy of some offensive skills and perceptions Sense - kinetic of field hockey players, doctoral thesis, University of Benha, Faculty of Physical Education for Boys, 2015, p.26


Change Commitment and Change Efficacy of Public Health Center in Indonesia in Implementing Efforts to Improve the Quality of Health Services

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¹The Doctoral Program of Public Health, ²Department of Health Policy and Administration, ³Department of Health Promotion, Faculty of Public Health, Universitas Airlangga; ⁴National Institute of Health Research and Development, Indonesian Ministry of Health

ABSTRACT

The successful implementation of efforts to improve the quality of health services is influenced by many variables, both organizational and individual variables. The two main variables that are widely discussed when studying the level of organizational readiness to change are commitment to change and efficacy to change. This research was conducted to analyze change commitment and change the efficacy of Public Health Centers (PHC) in Indonesia in implementing efforts to improve the quality of health services. A cross-sectional survey was conducted on health workers in 40 PHCs in Surabaya, to measure change commitment, change efficacy, and efforts to improve the quality of health services that have been implemented. The rank Spearman correlation test is done to prove the relationship between these variables. The results showed that the implementation of efforts to improve the quality of health services was not significantly related to change commitment, but there was a significant relationship with change efficacy. Therefore, so that the implementation of efforts to improve the quality of health services can run well, it is necessary to carry out various activities to improve the capabilities and skills of the staff of PHCs to have an impact on increasing efficacy.

Keywords: Change commitment, change efficacy, health service quality, readiness to change

Introduction

Organizational change is not a new domain in the study of organizational behavior. Various studies have been conducted by researchers from various countries to examine aspects of organizational change, including research in India¹, Canada², and Indonesia³. Various studies have found that organizational change processes are influenced by many variables, both organizational and individual level variables. Some of the individual variables examined in the study included commitment, self-efficacy, and change readiness. Weiner⁴ found that organizational readiness to change is a key factor that will determine the success of implementing change. Therefore, research on organizational readiness to change will always be an interesting area of study, because, for all organizations that want to grow, organizational change is an event that cannot be avoided.

For primary health care organizations in Indonesia, in the last 4 years, there has been a huge wave of change. Since the implementation of the National Health Insurance policy in 2014, all Public Health Centers (PHC) in Indonesia must carry out a new management order in which it emphasizes the importance of the quality of health services, through the accreditation mechanism. The quality standards written in the accreditation guidelines stipulate that quality audits both internal and external are obligations that must be routinely carried out. This rule has succeeded in overhauling various habits and patterns of program governance from conventional ways to being more professional and accountable. International
surveys conducted in 2002\textsuperscript{3} and 2010\textsuperscript{6}, prove that health care accreditation is often used for quality improvement or as a means for health reform.

But unfortunately not all health workers at the PHC are ready to change. In a preliminary survey conducted at one of the PHC in Surabaya, there was still 4.9\% of staff who did not support the accreditation process, and 9.8\% of staff felt indifferent. The attitude of these officers will certainly influence the readiness of the PHC to change.

In accordance with the concept presented by Weiner\textsuperscript{4} that commitment and efficacy are indicators of change readiness, measurement of commitment and efficacy is important to diagnose the level of readiness to change in an organization. Therefore, this research was conducted with the aim of analyzing the readiness of PHCs in Indonesia in implementing efforts to improve service quality, through measuring commitment and efficacy.

**Method**

The study was conducted at a PHC in the city of Surabaya. Surabaya is the capital of the East Java province, and is the second largest city, after Jakarta. The number of PHCs involved in this study was 40, which were selected by simple random sampling from 63 PHCs in Surabaya. The variables measured in this study are a commitment to change and efficacy to change as independent variables and the implementation of efforts to improve service quality as dependent variables. Each variable was measured using a questionnaire with closed-ended answers, with 4 rating scales, 1: poor, 2: near poor, 3: fair, 4: excellent. Data were collected through surveys with cross-sectional design.

Commitment to change is defined as a strong will or mindset that binds individuals to behave in a certain way needed for successful implementation of change\textsuperscript{7}. While change efficacy describes shared beliefs of organizational members that they have the capability to manage and carry out a series of actions in implementing change\textsuperscript{4}.

The measurement of change commitment in this study refers to article by Visagie and Steyn\textsuperscript{8} which state that the change commitment indicator consists of: (1) Willing to make extra efforts to ensure the organization succeeds in implementing changes; (2) Willing to carry out relational functions, share information with other parties during the change; (3) Willing to act beyond the normative demands to help the organization function. Whereas the measurement of change efficacy refers to the article by Bandura\textsuperscript{9} which states that there are several things that describe efficacy, including the belief in one’s ability to diagnose the demands of the task, design and evaluate alternative actions, set goals, motivate themselves, manage stress, and attenuate disturbing thoughts. Implementation of efforts to improve service quality is measured by using measurement indicators developed based on several standard assessment points in the accreditation guidebook issued by the Indonesia Ministry of Health.

The data collected from the survey results are processed in stages, first a descriptive analysis is performed to get a description of the conditions in each measured variable, and the second bi-variate analysis with the Rank Spearman correlation test to draw conclusions about the relationship between change commitment and change efficacy with the implementation of efforts to improve service quality.

**Findings**

The descriptive analysis indicate variations in measurement results, as shown in table 1. Change commitment obtained the highest score compared to the other two variables. With the score of mode 4.00 and a mean 3.143, it shows that the commitment of the PHC staff to change is in fair condition. The result of change efficacy measurement is only a slight difference, which is the mean 3.083, meaning that the level of confidence of the PHC staff to be able to implement the changes has been fair, but the mode score obtained is only 2.97. This illustrates that there are still many PHCs staffs that are a little less confident in their ability to implement the efforts to improve service quality. Meanwhile, the results of the efforts to improve service quality results in the lowest score, that is modes 2.18 and mean 2.446, meaning that the PHCs has not been able to implement service quality standards properly.
Table 1: The change commitment, change efficacy, and implementation of efforts to improve service quality at the PHC

<table>
<thead>
<tr>
<th>Variables</th>
<th>n</th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>Mode</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change commitment</td>
<td>40</td>
<td>2.13</td>
<td>4.00</td>
<td>3.143</td>
<td>4.00</td>
<td>0.5336</td>
</tr>
<tr>
<td>Change efficacy</td>
<td>40</td>
<td>2.00</td>
<td>4.00</td>
<td>3.083</td>
<td>2.97</td>
<td>0.4870</td>
</tr>
<tr>
<td>Implementation of efforts to improve service quality</td>
<td>40</td>
<td>2.02</td>
<td>2.82</td>
<td>2.446</td>
<td>2.18</td>
<td>0.1905</td>
</tr>
</tbody>
</table>

To examine whether there is a relationship between change commitment, change efficacy and the implementation of efforts to improve service quality, the Rank Spearman correlation test is conducted, with results as can be seen in table 2. The test results between change commitment and the implementation of efforts to improve service quality obtained a correlation coefficient of 0.207 and sig. (2-tailed) 0.200. This means that the strength of the relationship between change commitment and the implementation of efforts to improve service quality is very weak, so the relationship is said to be insignificant.

While for the change efficacy obtained different results. The strength of the relationship between change efficacy and the implementation of efforts to improve service quality is 0.347 and sig. (2-tailed) 0.028. This means that change efficacy is related to the implementation of efforts to improve service quality with sufficient relationship strength so that the relationship between the two is significant. According to these results, it can be concluded that what is more necessary for the success of the implementation of efforts to improve service quality in this study is change efficacy.

Table 2: The relationship between change commitment and change efficacy with the implementation of efforts to improve service quality

<table>
<thead>
<tr>
<th>Spearman’s rho</th>
<th>Change commitment</th>
<th>Implementation of efforts to improve service quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change commitment</td>
<td>Correlation Coefficient</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>40</td>
</tr>
<tr>
<td>Implementation of quality standard</td>
<td>Correlation Coefficient</td>
<td>0.207</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>0.200</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>40</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Spearman’s rho</th>
<th>Change efficacy</th>
<th>Implementation of efforts to improve service quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change efficacy</td>
<td>Correlation Coefficient</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>40</td>
</tr>
<tr>
<td>Implementation of quality standard</td>
<td>Correlation Coefficient</td>
<td>0.347*</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>0.028</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>40</td>
</tr>
</tbody>
</table>

*Correlation is significant at the 0.05 level (2-tailed).

Both change commitment and change efficacy, describe the psychological conditions possessed by members of the organization, or often referred to as the shared team property. High organizational readiness to change will be obtained if shared property teams are dominated by members of the organization who have high commitment and efficacy of change so that they will be encouraged to initiate change, exert greater effort, show greater persistence, and display more cooperative behavior.

The findings of this study indicate that the implementation of efforts to improve service quality at the PHC in Surabaya is still in a sufficient category.
Based on the results of statistical tests, it was obtained information that the factors that contributed to the less optimal implementation of efforts to improve service quality were the change efficacy. Although change commitment is good, but change efficacy still tends to be low, this has resulted in health service quality standards as required in the accreditation guidelines cannot be implemented optimally.

As has been widely known, the implementation of health service accreditation has been recognized internationally as a process used to assess and improve the quality of services¹. Indonesian government regulations that require every health service organization to be accredited, can be seen as a factor causing changes in PHCs. The impact of accreditation on health service organizations can be manifested in three types of changes, that is: 1) changes in the area of management, organization and culture; 2) changes in professional practice and clinical procedures; and 3) changes in health service outcomes. Assessment standards in accreditation require health service organizations to apply rigid quality standards, in accordance with those set out in the accreditation handbook. The implementation of PHC accreditation in Indonesia forced the PHC to radically improve management practices. If not prepared properly, the process of improving quality through this accreditation will fail.

To avoid these failures, both change commitment and change efficacy are needed together. As an attitude, commitment is often defined as (1) a strong desire to remain a member of a particular organization; (2) willingness to mobilize high-level efforts on behalf of the organization; and (3) confidence, trust and acceptance of the values and objectives of the organization. Hakim in his article also stated that the willingness of employees to contribute energy in achieving organizational goals was significantly affected by a commitment to the organization. The greater the energy contributed, the better the change effort will be carried out. Meanwhile, efficacy describes the beliefs of organizational members in carrying out their efforts to achieve goals. Goddard and Salloum argue that the level of group effectiveness in resolving challenges depends heavily on the collective efficacy they have. Positive beliefs will positively influence the normative environment of the working group and will stimulate the emergence of creativity, endurance, and commitment to achieving performance goals.

If in an organization that is experiencing a phase of change, one of the commitments or efficacy is in a weak condition, it will weaken the level of readiness to change. As the results in this study, change commitment is actually already in a good condition, but because change efficacy still tends to be weak, it results in less effective implementation of efforts to improve service quality in PHCs. Klein and Sorra define the effectiveness of implementation as the consistency and quality of efforts by members of the organization of new ideas, programs, processes, practices or technologies. Referring to the opinion of Klein and Sorra, it can be interpreted that the PHCs in Surabaya have not consistently made efforts to improve the quality of health services. Consistency in implementing service quality standards requires a long-term and sustainable effort. Some previous research found that consistency often appears as a weakness of the accreditation process. For example, a time series study conducted by Devkaran and O’Farrell found that although accreditation was carried out with the aim of improving the performance of quality health care organizations, this increase was not able to be maintained during the 3-year accreditation cycle. To ensure that efforts are made to improve quality over the long term, it is important that the commitment is accompanied by strong efficacy.

Commitment is indeed to make PHC staff have a strong intention to carry out health services according to the quality standards that should be, but if this is not supported by the belief that they can implement quality standards properly, what will happen is a decrease in staff motivation at work. Of course, this will ultimately have an impact on decreasing the PHC’s performance.

Therefore, the recommendations that can be given based on the results of this study are the need for increase self-efficacy for PHC officers through a series of capacity building activities and training related to the implementation effort to improve health service quality. The improvement of the capabilities of the PHC staff is needed as a way to maintain and foster staff commitment in implementing quality standards on an ongoing basis.

**Conclusion**

To establish health service organizations to be ready to change, change commitment and change efficacy is needed. The correlation test results show the relationship between change commitment and the implementation of
efforts to improve service quality is not significant, but between change efficacy and the implementation of efforts to improve service quality, significant results are obtained. The existence of high commitment makes PHC staff willing to devote greater energy to the successful implementation of better quality improvement for health services. But commitment without high efficacy will cause obstacles in implementing high-quality standards properly.

**Ethical Approval and Consent to Participate:** This study has an ethical clearance that was approved by the national ethics committee (ethic number: 500-KEPK). Informed consent was used during data collection, which was considered aspects of data collection procedures, voluntary, and confidentiality.

**Conflict of Interest:** The authors declare no conflict of interest, financial or otherwise.

**Acknowledgments**

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Post Immunization Follow-up Events (KIPI) of Diphtheria Outbreak Response Immunization (ORI) in Health Office of East Java Provincial

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ABSTRACT

Outbreak Response Immunization (ORI) is an activity carried out in an effort to overcome diphtheria outbreaks. Post Immunization Follow-up Events (KIPI) are medical events related to immunization. Diphtheria is an acute upper respiratory tract disease that is highly contagious but can be prevented by administering the DPT vaccine. The purpose of this study is to describe the profile of diphtheria cases in the East Java province. The design of this study used a descriptive research design with a case report design. Data obtained based on case reports of KIPI diphtheria ORI reported by KIPI surveillance officers from 38 regencies of East Java in 2018. Based on subjects who experienced KIPI cases as many as 2007 cases, the most age who experienced KIPI after being given diphtheria immunization was Age <5 year (59.2%) with female sex (52.6%). While the symptoms most often experienced after DPT immunization were heat (45.2%), fever and swelling injection location (17.7%), swelling (8.9%), dizziness (5.5%) and mutation and fever (5.2%). The need for coordination between health workers is still needed so that they can take appropriate action if the baby or toddler experiences a KIPI reaction.

Keywords: immunization, outbreaks, and diphtheria

Introduction

In the era of globalization, immunization is an effort to prevent an infectious disease that is the most perfect and has an impact on improving public health. Therefore, the need for vaccines is increasing along with the world’s desire to prevent various diseases that can cause disability and death. Diphtheria is an acute disease caused by corynebacterium diphtheria which is transmitted through direct contact or droplets from patients(1). DPT immunization is an attempt to administer diphtheria toxoid from coughing, sneezing, vomiting, through cutlery with patient, pertussis vaccine and tetanus toxoid which aims to cause active immunity to diphtheria, pertussis, and tetanus at the same time(2). Increasing the scope of immunization provision will increase vaccine use as well as related events after immunization(3).

Diphtheria is one of the types of infectious diseases that can cause an outbreak. Indonesia is one of the countries with the largest cases of diphtheria in the world(4). So if one case of probable diphtheria is found or a confirmed case is an extraordinary event(5). In the last three years diphtheria cases experienced a significant increase in 2015 as many as 529 cases, in 2016 as many as 591 cases, and in 2017 as many as 622 cases(6)(7).

Adverse Events Following Immunization (AEFI) or Post-Immunization Follow-up Events (KIPI) are those related to immunization or relating to vaccines given or happened by chance(8). According Sari et.al (2018) when dealing with events related to immunization, please note that these events are related to vaccines given or happened incidentally. The purpose of KIPI monitoring is to monitor the events that occur due to immunization, it is necessary to report recording of all reactions that arise after giving immunization. The KIPI reaction can be monitored through a good surveillance system to obtain a safety profile of vaccine use in the field. To find out the magnitude of KIPI problems in Indonesia, KIPI reporting and recording is needed and coordination.
between decision makers and implementing officers in the field, in order to determine the attitude in overcoming the KIPI that occurs.

Material and Method

This research was a descriptive study with a case report method. The time for data collection began at the time of the first round of diphtheria ORI implementation in February, the second round of July and the third round in November 2018. The population in this study was all infants or toddlers who got in the East Java Provincial Health Office in 2018. Samples at this study was data on infants or toddlers who experience KIPI diphtheria ORI reported from 38 regencies reported by KIPI surveillance officers. Sampling uses a simple random sampling technique based on data from a case report of KIPI diphtheria ORI reported by surveillance officers in 38 in East Java province 2018.

Findings

Characteristics of Case Patients with KIPI Diphtheria ORI in East Java in 2018

Table 1: Distribution of Gender of Respondents Case of KIPI Diphtheria ORI in Health Office of East Java Provincial 2018

<table>
<thead>
<tr>
<th>Sex</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men</td>
<td>951</td>
<td>47.4%</td>
</tr>
<tr>
<td>Women</td>
<td>1056</td>
<td>52.6%</td>
</tr>
<tr>
<td>Total</td>
<td>2007</td>
<td>100%</td>
</tr>
</tbody>
</table>

Based on Table 1 shows that the respondent sex of patients with KIPI diphtheria ORI were more women than men who numbered (52.6%).

Table 2: Distribution of Age Respondents in the Case of KIPI Diphtheria ORI Health Office of East Java Provincial 2018

<table>
<thead>
<tr>
<th>Age</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;5 Year</td>
<td>1189</td>
<td>59.2%</td>
</tr>
<tr>
<td>≥5 Year</td>
<td>818</td>
<td>40.8%</td>
</tr>
<tr>
<td>Total</td>
<td>2007</td>
<td>100%</td>
</tr>
</tbody>
</table>

Based on Table 2 shows that the age of respondents with KIPI diphtheria ORI is more than <5 years old, amounting to (52.6%).

Table 3: Distribution of KIPI Reactions in Respondents in the Case of KIPI Diphtheria ORI in Health Office of East Java Provincial 2018

<table>
<thead>
<tr>
<th>KIPI Reactions</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hot</td>
<td>908</td>
<td>45.2%</td>
</tr>
<tr>
<td>Fever and dizziness</td>
<td>9</td>
<td>0.4%</td>
</tr>
<tr>
<td>Fever, Dizziness, Vomiting and Swelling</td>
<td>14</td>
<td>0.7%</td>
</tr>
<tr>
<td>Fever, Swelling and Red</td>
<td>23</td>
<td>1.1%</td>
</tr>
<tr>
<td>Fever and Swelling</td>
<td>356</td>
<td>17.7%</td>
</tr>
<tr>
<td>Dizziness and fainting</td>
<td>14</td>
<td>0.7%</td>
</tr>
<tr>
<td>A cold sweat</td>
<td>1</td>
<td>0.0%</td>
</tr>
<tr>
<td>Vomiting and Diarrhea</td>
<td>22</td>
<td>1.1%</td>
</tr>
<tr>
<td>Allergy</td>
<td>7</td>
<td>0.3%</td>
</tr>
<tr>
<td>GE</td>
<td>5</td>
<td>0.2%</td>
</tr>
<tr>
<td>Seizures</td>
<td>7</td>
<td>0.3%</td>
</tr>
<tr>
<td>Swelling and heat</td>
<td>36</td>
<td>1.8%</td>
</tr>
<tr>
<td>Arm pain</td>
<td>26</td>
<td>1.3%</td>
</tr>
<tr>
<td>Diarrhea and severe dehydration</td>
<td>3</td>
<td>0.1%</td>
</tr>
<tr>
<td>Fever and seizures</td>
<td>41</td>
<td>2.0%</td>
</tr>
<tr>
<td>Epilepticsuses</td>
<td>1</td>
<td>0.0%</td>
</tr>
<tr>
<td>Meningoencephalitis</td>
<td>1</td>
<td>0.0%</td>
</tr>
<tr>
<td>Fever, Bapil, Nausea and Vomiting</td>
<td>6</td>
<td>0.3%</td>
</tr>
<tr>
<td>Myalgia dan Atralgia</td>
<td>1</td>
<td>0.0%</td>
</tr>
<tr>
<td>Urtikari</td>
<td>17</td>
<td>0.8%</td>
</tr>
<tr>
<td>Coughs and colds</td>
<td>5</td>
<td>0.2%</td>
</tr>
<tr>
<td>Swollen</td>
<td>179</td>
<td>8.9%</td>
</tr>
<tr>
<td>Gag</td>
<td>58</td>
<td>2.9%</td>
</tr>
<tr>
<td>Dizzy</td>
<td>110</td>
<td>5.5%</td>
</tr>
<tr>
<td>Fever, Swelling and Seizures</td>
<td>5</td>
<td>0.2%</td>
</tr>
<tr>
<td>Vomiting and dizziness</td>
<td>33</td>
<td>1.6%</td>
</tr>
<tr>
<td>Vomiting and Fever</td>
<td>105</td>
<td>5.2%</td>
</tr>
<tr>
<td>Swelling, Vomiting and Dizziness</td>
<td>1</td>
<td>0.0%</td>
</tr>
<tr>
<td>Coughs and colds</td>
<td>1</td>
<td>0.0%</td>
</tr>
<tr>
<td>Fever and Swelling Injections</td>
<td>1</td>
<td>0.0%</td>
</tr>
<tr>
<td>Fever, Nausea and Vomiting</td>
<td>1</td>
<td>0.0%</td>
</tr>
<tr>
<td>Nausea and Vomiting</td>
<td>1</td>
<td>0.0%</td>
</tr>
<tr>
<td>Nausea, Vomiting, Diarrhea and Shortness</td>
<td>1</td>
<td>0.0%</td>
</tr>
<tr>
<td>Total</td>
<td>2007</td>
<td>100%</td>
</tr>
</tbody>
</table>
Based on Table 3 shows that after DPT immunization, the most KIPI reactions from respondents with KIPI Diphtheria ORI patients were fever in 908 cases (45.2%), fever and swelling 356 cases (17.7%), swelling 179 cases (11%), and vomiting and diarrhea 105 (5.5%).

Discussion

Based on the results of the KIPI surveillance officer report that occurred in infants and children after DPT immunization was fever. If a toddler or child has a fever after immunization, then a toddler or child is stated to experience a KIPI reaction in the form of a general reaction that occurs after immunization\(^9\). In Table 3, the most common symptoms of KIPI are fever of 45.2%, then symptoms of fever accompanied by swelling at the injection site 17.7%. Ranuh\( et.al\) (2014) stated that, KIPI reactions often occur in infants after DPT immunization. Children who after being given DPT immunization experience a KIPI reaction in the form of fever, this can occur as a result of the preparation of a vaccine that is not in accordance with the procedures and methods of injection in infants that are not appropriate. Therefore, health workers must really understand and apply the theory of how to prepare vaccines, how to inject the right ones to babies so as to suppress the occurrence of KIPI reactions.

Some studies say that children will experience KIPI after DPT immunization. The results of the KIPI surveillance report data analysis were supported by Sari’s research (2018) that the symptoms of KIPI that appeared most after receiving KIPI immunization were fever of 82.9%. The most common symptoms are fever, swelling in the location of injection and redness at the injection site\(^9\). In addition, research conducted by Sari (2018) that symptoms that occur after immunization is related to vaccine induction, which is generally predictable before immunization is given because vaccine adverse reactions and clinically are usually mild, and these intersection reactions have been well identified and are listed in the vaccine usage instructions.

The results of research conducted by Sari (2018) found that it was interesting that one child could experience 4 symptoms at a time, but the symptoms of KIPI on DPT experienced by children were mild KIPI with local symptoms and general symptoms. Mild KIPI is an event or symptom that is commonly experienced by post-immunization infants so that the incident is prevalent because the care can still be done by the baby’s parents. The most common symptoms of local KIPI are swelling at the injection site and symptoms of KIPI, the most common of which is fever.

Conclusion

Based on the analysis of report data 2018 on KIPI diphtheria ORI in children who were immunized against DPT, 45.2% had a fever. This happens because fever is a normal reaction that occurs in people who have just received DPT immunization. However, it should be noted from parents, especially mothers, to understand the situation, so parents do not stop giving DPT immunization.

Conflict of Interest: None

Source of Funding: Independent

Ethical Clearance: This Study was approved by Health Research Ethics Committee of Public Health, Airlangga University.

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Evaluation *Eruca Sativa* Aqueous and Alcoholic Extract on *Fusarium Oxysporum* Growth

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**ABSTRACT**

The current study was done to evaluate the effect arugula extracts on the growth of *Fusarium oxysporum* mushrooms, which included extraction of active ingredients in the plant, and effect of these extracts on inhibition of *fusarium oxysporum* fungus. The results of the study showed the efficacy of alcoholic and aquatic plant extracts on fungus growth, and the results showed that the alcoholic extract has a significant effect in inhibition the growth of fungus, it was noted that the developing colony diameter decreases in the higher the concentration of aquatic and alcoholic extract of plant to the lowest diameter 0.75 mm when the concentration 100% of the extract compared to the control treatment of 3.4 mm. The statistical analysis of the results indicates that there were differences in the bioactivity in comparing between the alcoholic extract and water extract according to the concentrations. It was found that bioactivity of the extract increases with the increasing of the concentration and the 100% of alcoholic extract shows the higher bioactivity in comparing with other concentrations and in comparing with water extract.

**Keywords:** *Eruca Sativa*, *Fusarium oxysporum*, Growth, Evaluation

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**Introduction**

The origin of the word *Eruca sativa* rocket can be attributed to the sharp taste caused by leaves on the tongue and has a variety of labels and most often called the vegetable table (Salad rocket) (¹).

The plant is described as having a length of 30-60 cm. Its leaves are simple or fragmentary to the feathers of the shape, the upper leaves have equal edges. Flowers are light purple or yellow, and bloom in March to July seeds oval shape (², ³).

The rocket plant uses many medicinal uses for the treatment of dermatitis, localized burns, poor digestion, hair loss and reduced blood sugar for people with diabetes, which works to slow absorption of sugar in the intestines and sexual anchors (⁴).

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It has a very large proportion of nutrients for the weight of its leaves, as well as being very rich in food compared to the very small quantity that gives it calories, as it contains many important vitamins for the body, such as vitamins A, C and K, as well as Minerals, including calcium, magnesium and potassium, Sodium, and in this sense, it is a good choice for those who want to lose weight. Research and studies have indicated that drinking watercress leaves and eating sour seeds, such as mustard, as well as eating leafy leaves, has many different benefits. (⁵).

Rocket has certain benefits because of the food it contains, it helps to reduce the risk of cancer, increase bone health, improve the health of eyesight and skin, as well as it raises the performance of the brain and immune system. The most common causes of vascular wilt disease, mainly affects annual vegetables, *Fusarium* longer fungus. Agricultural crops, plants grown for their flowers, ornamental plants, perennials and herbs, and mediated by several specialized forms of each family known as Forma-specials and genetically different, which has so far identified 75 patterns (⁶-⁸).

The fungus grows through on the plant bark of the root towards the vascular vessels, and is placed in the wooden vessels of the plant, which leads to wall clogging
or rupture. In both cases, the fungus stops. The arrival of water and nutrients into leaves branches dry and wilt occurs (9, 10). This will cause economic losses to crops and the advantage of the mushroom ability to produce many of the toxins such as Fusaric Acid, Vomitoxin and Desoxynivalenol, since no studies have been conducted on the effect of the watercress leaves extract on the growth of the plant, F. oxysporum fungi. In this study we looked at the selection of different concentrations of water and alcohol extract of the watercress plant on the growth of Foxy Sporum fungus laboratory (11, 12).

Material and Method

Plant Combination: The plant sample was collected from the popular markets in the Dora area in Baghdad. The plant was washed with running water to remove the dust and soil from the surface if the plant then it was left to dry at room temperature, taking into account continuous rounding to prevent rot, then the powder was kept in dry packs.

Preparation of plant extract

Hot Water Extract: For the purpose of preparing the hot water extract, the following method was followed (13):

Weight 10 grams of the vegetable powder and put it in a 250 ml flask, add 100 ml of boiling distilled water, and place it in the shaking incubator for 30 minutes at a temperature of 70 °C, then use sterilized gauze as a filter and place it in the centrifuge at 2500 rpm for 10 minutes.

Cold Alcoholic Extract: In this extraction method ethyl alcohol was used with a 70% concentration instead of distilled water. The extract should be kept in dark environment and the flask was coated with aluminum foil (13, 14).

Fusarium Isolates: The F. oxysporum isolates were obtained from the Faculty of Agriculture, the final extract obtained after the centrifugation process was 100% stock solution and three concentrations were prepared from the stock solution: 75, 50, 25% and, then sterilized with autoclaving at 121°C.

Phytochemical Screening:

Phytochemical screening by chemical tests (15).

Antioxidant Capacity: Different concentration (1 mg to 5 mg) of the samples were added to (5 ml) of 0.004% DPPH solution in methanol and kept for 30 min at RT (Room Temperature). The absorbance was taken against a blank at 517 nm using a spectrophotometer. Scavenging of DPPH free radical with a reduction in absorbance of the sample was taken as a measure of their antioxidant activity (7). Ascorbic acid was used as positive control. IC which represented the concentration of sample that caused 50% neutralization of DPPH radicals was calculated from the graph plotting between percentage inhibition and concentration

\[ I % = \frac{(A \text{ Control} - A \text{ Sample})}{(A \text{ Control} - A \text{ Blank})} \times 100 \]

Preparation of sample for GC-MS: 0.5 g of methanolic-ethanolic extract (F3) was dissolved 95% methanol, the extract was filtered through micro filter 0.45 µm, and then 2 µl of this solution was employed for GC/MS screening 19-21.

GC-MS screening: GC-MS screening was carried out on a Shimadzu GCMS-QP2010Ultra system comprising a gas chromatograph interfaced to a mass spectrometer (GC-MS) instrument employing the following conditions: column Elite-I fused silica capillary column (30×0.25 mm ID×1EM df, composed of 100% Dimethyl poly siloxane), helium (99.999%) was used.
as carrier gas at a Flow Control Mode: Pressure: 100.0 kPa, Total Flow: 17.6 mL/min, Column Flow: 1.33 mL/min, Linear Velocity: 43.0 cm/sec, Purge Flow: 3.0 mL/min, Split Ratio: 10.0, injector temperature 220°C; ion-source temperature 200°C. The oven temperature was programmed from 100°C (isothermal for 2 min), with an increase of 10°C/min, to 200°C, then 5°C/min to 220°C, ending with a 9 min isothermal at 220°C. Mass spectra were taken at 70 eV, then the time required for sample chromatography was 20 minutes.

**Effect of water and alcoholic extract on Fusarium oxysporum:** In this experiment we used 9 flasks of 100 ml and add 3.9 g of nutrient medium Potato Dextrose Agar (PDA) and add 75 ml, and completed to 100 ml and well enough to ensure thawing of the medium before it was introduced into sterilization.

Comparative treatment (1) PDA only—

1. Treatment comparison (2) PDA + 25 ml ethanol alcohol concentration (70%).
2. Alcoholic extract (100%) take 75 ml PDA + 25 ml of the extract
3. Alcoholic extract 75% take 75 ml PDA + 25 ml of alcohol extract
4. alcoholic extract (50%) take 75 PDA ml+ 25 ml of alcoholic extract
5. alcoholic extract (25%) 75 ml PDA + 25 ml of alcoholic extract 25%
6. water extract (100%) take75 ml PDA + 25 ml of water extract
7. Aqueous extract (75%) 75 ml of PDA + 25 ml of water extract
8. Aqueous extract (50%) take 75 ml PDA + 25 ml of water extract
9. Aqueous extract (25%) take 75 ml of PDA + 25 ml of water extract

The media was sterilized by autoclave at 121°C and pressure 1 bar after sterilization. Left the food medium in the laboratory and before its fixation, the alcoholic and water extracts were added at 100, 75, 50 and 25% concentrations for each flask separately. Was represented by the PDA alone. After inserting the extract with 25 ml to the PDA medium, stir well to ensure that the extract is distributed to the medium. Then, the sterile Petri dishes are placed 9 cm in diameter and left until the center is hardened. A small piece of *F. oxysporum* has been added to each dish.

The small pieces of the fungus were placed upside down until the fungal growth touched the surface of the medium. The dishes were incubated in the incubator at 25°C and the result was taken after five days of incubation. The percentage of growth inhibition was calculated by calculating the average of two perpendicular diameter of each colony, Mushrooms by

The following equation:

\[
\text{%inhibition} = \frac{\text{Comparative treatment in colony diameter} - \text{Colony treatment diameter}}{\text{Comparative treatment in colony diameter}} \times 100\%
\]

The results were statistically analyzed and their averages were measured according to the Duncan Multidimensional Test

**Results and Discussion**

Table (1) represent the detection of effective chemical compounds for plant extracts. The table shows the active compounds in the leaves of the rocket plant, which is attributed to the medical or physiological effect of the plant, and has great medicinal significance.

*Eruca sativa*, dried leaves and its extract revealed the presence of medicinal active constituents. In the GC-MS analysis, 81 bioactive photochemical compounds were identified in the methanolic-ethanolic extract of *Eruca sativa*. The major ten compounds have been identified for the first times in sample of Eruca sativa dried leaves were illustrated in the Figure 2 that represents the GC-MS Spectrum, while Figure 3 represent the comparison between the extract and ascorbic acid (which are approximately the same).

Table 1 shows the chemical component of the abstract. (These components were specified from GC-MS Spectrum).
Figure 2: GC-MS Chromatogram of *Eruca sativa* dried leaves.

Table 1: Phytocomponents that was identified in the methanolic-ethanolic extracts of the dried leaves of *Eruca sativa* by GC-MS

<table>
<thead>
<tr>
<th>Number of peaks</th>
<th>Retention time</th>
<th>Peak area %</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>36.365</td>
<td>0.26</td>
<td>1-propyl,9,12,octadectrienoate</td>
</tr>
<tr>
<td>2</td>
<td>36.568</td>
<td>1.07</td>
<td>Phytol</td>
</tr>
<tr>
<td>3</td>
<td>36.689</td>
<td>5.44</td>
<td>Phytol</td>
</tr>
<tr>
<td>4</td>
<td>37.631</td>
<td>4.27</td>
<td>1-propyl,9,12,15-,octadectrienoate</td>
</tr>
<tr>
<td>5</td>
<td>39.766</td>
<td>0.26</td>
<td>1-propyl,9,12,15-,octadectrienoateacid</td>
</tr>
<tr>
<td>6</td>
<td>39.84</td>
<td>0.27</td>
<td>2-piperidinone</td>
</tr>
<tr>
<td>7</td>
<td>41.436</td>
<td>0.20</td>
<td>Hexacosanol- 1</td>
</tr>
<tr>
<td>8</td>
<td>42.694</td>
<td>0.25</td>
<td>5-Heptane</td>
</tr>
<tr>
<td>9</td>
<td>43.960</td>
<td>0.960</td>
<td>Bis-(2-ethylhexyl)</td>
</tr>
<tr>
<td>10</td>
<td>44.646</td>
<td>0.35</td>
<td>2- piperidinone</td>
</tr>
<tr>
<td>11</td>
<td>46.213</td>
<td>7.26</td>
<td>1-Heptacosanol</td>
</tr>
<tr>
<td>12</td>
<td>46.620</td>
<td>0.09</td>
<td>Fumaric</td>
</tr>
<tr>
<td>13</td>
<td>47.547</td>
<td>0.57</td>
<td>Docosanoic acid</td>
</tr>
<tr>
<td>14</td>
<td>47.977</td>
<td>0.56</td>
<td>Sequaiene</td>
</tr>
<tr>
<td>15</td>
<td>48.421</td>
<td>0.11</td>
<td>IH-Indene</td>
</tr>
<tr>
<td>16</td>
<td>48.956</td>
<td>2.28</td>
<td>Octacosane</td>
</tr>
<tr>
<td>17</td>
<td>49.891</td>
<td>0.30</td>
<td>IH-Indene</td>
</tr>
<tr>
<td>18</td>
<td>50.380</td>
<td>0.4</td>
<td>Pentanoic</td>
</tr>
<tr>
<td>19</td>
<td>51.548</td>
<td>0.23</td>
<td>Delta-tocopherol</td>
</tr>
<tr>
<td>20</td>
<td>52.213</td>
<td>1.75</td>
<td>Triacontain</td>
</tr>
<tr>
<td>21</td>
<td>52.799</td>
<td>1.14</td>
<td>Cholesterol</td>
</tr>
<tr>
<td>22</td>
<td>53.101</td>
<td>9.60</td>
<td>di-alpha-tocopherol</td>
</tr>
<tr>
<td>23</td>
<td>53.334</td>
<td>1.11</td>
<td>Silane</td>
</tr>
</tbody>
</table>
**Antioxidant activity of Eruca Sativa:** The Antioxidant activity of the *Eruca Sativa* leaves was evaluated by comparing with IC\(_{50}\) of the ascorbic acid. During DPPH free radical scavenging activity the IC\(_{50}\) of the *Eruca Sativa* found to be 2.2 ± 0.05 mg/ml which is closer to the ascorbic acid 2.2 ± 0.01 mg/ml (Table 2) synthetic antioxidants are known to prompt liver and kidney dysfunction. The antioxidant activity of the turmeric flower is not as effective as the synthetic one like ascorbic acid, but this may be used as a long term natural antioxidant in medication or even as an additives to a certain food.

Table 2: Shows the percentage of diameters of the developing colonies in the dishes

<table>
<thead>
<tr>
<th>Treatment Type</th>
<th>Treatment</th>
<th>R1</th>
<th>R2</th>
<th>R3</th>
<th>Mean</th>
<th>Inhibition %</th>
<th>R1</th>
<th>R2</th>
<th>R3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control water</td>
<td>3.75</td>
<td>3.5</td>
<td>4</td>
<td>3.75</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Control alcohol</td>
<td>3.5</td>
<td>3.12</td>
<td>3.5</td>
<td>3.4</td>
<td>6.6</td>
<td>10.8</td>
<td>12.5</td>
<td>9.9</td>
<td></td>
</tr>
<tr>
<td>Alcohol Extraction</td>
<td>100%</td>
<td>0</td>
<td>0</td>
<td>0.75</td>
<td>0.2</td>
<td>72.9</td>
<td>72.4</td>
<td>79.7</td>
<td>75.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>75%</td>
<td>1.5</td>
<td>1.5</td>
<td>2</td>
<td>1.6</td>
<td>59.4</td>
<td>59.4</td>
<td>45.9</td>
<td>54.9</td>
<td></td>
</tr>
<tr>
<td></td>
<td>50%</td>
<td>2.5</td>
<td>2</td>
<td>2</td>
<td>2.1</td>
<td>32.4</td>
<td>45.9</td>
<td>45.9</td>
<td>41.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>25%</td>
<td>2.75</td>
<td>2.75</td>
<td>3</td>
<td>2.8</td>
<td>25.6</td>
<td>25.6</td>
<td>18.9</td>
<td>21.9</td>
<td></td>
</tr>
<tr>
<td>Water Extraction</td>
<td>100%</td>
<td>2</td>
<td>1.5</td>
<td>2.5</td>
<td>2</td>
<td>45.9</td>
<td>59.4</td>
<td>32.4</td>
<td>45.9</td>
<td></td>
</tr>
<tr>
<td></td>
<td>75%</td>
<td>2.5</td>
<td>2</td>
<td>2</td>
<td>2.1</td>
<td>32.4</td>
<td>45.9</td>
<td>45.9</td>
<td>41.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>50%</td>
<td>2.5</td>
<td>2.5</td>
<td>2.5</td>
<td>2.5</td>
<td>32.4</td>
<td>32.4</td>
<td>32.4</td>
<td>32.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>25%</td>
<td>3</td>
<td>3</td>
<td>2.5</td>
<td>2.8</td>
<td>18.9</td>
<td>18.9</td>
<td>32.4</td>
<td>23.4</td>
<td></td>
</tr>
</tbody>
</table>

The results of Table (2) indicate that the highest mean value of the diameter of the colony in comparison between alcohol treatment and water treatment where there are no significant differences between them and the colony diameter 3.75 and 3.4 respectively, followed by treatment of water and alcohol extract at the concentration 25% diameter was 2.8 for both water extract and alcohol extract. The mean diameter value of 50% alcohol extract and 50% of water extract the diameter reached 2.1 and 2.5 respectively which indicates no significant differences between them. In 75% concentration, the diameter of the plant was 2.1 for water extract and the alcohol extract was 1.6 which indicates a significant difference. Finally, the 100% concentration shows 0.2 in alcoholic extract while the mean value in water extract was 2, this maximum effect is due to the fact that the most of active compounds present in the alcohol extract and can’t extracted with water, especially alkaloids compounds and most of organic compounds which have activity against microbes and considered as antimicrobial compounds\(^{(14-16)}\).

The inhibition percent in of alcoholic extract with concentration of 100%, 75%, 50% and 25% were 75.1, 54.9, 41.4 and 21.9 respectively, while, and for the same sequence of concentrations for water extract were 45.9, 41.4, 32.4 and 23.4 respectively, this results indicate that alcohol extract has much more activity against microbes than water extract and this bioactivity of alcoholic extract increase with concentration increases, and as it is clear from Table 3 below, the P-Value of alcoholic extract is 0.01 while there is no significant differences in the demineralized water (DM) extract.

Table 3: Shows the effect of concentrations used for Eruca Sativa extracts

<table>
<thead>
<tr>
<th>Extraction Type</th>
<th>Control DW</th>
<th>Control Alcohol</th>
<th>25%</th>
<th>50%</th>
<th>75%</th>
<th>100%</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol Ex.</td>
<td>3.75 ± 0.25</td>
<td>3.4 ± 0.33</td>
<td>2.8 ± 0.14</td>
<td>2.16 ± 0.28</td>
<td>1.66 ± 0.28</td>
<td>0.75 ± 0.43</td>
<td>0.01</td>
</tr>
<tr>
<td>Water Ex</td>
<td>3.75 ± 0.25</td>
<td>3.4 ± 0.33</td>
<td>2.8 ± 0.28</td>
<td>2.5 ± 0</td>
<td>2.1 ± 0.28</td>
<td>2 ± 0.5</td>
<td>NS</td>
</tr>
<tr>
<td>P value</td>
<td>----</td>
<td>----</td>
<td>NS</td>
<td>NS</td>
<td>0.05</td>
<td>0.01</td>
<td></td>
</tr>
</tbody>
</table>
The letters a, b, c, d refer to the difference in the difference between the different transaction rates and the similarity of the letters means that the difference is significant. A letter means a greater effect and a lower effect followed by c and then d. NS: Non significant (Non Significant)

Conflict of Interest: All authors hereby declare no conflict of interest.

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Ethical Clearance: Experimental study (In-Vitro)

REFERENCES


A Stereomicroscopic Analysis of Dentinal Micro Cracks after Root Canal Preparation Using Four Different Rotary Instruments

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ABSTRACT

A variety of single-engine driven files and kinematics have been introduced to improve the clinical performance of NiTi rotary files. The purpose of this in vitro study was to measure and compare the incidence of dentinal defects after root canal preparation with different single file systems.

Keywords: Root canal preparations, Root canal instrumentation, Tooth cracks

Introduction

During and after chemomechanical root canal preparation with rotary instruments that aimed to remove infected soft and hard tissue through the enlarged root canal; [¹] the root canal wall can be harmed with the development of dentinal defects in the form of dentinal cracks or craze line which serves as localized sites of increased stress. [²]

Through the application of repeated tension via occlusal forces or when further clinical procedures are required such as post placement, these dentinal defects may have the potential to develop into vertical root fracture (VRF)[³,⁴,⁵].

Most shaping systems are categorized as to whether the file has active or passive cutting edges, a fixed or variable taper along its active portion, or a more traditional or unique cross-sectional design [⁶]. In addition to that whether the file has benefited from heat treatment that improves flexibility and the resistance to cyclic fatigue [⁷]. Also described whether it has a centered or offset mass of rotation, works with a rotary or reciprocation, whether the clockwise (CW) and counter clockwise (CCW) angles are equal or unequal [⁸,⁹,¹⁰]. A single file technique in conjunction with a novel reciprocating movement of unequal bidirectional angles that complete a full forward rotation of 360 degrees after four 90-degree cutting cycles of reciprocation can start and fully complete the preparation of a canal to a perfect shape [¹¹].

It operates at 350 rpm speed in 170ºCCW and 50ºCW direction and completes 360º, torque 5 Ncm in 3 cycles, also it has parallelogram cross-section with two cutting edges at apical end [¹²].

F 6 Sky Taper (Komet Brasseler GmbH and Co., Lemgo, Germany) is a NiTi system that performs root canal treatment with continuous clockwise rotation, speed 300 rpm and torque 2.2 Ncm. It is available in five different sizes (20, 25, 30, 35 and 40) with a constant taper of 0.06 with S-shape section [¹³].

When using this instrument alone. It performs root canal preparation with continuous rotation at speed 800 rpm and torque 1 Ncm [¹⁴].

AF Blue R3 (Shanghai Fanta Dental Materials Co., Ltd) is a rotary AF- R wire- 3- files- system suitable for curved canals, it performs root canal preparation with a reciprocating motion. It operates at 300 rpm speed, torque 2.6 Ncm in 150ºCCW and 30 º CW direction with 06 taper design and improved file flexibility while still retaining the cutting efficiency [¹⁵].

Root sectioning at different levels and inspection through a digital stereomicroscope allows direct inspection of dentinal defects on the root surface and provides information regarding the extension pattern and direction of cracks [¹⁶, ¹⁷].

To the best of our knowledge, little information has been found regarding the incidence of dentinal defects
resulting from the use of AF Blue R3, and F6 Sky Taper systems. Thus, the purpose of this study was to measure and compare the incidence of dentinal root defects after root canal shaping with four automated file systems: Wave One Gold, AF Blue R3, F6 Sky Taper and XP-Endo Shaper. The null hypothesis was that there would be no significant difference in dentinal defects amongst the studied groups.

**Materials and Method**

Seventy-five freshly extracted human mandibular premolars with approximately similar bucco-lingual and mesio-distal. The teeth were disinfected in a 0.1% thymol solution at room temperature for 24 h and were kept in purified filtered water until they were used.[19] Savannah, GA USA) under copious water coolant approximately 17 mm from the apex to the facial CEJ[20]. The patency of the canal was ensured before and after instrumentation [21]. All the roots were imbedded in its simulated socket in impression materials [22].

Seventy-five root samples were randomly divided into five groups.

**Group I:** Specimens were instrumented by Wave One Gold (25 0.07), length 25 mm in a reciprocating movement.

**Group II:** Specimens were instrumented by AF Blue R3 (25 0.06), length 25 mm in a reciprocating movement using endodontic micromotor (speed: 300rpm and torque: 2.6 Ncm).

**Group III:** Specimens were instrumented by F6 Sky Taper (25 0.06), length 25 mm in a rotation movement at WL with gentle in-and out- motion using endodontic micromotor (speed: 300rpm, torque: 2.2Ncm).

**Group IV:** Specimens were instrumented by XP-Endo Shaper (30 0.04), length 25 mm in a rotation movement at WL with gentle in-and out- motion using endodontic micromotor (speed: 800 rpm, torque: 1Ncm).

**Group V:** Specimens without instrumentation (control group).

The glide path was performed using size #15 K-file (DentsplyMaillefer) up to the working length. A total amount 12 ml of 1% NaOCl was used per canal [23, 24].

A final flush of 5 ml of distilled water was administered to the prepared specimens to remove the remnant debris and irrigating solutions inside each canal. All root canals were dried with a sterile paper points to ensure that a complete instrumentation was achieved [25]. All the root samples were sectioned perpendicularly to the long axis in 3, 6, and 9 mm slices from the root apex [26, 27] using diamond disc (0.1 mm) under water cooling to avoid heating and to minimize smearing [28].

“Defect” was defined if any craze lines, microcracks, or fractures were present in root dentin or extending to outer root surface [18].

**Results**

The distribution of incidence of dental defects by the experimental groups at each level (apical, middle, and coronal) is shown in Table (1).

<table>
<thead>
<tr>
<th>Total group</th>
<th>Status</th>
<th>Apical level(3mm)</th>
<th>Middle level (6mm)</th>
<th>Coronal level (9mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Group I (Wave One Gold)</td>
<td>Defects</td>
<td>6</td>
<td>40%</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>No defects</td>
<td>9</td>
<td>60%</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>15</td>
<td>100%</td>
<td>15</td>
</tr>
<tr>
<td>Group II (AF Blue R3)</td>
<td>Defects</td>
<td>2</td>
<td>13.33%</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>No defects</td>
<td>13</td>
<td>86.67%</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>15</td>
<td>100%</td>
<td>15</td>
</tr>
<tr>
<td>Group III (F6 SkyTaper)</td>
<td>Defects</td>
<td>5</td>
<td>33.33%</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>No defects</td>
<td>10</td>
<td>66.67%</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>15</td>
<td>100%</td>
<td>15</td>
</tr>
</tbody>
</table>
Conted…

<table>
<thead>
<tr>
<th>Group IV (XP-Endo Shaper)</th>
<th>Defect</th>
<th>1</th>
<th>6.67%</th>
<th>1</th>
<th>6.67%</th>
<th>0</th>
<th>0%</th>
</tr>
</thead>
<tbody>
<tr>
<td>No defects</td>
<td>14</td>
<td>93.33%</td>
<td>14</td>
<td>93.33%</td>
<td>15</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>100%</td>
<td>15</td>
<td>100%</td>
<td>15</td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Chi-Square test for the incidence of dentinal defects among different groups at the apical level (3mm). p>0.05 Non-Significant (NS), p<= 0.05 Significant (S)

<table>
<thead>
<tr>
<th>Groups</th>
<th>Defect</th>
<th>No Defect</th>
<th>Total</th>
<th>Chi-Square test</th>
<th>d.f.</th>
<th>P-value</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wave One gold</td>
<td>6</td>
<td>9</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AF Blue R3</td>
<td>2</td>
<td>13</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F6 SkyTaper</td>
<td>5</td>
<td>10</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>XP-EndoShaper</td>
<td>1</td>
<td>14</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>0</td>
<td>15</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3: Chi-Square test for the incidence of dentinal defects among different groups at the middle level (6mm)

<table>
<thead>
<tr>
<th>Groups</th>
<th>Defect</th>
<th>No Defect</th>
<th>Total</th>
<th>Chi-Square test</th>
<th>d.f.</th>
<th>P-value</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wave One gold</td>
<td>4</td>
<td>11</td>
<td>15</td>
<td>6.818</td>
<td>4</td>
<td>0.211</td>
<td>NS</td>
</tr>
<tr>
<td>AF Blue R3</td>
<td>1</td>
<td>14</td>
<td>15</td>
<td></td>
<td></td>
<td>0.02</td>
<td></td>
</tr>
<tr>
<td>F6 SkyTaper</td>
<td>3</td>
<td>12</td>
<td>15</td>
<td></td>
<td></td>
<td>0.02</td>
<td></td>
</tr>
<tr>
<td>XP-EndoShaper</td>
<td>1</td>
<td>14</td>
<td>15</td>
<td></td>
<td></td>
<td>0.02</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>0</td>
<td>15</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4: Chi-Square test for the incidence of dentinal defects among different groups at the coronal level (9mm)

<table>
<thead>
<tr>
<th>Groups</th>
<th>Defect</th>
<th>No Defect</th>
<th>Total</th>
<th>Chi-Square test</th>
<th>d.f.</th>
<th>P-value</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wave One gold</td>
<td>2</td>
<td>13</td>
<td>15</td>
<td>4.285</td>
<td>4</td>
<td>0.404</td>
<td>NS</td>
</tr>
<tr>
<td>AF Blue R3</td>
<td>1</td>
<td>14</td>
<td>15</td>
<td></td>
<td></td>
<td>0.404</td>
<td></td>
</tr>
<tr>
<td>F6 SkyTaper</td>
<td>2</td>
<td>13</td>
<td>15</td>
<td></td>
<td></td>
<td>0.404</td>
<td></td>
</tr>
<tr>
<td>XP-EndoShaper</td>
<td>0</td>
<td>15</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>0</td>
<td>15</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 5: Chi-Square test for the incidence of dentinal defects among different level of Wave One Gold group

<table>
<thead>
<tr>
<th>Wave one cold</th>
<th>Defect</th>
<th>No Defect</th>
<th>Total</th>
<th>Chi- Square Test</th>
<th>d.f.</th>
<th>p-Value</th>
<th>sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apical level</td>
<td>6</td>
<td>9</td>
<td>15</td>
<td>2.727</td>
<td>2</td>
<td>0.27</td>
<td>NS</td>
</tr>
<tr>
<td>Middle level</td>
<td>4</td>
<td>11</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coronal level</td>
<td>2</td>
<td>13</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Discussion

During the root canal instrumentation using engine driven instruments, high stress concentration in the wall of the root canal system is applied. This may increase the risk of dentinal damage predisposing the tooth to vertical root fracture [29].

Dentinal defects and then root cracking are a complex procedure because it is affected by many factors such as the design feature of the file used and its kinematics in addition to the alloy from which the instrument was manufactured. Since the primary aim of chemomechanical root canal preparation is to decrease the bacterial load and prepare the root canal for
obturation, at the same time; the preservation of tooth structure and increase its resistance to fracture that lead to a long-term survival rate to the tooth [30]. The length of the canal and lower overall stresses, also to facilitate comparison of the results with several previous studies in which similar teeth had been used [27,31].

Adorno et al., found that apical cracks occurred in 50% of mandibular premolars after root canal preparation [32].

The teeth samples were selected from young adult patients because aging result in changes in the dentinal microstructure which in turn change the mechanical behavior of dentin resulting in average reduction of its strength predisposing it to crack growth and dentinal defects [33], [34]. Unlike the use of SEM that requires section treatment which may change the actual status of the tissue [35].

Although high resolution micro CT scans method is conservative and non-destructive, it is a complex procedure that lasts for an hour or more, this may increase dehydration of the samples resulting in spontaneous cracks in dentin [36].

The control group after sectioning was not shows any dentinal defects. This finding comes in line with several studies [4,18].

The largest number of dentinal defects promoted by Wave One Gold instruments may be related to its high level of flexibility due to the heat treatment of NiTi alloy and its parallelogram-shaped cross section [37]. During root canal preparation [40], which agrees with previous reports [16,18]. However; reciprocating movement could prevent the continuous rotary force and constant torque that are applied to the walls of the canal [41].

The occurrence of dentinal defects is independent on the kind of the instrument used. The experimental groups varied in their design, cross section, tip design and taper but similar only in size (#25) of the tip, therefore; the null hypothesis of the present study has been partially accepted.

Conclusions

Within the scope of this in vitro study, it can be concluded that Wave One Gold system generated the significantly higher incidence of dentinal defects in mandibular premolars compare to the other tested file systems. While XP-EndoShaper system generates the lowest incident of defects in the rotating file systems compare to F6 SkyTaper file systems. The highest incidence was at the apical level in all of the tested groups. Additional researches may be required to assess these instruments on crack propagation and the fracture resistance of the root canal treated teeth.

Conflict of Interest: Nil

Source of Funding: Self

Ethical Clearance: Not required

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Predictive Value of Spectral Waveform Indices; Intimal Medial Thickness and Lumen Diameter of Carotid Artery in Iraqi Diabetic and Hypertensive Patients

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ABSTRACT

Background: Diabetes and hypertension are related to cardiovascular risk factors and are possible to detect development of atherosclerosis in cardiovascular system, were can predict their effect and measurement by ultrasound and Doppler study. These risk factors included increased intima-media thickness, resistive index (RI) and pulsatility index (PI) of the right common carotid arteries.

Method: We studied 20 patients with diabetes and hypertension, and 20 patients with diabetes only, were examine right carotid arteries for these two groups. In this sample we studied the Lumen diameter of the Rt. carotid arteries, Intima – media thickness (IMT), peak systolic velocity, end diastolic velocity, and Pulsatility index, Resistance index were measured.

Results: Showed that the change differences in Intima – media thickness and Lumen diameter between patients with diabetes and hypertension than diabetes only were (-18.29%), (-11.26%) respectively with significant (p value <0.05). On the other hand the change difference in peak systolic velocity was (21.25%) for diabetes and hypertension, and diabetes only, with significant p value <0.05. The end diastolic velocity is higher value at DM group than diabetic and hypertensive group with significant p value. The change difference between Pulsatility and Resistance Index for both patients group were (-18.18%), (-16.12) respectively, with significant (p value <0.05).

Conclusion: Spectral waveform indices of Rt. Internal carotid artery including Peak systolic velocity (PSV); End-diastolic velocity (EDV), Resistive index (RI) and Pulsatility index (PI) are profound predictive value of atherosclerosis, cardiovascular disease and ischemic changes in Diabetic and hypertensive Iraqi patients beside the intima –media thickness increment and lumen diameter change effect of common carotid artery.

Keywords: Resistance index, blood flow velocity, atherosclerosis, diabetic and hypertension, pulsatility index (PI).

Introduction

Intima-media thickness of carotid artery is associated with cardiovascular complications and thus is considered an indicator of atherosclerosis, were can easily measured by high-frequency B-mode ultrasonography, which is a noninvasive, safe, and inexpensive ¹.

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Diabetes, and hypertension are the most potent cause of decrease in artery compliance, that is lead to structural changes within the arterial wall thickness. These changes include elastic component decrement; increased fragmentation; increased concentration of collagen; reduction of endothelial nitric oxide values; and increased smooth muscle ²³.

Flow velocity (end diastolic velocity and peak systolic velocity) obtained by Doppler sonography. End diastolic velocity is a predictive value of intracranial resistance, low end diastolic velocity is associated with an increased risk of stroke or ischemia ⁴.
Resistive index (RI) is considered an important risk factor for both atherosclerotic and cardiovascular disease. Many studies show that resistive index is related to the vascular resistance and vascular compliance, vascular compliance defined (change in volume of vessel with change in pressure).

Pulsatility index is a popular parameter for characterizing the arterial waveform at Doppler ultrasound and this parameter is related to resistive index, which has also been shown that related to vascular resistance. Both RI and PI show changes in the carotid artery blood velocity and waveforms.

The aim of the present study was to determine the effect of diabetes and hypertension effect on carotid hemodynamics such as waveform parameters (RI and PI) and blood flow velocity relative to diabetes only.

Patients and Method

From October 2017 to May 2018, a total of 40 patients were studied. The study included 20 patients with type 2 diabetes and hypertension (12 females and 8 males, the age ranged 41-68 years, mean age 56.6 ± 6.42) and 20 patients with type 2 diabetes mellitus only (9 males and 11 females, the age ranged from 40-67 years, mean age 54.75 ± 8.077). The study was conducted in compliance to the medical ethics rules and all participants have given their consent. The study was performed in National Diabetic Center/AL-Mustansyria University. The following laboratory parameters obtained for known diabetic and know hypertensive patients were: fasting glucose, cholesterol, Triglycaide(TG), and HbA1C. Ultrasound examination was performed by the use of a linear-array 6-9 MHz probe of (FUT-LD 386-9A) Fukuda Denshi (UF-750XT). Patient was examined to lie in a supine position and aid of a pillow inserted just below the shoulder and neck to enable the common carotid and internal arteries to be visible for examination. Diameter of the common carotid artery was measured by placing the probe on the neck at the level of the Isthmus of the thyroid.

Peak systolic velocity (PSV) was measured by duplex sonography is a widely accepted and reliable diagnostic method for assessing internal carotid artery (ICA) stenosis. PSV measurements from the common carotid artery and the internal carotid artery in order to have a record of the examination. These are obtained using spectral Doppler from the upper common carotid artery 2-3 cm below the bifurcation; the internal carotid artery from 1 to 2 cm above the bulb, or as high as possible, in order to allow the normal bulbar turbulence to settle.

Resistance index (RI), Pulsatility (PI) were measured and recorded.

Statistical Analysis: Results were expressed as mean values with standard deviations and the difference as percentage. The comparison between the values for both groups was tested by paired student’s t-test and p value < 0.05 was considered the level of significance.

Results

Table 1: shows the change difference between right common carotid (CCA) and internal carotid artery (ICA) in patients with diabetes and hypertension group, and diabetes group only.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>(DM+HT) Patients Mean ± SD</th>
<th>(DM) Patients Mean ± SD</th>
<th>Change %= [(DM- (DM+HT)]/DM ×100</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMT(mm)</td>
<td>0.97 ± 0.33</td>
<td>0.82 ± 0.157</td>
<td>-18.29%</td>
<td>&lt; 0.05</td>
</tr>
<tr>
<td>Lumen D(mm)</td>
<td>5.63 ± 0.67</td>
<td>5.06 ± 0.902</td>
<td>-11.26%</td>
<td>&lt; 0.05</td>
</tr>
<tr>
<td>PSV (cm/s)</td>
<td>29.60 ± 5.59</td>
<td>37.59 ± 5.31</td>
<td>21.25%</td>
<td>&lt; 0.05</td>
</tr>
<tr>
<td>EDV (cm/s)</td>
<td>10.38 ± 2.28</td>
<td>13.91 ± 3.58</td>
<td>25.37%</td>
<td>&lt; 0.05</td>
</tr>
<tr>
<td>RI</td>
<td>0.72 ± 0.061</td>
<td>0.62 ± 0.073</td>
<td>-16.12</td>
<td>&lt; 0.05</td>
</tr>
<tr>
<td>------</td>
<td>--------------</td>
<td>--------------</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td>PI</td>
<td>1.17 ± 0.26</td>
<td>0.99 ± 0.21</td>
<td>-18.18%</td>
<td>&lt; 0.05</td>
</tr>
</tbody>
</table>

**Discussion**

Ultrasonography is used to detect changes in carotid arteries. Many studies show that the increase in IMT thickness provides markers for the development of atherosclerosis and cardiovascular diseases. Increased IMT and reduced distensibility related to hypertension and diabetes mellitus. The results of the present study showed that the increase in both of lumen diameter and IMT of carotid arteries in (DM+H) patients correlated with reduced compliance and distensibility of arterial wall, leading to carotid artery become stiffer. Arterial stiffness can be caused by two distinct mechanisms: a structural and a dynamic mechanism. The structural changes result from increase of collagen, arterial calcification an increased amount of glycation of both elastin and collagen, resulting in degenerative changes and interadventitial enlargement. The dynamic mechanism is represented by the tone of smooth muscle cells, also in the arterial media. This tone is dependent on vasoactive substances released from the endothelium.

The RI is called (impedance index) which is related to local vascular resistance and vascular compliance, that can be easily determined by Doppler sonography using Pourcelot’s formula, the peak systolic velocity and minimum end diastolic velocity are linked to the increases of resistive index with decreasing diastolic flow fraction. These findings that increase RI is associated with atherosclerosis and cardiovascular risk factors.

Arterial stiffness is due to atherosclerotic changes have also been shown to be associated with reduced blood flow velocity (PSV and EDV), in (DM+HT) patients which is reflected by an increase in the RI and diameter is associated with an increased risk of stroke and ischemia.

The pulsatility index (PI), which is calculated from (systolic velocity-diastolic velocity)/mean velocity, it measured by Doppler ultrasonography. Higher resistance beds have low diastolic flow, a peaked waveform, lead to higher PI.

The PI is a reflection of the vascular resistance distal to the examined artery; Higher PI may not only imply a higher severity of small vessel disease but also contribute to further vascular injury and progression of atherosclerosis in cerebral vasculature. Therefore the pathologies of small intracranial perforating arteries may affect the PI of the proximal artery (internal carotid arteries, immediately after bulb or distal) so, may be better than IMT for predicting cerebral infarction or ischemia. Thus, a high of resistive index and pulsatility index is associated with differences in velocity between systolic and diastolic phases, this difference in flow velocities reflects downstream resistance, which depend on the degree of arterial stiffness.

**Conflict of Interest:** There is no conflict of interest.

**Sources of Funding:** There were no external funding sources for this study.

**Ethical Clearance:** The study was conducted in compliance to the medical ethics rules and all participants have given their consent.

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Third Delay for Maternal Deaths in Maternity Hospitals in Baghdad

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ABSTRACT

Background: Among multiple other factors that cause preventable maternal deaths, the most significant one has been the ‘third delay’ or the delay in gaining access to quality care. If this third delay is reduced, or in other words, the health care service quality of existing facilities is improved, the avoidable maternal mortality would be significantly reduced.

Objectives: To determine the causes of maternal deaths, and recognize the substandard care factors, being the potential determinants of the third delays in maternal deaths.

Method: This is a descriptive retrospective study that utilized information from public datasets belonging to the Iraqi Ministry of Health (MOH), Baghdad Health Directorates, for a period of five years (from 1st January 2014 to the end of December 2018). Maternal death was classified according to the three delays model, but the research is focused on Type III delays. Therefore the analysis was provided only for the deaths that occurred within the health facilities.

Results: A total of 318 maternal deaths were reported during the study period. Maternal Mortality Ratio (MMR) showed an increasing pattern from 24.23/100000 live birth in 2014 to 30.04/100000 live birth in 2018. The mean age of pregnant women died was (30.1 ± 7.4 years) and the mean gravida number was (3.8 ± 2.3). Three quarters (74.5%) of the cases were caused by direct medical reasons while (21.4%) were having indirect medical reasons. Type III delay was the most common delay, and was identified in 71.4% of cases, and was mostly resulted from equipment shortage, limited availability of drugs and other supplies; delay in proper management; and also the incompetence of the care providers in the health care facilities.

Keywords: Maternal deaths, third delay, Baghdad.

Introduction

From the 10th Revision of the International Classification of Diseases i.e., ICD-10, the definition of maternal death is reported as “The death of a woman while pregnant or within 42 days of the end of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes” [1]. Maternal Mortality Ratio (MMR) as monitored by the Millennium Development Goals(MDGs) has declined worldwide from 385 in 1990 to 216 deaths per 100 000 live births in 2015 [2].

The WHO has reported the scenario of MMR for Iraq during 1990-2015. Statistically, 50 deaths were recorded in 2015 that were 107 per 100 000 live birth in 1990. Thus, annually 3.1% decline rate has been achieved, which is quite lower than the 5.5% annual decline necessary to achieve the MDG 5a [3]. Thaddeus and Maine (1994) had developed a three-delay model, having implication towards determining the scenarios of appropriate obstetric emergencies. This framework categorizes the delays in quality care delivery into three types. The first one refers to the delayed decision-making process of seeking care in case of complications.
It is then followed by the delay in reaching the medical facility (Type II), and the subsequent delay in gaining access to the appropriate care at the health care facility (Type III) \(^3\).

The efficacy of a health care facility in responding to the delivery of appropriate care in obstetric emergencies is affirmed to be affected by multiple factors. These factors have been grouped into six categories; equipment and drugs, human resources, infrastructure of the facility, policy and guidelines, and certain aspects related to patients and also referrals \(^4\).

**Method**

This is a descriptive retrospective study that utilized information from public datasets belonging to the Iraqi Ministry of Health (MOH), and Baghdad Health Directorates, for a period of five years (from 1st January 2014 to the end of December 2018). Maternal death cases where collected when they met criteria defined by WHO \(^1\). The death registers were thoroughly reviewed to evaluate the recorded death summaries, and as such identify the substandard care factors being the potential determinants of the third delay in maternal deaths. A structured questionnaire was designed for the purpose of the study depending on “maternal mortality inquiry form” which was already used by maternal deaths committee of Iraqi Ministry of Health.

The questionnaire included information regarding maternal age, parity, gestational age, the status of booking, arrival timing, death timing, the reason of death, and also the existence of below standard aspects of care. Maternal death was then classified according to the three delays model \(^3\). There could have been more than one delays with each maternal death, but the current research has targeted the type III delay. Accordingly, only the death cases have been analyzed that reportedly occurred at the facilities. Meanwhile, the identified aspects that were below standard with respect to the expected care quality were also noted, assuming to be the contributing factors of the third delay. The below standard care refers to the level of care quality that is lower than the standards of care to be given to such patients within this scenario. Once the data was collected, SPSS-25 was used as the statistical tool of analysis. The analysis was carried out in terms of frequency, percentage, central tendency (mean), and range and standard deviation as the measures of dispersion.

**Results**

During the study period, there were reportedly 318 cases of maternal death. MMR showed an increasing pattern from 24.23 to 30.04 per 100000 live birth from 2014 to 2018 (Table 1).

<table>
<thead>
<tr>
<th>Years</th>
<th>No. of live births</th>
<th>No. of maternal death</th>
<th>MMR/100000</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>218735</td>
<td>53</td>
<td>24.23</td>
</tr>
<tr>
<td>2015</td>
<td>237025</td>
<td>57</td>
<td>24.04</td>
</tr>
<tr>
<td>2016</td>
<td>232835</td>
<td>61</td>
<td>26.19</td>
</tr>
<tr>
<td>2017</td>
<td>229919</td>
<td>80</td>
<td>34.79</td>
</tr>
<tr>
<td>2018</td>
<td>223021</td>
<td>67</td>
<td>30.04</td>
</tr>
</tbody>
</table>

The mean age of pregnant women died was (30.1 ± 7.4) years, about one fourth (24.5%) of them were 35-39 years, whereas the lowest percentage (9.4%) were among 15-19 y as shown in Table 2.

<table>
<thead>
<tr>
<th>Age group (years)</th>
<th>No.</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-19 y</td>
<td>30</td>
<td>9.4</td>
</tr>
<tr>
<td>20-24y</td>
<td>54</td>
<td>17.0</td>
</tr>
<tr>
<td>25-29y</td>
<td>63</td>
<td>19.8</td>
</tr>
<tr>
<td>30-34y</td>
<td>58</td>
<td>18.2</td>
</tr>
<tr>
<td>35-39y</td>
<td>78</td>
<td>24.5</td>
</tr>
<tr>
<td>40y=&gt;</td>
<td>35</td>
<td>11.0</td>
</tr>
</tbody>
</table>

Mean ± SD = 30.1 ± 7.4

<table>
<thead>
<tr>
<th>No. of pregnancy</th>
<th>No. of maternal death</th>
<th>Of maternal death%</th>
</tr>
</thead>
<tbody>
<tr>
<td>First pregnancy</td>
<td>63</td>
<td>19.8</td>
</tr>
<tr>
<td>Two-Four</td>
<td>140</td>
<td>44.0</td>
</tr>
<tr>
<td>Five and more</td>
<td>115</td>
<td>36.2</td>
</tr>
</tbody>
</table>

Mean ± SD = 3.8 ± 2.3
Table 4 (a): Direct causes of maternal deaths

<table>
<thead>
<tr>
<th>Direct causes</th>
<th>No.</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Postpartum hemorrhage</td>
<td>81</td>
<td>34.2</td>
</tr>
<tr>
<td>Thromboembolism</td>
<td>48</td>
<td>20.3</td>
</tr>
<tr>
<td>Hypertensive disorders</td>
<td>44</td>
<td>18.6</td>
</tr>
<tr>
<td>Uterine rupture</td>
<td>21</td>
<td>8.9</td>
</tr>
<tr>
<td>Pregnancy related infections</td>
<td>16</td>
<td>6.8</td>
</tr>
<tr>
<td>Antepartum hemorrhage</td>
<td>10</td>
<td>4.2</td>
</tr>
<tr>
<td>Abortion</td>
<td>6</td>
<td>2.5</td>
</tr>
<tr>
<td>Obstructed labor</td>
<td>6</td>
<td>2.5</td>
</tr>
<tr>
<td>Other direct causes</td>
<td>5</td>
<td>2.1</td>
</tr>
<tr>
<td>Total</td>
<td>237</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 4 (b): Indirect causes of maternal deaths

<table>
<thead>
<tr>
<th>Indirect causes</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart diseases</td>
<td>37</td>
<td>54.4</td>
</tr>
<tr>
<td>Respiratory system diseases</td>
<td>15</td>
<td>22.1</td>
</tr>
<tr>
<td>Hepatic failure</td>
<td>7</td>
<td>10.3</td>
</tr>
<tr>
<td>Renal failure</td>
<td>4</td>
<td>5.9</td>
</tr>
<tr>
<td>Anemia</td>
<td>3</td>
<td>4.4</td>
</tr>
<tr>
<td>Endocrine diseases</td>
<td>2</td>
<td>2.9</td>
</tr>
<tr>
<td>Total</td>
<td>68</td>
<td>100</td>
</tr>
</tbody>
</table>

Table (4a and b) highlight the leading direct and indirect contributors to maternal deaths, though the cause of death was mentioned in 298 cases of maternal deaths. As such, for 13 cases (4.1%) out of 318 cases, the study could not determine the cause of maternal death. Three quarters (74.5%) of the cases were directly caused by medical reasons while (21.4%) were having indirect medical reasons. Post-partum hemorrhage (34.2%) was identified as the most reported direct cause of maternal deaths, followed by sudden death due to thromboembolism (20.3%), and also maternal hypertensive disorders (18.6%).

Cardiac was among the mostly reported indirect cause of these deaths, which accounted for (54.4%) of the total indirect deaths.

Table 5: Maternal deaths distribution according to the types of delay

<table>
<thead>
<tr>
<th>Types of delays</th>
<th>No.</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delay in seeking care (D1)</td>
<td>50</td>
<td>15.7</td>
</tr>
<tr>
<td>Delay in reaching health care facility (D2)</td>
<td>3</td>
<td>1.0</td>
</tr>
</tbody>
</table>

Table (5) showed the types of delays reported in the maternal deaths. Almost 71.4% of cases reported Type-III delays to be the cause of maternal deaths. Type 1 delays were reported in 15.7% of cases while type 2 delays were reported in only 1.0% of all deceased women.

Table (6) showed the reasons for type III delay, where wrong assessment and management were identified in (39.6%) of cases. Shortage of equipment, drugs, and supplies was identified in (32.6%), including the unavailability of blood, inadequate Intensive Care Units, and limited availability of drugs. In addition, (30%) of cases reported that the health care providers were typically unskilled or incompetent with respect to the nature of the cases, while poor follow-up of the patient was detected in 29.5% of cases.

Table 6: Reasons for type 3 Delay identified for maternal deaths (n = 227)

<table>
<thead>
<tr>
<th>Substandard care factors</th>
<th>Numbers*</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wrong assessment of risk, wrong management</td>
<td>90</td>
<td>39.6</td>
</tr>
<tr>
<td>Shortage of equipment and supplies</td>
<td>74</td>
<td>32.6</td>
</tr>
<tr>
<td>Lack of competence or skills among available health care providers</td>
<td>68</td>
<td>30.0</td>
</tr>
<tr>
<td>Lack of patient follow up</td>
<td>67</td>
<td>29.5</td>
</tr>
<tr>
<td>Delay in proper management</td>
<td>61</td>
<td>26.9</td>
</tr>
<tr>
<td>Inadequate referral system</td>
<td>25</td>
<td>11.0</td>
</tr>
<tr>
<td>Unavailable health care providers</td>
<td>21</td>
<td>9.2</td>
</tr>
<tr>
<td>Shortage of health care providers</td>
<td>15</td>
<td>6.6</td>
</tr>
<tr>
<td>Lack of inter-departmental cooperation</td>
<td>14</td>
<td>6.2</td>
</tr>
</tbody>
</table>

*The Same woman experienced more than one substandard care at a health facility, therefore the total exceeds 227.
Discussion

In Iraq, the national MMR in 2015 was 35.08/100,000 live births\(^5\). This figure is very high, in comparison with, 4 in Kuwait, 6 in the United Arab Emirates, 12 in Saudi Arabia, 16 in Turkey, and 25 in Iran, but near to Egypt 33, and less than 58 in Jordan \(^2\). Analyzing the findings of the study, it is interpreted that the MMR for Baghdad has increased from 24.23/100,000 live births in 2014 to 30.04/100,000 live births in 2018. In this regard, it can be asserted that maternal age has been the most significant factor that contributes to maternal mortality. Being older turns out to potentially increase the risks of death in pregnant women. This can be interpreted that old-age women are more likely to have symptoms of an underlying undiagnosed cardiovascular diseases, which typically make these women in adaptive towards the usual psychological aspects of pregnancy \(^6\).

The current study affirmed that women over 35 years of age (35.5\%) were the most to suffer maternal death. It signifies that there is a great need for providing high-quality care to such old-aged women having comorbidities, both before, during, and after pregnancy. Aside from the age factor, a significant relationship between parity (number of pregnancies) and maternal death has also been identified. In other words, the greater is the number of pregnancy, the more likely are the women to suffer maternal death. A study reported maternal deaths to be 1:400 for the women being first time pregnant, 1:200 for the women being second time pregnant, and 1:100 for women being pregnant for the fourth time \(^9\). As such, the findings of the current study are consistent with an existing study on Iraq, affirming the increased rate of maternal death among multigravida \(^7\).

A vast majority of maternal deaths in this study were found to be due to direct obstetrical causes. Similar findings have also been established by other existing studies \(^8-10\). Postpartum hemorrhage was the most common direct cause (34.2\%) identified in the present work. Most of these cases were due to inappropriate diagnosis or delayed onset of management caused by delayed referral from peripheral or private hospitals, delay in replacing blood and blood products, also most of these women were anemic and not managed properly during the antenatal period. Same results were reported in other studies in Iraq and neighboring countries. \(^5,7,11,12,13\).

In accordance with the systemic analysis of WHO, almost 28\% i.e., more than a quarter of reported maternal deaths during 2003-2009 were caused by indirect reasons. Thus, these indirect causes have become to be the second most significant reasons for maternal death (the leading cause is Hemorrhage) \(^14\). More specifically, these indirect causes are counted as the key contributors of most of the maternal deaths in the high-income countries \(^15\). The current study has established cardiac disorders among pregnant women as the most significant indirect cause of maternal mortality in Baghdad. It is in line with the scenario of an increased occurrence of Congenital Heart Disease (CHD) among women in their age. Alongside, the women with chronic medical diseases are already at risk for cardiac complications. These findings are consistent with the previous studies \(^5-6\).

It can be asserted that the outcomes of delays have always been poorer, regardless of the delay type. Still, Type III delays are affirmed to be typically stressing the below standard service delivery at healthcare facilities. Which may be due to poorly functioning health systems, limited or no availability of required equipment and drugs, incompetent staff, inaccurate diagnoses, wrong or delayed treatment, inappropriate monitoring, and also delayed referrals \(^3-17\). The findings of this study represent that the death cases involved all three delay types, but type III was the most reported cause among the deceased women (71.4\%). It highlights the scenario of care delivery at the majority of the facilities i.e., the facilities are ineffective in dealing with serious obstetric emergencies due to typically lacking in resources and competence.

A similar review of maternal deaths in relation to facilities was carried out in Malawi, which reported the presence of type III delays in 96.8\% cases, mainly including delayed treatment, delayed admission, lack of drugs, and lastly the incompetent staff \(^18\). Likewise, a similar inquiry was carried out in South Africa, which revealed that the clinical settings suffered delayed referrals, exploitation of standard protocols, and inability towards a responsive monitoring system \(^19\). The current study revealed that unavailability of essential drugs, equipment and supplies happened in 32.6\% of the cases, delayed treatment was recorded for 26.9\% of cases of maternal deaths, inadequate referral system, and several referrals were carried out from lower to higher level facilities in 11\% of the deceased women, and a total of 9.3\% cases suffered the delayed treatments and then deaths due to the unavailability of doctor.
It is critical that the presence of professionally competent healthcare providers is ensured in a well-functioning system of care, which is resourceful both in human and financial domains and offers quick and easy access to essential equipment and drugs \(^{[20]}\). In addition, the staff must be given frequent skill-based training to ascertain the delivery of quality care as expected for obstetric emergencies (like birth attendance, neonatal care, and other emergencies) \(^{[21-22]}\).

**Conclusion**

Third delay was present in most of the cases. It is concluded that effective care delivery in obstetric emergencies greatly relies on the capability of a healthcare provider in identifying the existence of an abnormal condition that would immediately demand determining the level of severity and the correspondingly needed intervention plan.

**Source of Funding:** No funding sources

**Conflict of interest:** None declared

**Ethical Clearance:** The study was approved by the Institutional Ethics Committee

**REFERENCES**


Implementation of Food Safety for the Soft Drink Industry in Indonesia

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ABSTRACT

Background: The awareness of food safety and the responsibility to meet the standards in the food industry is still lacking. As a logical consequence, the authorities implement the HACCP (Hazard Analysis Critical Control Point) system as a strategy for fostering and supervising food safety in the food and beverage industry. This study aimed to assess the implementation of food safety in the soft drinks industry.

Method: The database used in this systematic review was Ebsco/Annuler/Pubmed/Google Scholar/ScienceDirect/Willey Online Library. The search for Scopus-indexed literature about food safety keywords including Implementation, Food safety, Food security, Industry, and Soft drinks. The total number of literature found was 18,829 and then data extracts were obtained to get the number of articles 184 and finally a total of articles 7 that carried out the analysis to obtain the thematic phenomena of the description of implementation. The criteria for systematic literature review was using Prisma method. This study also compares the implementation of food safety in Indonesia with other relevant countries such as Pakistan and India.

Result: This study revealed that the awareness of the soft drink companies in meeting the requirements for production permits was low. The licensing system for beverage industry in Indonesia uses HACCP (Hazard Analysis Critical Control Point), as recommended by the Codex Alimentarius Commission (CAC) WHO/FAO as the basis for developing the quality management system in ASEAN countries. The level of security and the constraints of this system has been recognized internationally. The application of the HACCP system in the soft drink industry in Indonesia only fulfilled 8 of the 12 procedures of the HACCP system.

Conclusion: Implementation of the HACCP process in the soft drink industry in Indonesia is not in accordance with the actual HACCP procedure. The application of the principle of food safety in the soft drink industry in Indonesia only includes 8 steps, while the correct HACCP procedure consists of 12 steps.

Keywords: Implementation, food safety, food security, Industry, Soft drink

Introduction

Fundamental needs of every human being include clothing, food, and housing. Nowadays, the demand for basic needs is continuously increasing and becoming more diverse as people find it difficult to distinguish the primary needs and secondary needs. Basically, humans have basic needs that must be met in order to survive, including water, food, security, and love.

The development of public consumption is reflected by the development of the beverage industry which began in 2016, where the number of soft drink industries reached 335 business units with a production capacity of 4.7 tons per year. This industry is not only dominated by large companies but also small and medium industries (IKM). Small and medium industries (IKM) contribute 40% to the overall IKM sector GDP. The increasing development and demand of the beverage industry affect the requirement or standard of food security, which is also increasing. This makes food security issues to be crucial for the industry and food business.
Food security in Indonesia is identified from 4 aspects, namely affordability (related to how to simplify the supply chains), availability (maintenance of supply), quality and safety (quality and safety of nutritional standards and supervision), and natural resources and resilience (related to the area and food production). Food security in Indonesia scored 55.2% in 2018.

Industry awareness of food security and responsibility in fulfilling standards is still lacking. As a result, the strategy for fostering and supervising food safety in the food industry is carried out through the application of the Hazard Analysis Critical HACCP system. The HACCP system is believed to be the best system since it is more effective, safe, and has been recognized internationally (2)(3)(4).

Commonly, food distributors do not fully understand the Good Distribution Practice (GDP). Examination of food product distribution facilities in terms of sanitation, buildings, and facilities used, and distributed products found that 41.60 to 44.29% of food distribution facilities did not meet the requirements. In addition, the lack of knowledge and concern of consumers about food security is reflected in the small number of consumers who demand producers to produce safe and quality food products, (5)(6)(7).

Method

This research implemented systematic review using secondary data. The criteria for determining the articles were based on the Prisma method which consists of 5 stages of literature review. The first stage was the identification of articles based on inclusion and exclusion criteria. The inclusion categories for selected articles were 2009 – 2019 publication time, using qualitative method, listed on open access journal, focus on the food industry, and has the output on the implementation of food security in the soft drink industry. The exclusion categories are articles that have been published for more than 10 years and carried out in developed countries.

As for the search of secondary data, initial exploration was obtained in six publishers; Ebsco, Annuler, Pubmed, Google Scholar, Science Direct, and Willey Online Library. The second stage was the screening by using specific keywords; Implementation, food security, food security, industry, and soft drinks. The total of literature found based on those keywords was 18,829 articles, thus the data extraction was needed using specific keywords and location. Furthermore, the data was extracted using inclusion criteria, and 65 articles were obtained. Meanwhile, 30 articles were eliminated since they did not comply with the inclusion criteria.

The third stage was accessibility, of 65 articles that have been extracted (and 30 articles are eliminated), 35 articles were selected based on the titles and abstracts. These 35 articles were then extracted again by considering the inclusion category; published in 2009-2019, using qualitative methods, and is open access. After that, the literature data was extracted again until 7 articles were determined to be reviewed. This is the included stage, which is the last stage in the method.

Based on the inclusion and exclusion criteria, 7 articles were found suitable to illustrate the importance of food security in the soft drink industry in Indonesia, and to describe the implementation of food security. Those 7 articles were then selected for further study. We also compared the application of the HACCP system in other developing countries that have the same conditions in terms of food security procedures. Countries chosen for comparison were Pakistan and India. Both were selected based on predetermined inclusion and exclusion criteria. In addition, Pakistan and India have the same implementation of food security as Indonesia. These are the articles:

1. “Quality control of raw materials for carbonated beverage products on line 8 of PT Coca-Cola Armatil Indonesia Central Java” by Julius. Accessed from Ebscco. Participants were asked about the application of food security with the HACCP system.

2. “Analysis of Application of Hazard analysis & critical control points (HACCP) in your drinking water UMS” by M. Noor. Accessed from Google Scholar. Participants were asked about methods of controlling food security and the process of controlling food security.

3. “Sensory Test of Liquid Milk and Sweetened Condensed Milk at PT Frisian Flag Indonesia” by Linda. Accessed from Willey Online Library. Participants were asked about the production mechanism.

4. “Increased Competitiveness of Instant Functional Drinks (Celup and Apple Juice), as a Typical
Product of Agrowisata Batu” by Elok et al. Accessed from Willey Online Library. Participants were asked about the production mechanism and the stages.

5. “Study on Hazard Analysis Critical Control Point (HACCP) On Unlabeled Soft Drink Products Sold By Street Traders in Banda Aceh” by Bhayu. Accessed from Willey Online Library. Participants were asked about the process of selling soft drinks without labels and carried out observations at the implementation stage.

6. “Food security and access to healthy foods in India country: Learning from the Food Distribution Program on India” by Nancy and Carol. Accessed from Willey Online Library. The researchers worked with the stakeholders to find out the stages of food security.

7. “Factors affecting household food security in rural northern hinterland of Pakistan” by Abdullah et al. Accessed from Science Direct. The researchers conducted random sampling to select samples and obtained 294 participants to investigate the food security related to the policy.

Results

The application of the HACCP principle follows the concept prepared by the world food agencies (FAO and WHO), as well as by the National Advisory Committee on Microbiological Criteria for Foods (NACMCF) which consists of 12 steps and 7 principles. The following are the steps for implementing HACCP in industry: (5)(8)(9)(10)(11)

a. Assemble the HACCP Team: Formed based on 3-6 special members.

b. Describe the product: The stage of applying the HACCP system concept which includes product name, product specifications, packaging size, presentation method, durability, product distribution, packaging properties, type, and packaging label

c. Identify the intended/expected use: How to use soft drink products by consumers and how producers serve consumers

d. Construct a flow diagram: Process diagram explains the flow of the manufacturing process from production to finishing

e. Perform an on-site confirmation: At this stage, the HACCP team matches the diagrams that have been made to ensure that the process applied is in accordance with the procedure.

f. Conduct a hazard analysis: A step where control can be applied and the danger of security can be eliminated, or reduced to the acceptable limits.

g. Determine Critical Control Points (CCPs): Control points can be seen from the process stage, hazard, correction measures and critical limits.

h. Monitoring: According to Codex in the book “Food International” (2012), monitoring is the act of carrying out a series of observations or planned parameter measurements to ensure control of the process according to the procedure.

The implementation of HACCP for food security in Indonesia has been carried out by every industry player. The implementation of these stages has no obstacles. (12)(13)(10)

The stages included 8 steps, where the findings are the same as the implementation of HACCP in Pakistan. The application of HACCP in Pakistan is more emphasized in the food production process. The biggest producer barriers are access to mileage, transportation costs, and infrastructure which are also included in one of the sizes of building for industrial companies. 8% of household producers in Pakistan have a very low level of food security which has an effect on their income insecurity (13)(12)(6)(8)

The findings of this study are in line with research conducted in India about the factors that affect household food security, the results obtained that the small-scale home industry food security has a significant relationship with building size in home industry companies, distance to the place of production, costs transportation, competition between producers, and the risk of rising food prices. Another obstacle in home industry companies in India is that most rural areas still have limited internet and cellular services so online bookings cannot be made. As for the current era of globalization, almost most human activities are supported by technology (8)(3)

Based on studies conducted in Pakistan and India, it can be stated that food security is more emphasized in the production process, and has different techniques and obstacles. This is in line with the conditions in Indonesia
Discussion

Initially, security guarantees in the food processing sector depended on the application of Good Manufacturing Practices (GMP) or Guidelines for Good Processed Food Production. In RI Government Regulation No. 28 of 2004 concerning Food Safety. HACCP is a procedure for identifying, evaluating and controlling the hazards found in foodstuffs as well as indirect risks derived from food (Hulebak and Schlosser, 2002; Mortimer et al., 2004). HACCP is designed as an effort to prevent risk and at the same time as an alternative to food safety assurance that focuses on testing end-food products (Ropkins and Beck, 2000). HACCP as a food safety guarantee system is not easy to implement in the food industry. Every food company that wants to implement must develop its own HACCP plan in accordance with their respective conditions and situations.\(^{(19)(14)}\)

In Indonesia, HACCP has experienced rapid development since 1990, where this system was later adopted in the Indonesian standardization system in 1998 to become SNI 01-4852-1998, adopted from CAC/RCP 1-1969, Rev. 3 (1997) -Recommended International Code of Practice-General Principles of Food Hygiene. Technically, the National Standardization Agency (BSN) in Indonesia gives authority to certain agencies or institutions to issue HACCP certificates.\(^{(11)(13)}\)

In theory, HACCP steps include the establishment of a HACCP team, the preparation of a product description, identification of usage plans, arrangement of process flow diagrams, verification of flow diagrams in fields, Hazard analysis, detection of critical control points (CCP), the set of critical limits, establishment of supervision system, Establishment of corrective actions, and verification procedures. However, HACCP implemented by the soft drink companies include describing the product, Identifying the intended/expected use, Construct a flow diagram, On-site confirmation of the flow diagram, Conduct a hazard analysis, Determine Critical Control Points (CCPs) and Monitoring.\(^{(12)(16)}\)

The result demonstrated that there is a difference between the theory and the practice. The HACCP mechanism applied by the soft drink industries have 5 differences with the HACCP procedures in its theory. These differences include corrective action designed to identify the potential health hazards, and enforce the appropriate strategies to prevent health.\(^{(12)(13)}\)

In the table there are 5 stages that are not carried out by the industry, namely forming the HACCP team, establishing Critical Limit, establishing corrective actions, establishing verification procedures and establishing documentation. The 5 stages that did not do so did not explain the reasons why they did not do this step.\(^{(15)(13)(11)}\)

Basically, the application and development of HACCP systems in industry is only 7 which is the main principle and that has been done by the industry and the other 5 stages are the stages of the process flow diagram called process flow verification verification so that the first 5 steps to build the HACCP, 5 these steps are steps that are not carried out by the industries mentioned above. So if put together into 12 steps to build an effective HACCP system and this 12-step concept is the HACCP concept according to CAC where 7 main principles of HACCP are included.\(^{(11)(13)}\)

Conclusions

This result of this study demonstrated that the implementation of the HACCP process in the soft drink industry in Indonesia is not in accordance with the actual HACCP procedure. The application of the principle of food safety in the soft drink industry in Indonesia only includes 8 steps, while the correct HACCP procedure consists of 12 steps. HACCP must play an active role in raising awareness of the industry that the HACCP procedure must be implemented properly and thoroughly to ensure food products are safe before being traded to the public.

Ethical Clearance: None

Source of Funding: Self

Conflict of Interest: Nil

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Improvement of Oral Health Knowledge and Behaviors by Oral Health Education for Multicultural Families in Busan

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ABSTRACT

The purpose of this study was to investigate the change of oral hygiene and attitude in oral health education for multicultural families. To investigate changes in knowledge and attitudes before and after the training, a structured questionnaire was conducted by self-filling method. O’Leary index was used after coloring with all teeth and measure the quantity of plaque of supragingival. The oral health education was conducted mainly on oral knowledge, and demonstration practice training was conducted mainly on oral hygiene products. In addition, in-depth interviews were provided about the necessity of oral health education for multicultural women. Most of the subjects were interested in general health as well as oral health. The attitudes of the subjects were 1.50 ± 1.73 before the training and 2.20 ± 2.12 after the training so that the change of attitude after the training was positive. There were significant differences in attitude according to oral health education (p<0.05). The oral hygiene management ability test of the subjects showed 25.97 ± 19.77 before training and 10.38 ± 5.33 after training. There was significant difference in oral hygiene management ability index according to education (p<0.05). However, there was so significant difference in tooth brushing and knowledge after training.

Keywords: health knowledge, behavior, oral health education, multi-cultural family

Introduction

Recently, the Korean society is rapidly becoming a ‘multicultural society’ as the multicultural families are increasing due to the increase of foreign workers, North Korean defectors, and international marriages. Petersen P.E., et al. reported that immigrants, minority racial and ethnic groups, and poor indigenous peoples have poor oral health status(1).

The dental caries occurrence patterns are as follows. First, the distribution of disease does not appear equally in all people, and there is a specific group of dental caries activity. The distribution of disease has a distribution that is biased toward on side distribution rather than a normal distribution(2). Second, it does not occur equally in all teeth in the dentition, but in specific teeth(3). In other words, there is a dentition in which dental caries develops in one of the teeth, and the results of epidemiological studies are different in children in Africa and Asia(4).

In one study, the oral status of Alaskan native children was reported to be higher than that of native immigrants, and the rural children(5), and the social environment factors such as race, economic power, and educational environment to prepare for the occurrence of caries(6). As multicultural families grow, attention to oral health is also needed to improve their lives. However, it was difficult to obtain knowledge and information about oral health because of lack of education.

The purpose of this study is to understand the importance of oral health education in multicultural families by examining whether knowledge, attitude and oral hygiene status are changing when oral health education is conducted.
Material and Method

**Subjects and Period:** From June to July, 2017, randomly biased sampling method was conducted on multicultural women living in Busan area. A self-entry questionnaire was administered to the subjects who were explained the purpose of the study and had voluntary consent, and 20 subject were selected as the final subjects except for the unfair responses.

**Research Method:** The subjects were instructed to use proper tooth brushing methods and oral appliances (dental floss, toothbrush and tongue cleaner) and provided three times of training through lecture, demonstration and practice. Lecture training was conducted mainly on oral knowledge, and demonstration practice training was conducted mainly on oral hygiene products. To investigate the change of the number of brushing, knowledge and attitude change, before and after the training, we surveyed structured questionnaire by self-entry method and examine changes of brushing frequency, oral hygiene knowledge and attitude by proceeding to 1st and 3rd rounds. To quantify the amount of bacterial membranes in the tooth surface, O’Leary index was used after coloring with all the teeth and measure the changes on the progress of the education. In addition, in-depth interviews were conducted about the necessity of oral health education for multicultural women.

**Statistical Analysis:** Statistical analyses were performed with the Statistical Package for the Social Sciences (SPSS), version 24 (IBM SPSS Statistics for Windows, Armonk, NY, USA). To examine the frequency, percentages were calculated and evaluated by using the analytical technique that is based on the general characteristics of the subjects, subjective perception and interest in the health and oral health of the subjects, periodic health and oral examination, and awareness of oral health education needs. A t-test was conducted to examine the changes in the number of teeth brushing, knowledge, attitude score, and O’Leary index before and after oral health education. The level of significance was set at $p < 0.05$.

**Findings:** Total subjects were 20 people in which 17 subjects (85.0%) were under 30 years of age and 3 subjects (15.0%) were over 31 years of age. The nationality is as follows: 7 (35.0%) from Vietnam, 4(20.0%) from Cambodia, 2 (10.0%) from Philippines, 1 (5.0%) from Uzbekistan, and 4 (20.0%) were not responded their nationality (Table 1).

### Table 1: General characteristics of subjects

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Sort by</th>
<th>Frequency (number of subjects)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>age</strong></td>
<td>Under 30</td>
<td>17</td>
<td>85.0</td>
</tr>
<tr>
<td></td>
<td>Above 30</td>
<td>3</td>
<td>15.0</td>
</tr>
<tr>
<td><strong>nationality</strong></td>
<td>Vietnam</td>
<td>7</td>
<td>35.0</td>
</tr>
<tr>
<td></td>
<td>Cambodia</td>
<td>4</td>
<td>20.0</td>
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<tr>
<td></td>
<td>Philippine</td>
<td>2</td>
<td>10.0</td>
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<tr>
<td></td>
<td>Uzbekistan</td>
<td>1</td>
<td>5.0</td>
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<tr>
<td></td>
<td>Japan</td>
<td>1</td>
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<tr>
<td></td>
<td>China</td>
<td>1</td>
<td>5.0</td>
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<tr>
<td></td>
<td>Non-response</td>
<td>4</td>
<td>20.0</td>
</tr>
<tr>
<td><strong>Length of residence in Korea</strong></td>
<td>1 year</td>
<td>9</td>
<td>45.0</td>
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<tr>
<td></td>
<td>2 years</td>
<td>2</td>
<td>10.0</td>
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<td></td>
<td>3 years</td>
<td>1</td>
<td>5.0</td>
</tr>
<tr>
<td></td>
<td>4 years</td>
<td>1</td>
<td>5.0</td>
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<tr>
<td></td>
<td>5 years</td>
<td>2</td>
<td>10.0</td>
</tr>
<tr>
<td></td>
<td>6 years</td>
<td>3</td>
<td>15.0</td>
</tr>
<tr>
<td></td>
<td>10 years</td>
<td>2</td>
<td>10.0</td>
</tr>
<tr>
<td><strong>Level of education</strong></td>
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</tr>
<tr>
<td></td>
<td>Middle school</td>
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</tr>
<tr>
<td></td>
<td>High school</td>
<td>5</td>
<td>25.0</td>
</tr>
<tr>
<td></td>
<td>College</td>
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<td>30.0</td>
</tr>
<tr>
<td></td>
<td>Non-response</td>
<td>3</td>
<td>15.0</td>
</tr>
<tr>
<td><strong>Linguistic ability to speak Korean</strong></td>
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<td>0.0</td>
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<tr>
<td></td>
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<tr>
<td></td>
<td>Normal</td>
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<td>50.0</td>
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<tr>
<td></td>
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<td>15.0</td>
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<td></td>
<td>Very well</td>
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<td>0.0</td>
</tr>
<tr>
<td><strong>Reading ability in Korean</strong></td>
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</tr>
<tr>
<td></td>
<td>Normal</td>
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<td>45.0</td>
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<td></td>
<td>Somewhat poor</td>
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<td></td>
<td>Very poor</td>
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<td></td>
<td>Very well</td>
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<tr>
<td><strong>Writing ability in Korean</strong></td>
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<tr>
<td></td>
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<td></td>
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<tr>
<td></td>
<td>Very poor</td>
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<td>25.0</td>
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<tr>
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</tr>
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<tr>
<td></td>
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<td>10.0</td>
</tr>
<tr>
<td></td>
<td>3 children</td>
<td>1</td>
<td>5.0</td>
</tr>
</tbody>
</table>

**Number of children**
The subjects’ subjective health status was 2 (10.0%) for ‘very good’, 6 (30.0%) for ‘good’, 6 (30.0%) for ‘normal’. ‘Interest of the health’ responded as follows: 1 (5.0%) for ‘very high’, 6 (30.0%) for ‘high’, and 9 (45.0%) for ‘normal’. ‘Regular health Examination’ responded as follows: 7 (35.0%) for ‘receiving’, and 13 (65.0%) for ‘not receiving’.

The subjects’ ‘subjective oral health status’ was as follows: 1 (5.0%) for ‘very good’, 7 (35.0%) for ‘good’, 7 (35.0%) for ‘normal’. ‘Interest of the oral health’ responded as follows: 4 (20.0%) for ‘very high’, 6 (30.0%) for ‘high’, and 5 (30.0%) for ‘normal’. ‘Regular oral examination’ responded as follows: 3 (15.0%) for ‘Receiving’, and 17 (85.0%) for ‘not receiving’ (Table 2).

Table 2: Awareness and interest in health and oral health of the subjects, regular health and oral examinations

<table>
<thead>
<tr>
<th>Characteristics</th>
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<th>Frequency (Number of subjects)</th>
<th>Percentage (%)</th>
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</thead>
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<td>Subjective health status</td>
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</tr>
<tr>
<td>Very good</td>
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</tr>
<tr>
<td>Good</td>
<td></td>
<td>6</td>
<td>30.0</td>
</tr>
<tr>
<td>Normal</td>
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<td>30.0</td>
</tr>
<tr>
<td>Bad</td>
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<tr>
<td>Very bad</td>
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<td>3</td>
<td>15.0</td>
</tr>
<tr>
<td>Interest in health</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Very interested</td>
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<td>5.0</td>
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<tr>
<td>Interested</td>
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<tr>
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</tr>
<tr>
<td>Not interested</td>
<td></td>
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<td>0.0</td>
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<tr>
<td>Regular health examination</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Receiving</td>
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<td>35.0</td>
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<tr>
<td>Not receiving</td>
<td></td>
<td>13</td>
<td>65.0</td>
</tr>
<tr>
<td>Subjective oral health status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very good</td>
<td></td>
<td>1</td>
<td>5.0</td>
</tr>
<tr>
<td>Good</td>
<td></td>
<td>7</td>
<td>35.0</td>
</tr>
<tr>
<td>Normal</td>
<td></td>
<td>7</td>
<td>35.0</td>
</tr>
<tr>
<td>Bad</td>
<td></td>
<td>2</td>
<td>10.0</td>
</tr>
<tr>
<td>Very bad</td>
<td></td>
<td>3</td>
<td>15.0</td>
</tr>
<tr>
<td>Interest in oral health</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very interested</td>
<td></td>
<td>4</td>
<td>20.0</td>
</tr>
<tr>
<td>Interested</td>
<td></td>
<td>6</td>
<td>30.0</td>
</tr>
<tr>
<td>Somewhat interested</td>
<td></td>
<td>5</td>
<td>25.0</td>
</tr>
<tr>
<td>Not interested</td>
<td></td>
<td>4</td>
<td>20.0</td>
</tr>
<tr>
<td>Not interested</td>
<td></td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Regular oral examination</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Receiving</td>
<td></td>
<td>3</td>
<td>15.0</td>
</tr>
<tr>
<td>Not receiving</td>
<td></td>
<td>17</td>
<td>85.0</td>
</tr>
</tbody>
</table>

The number of ‘Brushing’ of the subjects was 1.3 times before the education, whereas 2.30 times after the education, and the ‘Knowledge’ score was 1.60 before but 2.50 after the education. Attitude score was 1.50 before the education, but 2.20 after the education, and O’Leary Index was 25.97 before the education, whereas 10.38 after the education (Table 3, P<0.05).

Table 3: The subjects’ number of tooth brushing and its knowledge, attitude score and O’Leary index change before and after the oral health education

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Before education</th>
<th>After education</th>
<th>Probability of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of brushing</td>
<td>1.30 ± 1.49</td>
<td>2.30 ± 1.41</td>
<td>0.209</td>
</tr>
<tr>
<td>Knowledge score</td>
<td>1.60 ± 1.96</td>
<td>2.50 ± 2.26</td>
<td>0.151</td>
</tr>
<tr>
<td>Attitude score</td>
<td>1.50 ± 1.73</td>
<td>2.20 ± 2.12</td>
<td>0.040*</td>
</tr>
<tr>
<td>O’Leary Index</td>
<td>25.97 ± 19.77</td>
<td>10.38 ± 5.33</td>
<td>0.002*</td>
</tr>
</tbody>
</table>

** P<0.01 * P < 0.05

The need for oral hygiene education was as follows: 1 (5.0%) for ‘Never need’, 1 (5.0%) for ‘Not need’ before the education, but these answers has changed to 0 (0.0%) after the education. The answer for ‘Very need’ was 5 (25.0%) before the education but it increased to 8 (40.0%) after the education. The oral hygiene education was conducted by lecture and there were 10 (50.0%) subjects but 4 (20.0%) after the education. Whereas 1:1 education...
(personal education) was 7 (35.0%) before the education but 14 (70.0%) after the education. For oral hygiene education location before the education was as follows: 4 (20.0%) for community health center and 15 (75.0%) for multicultural family support centers. However, the answer for multicultural family support centers increased to 19 (95.0%) after the education. The appropriate oral hygiene education time for less than an hour was 16 (80.0%) but 17 (85.0%) after the education. The average number of oral hygiene education courses was 5 (25.0%) for 1-2 times per week, 5 (25.0%) for once a month, and 6 (30.0%) for twice a month before education, but 3 (15.0%) for 1-2 times per week, 9 (45.0%) for once a month, and 4 (20.0%) for twice a month after the education (Table 4).

Table 4: Recognize the needs for oral hygiene education and its methods, place, time, and numbers

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Sort by</th>
<th>Before education</th>
<th>After education</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Need of oral hygiene education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never need</td>
<td>1</td>
<td>5.0</td>
<td>0</td>
</tr>
<tr>
<td>Not need</td>
<td>1</td>
<td>5.0</td>
<td>0</td>
</tr>
<tr>
<td>Normal</td>
<td>3</td>
<td>15.0</td>
<td>4</td>
</tr>
<tr>
<td>Need</td>
<td>10</td>
<td>50.0</td>
<td>8</td>
</tr>
<tr>
<td>Very need</td>
<td>5</td>
<td>25.0</td>
<td>8</td>
</tr>
<tr>
<td>Methods of oral hygiene education process</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lecture</td>
<td>10</td>
<td>50.0</td>
<td>4</td>
</tr>
<tr>
<td>On-line program</td>
<td>3</td>
<td>15.0</td>
<td>2</td>
</tr>
<tr>
<td>1:1 personal education</td>
<td>7</td>
<td>35.0</td>
<td>14</td>
</tr>
<tr>
<td>Place to have oral hygiene education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community health center</td>
<td>4</td>
<td>20.0</td>
<td>0</td>
</tr>
<tr>
<td>Multicultural family support center</td>
<td>15</td>
<td>75.0</td>
<td>19</td>
</tr>
<tr>
<td>others</td>
<td>1</td>
<td>5.0</td>
<td>1</td>
</tr>
<tr>
<td>Appropriate oral hygiene education duration for 1 time</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 30 minutes</td>
<td>1</td>
<td>5.0</td>
<td>1</td>
</tr>
<tr>
<td>Less than 1 hour</td>
<td>16</td>
<td>90.0</td>
<td>17</td>
</tr>
<tr>
<td>Less than 2 hours</td>
<td>3</td>
<td>15.0</td>
<td>2</td>
</tr>
<tr>
<td>Number of oral hygiene education programs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-2 times a week</td>
<td>5</td>
<td>25.0</td>
<td>3</td>
</tr>
<tr>
<td>Once a month</td>
<td>5</td>
<td>25.0</td>
<td>9</td>
</tr>
<tr>
<td>Twice a month</td>
<td>6</td>
<td>30.0</td>
<td>4</td>
</tr>
<tr>
<td>1-2 times a year</td>
<td>1</td>
<td>5.0</td>
<td>1</td>
</tr>
<tr>
<td>3-4 times a year</td>
<td>3</td>
<td>15.0</td>
<td>5</td>
</tr>
</tbody>
</table>

Metz et al. reported that oral health behaviors of parents affected the knowledge, attitude and behavior of their children’s oral health(6), and in multicultural family mothers, dental treatment was delayed until the subjective symptoms become severe(7,8), the prevalence of dental caries in immigrant groups and economically difficult children is high(9), and the incidence and appearance of dental caries vary according to race, country and region(10).

In addition, the parents’ social class and income level were inversely related to the children’s cariogenic experience(11), the oral health consciousness of the mother has a great influence on the development and maintenance of the dental caries of the child(12). In the present study, the method of conducting oral hygiene education desired was a lecture before and after the education, 1:1 individual education was desired more, and the desired oral hygiene education place was the multicultural family support center. And the number of appropriate oral hygiene education was about once a month.

In multicultural families, the socio-demographic characteristics and oral health belief of each country are also necessary for understanding oral hygiene education and its improvement programs. The questionnaires and researches that considered these cultural differences were rare in Korea as well as overseas, and mainly the qualitative research by interview was made(13-15).
The opinions of women in multicultural families about the necessity of oral hygiene education through in-depth interviews were applied without knowing what oral hygiene education was about before the education, but there were many opinions that they had confidence after oral health education. Other comments suggested that it was difficult and time-consuming to decide the education time which could be matched together, and the role to get educated on oral hygiene was important because they can educate their children directly.

Teaching about brushing and its knowledge seems to be hardly effective at a certain level with only three rounds of education. The lecture-based knowledge part was not effective due to the linguistic problems. However, education seems to be needed because it led to a positive change in attitude and oral hygiene management ability index by conducting oral hygiene product education and demonstration.

**Conclusion**

The purpose of this study was to compare the change of knowledge, attitude and oral hygiene status in oral hygiene education for multicultural women. The before- and after-education changes increased the number of people who needed oral hygiene education and method of oral hygiene education process preferred the 1:1 personally study rather than lecture style. It was suggested that number of oral hygiene education programs should be from twice a month to once a month. There was no significant difference in tooth brushing and knowledge change after the education. However there was a positive difference in attitude and oral hygiene management ability index.

**Conflict of Interest:** The authors declare no conflict of interest.

**Source of Funding:** This work was supported by Dongseo University, "Dongseo Cluster Project" Research Fund of 2019 (DSU-20190002)

**Ethical Clearance:** There was no ethical clearance.

**REFERENCES**


The Effectiveness of the Use of Propolis toward the Number of Polymorphonucleas Cells in Mice Wounds

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ABSTRACT

Background: Propolis is a honey bee product with a very complex chemical composition, made by gummy and balsamic materials collected by bees from sprouts, flower buds, trees and other vegetal-tissue resinous trees. Propolis is useful as an antibacterial, antifungal and anti-inflammatory. During inflammation, polymorphonuclear migration to the wound area increases and propolis acts to suppress the amount of polymorphonuclear in the wound.

Objective: To know the effectiveness of propolis to decrease the migration of polymorphonuclear neutrophil cells to the wound in mice.

Method: Experimental research with post-test only design with group control design. Propolis taken from the forest then made an extract with a concentration of 80% and then the mice were inserted with a wound depth of 2 mm and a wound length of 15 mm. Cut wounds of mice smeared with 80% propolis extract twice a day and then sacrificed 3 mice for check-up on days 1, 3, 5, and 7. Then histology was examined. Statistical analysis was performed by Mann Whitney test.

Results: There were significant differences between treatment groups and control groups.

Conclusion: Propolis extract with 80% concentration has an influence on suppressing the amount of polymorphonuclear migration to the inflammatory area.

Keywords: Propolis, Inflammation, Polymorphonuclear.

Introduction

The incidence of injuries is increasing due to the increasingly complex activities carried out in everyday life. In carrying out activities, we often experience accidents that result in injuries. Both minor injuries and severe injuries. Wounds are damage or loss of body tissue due to a factor that interferes with the body’s protection system. These factors include trauma, temperature changes, chemicals, explosions, electric shock, or animal bites.¹ The body has a physiological response to wounds, namely the process of wound healing. The wound healing process consists of various complex processes to restore network integrity. During this process blood clots, acute and chronic inflammatory responses, neovascularization, cell proliferation to apoptosis occur. This process is mediated by various cells, cytokines, matrices, and growth factors. Disregulation of the process can cause complications or abnormalities of the wound, hypethrophic and keloid wounds. Healing skin wounds without outside help runs naturally, but sometimes special treatment is needed to help the process.¹

Tissue healing is an adaptive biological response that makes repair of damaged tissue. The initial stage of healing is represented by an acute inflammatory reaction, wherein inflammatory cells migrate to damaged tissue and phagocyte debris, in this phase occurs interrupted blood vessels in the wound will be stopped by the occurrence of vasoconstriction reactions to restore blood flow and inflammation to remove tissue damaged and prevents bacterial infections. In the later stages, endothelial cells are fibroblasts and multiply and produce scars. The occurrence of an inflammatory process with incomplete healing has been a concern for hundreds of years. Various kinds of natural products have been used as anti-inflammatory and healing agents, with propolis being an extraordinary choice.¹

Propolis is a resinous substance with various colors and consistency. Propolis is a honey bee product with a
very complex chemical composition, made by gummy and balsamic materials collected by bees from sprouts, flower buds, trees and other vegetal-tissue resinous trees.²

Polymorphonuclear neutrophils (PMN) and macrophages will migrate to areas that have inflammation. Both types of cells function to eat and clean infected tissue or from toxic agents. The process of inflammation of the initial cellular phase is the phase where there is the first cell that is chemically attracted to the inflammatory area, namely polymorphonuclear neutrophil cells (PMN). Polymorphonuclear neutrophils (PMN) are mature cells that can attack and damage bacteria and viruses even in blood circulation. In an inflammatory process, neutrophils are responsible for cleaning tissue from infectious or toxic agents, that it can be used as a reference in assessing inflammation. Neutrophilia (PMN) is caused by inflammation products that enter the bloodstream which are then transported to the bone marrow and work on the bone marrow capillaries and in stored neutrophils to move these neutrophils quickly into the blood circulation causing an increase in the number of neutrophils in inflamed tissue.³

Method

The type of research used is an experimental (true experiment) laboratory with post test only with control group design research.

Propolis used is propolis from Trigona Spp bee, which is widely found in South Sulawesi’s North Luwu Regency. What is applied to the wound is mice twice a day.

The mice used were Mus Musculus ages 2-3 months and weighing 20-30 gr. The next one will be wound with a length of 15 mm and a depth of 2 mm(fullthicknesswound).

Neutrophils Polymorphonuclear was seen on a microscope by counting the number of polymorphonuclear neutrophils on a tissue preparation.

The number of samples were 24, and was divided into 8 groups. And each group consisted of 3 mice. Then the results of the calculation of the number of Neutrophil PMN in the two groups, namely the control group and the treatment group, will be analyzed by the statistical parametric method, Mann Whitney.

Results

Table 1: The results of the calculation of the number of Polymorphonuclear per field of view in the control group (placebo)

<table>
<thead>
<tr>
<th>Control group</th>
<th>H1</th>
<th>H3</th>
<th>H5</th>
<th>H7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control 1</td>
<td>41</td>
<td>71</td>
<td>28</td>
<td>18</td>
</tr>
<tr>
<td>Control 2</td>
<td>39</td>
<td>42</td>
<td>20</td>
<td>19</td>
</tr>
<tr>
<td>Control 3</td>
<td>40</td>
<td>50</td>
<td>21</td>
<td>17</td>
</tr>
<tr>
<td>Average</td>
<td>40</td>
<td>54,33333</td>
<td>23</td>
<td>18</td>
</tr>
</tbody>
</table>

Table 2: Results of calculation of the number of Polimorfonuklear per field of view in the treatment group (propolis)

<table>
<thead>
<tr>
<th>Treatment Group</th>
<th>H1</th>
<th>H3</th>
<th>H5</th>
<th>H7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment 1</td>
<td>19</td>
<td>25</td>
<td>21</td>
<td>18</td>
</tr>
<tr>
<td>Treatment 2</td>
<td>16</td>
<td>26</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>Treatment 3</td>
<td>17</td>
<td>32</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>Average</td>
<td>17,33333</td>
<td>27,66667</td>
<td>16.66667</td>
<td>15,66667</td>
</tr>
</tbody>
</table>

Based on the table above, it can be seen that the average value of the number of polymorphonuclear in the control group on the first day is 40 which is higher than the average value of the number of polymorphonuclear treatment groups in the first day, which is 17.33333. on the 3rd day the average value of the polymorphonuclear control group was 54.33333 while the treatment group was lower at 27.66677 where this was the highest number of each group. on the 5th day the average number of polymorphonuclear in the control group was 23 higher than the average number of polymorphonuclear treatment groups on the first day i.e 16.66667 and on day 7 also showed a higher number of polymorphonuclear in the control group i.e 18 compared the treatment group was 15.66667.

From the above data it can be visualized the number of polymorphonuclear in the graph below:

![Graph of average polymorphonuclear quantities](image_url)
Based on the above graph it can be seen that polymorphonuclear began to appear on the first day and then increased on the third day and then decreased on the fifth day and the seventh day. And the average number of polymorphonuclear in the group given propolis extract was lower than the group not given propolis.

**Observation of polymorphonuclear cells (PMN):**

1. First day (Control)

![Figure 2: Day One of Control](image)

2. First day (treatment)

![Figure 3: First day of treatment](image)

3. Seventh day (Treatment)

![Figure 4: Seventh day of treatment](image)

**Discussion**

From the research conducted, the results obtained that the administration of propolis in the wound of mice caused a reduction in migration of polymorphonuclear cells. Polymorphonuclear activity arises since the onset of injury. Inflammation occurs due to mediation by cytokines, chemokines, growth factors, and effects on receptors. When the inflammatory process passes through the first hour then a number of neutrophils will invade the inflammatory area and mature cells are formed that function to kill bacteria and increase the number of neutrophils which is four times the normal number of neutrophils (normal = 4000 – 5000).\(^4,5,6\)

At the time of inflammation, changes occur in the area around the affected tissue, namely increased heat (heat), redness (rubor), swelling (tumor), and loss of function (laesa function).\(^7\)

Then the incisions made on mice were given propolis extract for healing and some were left alone without giving anything and allowing physiological changes to occur. Incisions given by propolis extract showed that the amount of polymorphonuclear cell migration was lower than the incision which was left alone without propolis and was allowed to undergo physiological changes.

This caused a reduction in the number of polymorphonuclear cell migration, which was due to the presence of Caffeic Acid Phenetyl Ester (CAPE) which is a derivative of other flavonoid compounds with anti-inflammatory ability because it inhibits the release of arachidonates by cell membranes, causing inflammatory mediators to be formed.\(^2\)

According to other literature, research carried out both in vivo and in vitro shows the biological and pharmacological activities of flavonoids are very diverse, namely as anti-inflammatory, anti-microbial to fight bacteria, anti-fungal, and anti-viral.\(^5,9,10\) Other contents found in propolis are vitamin B1, vitamin B2, vitamin B6, niconitic acid, pantothenic acid, and riboflavin.\(^2,8,12\)

Anti-inflammatory compounds contained *quercetin*, *pinostrobin*, *kaempferol*, *galangin*, *pinocembrin*, *pinobaksin* as well as several types of compounds from other phenolic groups, namely *cinnamic acid, cinnamic alcohol, vanilin, benzyl alkhol, benzoic acid, caffeic* as well asferulic acid which causes a decrease in polymorphonuclear neutrophil (PMN) activity. Flavonoids will suppress the formation of prostaglandins which function to increase vascular permeability in the inflammation process.\(^2,11,13\)

Provision of propolis causes wound healing because the content contained in propolis can reduce the amount...
of immigration of polymorphonuclear neutrophil cells so that there is no accumulation of polymorphonuclear neutrophil cells and can accelerate healing compared to wounds not given propolis.  

**Conclusion**

The conclusion of this study is that there are significant differences between the number of PMN in the treatment group and the control group.

At the beginning of the inflammatory process, polymorphonuclear neutrophils (PMN) begin to invade the inflammatory area and form mature cells.

The increase in the number of polymorphonuclear neutrophils (PMN) is four to five times, from 4000 to 5000 to 15000 to 25000 polymorphonuclear cells (PMN).

The life span of polymorphonuclear cells (PMN) is 1 to 4 days and greatly increases on the 3rd day and starts apoptosis on the 4th day.

Topical administration of propolis extract can reduce the number of polymorphonuclear neutrophil cell migration (PMN).

**Conflict of Interest:** There is no conflict of interest in this study.

**Source of Funding:** Domestic government

**Ethical Clearance:** This study obtained a label of ethics escaped by the number: 0036/PL09/KEPKFKG - RSGMUNHAS/2018 and register number UH 17120029 on Oktober 8, 2018.

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Hazardous Effects of Lead (Pb) on Hematological and Biochemical Parameters in Awassi Sheep Grazing in the Najaf Center

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ABSTRACT

This study was aimed to compare between lead blood levels and its hazardous effects on hematological and biochemical parameters in Awassi sheep grazed on pastures located in Najaf center and sheep grazed in desert of Al- Najaf province-Iraq. The results showed that the lower blood lead levels in sheep grazed on desert with values enclosed in generally within the normal limits, while, higher blood lead levels were shown in sheep grazed on pasture located in the city center of Al- Najaf, with average values significantly higher than the maximum limits. On the other hand, there are a significant decrease (p<0.05) in hematological parameters (Red blood cells (RBCs), hemoglobin (Hb), packed cell volume (PCV), mean corpuscular volume (MCV), mean corpuscular hemoglobin (MCH), and mean corpuscular hemoglobin concentration (MCHC), also, a significant increase (p<0.05) in biochemical parameters (alanine aminotransferase (ALT), aspartate aminotransferase (AST), sorbitol dehydrogenase (SDH), blood urea nitrogen (BUN) and creatinine) but decrease in total protein (TP) in sheep grazed on pasture located in the city center compared with sheep grazing in desert Al- Najaf. Thus, the current study showed that elevated mean blood lead level above the acceptable limit of (0.1 ppm) in all Sheep living in the city Centre, suggesting that iron deficiency anemia may amplify the effect of lead contamination in the environment.

Keywords: Awassi sheep, Hematological parameters, Serum biochemistry, Lead (Pb).

Introduction

Lead (Pb) is found ubiquitously in the environment1 and even though lead is a non-essential metal, its presence in the body at any level could be considered as contaminated2, therefore, it has well-known hazardous effects on human and animal health as it accumulates in the body via the food chain3. Excessive blood lead level could affect hematopoiesis and bone formation as well as the nervous and cardiovascular systems, renal insufficiency, impaired cognitive function, abdominal pain, and peripheral neuropathy in the general population4,5,6. However, high levels of lead exposure, anemia may occur due to the interference with heme synthesis and also to red cell destruction7. Also, it can seriously affect the hematopoietic, renal, reproductive, nervous, and hepatic tissues to produce metabolic interactions with enzyme systems8. Moreover, in ruminants, the acidic environment of the fore-stomach enhances its absorption and thus makes it as extremely toxic. Among domestic animals, sheep exhibit more chances of ingestion of Pb due to grazing of herbage very close to the ground surface therefore, it has been found to excrete more Pb compared to other animals9.

The aim of this study was to evaluate the magnitude of lead exposure in sheep living in Najaf city and sheep living in the desert, also, explain the relationship between blood lead levels, hematological and biochemical parameters level in sheep. In Najaf, there are no available data in this context, so this research work has been carried out to study the alterations of blood parameters in sheep.

Materials and Method

This study was carried out on a total of 90 sheep living in Al- Najaf city grouped as follows: group 1 (40 sheep)
living in city center, group 2 (50 sheep) living in the desert during the period from September 2018 to February 2019, both aged 7-12 months in Najaf governorate.

A venous blood sample (10mL) was taken from the jugular vein for hematological parameters screening. Blood samples from each sheep divided into two tubes. The first tube (3 mL in EDTA tube) used for estimation of hematological parameters; PCV was measured by using micro hematocrit centrifuge according to10, the hemoglobin was determined by Drabkins reagent and measured by spectrophotometer11. RBCs counts were measured by using hemocytometer (12). The MCV, MCH and MCHC were calculated according to the following formulas; MCV=PCV/RBC×10fl, MCH=Hb/RBC×10pg and MCHC=Hb/PCV×100g/dl12.

The second blood sample (7 mL) was collected into plain tube used for obtaining serum. Blood samples in plain tubes were centrifuged at 3000 rpm for 15 minutes, after which serum was harvested according to standard methods12. Biochemical analysis included the measurements of serum total proteins (TP); aspartate aminotransferase (AST), alanine aminotransferase (ALT), sorbitol dehydrogenase (SDH), Creatinine and blood urea nitrogen (BUN). Serum biochemical variables were measured using UV spectrophotometer. The third tube (3ml in EDTA tube) used for estimation of lead by using Flame Atomic Absorption Spectrophotometer (AAS).

Data were analyzed using SPSS version 21. The least significant differences test (LSD) were used to determine differences among groups. Data were subjected to analysis of variance statistically using one-way ANOVA.

### Results

The result of serum lead concentration illustrates in table (1). The serum of Awassi sheep live in the city show significant increase in lead concentration (p<0.05) when compared with sheep live in the desert

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Sheep live in desert</th>
<th>Sheep live in city center</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead (Pb)</td>
<td>0.000-0.01</td>
<td>0.002-0.006</td>
</tr>
<tr>
<td></td>
<td>0.0024 ± 0.0002</td>
<td>0.0415 ± 0.0013</td>
</tr>
</tbody>
</table>

Different letters horizontally refer to the presence of significant (P<0.05) differences.

Moreover, the serum biochemical parameters (table 2) revealed significant increase in ALT, AST and SDH activities, also, obvious significant increase in both urea and creatinine. While, a significant (p<0.05) decrease in total protein in sheep living in city center compared with sheep living in desert areas.

### Table 2: Hematological parameters for sheep living in desert areas (control) and sheep living in the city center; ranges and means ± SE.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Sheep live in desert Control (40)</th>
<th>Sheep live in city center (50)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RBC×106/μL</td>
<td>8.8-13.3 10.5 ± 0.1 A</td>
<td>5.6-11.9 8.6 ± 0.2 B</td>
</tr>
<tr>
<td>HB (g/dL)</td>
<td>8.6-13.9 10.8 ± 0.2 A</td>
<td>4.5-8.0 6.9 ± 0.1 B</td>
</tr>
<tr>
<td>PCV (%)</td>
<td>28-42 33.6 ± 0.5 A</td>
<td>15-27 23.5 ± 0.4 B</td>
</tr>
<tr>
<td>MCV (fl)</td>
<td>27.6-35.9 31.8 ± 0.4 A</td>
<td>22.3-38.9 27.4 ± 0.5 B</td>
</tr>
<tr>
<td>MCH (pg/cell)</td>
<td>8.5-12 10.2 ± 0.1 A</td>
<td>5.7-10.8 8.1 ± 0.1 B</td>
</tr>
<tr>
<td>MCHC (g/dL)</td>
<td>30.6-36 32.3 ± 0.2 A</td>
<td>24.8-37.5 29.6 ± 0.4 B</td>
</tr>
</tbody>
</table>

Different letters horizontally refer to the presence of significant (p<0.05) differences.
Table 3: Biochemical parameters for sheep living in desert areas (control) and sheep living in city centers; ranges and means ± SE.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Abnormal 50</th>
<th>Normal 40</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALT U/L</td>
<td>21.8-51.8</td>
<td>13.9-43.8</td>
</tr>
<tr>
<td></td>
<td>33.5 ± 0.8 A</td>
<td>25.5 ± 1.1 B</td>
</tr>
<tr>
<td>AST U/L</td>
<td>290.9-397.6</td>
<td>126.4-269.9</td>
</tr>
<tr>
<td></td>
<td>313.1 ± 2.8 A</td>
<td>177.9 ± 5.9 B</td>
</tr>
<tr>
<td>SDH U/L</td>
<td>28.8-35.2</td>
<td>9.5-29.4</td>
</tr>
<tr>
<td></td>
<td>31.7 ± 0.2 A</td>
<td>20.5 ± 0.9 B</td>
</tr>
<tr>
<td>TP g/dl</td>
<td>3-6.9</td>
<td>5.3-9.3</td>
</tr>
<tr>
<td></td>
<td>4.9 ± 0.1 B</td>
<td>7.1 ± 0.1 A</td>
</tr>
<tr>
<td>BUN (mmol/L)</td>
<td>9.9-14.6</td>
<td>4.3-11.1</td>
</tr>
<tr>
<td></td>
<td>12.4 ± 0.1 A</td>
<td>7.7 ± 0.2 B</td>
</tr>
<tr>
<td>Creatinine</td>
<td>112.8-156.9</td>
<td>73.7-110.8</td>
</tr>
<tr>
<td>µmol/L</td>
<td>129.6 ± 1.3 A</td>
<td>92.8 ± 1.6 B</td>
</tr>
</tbody>
</table>

Different letters horizontally refer to the presence of significant (P<0.05) differences.

Discussion

The results of this study indicated that concentration of lead in sheep blood living in desert close from the normal references of lead obtained by (13, 14). Also, the sheep living in city center that have more lead concentration were close from Pb level of sheep blood in Pakistan obtained by13,15 in Turkey.

Therefore, our results showed that sheep living in Najaf city exposed to high lead levels in their environment through vehicles exhaust (leaded petrol) and lead used in various industries (lead-acid batteries and paints) are the main cause of the widespread existence of lead in the environment16,17, where their mean blood lead level twice as high as the limit value of 0.01 ppm16.

Moreover, effects of lead (Pb) on blood parameters in table (2). The significant decrease(p<0.05) in levels of RBCs, Hb, PCV, MCV, MCH, and MCHC are observed in the Awassi sheep live in the city center resulting in microcytic hypochromic anemia this agreement with18,19,20.

High levels of lead exposure, anemia may occur due to the interference with heme synthesis and also to red cell destruction. The mitochondrial enzyme ferrochelatase is the enzyme in the heme biosynthetic pathway inhibited by lead. Ferrochelatase catalyzes the transfer of iron from ferritin into protoporphyrin to form heme. Inhibition of this enzyme results an increase of the substrates erythrocyte porphyrin (EP), and zinc protoporphyrin (ZPP)5,6.

In table 3 there is a significant increase in ALT, AST and SDH, which may be due to increased cellular basal metabolic rate, irritability and the destructive changes of liver and skeletal muscle cells21. Sorbitol dehydrogenase (SDH) is an enzyme most specific for ruminant predominantly found in the liver and its elevation in serum is an accurate indicator of hepatic injury, also, Mild increases in SDH can also occur by obstructive GI lesions, endotoxemia, and anoxia from shock, acute anemia22,23. Similar results were attained by24,25.

Also, a significant decrease in total protein, this decrease in total protein values may be a result of damage of liver responsible for protein biosynthesis in the body as well as renal tissue damage. Similar results were recorded as a result of exposure to different doses of lead in sheep26.

Moreover, this study revealed a significant increase in both urea and creatinine were used to check kidney function indicating renal deficiency in sheep living in city center compared with sheep in desert areas this agreement with27,28,29.

Conclusion

The results of this study showed that sheep living in Najaf city are suffering from a high risk of environmental lead exposure indicated by the elevated mean blood lead level above the acceptable limit of (0.01 ppm). This study suggested that the use of leaded petrol has served a continuous source of lead accumulation in sheep which may pose serious health hazards for the consumers. This is the first study, which correlates the concentration of a heavy metal (Pb) in a natural environment and its cumulative effect on the liver, kidney and blood parameters in sheep grazing in the city center.

Conflict of Interest: None

Source of Funding: Self

Ethical Clearance: Not required.

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15. Or ME, Kayar A, Kiziler AR, Parkan C, Gonul R, Barutçu B, Dodurka HT. Determination of levels of some essential (iron, copper, zinc) and toxic (lead, cadmium) metals in the blood of sheep and in samples of water, plants and soil in Northwest Turkey. Veterinarski arhiv, 2005. 75(4), 359.


Reproductive Risk Factors of Breast Cancer in Erbil

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ABSTRACT

Introduction: Breast cancer is the most common cancer that threatens life of women all over the world, in Iraq breast cancer has become the second leading cause of death among women after cardiovascular diseases, with a cancer-related mortality rate of 23%. The objectives of the study is to find out the reproductive risk factors of breast cancer in the pre-menopausal and post-menopausal women.

Patients and Method: A case-control study was conducted in Erbil Breast Center, and Erbil Teaching Hospital in Erbil city-Kurdistan- Iraq, between the 1st of September 2016 and the 30th of April 2018. Cases were breast cancer patients who had visited Erbil Breast Center. Controls were women who have visited the surgical consultation unit in Erbil Teaching Hospital for surgical problems other than breast.

Results: Out of 136 breast cancer patients, 91 (66.91%) were pre-menopausal, 44 (32.35%) were post-menopausal, and one case (0.74%) underwent hysterectomy at 42 years old. Out of the 150 non breast cancer women; 110 (73%) were premenopausal women and 33 (22%) were postmenopausal, and 7 (5%) women underwent hysterectomy. Early menarche was a risk factor for breast cancer in pre-menopausal women only, while post-menopausal women having < 3 children were at increased risk for breast cancer.

Conclusions: Reproductive risk factors association with breast cancer are more important for post-menopausal breast cancer than for pre-menopausal breast cancer.

Keywords: Breast cancer, women, malignancy, Erbil.

Introduction

Breast cancer is the most common cancer that threatens life of women all over the world, there were over 2 million new cases all over the world in 2018¹.

In Iraq it is the most common cancer; 5141 new cases of breast cancer registered in 2018 comprising 36.7% of all women cancers and 20.3% of all cancers in both sexes.²

In Kurdistan Region of Iraq (KRG), breast cancer is the most common female cancer; in Erbil (the capital city of KRG) the incidence of breast cancer was 37.95 per 100,000 women in 2016.³

The age standardised breast cancer incidence varies across different populations ranging from 18 per 100,000 in South Africa to 88 per 100,000 women in Western Europe⁴; as the menstrual and reproductive factors are the most important risk factors for breast cancer, therefore the differences in these two factors may mainly attribute to this variation. As hormonal factors play significant role in causing breast cancer and there is a marked variation in the level of these hormones throughout the life of a women starting with menarche then pregnancy and lactation and start of menopause, therefore pre-menopausal women might not have the same hormonal risk factors as do the post-menopausal women. Many studies have tried to address this question and have found variable results.⁵-¹³

The objective of the study is to find out the reproductive risk factors of breast cancer in the pre-menopausal and post-menopausal women.
Patients and Method

A prospective case-control study was conducted in Erbil Breast Center, and Erbil Teaching Hospital in Erbil city-Kurdistan Region of Iraq, between the 1st of September 2016 and the 30th of April 2018. Cases were women visiting Erbil Breast Center who have been diagnosed as breast cancer. Controls were women visiting the surgical consultation clinic of Erbil Teaching Hospital for surgical problems other than breast problems.

After obtaining verbal consent from the women, both the cases and the controls were asked about their basic demographic characteristics, menstrual and reproductive history were taken in detail by direct interview and any missing data was obtained by phone contact. Physical examination and radiological investigations were done for both women groups and the women with breast masses underwent core biopsy by a radiologist using 14 G needle and the specimens were examined by the same histopathologist in the lab of Erbil Maternity Teaching Hospital. 142 women with breast masses suspicious for breast cancer were enrolled in the study, they have been sent for core biopsy and histopathological examination, 135 of them proved to have cancer by the mentioned test, seven women had not completed their investigations and they were excluded from the study, while 170 women enrolled in the study as the control group, only 151 women continued with the study, one of these 151 women had a breast mass proved to be cancer by histopathological examination and included in the breast cancer group.

The data were analyzed using the Statistical Package for Social Sciences (SPSS, version 22), Chi-square test was used to compare the proportions of the two groups, and the p-value ≤ 0.05 was regarded as statistically significant.

Results

The total number of the sample was 286 women, 136 were cases of breast cancer, and 150 women had no breast cancer (control group). The highest proportion of the sample (34.3%) aged less than 40 years, and 33.9% aged 40-49 years. No significant (p = 0.122) difference in the age distribution of the sample was detected between cases and controls as presented in Table 1.

Table 1: Age distribution of the study groups

<table>
<thead>
<tr>
<th></th>
<th>Breast CA</th>
<th>Control</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. (%)</td>
<td>No. (%)</td>
<td>No. (%)</td>
</tr>
<tr>
<td>&lt; 40</td>
<td>38 (27.9)</td>
<td>60 (40.0)</td>
<td>98 (34.3)</td>
</tr>
<tr>
<td>40-49</td>
<td>47 (34.6)</td>
<td>50 (33.3)</td>
<td>97 (33.9)</td>
</tr>
<tr>
<td>50-59</td>
<td>38 (27.9)</td>
<td>31 (20.7)</td>
<td>69 (24.1)</td>
</tr>
<tr>
<td>≥ 60</td>
<td>13 (9.6)</td>
<td>9 (6.0)</td>
<td>22 (7.7)</td>
</tr>
<tr>
<td>Total</td>
<td>136 (100.0)</td>
<td>150 (100.0)</td>
<td>286 (100.0)</td>
</tr>
</tbody>
</table>

Among the women with breast cancer; 66.9% were pre-menopausal, 32.3% were post-menopausal, and one case (0.7%) underwent hysterectomy at 42 years old. Among the women in the control group; 73.3% were premenopausal, 22% were postmenopausal and 4.7% of the women underwent hysterectomy before menopause (Table 2).

Table 2: Menopausal state of the breast cancer patients and the control women

<table>
<thead>
<tr>
<th>Menopausal State</th>
<th>Breast Cancer No. (%)</th>
<th>Control No. (%)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>P remenopause</td>
<td>91 (66.9)</td>
<td>110 (73.3)</td>
<td></td>
</tr>
<tr>
<td>Postmenopause</td>
<td>44 (32.4)</td>
<td>33 (22.0)</td>
<td>0.026*</td>
</tr>
<tr>
<td>Hysterectomised</td>
<td>1 (0.7)</td>
<td>7 (4.7)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>136 (100)</td>
<td>150 (100)</td>
<td></td>
</tr>
</tbody>
</table>

*By Fisher’s exact test.

Table 3 and 4 show that early menarche was a risk factor for breast cancer in premenopausal women only, while Nulliparity and delivery of < 3 live births, no breastfeeding or short duration of breastfeeding were risk factors of breast cancer in postmenopausal women.
### Table 3: Premenopausal-reproductive and hormonal risk factors

<table>
<thead>
<tr>
<th>Variables</th>
<th>Breast cancer</th>
<th>Control</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. (%)</td>
<td>No. (%)</td>
<td></td>
</tr>
<tr>
<td>Early menarche</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>7 (7.7)</td>
<td>4 (3.6)</td>
<td>0.042</td>
</tr>
<tr>
<td>No</td>
<td>84 (92.3)</td>
<td>106 (96.4)</td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>71 (84.6)</td>
<td>98 (89.1)</td>
<td>0.427</td>
</tr>
<tr>
<td>No</td>
<td>14 (15.4)</td>
<td>12 (10.9)</td>
<td></td>
</tr>
<tr>
<td>Age at first live birth</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;35 years</td>
<td>68 (98.6)</td>
<td>91 (100)</td>
<td>0.431</td>
</tr>
<tr>
<td>≥ 35</td>
<td>1 (1.4)</td>
<td>0 (0)</td>
<td></td>
</tr>
<tr>
<td>Number of life births</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>22 (24.2)</td>
<td>19 (17.3)</td>
<td>0.193</td>
</tr>
<tr>
<td>1-2</td>
<td>10 (11.0)</td>
<td>21 (19.1)</td>
<td></td>
</tr>
<tr>
<td>≥ 3</td>
<td>59 (64.8)</td>
<td>71 (63.6)</td>
<td></td>
</tr>
<tr>
<td>breastfeeding</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>67 (73.6)</td>
<td>88 (80.0)</td>
<td>0.284</td>
</tr>
<tr>
<td>No</td>
<td>24 (26.4)</td>
<td>22 (20.0)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>91 (100)</td>
<td>110 (100.0)</td>
<td></td>
</tr>
</tbody>
</table>

### Table 4: Post-menopausal reproductive and hormonal risk factors

<table>
<thead>
<tr>
<th>Variable</th>
<th>Breast cancer</th>
<th>Control</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. (%)</td>
<td>No. (%)</td>
<td></td>
</tr>
<tr>
<td>Early menarche</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1 (2.27)</td>
<td>1 (3.0)</td>
<td>0.723</td>
</tr>
<tr>
<td>No</td>
<td>43 (97.73)</td>
<td>32 (97.0)</td>
<td></td>
</tr>
<tr>
<td>Late menopause</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>3 (6.8)</td>
<td>2 (6.0)</td>
<td>0.504</td>
</tr>
<tr>
<td>No</td>
<td>41 (93.2)</td>
<td>31 (94.0)</td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>40 (90.9)</td>
<td>33 (100.0)</td>
<td>0.251</td>
</tr>
<tr>
<td>No</td>
<td>4 (9.1)</td>
<td>0 (0)</td>
<td></td>
</tr>
<tr>
<td>Age at first live birth</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;35 years</td>
<td>32** (88.9)</td>
<td>32* (100)</td>
<td>0.116</td>
</tr>
<tr>
<td>≥ 35</td>
<td>4** (11.1)</td>
<td>0* (0)</td>
<td></td>
</tr>
<tr>
<td>No. of live births</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>8 (18.2)</td>
<td>1 (3.0)</td>
<td>0.021</td>
</tr>
<tr>
<td>1-2</td>
<td>8 (18.2)</td>
<td>2 (6.1)</td>
<td></td>
</tr>
<tr>
<td>≥ 3</td>
<td>28 (63.6)</td>
<td>30 (90.9)</td>
<td></td>
</tr>
<tr>
<td>Breastfeeding</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>35 (79.5)</td>
<td>32 (97.0)</td>
<td>0.037</td>
</tr>
<tr>
<td>No</td>
<td>9 (20.5)</td>
<td>1 (3.0)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>44 (100.0)</td>
<td>33 (100.0)</td>
<td></td>
</tr>
</tbody>
</table>

*Out of 33 women of the control group, who were married, one of them had no live birth.

** Out of 44 women with breast cancer, 8 had no live births.

**Discussion**

This study showed that early menarche increased the risk of breast cancer in pre-menopausal women, this finding is consistent with two other studies 8,14, on the other hand it is inconsistent with other studies; Antoniou et al concluded that early menarche increases risk only in post-menopausal women.13 A number of studies reported that early menarche increase breast cancer risk in both pre-menopausal and post-menopausal women 5-11, while in a Malaysian study no association found between age at menarche and breast cancer risk.12 A review of 26 articles concluded that older age at menarche decrease breast cancer risk in both pre and post-menopausal women; for every year older menarche age, decreased the risk of breast cancer by 9% and 4% in pre-menopausal post-menopausal women respectively.5
The current study showed that marital status has no association with the risk of breast cancer, which is consistent with two local studies done in Iraq; Sulaimaniyah, Kurdistan Region of Iraq, and Baghdad, same results were obtained in a study done in southern Iran, however a study done in Qatar showed that single women has more risk for breast cancer.

This study has found that, post-menopausal nulliparous women are at increased risk for developing breast cancer which is consistent with another study, a study done in UK showed increased risk for both pre and postmenopausal women, however, another study has reported increased risk for only pre-menopausal women. At the same time, women with three or more live births get more protection against breast cancer in their postmenopausal age, which is consistent with another two local studies done in Kurdistan Region of Iraq, and a study done in France. Some studies have found that increasing parity decreased risk in both pre and post-menopausal women. A review article concluded that each full term pregnancy reduces breast cancer risk by 3% for pre-menopause and 12% for post-menopausal women. The protective effect of parity against breast cancer can be explained by the process of differentiation of the mammary epithelium during pregnancy and subsequent lactation, thus the mammary epithelium is protected from the estrogen because of the cessation of menstrual cycle along the period of pregnancy and subsequent lactation.

In this study, women having their first live birth (FLB) at age younger than 35 years did not get decrease risk of breast cancer development neither in pre-menopausal nor in their post-menopausal age, this finding is inconsistent with many previous studies which found that younger age at FLB decreased breast cancer risk in both pre and post-menopausal women. However, some studies found that a higher age at first live birth is a risk factor only for postmenopausal women. In a cohort study, the relative risk of breast cancer for age at FLB >30 years was 1.63 for pre-menopausal women and 1.35 for post-menopausal women. A study done by Russo et al found that women who gave birth to a child before 24 years of age exhibit a decrease in their lifetime risk of developing breast cancer, and moreover additional pregnancies increase the protective effect. These findings may be explained by the fact that, the younger age at first pregnancy (and live birth and lactation) the earlier the process of the mammary epithelial cells differentiation, and more capability of metabolizing carcinogens and more efficient DNA damage repair, in addition to the earlier protective effect of pregnancy and lactation against estrogen exposure as long as the menstrual cycle ceases during these periods.

This study showed that late menopause was not a risk factor for post-menopausal women. This finding is consistent with three local studies (Kurdistan Region of Iraq); two studies done in Erbil, and a study done in Sulaimaniya, a meta-analysis including 117 epidemiological studies performed by a Collaborative Group on Hormonal Factors in Breast Cancer concluded that for every year older at menopause the risk for developing breast cancer increases by 1.029.

We found that breastfeeding was protective against breast cancer only for post-menopausal women, which is consistent with a western study. Two local studies in Erbil showed no protective effect of breastfeeding against breast cancer, while two regional studies showed that breastfeeding is generally protective against breast cancer and the more the duration of breastfeeding, the more the protective effect. Some western studies have shown that breastfeeding is protective against pre-menopausal breast cancer. A collaborative re-analysis of 47 studies showed that breastfeeding was protective for both pre-menopausal and post-menopausal women.

Conclusion

In the postmenopausal women, the factors that associated with breast cancer were less number of live births, lower rates of breast feeding. In the pre-menopausal women, early menarche was the only factor that was associated with breast cancer.

Limitations: Small number of breast cancer cases because we only included women with breast problems visiting Erbil Breast Center which is the only governmental center receiving women with breast problems, while women who visit private clinics are not included because of difficulty in obtaining information from private clinics and hospitals.

Conflicts of Interest: There author not conflict of interest in this study.

Source of Funding: None

Ethical Clearance: This study is part of an ongoing PhD research sponsored by college of medicine/ Hawler Medical University, it is approved by the ethics committee of the college of medicine in the meeting code 7 on 10th May 016.
REFERENCES


Effectiveness of CBCL/1,5–5 for Detection of Emotional and Behavioral Problem in Autistic Spectrum Disorder Children

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ABSTRACT

Background: The Child Behavior Checklist/1,5-5 is a widely utilize to assess emotional and behavioral problems (EBP) in children aged 1,5-5 years in USA and Europe. Although, CBCL/1,5-5 have been used on ASD and normal children in many societies. However, the CBCL/1,5-5 in Indonesian version has not been proven to assess EBP in Indonesian ASD children.

Aim: The aim of this study was to examine the effectiveness of CBCL/1,5-5 to screen of EBP in Indonesian children with ASD.

Method: This study used a Cross-Sectional design. One hundred and eighteen mothers of ASD and Typical Development children (TD) were registered in this study. Statistical analysis was performed using A Chi-Square and Independent T-Test.

Results: Six of seven CBCL/1,5-5 scales were significantly higher in children with ASD compared to TD (except anxious). Total problems, internalizing, and externalizing scores were significantly higher in ASD than those with TD children in Indonesia.

Conclusions: The CBCL/1,5-5 is suitable tool to detect problem of emotional and behavioral in Indonesian ASD children

Keywords: Problems of Emotional and Behavioral, Children with ASD, Child Behavior Checklist/CBCL 1,5-5.

Introduction

Globally, autistic disorders accounted for more than 58 per 100,000 population and others ASDs accounted for 53 per 100,000,1 16.8 per 1.000 in children aged 8 years.2 Prevalence of childhood autism was 11.6 - 18.75 per 10.000 in Northern European Region (IUK, Iceland, Denmark, and Sweden), 11.6 per 10.000 in Western Pacific region (Japan, China), and South East Asia.3

Children with ASD present high rate of emotional (internalizing) and behavioral (externalizing) problems.4,5,6 Young children with ASD commonly exhibit the following EBP: including internalizing (emotionally reactive, anxious, somatic complaints, and withdrawn) and externalizing (attention problems and aggressive behavior).7,8,9 Preschool children with ASD have been found to exhibit EBP frequently.10,11,12 A previous study shown that 72-86% of children with high-functioning ASD had at least one problem of emotional and behavioral in Singapore.13 Internalizing was also reported higher in ASD Children with Developmental Regression.14

Previous studies reported that the CBCL/1,5-5 (items had positive correlations with total score and had high internal consistency.7,15,16 The CBCL/1,5-5 is a widely used tool to assess EBP in children aged 1,5-5 years in USA and Europe.17 The CBCL scales were developed through factor analysis of data from normal children populations.18,19,20 Internal consistency of the CBCL scale in Indonesian version, measuring

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Material and Method

Design and Sample: This study used a cross-sectional design. The participants of this study were mothers of children with ASD and TD aged 1.5–6 years. Children with ASD were recruited from a special school in Yogyakarta and Surabaya, whereas TD children were recruited from kindergartens in the same area. ASD diagnoses were made by pediatric neurologists refer to DSM IV TR. 23

Instruments: The CBCL/1,5-5 was used in this study. The CBCL/1,5-5 consists of 100 items (7 scales, such as emotionally reactive, anxious, somatic complaints, withdrawn, sleep problems, attention problems, and aggressive behavior). 17 Emotional reactive, anxious, somatic complaints, and withdraw belong in the internalizing category. Whereas, externalizing consists of attention problems and aggressive behavior. The CBCL/1,5-5 contains 3 pages and instructs parents to score each of the emotional/behavioral problem items by circling a 0 = not true of the child, 1 = somewhat or sometimes, and 2 = very true or often true. The questionnaire was translated from American English into Indonesian and then re-translated by another linguist back into American English. Finally, after ensuring the validity and reliability of the Indonesian version of CBCL/1,5-5, the questionnaire was given to parents of 130 Indonesian children. Ninety-six of the 100 items of CBCL have significant positive correlation with total problems score (ranged of items correlation, 0.22 to 0.69; p < 0.01). Four items of CBCL/1,5-5 did not have significant positive correlation with total problems score (upset by new people or situations, doesn’t want to sleep alone, nightmares, and physically attack people). However, those four items maintained significant positive correlation with CBCL scales. Internal consistency of CBCL scales ranged from 0.55 to 0.90. Cronbach alpha scores of total problems score, internalizing, and externalizing were 0.95, 0.92, and 0.90, respectively.

Data Collection: This study was conducted in Yogyakarta and Surabaya Province from July to December 2014. After the permission from parents was approved the questionnaires were distributed.

Data Analysis: Independent T-Test was used to compare CBCL scales, both internalizing and externalizing between children with ASD and TD.

CBCL items in ASD and TD Children: Five of 9 items on emotionally reactive were significantly higher on ASD than TD children. The mean of items of disturbed on children with ASD and TD aged 1–6 years old were enrolled in this study. The Chi-square analysis showed a significant differences male/female ratio in the sample. There were a significant different of participants’ religion (Table 1).

Participants’ Background: One hundred and eighteen mothers of children with ASD and TD aged 1–6 years old were enrolled in this study. The Chi-square analysis showed a significant differences male/female ratio in the sample. There were a significant different of participants’ religion (Table 1).

CBCL items in ASD and TD Children: Five of 9 items on emotionally reactive were significantly higher on ASD than TD children. The mean of items of disturbed on children with ASD and TD aged 1–6 years old were enrolled in this study. The Chi-square analysis showed a significant differences male/female ratio in the sample. There were a significant different of participants’ religion (Table 1).

Finding
There were 4 items of aggressive behavior (Can’t stand waiting, Demands must be met immediately, Stubborn, and Uncooperative), 3 items of attention problems (can’t concentrate, can’t sit, Poorly coordinated), and 3 items of withdrawn scales (doesn’t answer when people talk, avoid looking others in the eye, shows little interest) with the ten highest scores in children with ASD.

**CBCL scales among emotional (Internalizing) and behavior (Externalizing) Problems:** Table 2 shows there were six of seven scales were significantly higher in children with ASD than those TD. Emotional (internalizing), behavioral (externalizing) problems, and total problems score were significantly higher on children with ASD than TD.

<table>
<thead>
<tr>
<th>Participant’s Characteristic</th>
<th>Children</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ASD (N = 59)</td>
<td>TD (N = 59)</td>
<td>P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean ± SD</td>
<td>4.41 ± 1.09</td>
<td>4.12 ± 0.81</td>
<td>&gt; 0.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>47(80%)</td>
<td>47(80%)</td>
<td>&lt;0.001**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>12(20%)</td>
<td>12(20%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Religions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Muslim</td>
<td>46(78%)</td>
<td>55(93%)</td>
<td>&lt;0.001**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Muslim</td>
<td>13(22%)</td>
<td>4(6.8%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Parents</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mothers</td>
<td>48(81.4%)</td>
<td>57(96.6%)</td>
<td>&lt;0.001**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fathers</td>
<td>11(18.6%)</td>
<td>1(8%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>0(0%)</td>
<td>1(1.7%)</td>
<td>&gt;0.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Parents’ age (Mean ± SD)</td>
<td>34.4 ± 7.04</td>
<td>32.1 ± 4.1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ASD, Autistic Spectrum Disorders; TD, Typically Developing

<table>
<thead>
<tr>
<th>CBCL</th>
<th>ASD (N= 59)</th>
<th>TD (N= 59)</th>
<th>p</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotionally reactive</td>
<td>5.30 ± 3.78</td>
<td>2.67 ± 2.54</td>
<td>0.00**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxious</td>
<td>3.58 ± 2.73</td>
<td>2.67 ± 2.56</td>
<td>0.06</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Somatic complaints</td>
<td>3.50 ± 2.75</td>
<td>2.44 ± 2.32</td>
<td>0.02</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Withdrawn</td>
<td>7.78 ± 3.24</td>
<td>2.34 ± 2.23</td>
<td>0.00**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sleep problems</td>
<td>3.95 ± 2.36</td>
<td>2.85 ± 2.04</td>
<td>0.00**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attention problems</td>
<td>5.47 ± 2.06</td>
<td>2.59 ± 1.72</td>
<td>0.00**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aggressive behavior</td>
<td>15.97 ± 7.12</td>
<td>8.42 ± 5.27</td>
<td>0.00**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internalizing</td>
<td>20.17 ± 9.50</td>
<td>10.12 ± 8.19</td>
<td>0.00**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Externalizing</td>
<td>21.44 ± 8.32</td>
<td>5.18 ± 3.67</td>
<td>0.00**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total score of CBCL</td>
<td>64.97 ± 24.60</td>
<td>33.56 ± 21.23</td>
<td>0.00**</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*P<0.05; **P<0.01. CBCL, Children Behavior Checklist; ASD, Autistic Spectrum Disorder; TD, Typically Developing
Discussions

We found the total problem score of CBCL was significantly higher in children with ASD than TD (64.97 ± 24.60 vs 33.56 ± 21.23; \( p = 0.00 \)). A previous study reported the same finding that children with ASD score significantly higher in the total problems score of CBCL/1,5-5 compared than TD children in Italy, and in Korea.\(^7\)\(^8\)\(^9\) The finding showed that emotional (internalizing) and behavioral (externalizing) problems were significantly higher in children with ASD than TD. This finding was consistent with a previous study that reported the EBP were significantly higher in children with ASD than TD.\(^9\)\(^10\) The previous study reported that there were 29.6% of externalizing problems and 27.2% of internalizing problems in young children with ASD.\(^24\) The similar studies also reported the internalizing and externalizing were higher in preschool with ASD than TD.\(^7\)\(^8\)\(^16\)

We also found that six of seven scales were significantly higher in children with ASD than TD (except anxious). Similarly, a previous study in New York reported that children with ASD score significantly higher in the same 6 scale of CBCL (except anxious). Moreover, a previous study found that all of CBCL scales were significantly higher in preschool children with ASD than TD (emotionally reactive, anxious somatic complaints, withdrawal, sleep problems, attention problems, and aggressive behavior; \( p < 0.01 \)).\(^9\) Rescorla et al., (2012) reported the mean of CBCL scales across 15 countries were almost the same with the present study (the range of mean of CBCL scales, the present study = 2.34 ± 2.23 to 8.42 ± 5.27; Rescorla et al., = 0.8 ± 0.6 to 6.9 ± 2.4).\(^20\) Our study revealed that the highest of mean score of CBCL scales were aggressive behavior, withdrawn, and attention problems. This result is similar with a previous study on USA children with ASD (age, 1.5-5.8 years), which reported that the CBCL scales with the highest percentage of clinically significant scores were withdrawn, attention problems, and aggressive behavior.\(^11\)\(^24\)

We found the ten highest items scored in children with ASD, and three items (aggressive behavior), one item (attention problems), and one item (withdrawn); also the ten highest in TD children (aggressive behavior; can’t stand waiting, demands must be met immediately and stubborn; attention problems; can’t sit still; and withdrawn: doesn’t answer when people talk to him/her). Ivanova et al. (2010) evaluated the EBP in children in 23 countries.\(^18\) They found that the ten highest score of CBCL items ranged from 0.76 ± 0.06 (Emotionally reactive: sudden changes in mood or feelings) to 0.70 ± 0.08 (withdrawn: shows little affection toward people). Compared with previous studies in 24 countries, there were 5 items that were the same in the ten highest with the present study in TD children (can’t stand waiting, demands must be met immediately, quickly shifts from one activity to another, doesn’t want to sleep alone, and can’t sit still). Two items in the ten highest score were the same with the previous study in 24 countries.\(^22\)

Finally, we found the total problems score of CBCL, internalizing, and externalizing were not significantly different among boys and girls with ASD and TD. Several previous studies evaluated the differences of total problems score, internalizing, and externalizing among boys and girls. The results showed that the total problems score of CBCL/1,5-5, internalizing, and externalizing were not significantly different among boys and girls in Denmark\(^19\) and in Kosovo.\(^25\) Previous studies were reported that there was no significant different of emotional problem and hyperactivity of children with ASD based on gender.\(^26\)\(^27\) Studies in the Muslim population (Pakistan, and Turkey) reported no significant different in total problems of CBCL, externalizing\(^28\) and internalizing among boys and girls preschool aged.\(^23\)\(^28\)

Several limitations in this study should be mentioned. The number of children studied was limited. The studied area was also limited to the Java Island. In addition socio-economical situations of parents were not measured in this study.

Conclusion

The CBCL/1,5-5 is suitable tool for detection of EBP in Indonesian children aged 1,5-6 years with ASD.

Acknowledgments

We were grateful to Professor Thomas Achenbach who gave us permission to translate the CBCL 1,5-5 into Indonesian version and utilized the CBCL/1,5-5.

Conflict of Interest: The authors declare no conflict of interest.

Ethical Clearance: The Medical and Health Research Ethics Committee review board approved this study (KE/FK/918/EC). The funding of this study was from researchers team.
REFERENCES


The Effect of Health Promotion Based on the Health Promotion Model with a Peer Group Approach Regarding the Utilization of Maternal and Child Health Handbook

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¹Polytechnic of Health, Ministry of Health, Republic of Indonesia; ²Faculty of Nursing, Universitas Airlangga, Surabaya, Indonesia

ABSTRACT

Background: The reduction of maternal and child mortality in Indonesia is one of the government’s goals in the health sector. The use of maternal and child health books by mothers is still not optimal. The purpose of this study was to analyze the relationship between the functions of the maternal and children’s health book which included recording, education and communication with the maternal knowledge of maternal and children’s health.

Method: This study was quasi-experimental (pre-post-test control group design) with a sample of 50 respondents over both the control and treatment groups. The sampling technique used was simple random sampling. The instruments used were Individual Characteristics and Experiences and Specific Behavior Cognitions and Effects. The analysis used was regression analysis.

Results: There was a difference between before and after receiving a health promotion model-based health promotion with a result of $p < 0.05$ for all of the indicators in the treatment group. In the control group, there was no difference.

Conclusion: Health promotion model-based health promotion seeks to improve the perceptions of the benefits, perceived barriers, self-efficacy and attitudes toward any action plans that can improve maternal behavior in MCHHB utilization.

Keywords: health belief model, peer group, maternal and child health handbook.

Introduction

Maternal and child health improvement is one of Millennium Development Goals (MDGs) goals. Infants mortality in Indonesia is still a problem although showed a significant decreased recently. In 2017, infant mortality rate in Indonesia was 21 per 1,000 birth¹. There were 9 provinces in Indonesia which contribute to 75% of maternal and child mortality in Indonesia² and Easy Java is the highest province contributing to maternal and child mortality in Indonesia.

Government have made various effort to reduce maternal and child mortality such as Suami siaga (male engagement in maternal health) program³, village engagement in maternal health program⁴, strengthening the health system of universal health coverage and health services⁵⁶ and providing maternal and child health handbook (MCHHB) continuum⁷. This handbook was given to pregnant women during their first antenatal care visit in health care services. Previous study showed that the use of MCHH by pregnant women can increase antenatal care visits and improve communication between mothers and health care providers⁸⁹. Although this MCHHB distribution to all pregnant women is mandatory, MCHHB utilization and ownership is still limited.

MCHHB utilization have a lot benefit such as improving immunization coverage¹⁰, improving maternal knowledge on exclusive breastfeeding¹¹,
increasing ANC information, and improving proper nutrition during pregnancy and child health care. MCCHB utilization were correlated with wealth and education level, number of children, age of child, communication with health personnel. A preliminary study conducted in Public Health Center in East Java found that all pregnant woman who visited to Public Health Center for antenatal care had an MCHHB, but the MCHHB utilization is lacking. Mothers were not utilize MCHHB because of various reasons including have no time, lack of understanding, and mistaken assumption that the MCHHB was a notebook for the health personnel. MCHHB utilization coverage still below the Minimum Service Standards target.

Previous study found there was a significant positive relationship between commitment and maternal behavior. Commitment is a desire to do certain health behaviors, including the identification of strategies to be able to do so well. To build a commitment, it is necessary to provide health education or information through a method to increase one’s level of commitment. The purpose of this study was to analyze the effect of health promotion based on the health promotion model with a peer group approach regarding the utilization of maternal and child health handbook.

Method

The design used in the study was a quasi-experiment study (pre-post-test control group design). The research subjects in this study were pregnant women and mothers who had children who were under five years old who came to the health center in Surabaya. The inclusion criteria for respondents are 1) had an MCHHB and 2) able to read and write. The sampling used in this study was simple random sampling. The sample size in this study totaled 50 people for the treatment group and 50 for the control group.

Data on pregnant women in health care centers were collected. Prospective respondents who met the inclusion criteria were visited at home to be given an explanation of the study then asked to sign informed consent. The intervention was carried out in the form of providing health education that contained the benefits of the MCHHB book, followed by peer support on how they used and utilized MCHHB. Peer support also provides a solution to the difficulties experienced by mothers in utilizing MCHHB. On the first day in the form of health education about the use of MCHHB for 60 minutes. the second day, small groups were formed, each of which consisted of 5 people, the discussion continued with a discussion about the difficulties facing mothers in utilizing MCHHB books and discussions to provide solutions to each other.

Individual characteristics and experiences include prior related behavior and personal, biological, psychological and socio-cultural factors. The characteristic questionnaire was created by the researchers by adopting and developing from existing questionnaires. Specific cognitions affect behavior were measured which consist of perceived benefits of action questionnaire which consist of MCHHB ownership, perceived Benefits for mothers, perceived Benefits for the family, perceived Benefits for health services, and perceived Administrative benefits; perceived barriers question which consist of time and mothers understanding about MCHHB benefit and self efficacy question which consist of Level of difficulty, situations and Strength.

The commitment plan of action questionnaire was made by the researchers by adopting pender health promotion model combined with the MCHHB. The questionnaire was developed and modified by the researchers in accordance with the scope of the utilization of the MCH handbook.

Descriptive analysis and Mann Whitney test was used to determine differences between the groups, and Wilcoxon test was used to determine the effect within group with p-value of α=0.05.

Results

The majority of respondents were in the age range of 21-25 years old. The majority education level was a secondary level of education with the majority working as housewives. Most mothers had one child, and the majority of respondents had become Indonesian National Health Insurance System participants (Table 1).

Table 1: Distribution of characteristics of respondents

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Treatment</th>
<th>Control</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>&lt;20</td>
<td>2</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>21-25</td>
<td>27</td>
<td>54</td>
<td>15</td>
</tr>
<tr>
<td>26-30</td>
<td>12</td>
<td>24</td>
<td>10</td>
</tr>
<tr>
<td>31-35</td>
<td>3</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>36-40</td>
<td>5</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>&gt; 40</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

0.065
Conted table 1...

<table>
<thead>
<tr>
<th>Education</th>
<th>Mean ± SD</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elementary school</td>
<td>14 ± 28</td>
<td>17 ± 34</td>
</tr>
<tr>
<td>Middle</td>
<td>30 ± 60</td>
<td>30 ± 60</td>
</tr>
<tr>
<td>Higher education</td>
<td>6 ± 12</td>
<td>3 ± 6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mother's job</th>
<th>Mean ± SD</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housewife</td>
<td>37 ± 74</td>
<td>43 ± 86</td>
</tr>
<tr>
<td>Civil servants</td>
<td>0 ± 0</td>
<td>1 ± 1</td>
</tr>
<tr>
<td>Private</td>
<td>12 ± 12</td>
<td>6 ± 6</td>
</tr>
<tr>
<td>Etc</td>
<td>1 ± 1</td>
<td>0 ± 0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Husband's job</th>
<th>Mean ± SD</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Civil servants</td>
<td>1 ± 2</td>
<td>1 ± 2</td>
</tr>
<tr>
<td>Private</td>
<td>36 ± 72</td>
<td>40 ± 80</td>
</tr>
<tr>
<td>Etc</td>
<td>13 ± 26</td>
<td>9 ± 18</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of children</th>
<th>Mean ± SD</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>14 ± 28</td>
<td>19 ± 38</td>
</tr>
<tr>
<td>2</td>
<td>13 ± 26</td>
<td>14 ± 28</td>
</tr>
<tr>
<td>≥ 3</td>
<td>9 ± 18</td>
<td>13 ± 26</td>
</tr>
<tr>
<td>Do not have yet</td>
<td>14 ± 28</td>
<td>4 ± 8</td>
</tr>
</tbody>
</table>

Conted table 1...

<table>
<thead>
<tr>
<th>The age of the smallest child (yr)</th>
<th>Mean ± SD</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1</td>
<td>16 ± 32</td>
<td>16 ± 32</td>
</tr>
<tr>
<td>1-2</td>
<td>5 ± 10</td>
<td>10 ± 20</td>
</tr>
<tr>
<td>&gt; 5-6</td>
<td>9 ± 18</td>
<td>10 ± 20</td>
</tr>
<tr>
<td>Have not had</td>
<td>14 ± 28</td>
<td>4 ± 4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pregnancy to</th>
<th>Mean ± SD</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>16 ± 10</td>
<td>10 ± 20</td>
</tr>
<tr>
<td>2</td>
<td>17 ± 15</td>
<td>15 ± 30</td>
</tr>
<tr>
<td>&gt; 3</td>
<td>5 ± 10</td>
<td>10 ± 10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ownership of health insurance</th>
<th>Mean ± SD</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>37 ± 74</td>
<td>38 ± 76</td>
</tr>
<tr>
<td>Not</td>
<td>13 ± 26</td>
<td>12 ± 24</td>
</tr>
</tbody>
</table>

There were differences in the commitment to the plan to act after receiving the health promotion between the control group and the treatment group for all indicators of commitment, with a value of p < 0.05 (Table 2). There was a difference in the behavior of the utilization of the MCH books between the control and treatment groups after obtaining the HPM-based health promotion, with a p-value of <0.05 for all indicators (Table 3).

Table 2: The difference in commitment to the plan acts between the control group and Treatment group

<table>
<thead>
<tr>
<th>Commitment Indicator</th>
<th>Mean ± SD</th>
<th>Control</th>
<th>Treatment</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resilient attitude</td>
<td>3,093 ± 0,556</td>
<td>3,533 ± 0,509</td>
<td>0,000</td>
<td></td>
</tr>
<tr>
<td>Independency</td>
<td>3,072 ± 0,590</td>
<td>3,408 ± 0,591</td>
<td>0,003</td>
<td></td>
</tr>
<tr>
<td>Setting goals</td>
<td>3,080 ± 0,558</td>
<td>3,380 ± 0,567</td>
<td>0,003</td>
<td></td>
</tr>
<tr>
<td>Self-Desire</td>
<td>3,014 ± 0,579</td>
<td>3,317 ± 0,431</td>
<td>0,005</td>
<td></td>
</tr>
<tr>
<td>Desire to Succeed</td>
<td>3,080 ± 0,584</td>
<td>3,440 ± 0,489</td>
<td>0,001</td>
<td></td>
</tr>
</tbody>
</table>

Table 3: Difference Respondent’s Behavior in Utilizing the MCHHB between the Control and Treatment Groups After Getting Health Promotion

<table>
<thead>
<tr>
<th>Commitment Indicator</th>
<th>Mean ± SD</th>
<th>Control</th>
<th>Treatment</th>
<th>Delta</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>10,600 ± 1,309</td>
<td>11,560 ± 0,732</td>
<td>0,960</td>
<td>0,000</td>
<td></td>
</tr>
<tr>
<td>Attitude</td>
<td>3,176 ± 0,535</td>
<td>3,444 ± 0,448</td>
<td>0,268</td>
<td>0,012</td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>3,044 ± 0,724</td>
<td>3,544 ± 0,584</td>
<td>0,500</td>
<td>0,000</td>
<td></td>
</tr>
</tbody>
</table>

There was an influence of commitment to the plan of action referring to the behavior of the respondents related to the MCHHB utilization. In the control group, there was no effect from commitment on the plan to act related to the behavior of the respondents in reference to MCHHB utilization with a value of p > 0.05 for all indicators (Table 4).
Table 4: Influence of Commitment to the Behavior of Mothers in the Use of the MCHHB after obtaining HPM-Based Health Promotion

<table>
<thead>
<tr>
<th>Group</th>
<th>Variable</th>
<th>Coefficient</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>Commitment</td>
<td>Knowledge</td>
<td>0.051</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Attitude</td>
<td>0.165</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Action</td>
<td>0.197</td>
</tr>
<tr>
<td>Treatment</td>
<td>Commitment</td>
<td>Knowledge</td>
<td>0.964</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Attitude</td>
<td>0.625</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Action</td>
<td>0.819</td>
</tr>
</tbody>
</table>

Discussion

HPM-based health promotion affects the level of commitment to the action plan which consists of the indicators of resilience, independence, goal setting, self-desire and the desire to succeed in the plan for action. Commitment in relation to HPM is defined as the intention to carry out certain health behaviors, including the identification of strategies to be able to do well. Previous research stated that the HPM has a significant effect on the commitment of the public health center nurses and commitment has an influence on the duties of the nurses. Strong commitment is influenced by the high perceived benefits as one of the measures to achieve this vision will require proximity access and improving the quality of health services in the community. Health cottage village (Ponkesdes). The more that the mothers have perceptions of obstacles when fulfilling child nutrition according to nutritional adequacy standards, the more that their commitment will be increasingly weak when it comes to carrying out the actions.

There is a significant positive relationship between behavioral specific cognition and affect with the maternal commitment to the prevention of under-nutrition in children under five. Individuals are committed to carrying out behaviors where they have thought of useful or beneficial personal values. HPM-based health promotion affects the behavior of mothers when utilizing the MCCB. Perceived benefits directly affect the behavior of mothers in relation to fulfilling the nutrition of pre-school children. The perception of the benefits that can increase will affect the behavior of the mother when it comes to carrying out such an action. Positive perceptions relate to the implementation of increasing behavior.

A high level of confidence or self-efficacy will bring in more positive values to the individual, which will appear in their behavior. Parents’ beliefs in managing asthma in children will improve their parents’ abilities and related sub-scales. Behavior changes or adopting new behaviors is related to various processes, knowledge, attitudes and actions. In this study, there was an effect of HPM-based health promotion on the maternal behavior of MCHHB utilization in the intervention group. Attitude toward a given behavior together with belief will form the intention to behave in a certain way. In the theory, it states that behavior is influenced by intention. Someone will do an action when looking at and believing that the action is both positive and useful for themselves and others.

The results of the study showed that after being given a health promotion, there were significant improvements in the maternal behavior through their commitment to the plan of action. Commitment in HPM is defined as intention/the intention to carry out certain health behaviors, including the identification of strategies to be able to do well.

Based on the aforementioned, the mother needs to be informed about the importance of utilizing the MCH handbook in order to maintain her own health and to prepare her children as a qualified future generation. A person will commit and engage in a behavior that promotes health when seeing other people as an example, modeling the behavior and expecting the behavior to occur or be implemented while providing assistance and support to enable the behavior to be carried out. In an effort to improve the behavior of mothers in the use of MCH books, it is necessary to create a high commitment in the mother in order for them to be motivated and to have the strong intention to optimally utilize the MCH books. This motivation or intention will emerge if the mother has a good perception of the benefits of the action, a high self-efficacy perception, a good attitude about the positive action plans and a good perception of
the barriers. This can be generated through the HPM-based health promotion.

The role of peer support can influence the commitment of mothers to use MCHHB. Therefore, health care centers need to consider making a forum that contains pregnant women and mothers with children under five to give each other support and information to one another.

Conclusion

To increase success in relation to utilizing the MCH handbook, it is necessary to increase the mother’s commitment to the plan of action. Improved maternal behavior can be measured through an increase in knowledge, attitudes and actions. Health workers need to increase the level of understanding and commitment regarding the use of MCH books by pregnant women and by mothers who have children under the age of five. Further research is needed on the relationship of the other variables in HPM with the behavior of the mothers in the use of MCH books.

Conflict of Interest: None

Source of Funding: This study was self funded


REFERENCES

1. world bank group. Mortality rate, infant (per 1,000 live births). 2019.


The Risk of Protein Deficiency and Breast’s Milk Complimentary on the Event of Stunting Children

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ABSTRACT

Background: One of the severe threats to efforts to improve health, especially on the quality of future generations is stunting. This study aimed to determine the risk factors for lack of protein intake and the provision of breast milk complementary food for the incidence of stunting in children aged 12-24 months.

Method: This study uses the design of case-control. The study sample was toddlers aged 12-24 months in Semarang with 60 cases and 60 controls. Data collected includes sample and respondent identity, protein intake, and complementary feeding of breast milk. The test used is McNemar with α = 0.05.

Results: The test results showed as many as 15.9% of toddlers suffered from stunting. Lack of risky protein intake is significant for the incidence of stunting of children aged 12-24 months.

Conclusion: Toddlers who have sufficient protein intake probably has less five times the risk of suffering from stunting.

Keywords: Protein intake, Nutrition, Complimentary Breast Milk, Stunting

Introduction

The growth process experienced by toddlers is a cumulative result since the toddler was born. The condition of proper and healthy nutrition in toddlers (aged under five years) is an essential foundation for their health in the future. Conditions that have the potential to disrupt the fulfillment of nutrients, especially energy and protein in children, will cause problems with growth disorders (1).

Stunting or short toddlers are toddlers with chronic nutritional problems, who have nutritional status based on length or height according to the age of a toddler when compared to the standard WHO-MGRS (Multicentre Growth Reference Study) in 2005, have a Z-score of less than -2SD and if the z-score of less than -3 is categorized as a very short toddler (1). Stunting starts when the fetus is still in the womb, and only appears when the child is two years old. Stunting problems is a new issue that adversely affects nutritional problems in Indonesia because it affects the physical and functional aspects of the child’s body as well as the increase in child morbidity, even the stunting event has become the spotlight of the World Health Organization (WHO) to be completed soon (2).

One in three Indonesian children experience stunting and even the number is increasing from year to year. Stunting is a short or concise body condition. Stunting occurs due to malnutrition and recurrent disease for a long time since the fetus until the first two years of the life of a child (2). To improve the nutritional status of the community, attention must be paid to the health sector from the outset or under five. It is essential to make timely prevention efforts so that the growth of the brain of children up to the age of 5 years can run well, to avoid loss generation. Stunting is a serious threat to efforts to improve health, especially for the quality of future generations.

Method

The study design used a design case-control that is research to see the relationship between exposure and
effects by comparing case groups and controls. Control was taken with gender matching. The sampling technique used is simple random sampling. The population in this study was all toddlers aged 12-24 months in the working area of the Bangetayu Health Center in the City of Semarang.

Sample size calculation is by the formula:

\[
n_{\text{case}} = \frac{(M + 1) \left[ Z_{1-\alpha} (1 + \varphi) + 1Z_{1-\beta} \sqrt{\varphi^2} \right]}{2Mk(\varphi + 1)\pi p(1-\pi p)}
\]

\[
(1+1) \left[ \frac{1.96(1+3.5) + 2(0.84)\sqrt{3.5}}{3.5 - 1} \right]
\]

\[
n_{\text{case}} = \frac{n}{2(1)(0.28)(3.5 + 1)0.57(1-0.57)}
\]

\[
2 \times \left[ \frac{8.82 + 1.79}{2.5} \right]^2
\]

\[
n_{\text{case}} = \frac{n}{0.6176}
\]

\[
n_{\text{case}} = 2\times 8.03
\]

\[
n_{\text{case}} = \frac{2 \times 18.03}{0.6176}
\]

\[
n_{\text{case}} = 36.06
\]

\[
n_{\text{case}} = 0.6176
\]

\[
n_{\text{case}} = 58.3845 \sim 59
\]

Description:

\( n_{\text{case}} = \) large sample case

\( Z_{1-\alpha} = \) standard normal distribution value (table Z)

at \( \alpha = 0.05 \)

\( Z_{1-\beta} = \) standard normal distribution value (table Z)

at \( \beta = 0.2 \)

\( k = 1/[1 + (\varphi + 1)\pi p] = 0.28 \)

\( \varphi = \text{OR} = 3.5 \) (Widiyawati, 2013)

\( M = \text{Matching (control case)} \)

\( \pi p = p \text{ (exposure)} = 0.57 \)

Based on the above calculations in this study used a sample of 60 toddlers 12-24 months for each case and control group. With a ratio of 1:1, the number of samples (cases and controls) obtained was 120 toddlers 12-24 months with matching sexes.

To get a case of 59 stunting toddlers aged 12-24 months from the study population, there were 431 toddlers aged 12-24 months, an extensive calculation of cases that needed to be screened was needed. Then the screening calculation was carried out as follows:

\[
N = \frac{\text{sample size}}{\text{incidence prevalence in the population}}
\]

\[
N = \frac{59}{20.42%}
\]

\[
N = \frac{60}{0.2042}
\]

\[
N = 294
\]

Results

Work is often associated with the role of a mother who has additional work outside of household work to increase family income (3). The mother’s work data is obtained from the toddler’s identity form, then grouped into five categories: non-work, employees, entrepreneurs, farmers/fishermen/laborers, and other jobs. Distribution of frequency of respondents based on working mother can be seen in table 4.

Table 1: Distribution of under-five mothers according to the type of work in the working area of the Bangetayu health center in Semarang

<table>
<thead>
<tr>
<th>Type of work</th>
<th>Nutritional status</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cases</td>
<td>Control</td>
</tr>
<tr>
<td>Not working</td>
<td>45(75%)</td>
<td>43(71.7%)</td>
</tr>
<tr>
<td>Employees</td>
<td>4(6.7%)</td>
<td>3(5%)</td>
</tr>
<tr>
<td>Self employed</td>
<td>7(11.7%)</td>
<td>9(15%)</td>
</tr>
<tr>
<td>Farmers/fishermen/laborers</td>
<td>4(6.7%)</td>
<td>5(8.3%)</td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
<td>100</td>
</tr>
</tbody>
</table>

Based on Table 1. It can be seen that the respondents are divided into five types of work, case groups 75% of mothers of a toddler do not work while in the control group only 71.7% of mothers of the toddler are not working. This shows that there were more cases group respondents who did not work compared to the control group.
The sample used in this study is toddlers aged 12-24 months in the Bangetayu Community Health Center in Semarang. Frequency distribution of sample characteristics can be seen in table 5.

Table 2: Frequency Distribution Characteristics of the sample Toddlers 12-24 months age in Bangetayu Health Center Semarang

<table>
<thead>
<tr>
<th>Characteristics of the sample</th>
<th>N</th>
<th>Case</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (month)</td>
<td>60</td>
<td>19 ± 3.68</td>
<td>18 ± 3.53</td>
</tr>
<tr>
<td>Nutritional status</td>
<td>60</td>
<td>-2.61 ± 0.62</td>
<td>-0.47 ± 0.99</td>
</tr>
<tr>
<td>Protein intake</td>
<td>60</td>
<td>23.6 ± 6.10</td>
<td>28.6 ± 8.31</td>
</tr>
<tr>
<td>Provision of mother breast milk</td>
<td>60</td>
<td>70.3 ± 13.89</td>
<td>66.3 ± 11.19</td>
</tr>
</tbody>
</table>

The average age of the sample in the case group was 19 months, while in the control group, the average age was 18 months. The average nutritional status of the sample in this study, according to body height/age indicators in the case group had a Z-score of -2.6, while in the control group had a Z-score of -0.47. Characteristics of protein intake in this study sample, in the case group, had an average value of 23.6 grams of protein intake, while in the control group had an average protein intake value of 28.6 grams. The characteristics of complementary feeding of breast milk complimentary food in this study sample, in the case group, had an average score of 70.3, while in the control group had an average value of 66.3. Based on the results of body height/age nutritional status screening conducted on 314 toddlers aged 12-24 months in the working area of the Bangetayu Community Health Center in the City of Semarang, it was found that 15.9% of the toddler had low nutritional status and 4.8% of children were concise.

Discussion

Stunting is a high index state bodies according to age below minus two standard deviations based on WHO standards. Stunting is a long-term manifestation of the factor of consumption of low-quality diets, recurrent infectious diseases, and the environment \(^4\). The purpose of this study was to determine the factors associated with the incidence of stunting in children aged 24-59 months. This type of research is an observational analytic study with a cross-sectional design. A total of 74 samples were selected by simple random sampling. The study was conducted from March to April 2018. Data collection was done by measuring height, interviewing, and filling out questionnaires. Bivariate analysis using Chi-square test and multivariate using multiple logistic regression test. The results showed that the proportion of Stunting was 26.9 percent, and the average was 73.1 percent. Chi-square test results showed a significant relationship between the level of energy intake, history of duration of infectious disease, birth weight, maternal education level, and family income level with the incidence of Stunting. Mother’s education level has the most dominant relationship with the incidence of Stunting. This research suggests that governments, health agencies, and related parties collaborate in implementing policies to reduce the risk of Stunting. The community is advised to get quality education, provide balanced nutritional intake, and improve children’s health.

1. Relationship between Stunting Protein and Toddlers: Provision of protein to toddlers needs to be considered according to their needs because if excess can damage the kidneys, lack of protein is also not good for the health of toddlers’ growth. Protein needs are not only for physical growth but also crucial for brain cell growth. Given that brain cells will stop growing at the age of 3-4 years, then toddlers need to be monitored so that brain cell growth can be optimal \(^5\). Protein adequacy in toddlers aged 1-3 years, both male and female are 26 grams per day.

From the results of research conducted on 120 samples of toddlers to show the relationship between protein intake and the incidence of Stunting, the following data were obtained.

Table 3: Distribution of Toddlers by Protein Intake and Nutritional Status in Bangetayu Health Center in 2017

<table>
<thead>
<tr>
<th>Protein Intake</th>
<th>Control</th>
<th>Total</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Less</td>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>Case</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less</td>
<td>5</td>
<td>25</td>
<td>30 (50%)</td>
</tr>
<tr>
<td>Good</td>
<td>5</td>
<td>25</td>
<td>30 (50%)</td>
</tr>
<tr>
<td>Total</td>
<td>10 (16.7%)</td>
<td>50 (83.3%)</td>
<td>60 (100%)</td>
</tr>
</tbody>
</table>

Based on the table, it can be seen that in the case group, 50% were included in the category of less protein intake, whereas in the control group only 16.7% were included in the category of less...
protein intake. The difference in proportion after statistical tests using Mc. Nemar produces \( p = 0.00 \). This number gives a meaning that there is a significant relationship between protein intake to the incidence of stunting of children aged 12-24 months in the Bangetayu Health Center Working Area. Lack of pure protein at a severe stage causes quartz corps in children under five years. Protein deficiency is usually accompanied by a lack of energy, which causes a condition called marasmus \(^8\). Protein has many functions, including forming new body tissues during the period of growth and development of the body, repairing and replacing body tissues, repairing and replacing worn, damaged, or dead tissue. Children who experience growth barriers are caused by a lack of adequate food intake and recurrent infectious diseases and increased metabolic needs of decreased fiber appetite, thus increasing malnutrition in children. This situation makes it increasingly difficult to overcome growth disorders that ultimately have the chance of stunting \(^7\).

From the analysis results also obtained Odd Ratio \((OR) = 5\), which means that toddlers who have protein intake have less than five times greater risk of stunting than toddlers who have proper protein intake.

Protein intake is a substantial factor in the incidence of stunting because it directly affects the body. This happens because stunting is one form of malnutrition which is characterized by indicators of height according to age \(^6\). One of the causes of malnutrition itself is a lack of protein intake. Protein has many functions, including forming new body tissues during the growth and development of the body. In children who lack protein intake, there will be a growth disorder that ends in the incidence of stunting. Stunting children are caused by a lack of intake, especially energy and protein, which results in abnormalities in the form of short or concise bodies, even though gene factors in cells show the ability to grow normally \(^8\).

The results of this study are in line with the research conducted by before, entitled the Influence of maternal education on child immunization and stunting in Kenya. Based on the results of statistical tests, it is known that there is a significant relationship between the level of protein adequacy and stunting in infants. It was also explained that the less the level of protein sufficiency, the higher the child’s risk of being short \(^9\).

2. Relationship between Providing Complementary Breast milk with Stunting Events: Along with the growth of toddlers, nutritional needs will also increase. Slowly decreasing milk production makes toddlers need additional sources of nutrients. Provision of complementary food for breast milk as a compliment and preparation for developing toddlers \(^10\). From the results of research conducted on 120 samples of toddlers to show the relationship of the provision of complementary food with the occurrence of stunting, as stated in table 4.

<table>
<thead>
<tr>
<th>Provision of Complementary Food</th>
<th>Control of Control of</th>
<th>Total</th>
<th>( P )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case</td>
<td>Poor</td>
<td>21</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Good</td>
<td>21</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td>(53.3%)</td>
<td>(46.7%)</td>
<td></td>
</tr>
</tbody>
</table>

Based on the table, it can be seen that in the case group, 70% were included in the poor category of complementary feeding, whereas in the control group, 53.3% were included in the type of supplementary feeding.

The difference in proportions was carried out statistical tests using Mc. Nemar produced \( p = 0.11 \), and this number gives the meaning that there is a non-significant relationship between complementary feeding of complimentary breastfeeding and the incidence of Stunting in infants. In complimentary breastfeeding, it is necessary to pay attention to the timeliness of administration, frequency, type, amount of food ingredients, and how to make them. The provision of baby food is not right, one of which is feeding too early or too late. If the complimentary breastfeeding is too early given while in the baby’s intestine has not been able to absorb these foods often the baby has constipation so that the health of the baby is disturbed can cause other diseases and thus its growth will be disrupted \(^12\).
From the tabulation table, it can be found that OR = 1.9, which means that toddler with the provision of complimentary breastfeeding foods are at risk 1.9 times more likely to experience stunting.

This research is in line with the opinion of the Department of Health which states that growth disorders at the beginning of a baby’s life are due to malnutrition since the baby, the supply of complimentary breastfeeding is not nutritionally appropriate to the baby’s needs or the pattern of giving according to age and lack of proper care (11).

**Conclusion**

There is a significant relationship between the level of energy intake, the average duration of illness, birth weight, maternal education level, and family income level with the incidence of stunting in children aged 12-24 months in the work area of Bangetayu Health Center Semarang City. Levels of protein intake, the mean frequency of illness, exclusive breastfeeding status, completeness of primary immunization status, level of maternal knowledge about nutrition, and the number of household members did not show a significant relationship with the incidence of Stunting.

**Ethical Clearance:** Ethical clearance was obtained from the University of Diponegoro Semarang. We also wish to thank all the participants who contributed to this study.

**Conflict of Interest:** Nil.

**Source of Funding:** Nil.

**REFERENCES**


Effect of Using Coriander Seed Powder on *in Vivo* Digestion Coefficient, Total Volatile Fatty Acid and Some Blood Parameters on Awassi Lambs

Sundus F. M.¹, A. S. Rejab², A. Same¹, Z. Raid¹


ABSTRACT

Sixteen, lambs weighing 25 kg average initial weight and 4 to 5 months age, were divided into two groups (6 lambs each), to study the effect of two levels (0 and 6g/h/d) of coriander seed powder to support the digestive coefficient, rumen fermentation and some blood parameters. The experiment utilized one diet with concentrate: roughage ratios 70:30 on a dry basis, including a control group (0) and groups received a basal ration 6g/h/d, *coriander sativum* respectively. The result appeared significantly increased the digestion of dry and organic matter and total protein 67.17, 68.18 and 71.50 respectively, as well decreases ammonia-N and increases acetic proportion in rumen fermentation. On the other hand, no significant differences were noticed in serum total protein, albumin, globulin, glucose and essential oils effects on rumen microbial population, amount of volatile fatty acids. Recent studies have tended to regulate ratio by using plants and medicinal herbs as feed substitutes to avoid a few side effects of antibiotics and other dietary categories and their effect on animal health and performance.

Keywords: coriander seed powder, digestion coefficient, Herbs, volatile fatty acid, blood parameters, Awassi lambs

Introduction

Recently the use of herbal medicines, have been considered as an alternative for therapeutic usage. The major active compounds of medicinal plants (essential oils, saponins flavonoids, tannins and polyphenols) have been mainly tested as concentrated extracts to examine their antimicrobial activity¹ to decrease rumen methane emissions². Coriander (*C. sativum* L.) belonging to the family Umbelliferae/Apiaceae is an aromatic, herbaceous annual plant antibacterial, antifungal and antioxidant activities. *C. sativum* is useful in food preparation (as a flavouring agent and adjuvant) and preservation. This coriander seed essential oils was also found to improve blood glucose control and it held promise for use as an ant hyperglycemic agent³. The essential oil content ranged from 1.87 to 2.33% (v/w). The presence of 40 components of the coriander oil was determined, out of which 9 were unidentified. The main components of the coriander seed oil were as follows: linalool, camphor, α-pinene, geraniol, and γ-terpinene). Coriander fruit contains about 0.2%–1.5% of volatile oil and 13%–20% of fat oil⁴. However, it has been recorded that some cultivars contain up to 2.6% of volatile oil⁵. As has been reported by⁶. The researchers fed ruminants by adding some substances to improve the environment of animal and performance such as yeast⁷. Currently; the medicinal plants have been used to avoid harming their use and are considered safe. This is why coriander seed powder has been used in the current experiment. The objective of this study was to investigate the effects of various levels of coriander seed powder on the digestive coefficient, rumen fermentation, and some blood parameters.

Materials and Method

Sixteen, lambs weighing 25 kg average initial weight and 4 to 5 months age, were divided into two groups...
(6 lambs each), to study the effect of two levels (0 and 6 g/h/d) of *coriander sativum* to support the digestive coefficient, rumen fermentation and some blood. The experiment utilized one diet with concentrate: roughage ratio 70:30 on a dry basis. Table 1. Shows the nutritional composition of coriander seed powder.

1. Digestibility Trail: Digestibility trail was conducted to determine the digestibility coefficients of total diets. The sixth week was assigned for this trail using half of the lambs (three lambs per each treatment). The offered quantities of diets and those remained were accurately recorded to estimate daily intake during the 7 days-collection period. Feces excreted by each lamb were weighed and about 10% were subsample daily and stored at -20°C. Feces were collected by using special handmade digestion sacs, which suited for each lamb, and ensured separation of urine without preventing to their movement inside the individual pens. At the end of the collection period, Samples of diets and feces were thoroughly mixed and one sample of each was obtained and stored in deep-freezing for the subsequent chemical analysis a according to.

2. Rumen Fermentation: Rumen liquor samples were collected at the end of period feeding trial using a stomach tube and filtered through double layers of cheese cloth Samples were withdrawn from the same lambs in all sampling time, using a smooth stomach tube which connected to 50 ml syringe as described by. The concentration of total volatile fatty acid (VFA) was determined in rumen liquor samples by the steam distillation method using Markham micro-distillation, whereas analyzed ruminal NH3-N by the method of steam distillation with MgO using a Kjeltec (Gerhardt - Germany) distillate unit.

3. Blood Parameters: During the last week of the experiment and within one day. Blood samples (10 ml) were withdrawn from the same lambs that assigned to digestibility’s characteristics of nutrients in experimental diets and rumen fermentation, Samples were withdrawn via jugular vein puncture into vacationer tubes, which were immediately placed in refrigerator, before morning feeding to determine Serum glucose (SG) according to, Serum total protein (STP) and Serum urea nitrogen (SUN) according to concentration Serum albumin according to, Serum globulin according to.

### Table 1: Nutritional composition of coriander seed powder

<table>
<thead>
<tr>
<th>Component</th>
<th>Coriander seed %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry matter</td>
<td>88.0</td>
</tr>
<tr>
<td>Crude protein</td>
<td>15.27</td>
</tr>
<tr>
<td>Crude fiber</td>
<td>33.64</td>
</tr>
<tr>
<td>Ether extract</td>
<td>20.0</td>
</tr>
<tr>
<td>Ash</td>
<td>9.20</td>
</tr>
</tbody>
</table>

### Result and Dictation

1. Digestion Coefficient: Table 2. Shows that the addition of two levels of coriander (0 and 6 g/h/day) significantly increased the digestion of dry and organic matter and total protein 67.17, 68.18 and 71.50 respectively. The increases in the digestion factor may be due to improved rumen environment and increased utilization of the diet taken as a result of adding coriander powder containing some volatile oils and flavonoids are found in coriander seeds by increasing the efficiency of digestion and absorption as well as increasing enzymatic digestion of carbohydrate and protein this is consistent with. Whereas, there were no significant differences in the digestion coefficient of crude fiber, ether extract and nitrogen free extract 64.56, 55.62 And 74.63, respectively. The addition of coriander powder under the active compounds in the composition led to improved fermentation processes in addition to synchronize of energy and protein, which led to the formation of microbial protein. Khamisabadi, et. al., pointed out that in field experiment of fattening Sanjabi lambs no significant differences in digestion coefficient In a subsequent study feeding Holstein’s calves two levels, (0 and 4g) of flavonoids increased the digestion coefficient of dry and organic matter and the ether extract 84.7, 86.4.and 53.5%, respectively. on the other hand, added four levels 0, 2.5, 5and 7.5g fenugreek seeds/head/day to digestibility of DM, OM, CP, NDF and ADF were not affected significantly (P<0.05) by increasing levels of fenugreek seeds as well as pointed that in his study no significant differences were noticed in vitro
digestion coefficient of dry and organic matter when adding two levels of concentrate: roughage 70:30 and 30:70 with and without coriander seed powder (0 and 6g).

Table 2: The effect of coriander seed powder, on digestible Coefficient of A wissa lambs

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Without coriander seed powder</th>
<th>With coriander seed powder</th>
<th>Significant</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMD</td>
<td>60.62 ± 0.60b</td>
<td>67.17 ± 1.16a</td>
<td>*</td>
</tr>
<tr>
<td>OMD</td>
<td>60.86 ± 0.62b</td>
<td>68.18 ± 1.17a</td>
<td>*</td>
</tr>
<tr>
<td>CPD</td>
<td>63.62 ± 1.42b</td>
<td>71.50 ± 1.17a</td>
<td>*</td>
</tr>
<tr>
<td>CFD</td>
<td>61.23 ± 0.45a</td>
<td>64.56 ± 2.25a</td>
<td>NS</td>
</tr>
<tr>
<td>EED</td>
<td>57.46 ± 1.45a</td>
<td>55.62 ± 3.16a</td>
<td>NS</td>
</tr>
<tr>
<td>NFED</td>
<td>70.45 ± 0.84a</td>
<td>74.63 ± 1.97a</td>
<td>NS</td>
</tr>
</tbody>
</table>

a and b: Means in the same row for each item with superscripts different significantly * (P<0.05), N.S: No

2. Rumen Fermentation: Table 3. Shows that the addition of two levels of coriander (0 and 6 g/h/day) resulted in decreases ammonia-N and increases acetic proportion, whereas no significant with propionic and butyric. The results obtained from this study showed that herb coriander could improve the ration fermentation and volatile fatty acids production increase. Cieslak, et.al.20 added essential oils to the diet of ruminants changed microbial fermentation society and methane gas production. Hashemi21 demonstrate that using medicine plants effects positively rumen performance and reduction ammoniac nitrogen concentration, protein metabolism and improvement of volatile fatty acids production increase. GÜMÜŞ and IMIK22 reported that while serum NH3 levels were significantly increased in group 100ppm (P < 0.05) and slightly increased in group 200 ppm when Yucca schidigera powder added to lamb feed. Mohammed, et.al.19 revealed that no significant differences in NH3-N and TVFA, when adding two levels of concentrate: roughage 70:30 and 30:70 with and without coriander seed powder in A wissa ewe.

Table 3: The effect of coriander seed powder, rumen fermentation on Awassi lambs

<table>
<thead>
<tr>
<th>Parameters</th>
<th>With coriander seed powder</th>
<th>Without coriander seed powder</th>
<th>Significant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetic</td>
<td>67.25 ± 0.51a</td>
<td>63.17 ± 0.79b</td>
<td>*</td>
</tr>
<tr>
<td>Propionic</td>
<td>28.68 ± 0.23a</td>
<td>27.03 ± 0.98 a</td>
<td>NS</td>
</tr>
<tr>
<td>Butyric</td>
<td>11.11 ± 0.40a</td>
<td>10.81 ± 0.40a</td>
<td>NS</td>
</tr>
<tr>
<td>N-NH3</td>
<td>18.86 ± 0.81b</td>
<td>25.22 ± 0.58a</td>
<td>*</td>
</tr>
</tbody>
</table>

a and b: Means in the same row for each item with superscripts different significantly * (P<0.05), N.S: No

3. Blood Parameters: Table 4. Shows the concentrations of blood serum metabolites of these lambs. Addition of two levels of coriander (0 and 6 g/h/day) to the basal diet no significant differences were noticed in serum total protein, albumin, globulin, glucose and urea values of lambs serum among all treatments they were within normal range. Saffa23 found that supplemented the basal diet by either chamomile flowers or Nigella sativa seeds into three dietary treatments (0, 10 and 10 g/ewe/day) respectively. While, increased total protein and globulin concentration of these ewes and no significant differences were observed in albumin, glucose and urea concentrations. Mohan, et. al. 24 noted that feeding Murrah buffalo calves three levels of garlic powder at the dose rate of (0, 250 and 300) mg per kg body weight, respectively increase in the total protein, albumin, globulin. In addition to this, no significant difference was observed between the garlic supplemented blood urinary nitrogen (BUN) values (8) added to lamb feed three levels (0, 100 and 200ppm) Yucca schidigera powder (YSP) serum glucose, urea, and BUN levels were also found to be similar in the all groups.
Table 4: The effect of coriander seed powder, on blood serum on A wassi lambs

<table>
<thead>
<tr>
<th>Parameters</th>
<th>With coriander seed powder</th>
<th>Without coriander seed powder</th>
<th>Significant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total protein (mg/dl)</td>
<td>5.573 ± 0.80</td>
<td>5.537 ± 1.02</td>
<td>NS</td>
</tr>
<tr>
<td>Albumin (mg/dl)</td>
<td>3.477 ± 0.95</td>
<td>3.475 ± 1.59</td>
<td>NS</td>
</tr>
<tr>
<td>Globulin (mg/dl)</td>
<td>2.083 ± 0.47</td>
<td>2.066 ± 1.85</td>
<td>NS</td>
</tr>
<tr>
<td>Glucose (mg/dl)</td>
<td>68.14 ± 1.15</td>
<td>65.33 ± 2.56</td>
<td>NS</td>
</tr>
</tbody>
</table>

NS: No significant

Conclusion

Supplementing 6% of coriander seed powder in the diet increased the digestion of dry and organic matter and total protein 67.17, 68.18 and 71.50 respectively, as well decreases ammonia-N and increases acetic proportion in rumen fermentation.

Conflict of Interest: None

Source of Funding: self

Ethical Clearance: Not required.

REFERENCE


7. Hassan SA, Mohammed SF. Effect of *saccaromyces cerevisiae* supplementation on rumen characteristics in awassi lambs fed diets with different roughage to concentrate ratios. Iraqi Journal of Agricultural Sciences, 2016. 74: (Special Issue):


Knowledge and Attitude Regarding Disaster and Emergency Preparedness among Hospital Health Care Workers in West Java Province, Indonesia

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¹Public Health Program Study, STIKes Dharma Husada Bandung; ²Occupational Health & Safety Department, ³Health Administration & Policy Department, Faculty of Public Health, Universitas Indonesia

ABSTRACT

Objective: To assess the knowledge and attitude regarding disaster and emergency preparedness among health care workers.

Method: This cross-sectional descriptive analytical study was conducted in several public hospitals in West Java province, Indonesia. A self-administered questionnaire using modified Emergency Preparedness Information Questionnaire (EPIQ) was used for data collection. This questionnaire consists of 3 components, i.e. respondent sociodemographic data, basic knowledge on emergency preparedness, and attitude towards emergency and disaster preparedness.

Results: Health care workers from 9 public hospitals participated in this study by completing the questionnaire. Female comprised the majority of the respondents (70%). More than a half of the total respondents (53.2%, n=115) showed good knowledge on emergency and disaster preparedness. However, slightly less than a half of the respondents (46.8%, n=101) still had poor knowledge. The respondents’ attitude toward emergency preparedness was generally positive as most of them (75.9%, n=164) expressed a positive attitude although some still reflected negative attitudes towards it (24.1%, n=42).

Conclusion: There is a need to improve the overall knowledge on emergency preparedness among the respondents in order to achieve good hospital disaster preparedness. The positive attitude reflects the acceptability of emergency preparedness among health care workers. Therefore, routine emergency planning and drills should be integrated into the emergency and disaster management program in hospital as investments to achieve good hospital emergency and disaster management.

Keywords: Attitude, Disaster, Health Care Worker, Knowledge, Preparedness

Introduction

A disaster is one of the most difficult events healthcare personnel can face. They must be able to provide needed medical care while performing emergency plan tasks, communicating with incident command, managing supplies and resources, and facilitating patient flow. These tasks differ greatly from what normally is expected of hospital personnel on a daily basis. Unfortunately, most hospital personnel are unprepared to cope with a disaster.¹ ² ³ ⁴ ⁵ ⁶. It has been shown that hospital staff like healthcare workers that practice for disaster situations must well prepare during these events.

West Java province is an area that is considered as a disaster-prone area in Indonesia based on the Indonesian Disaster Risk Index (IDRI) issued by the National Agency for Disaster Management (BNPB) in 2014 that puts West Java province in the High classification.⁷

In September 2016, a flash flood in Garut district, which is one of the districts in West Java province, caused

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Health care facilities play an important role in the effort to reduce or minimize the number of victims in the event of a disaster and accelerate post-disaster recovery process (9). Health care workers, consisting of medical doctors, nurses, midwives, pharmacists, public health officers, and medical engineers, comprise the majority of workers in a hospital. Patient outcome and recovery during emergency situations in a hospital are largely dependent on the initial responses from the health care workers and the quality of care delivered. This means that the knowledge and attitude of these workers regarding emergency and emergency preparedness become a major factor that determines the patient outcome and recovery of. In addition to working towards patient survival, preparedness also encompasses planning, training, equipment provision, and drills or exercises (10).

With the high mortality rate due to disasters in Indonesia and worldwide, there is a need for assessing the responsiveness of emergency health care workers towards emergency and disaster situations, where their knowledge and attitude become one of the dominant factors. The World Health Organization (WHO) recommends that a periodic assessment of the capability of health care facilities to respond to emergencies should be implemented. Hospital preparedness assessment is a mean for the hospital to test and evaluate its capabilities and/or recovering from an event that placed a significant strain on its patient care and operating systems. Hence, this study aimed to assess public hospitals in West Java with regards to emergency management and preparedness and to determine the level of knowledge of emergency workers on emergency preparedness, attitudes of emergency workers towards emergency cases presenting to the hospital, current practices of emergency workers regarding emergency preparedness, and the availability of hospital-specific emergency plans. (11)

**Material and Method**

This study was performed in 9 public hospitals located in disaster high risk areas in West Java province. This cross-sectional descriptive study was carried out during the period of March-May 2018. Respondents for this study were 216 health care workers that included nurses and midwives.

A self-administered questionnaire using modified *Emergency Preparedness Information Questionnaire* (EPIQ) (12) was used for data collection. This questionnaire consists of 3 components, i.e. respondent sociodemographic data, basic knowledge on emergency preparedness, and attitude towards emergency and disaster preparedness. A correct response to the item of the questionnaire was given a “1” score while the incorrect response received “0” score. All scores were then combined to get the overall score for each respondent. Respondents with an aggregate score of 50-58 or higher were designated as “good” while those with a score between 30-48 or less were graded “poor.”. For attitude, 10 core questions about expected attitudes toward emergency preparedness were used to determine the respondents’ attitudes. The attitude was said to be positive if the respondent achieved a score of ≥15 and said to be negative when the score was <15. Results were presented in tabular and graphical forms using Microsoft Word.

**Findings**

Deficient hospital disaster planning and preparedness is more pronounced in developing countries as compared to developed countries (13). Majority who are injured and killed by natural disasters reside in developing countries (14). Thus, the impact of poor disaster planning is more pronounced for developing countries. Prior studies have shown that the socioeconomic level of a community influences the vulnerability of its inhabitants and their medical requirements in the event of a disaster (13).

The findings of this study revealed that only 115 (53.2%) of the respondents had good knowledge of emergency and disaster preparedness while the remaining 101 (46.8%) had poor knowledge. The respondents in this study had different levels of cognitive domain that result in various understanding of the concept of disaster. Each individual will have his or her own interpretation on knowledge about the definition of natural disaster, disaster
risk, disaster rescue technique, and means of saving lives. An overall deficiency in the knowledge of emergency preparedness was found in this study, which is in contrast to the finding in a study in Johannesburg where 70% of the respondents show good knowledge on emergency preparedness and 90% had above-average knowledge on emergency plan as a logistic structure to ensure the optimal use of resources. 

Respondents’ attitude toward emergency preparedness was generally positive as most of them, i.e. 164 (75.9%), believed that emergency plan should be regularly updated, emergency simulations should be performed routinely in the hospital, and staff should be adequately trained because emergency preparedness and management is important for all health workers in the hospital. They also believed that hospital management should adequately be prepared should an upsurge in emergency occur in the hospital and that every staff member should be involved actively, not only nurses and doctors alone. They also agreed that emergency drills should be conducted in the hospital. These findings are similar to those of a study in a Johannesburg hospital in South Africa. Only a small number of respondents (24.1%, n=54) had a negative attitude towards emergency and disaster preparedness.

Individual/group capacity to deal with disasters can be seen from the community’s potentials in resolving the negative impacts of disasters, including taking concrete steps to reduce risks. In addition to being prepared at the individual level, disaster preparedness at the community level is also needed as a form of preparedness in a more structural and systemic manner. Disaster education should not only given in schools, but also needs to be promoted to families and communities. Students who have received disaster education are expected to be able to teach their family members at home and the surrounding community so that disaster preparedness at the community level is formed. It is implicated that disaster preparedness for health care worker should be embedded in the curriculum starting from the diploma level.

In this study, most of the health care workers have a Diploma and only a small number has a bachelor degree (75.9% and 24.1%, respectively). Education can influence someone’s behavior, which is also reflected in disaster preparedness. In general, the higher the education level is, the easier it is for individual to receive information. The establishment of a high level of disaster preparedness requires full attention on the educational programs to ensure that the community will take appropriate actions to reduce vulnerability, especially during the critical phase (72 hours) after the disaster

More than half of the total respondents never attended disaster training (57%) and less than half attended disaster-related training (42%) such as Fire Extinguisher Use training, Integrated Emergency Management System training, and First Aid training. The average knowledge score of respondents who had attended the training was higher than the respondents who had never attended any disaster training. This might be due to the fact that training participants are given relevant information about the concept of emergencies that enable them to answer the related items in the questionnaire correctly.

The results of this study are in line with the findings in Duong’s study on 152 emergency nurses in Adelaide, Australia, that shows 95% of the respondents want to receive disaster-related training with 45% of respondents feel less confident with their disaster preparedness knowledge due to the lack of training and experience in facing disasters. Duong concluded that disaster education and training can increase nurses’ alertness to emergency conditions during disasters. These education and training sessions should include theories, case studies, and disaster simulations that are provided through a multi-profession collaborative approach. Duong also explained that it is very potential to start disaster preparedness education at the higher education level. The goal is that the higher education institutions will produce graduates with good self-confidence when facing emergencies.

<table>
<thead>
<tr>
<th>Table 1: Respondent Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Category</strong></td>
</tr>
<tr>
<td><strong>Gender</strong></td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td><strong>Education</strong></td>
</tr>
<tr>
<td>Diploma</td>
</tr>
<tr>
<td>Bachelor</td>
</tr>
<tr>
<td><strong>Training</strong></td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>
Table 2: Knowledge and Attitude of Health Care Workers towards Emergency and Disaster Preparedness

<table>
<thead>
<tr>
<th>Category</th>
<th>Frequency (n = 216)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>101 (46.8)</td>
</tr>
<tr>
<td>Poor</td>
<td>115 (53.2)</td>
</tr>
<tr>
<td>Education</td>
<td></td>
</tr>
<tr>
<td>Diploma</td>
<td>164 (75.9)</td>
</tr>
<tr>
<td>Bachelor</td>
<td>52 (24.1)</td>
</tr>
<tr>
<td>Training</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>91 (42.1)</td>
</tr>
<tr>
<td>No</td>
<td>125 (57.9)</td>
</tr>
<tr>
<td>Attitude</td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>164 (75.9)</td>
</tr>
<tr>
<td>Negative</td>
<td>52 (24.1)</td>
</tr>
<tr>
<td>Total</td>
<td>216</td>
</tr>
</tbody>
</table>

Conclusions

There is a need to improve the overall knowledge of emergency preparedness of health care workers to support the hospital disaster preparedness. Despite good attitude and acceptability of emergency preparedness, routine emergency drills are needed to be able to meet the existing demands of emergency care in the country and worldwide. Basic knowledge on emergency preparedness should be owned by all hospital staff members, both new and existing staff, especially among those who are involved in the management of emergencies. Emergency planning and drills should be done regularly and continuously as a part of the emergency and disaster management program in hospital, which will be good investments for good emergency and disaster hospital preparedness of the hospital.

Ethical Clearance: This study has been approved and has received ethical clearance from the Committee of Public Health Research Ethics of Public Health Faculty, Universitas Indonesia through the issuance of ethical clearance No : 80/UN2.F10/PPM.00.02/2017 dated 20 November 2017.

Source of Funding: This study was performed using ministry of research and technology higher education funds of the authors.

Conflict of Interest: There is no conflict of interests to declare.

REFERENCES


Functional Features of the Body in the Presence of Scoliosis

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ABSTRACT

Important in the formation of scoliosis are violations of the supporting, spring and elastic properties of the skeleton, ligamentous and muscular system, contributing to the formation of spinal deformity. As a result, the deformation of the musculoskeletal system, which can cause various dysfunctions in the body, develops. Moreover, all forms of scoliosis are divided into two main groups - congenital and acquired. Often in the pathogenesis of scoliosis, there are two main points. The first is a violation of the growth of the vertebra due to local damage or general disorders, the second is the neurological disorders that disorganize the balancing system of muscle groups. These common disturbances can often take on the nature of irreversible. Arrested from the concave side, normal or even accelerated growth from the convex side contributes to the bending of the spine, and the premature soldering of the germ cartilage of the arches from the convex side leads to the appearance of torsion.

Keywords: scoliosis, dysfunctions, pathology of internal organs, spine, intervertebral disks.

Introduction

In recent years, the world has seen a significant increase in various pathological manifestations in the human body¹². In their structure, an important place besides cardiovascular pathology¹ is occupied by disorders of the musculoskeletal system², including spinal curvature³. The prevalence in the world of scoliosis tends to increase in different age groups⁴.

Important in the formation of scoliosis are violations of the supporting, spring and elastic properties of the skeleton, ligaments and muscular system, contributing to the formation of spinal deformity⁷. As a result, the deformation of the musculoskeletal system develops, which can cause various dysfunctions in the body⁸⁹.

Timely detection of disorders of the musculoskeletal system, including scoliosis with early effective complex correction, prevents the progression of dysfunctions, helping to improve the morphological and functional state of organs and systems¹⁰¹¹.

Currently, scoliosis is considered as one of the most frequently encountered conditions, leading to various dysfunctions of internal organs¹². Consequently, scoliosis is manifested not only by curvature of the spine, but also leads to a number of common pronounced changes in the body, causing deterioration of the functions of internal organs and disturbing the metabolism in tissues, which reduces the overall resistance of the body¹³.

Objective: to consider dysfunction in the body in the presence of scoliosis.

Issues of the Etiopathogenesis of Scoliosis: For a number of years, observing a large group of patients
with scoliotic disease and subjecting them to the most thorough clinical, laboratory, special spondylographic and neurological examination, it was not possible to say that idiopathic scoliosis is based on only neurological changes, that they are the main cause for the occurrence of scoliotic disease\textsuperscript{14}.

The first group is represented by various neurological microsymptoms that do not change during the course of the disease, do not progress and do not disappear regardless of the progression of the disease or the medical manipulations undertaken. Many of them are similar to the status described by some authors. The second group includes neurological symptoms, which supposedly have a tendency to more clearly manifest themselves and worsen with the progression of the disease. In the process of treatment, some of them regress, and some remain. And finally, there is a group of the most pronounced neurological disorders (very severe and deep paresis or paralysis) that are absent in the early stages of the development of the disease and appear with the progression of the disease\textsuperscript{15}.

It has been suggested that the idiopathic scoliosis renewal consists of congenital mucopolysaccharide metabolic disorders\textsuperscript{6,17}. Developing this assumption about the value of mucopolysaccharides in the genesis of scoliosis, it was suggested that the rotation of vertebrae in scoliosis depends on the weakness of the fibrous ring and the increase in intradiscal pressure caused by changes in the mucopolysaccharides of intervertebral disc collagen\textsuperscript{18}. However, there are still no unambiguous judgments on this score\textsuperscript{19}.

A morphological and histochemical study of intervertebral discs, hyaline plates, sprout zones and vertebral bodies seized during surgery for a scoliotic disease from a large number of adolescents was carried out. Four spinal preparations were also investigated, which were withdrawn from patients who died of other causes at the age of 9 months, 12 and 15 years with scoliotic disease\textsuperscript{5}. As a result of the conducted research, it was established that in case of a second-degree scoliotic disease, the germ zone has a different structure depending on its location. On the convex side, it is predominantly four-layer, although the zone of proliferation is somewhat narrower than normal. Somewhat closer to the center, when passing to the concave side, the germ zone narrows considerably and is represented by two layers of cells, and the proliferation zone is absent. On the convex side of the curvature, there are quite a few dystrophy zones. Chondrocytes are predominantly dual-core and oriented perpendicular to the long axis of the spine or at some angle to it. A large number of clumps of an amylase-resistant substance are found in most cells of the proliferative zone\textsuperscript{13}. The cytoplasm of the cells of the fibrous ring of the disk contains a fairly large amount of an amylase-resistant substance and gives intense reactions to acid mucopolysaccharides. The pulposus nucleus of the disk shifts to the convex side of the curvature and reveals gross dystrophy in fibrous structures in the form of a glitchy disintegration, fragmentation and decollagenization. Bone beams are atrophic in places with jagged edges, indicating a restructuring of the bone structures. Bone marrow is predominantly fibrous and only in some areas myeloid. Hemorrhages and forming tissue cysts are visible, and in some cases plasma lakes, which confirms the impaired blood circulation\textsuperscript{20}.

On preparations withdrawn from patients with scoliosis of the third degree, dystrophic changes in the elements of the spine are aggravated. The germ zone is deformed, in places sharply narrowed and poor in cells. There are many zones of dystrophy in it, which go beyond the limits of the actual growth zone and penetrate into the hyaline plate\textsuperscript{21}.

Closer to the center, the growth zone is represented by fibrous cartilage, and in some places by connective tissue. Cells with basophilic nucleus and light cytoplasm. Dystrophy zones are painted rather intensively. In some areas, the germ zone was fragmented. Observed areas of osteoclastic resorption and along with this pronounced activation of the endosteam. The bone marrow spaces are made with fibrous fat marrow with tissue cysts and plasma lakes\textsuperscript{22}.

There are even more pronounced dystrophic changes on the drugs seized from patients with fourth-degree scoliotic disease. The germinal zone on the concave surface is almost not detected, on the convex - deformed and narrowed. Acid mucopolysaccharides in it are found in small quantities. Hyaline plates are fragmented with the presence of calcification and bone formation in them. The number of acid mucopolysaccharides in the hyaline plate is significantly reduced. Some pale colored foci of sulfated mucopolysaccharides are visible. Bone beams undergo pronounced adjustment. Characterized for them is the loss of osseomucoid and the exposure of the mesh structure of the beams. Expression of
endosteum is expressed with the growth of connective tissue elements in bone marrow spaces. Intervertebral disc tissue undergoes calcification. Zones of dystrophy alternate with zones of cell proliferation. There are extensive areas in which acidic mucopolysaccharides and glycogen are not detected\(^23\).

A change in carbohydrate metabolism in cartilage is evidenced by a decrease in the amount of glycogen in cartilage cells. The appearance of calcifications in the zone of enchondral growth and in the intervertebral disk indicates a pronounced shift in metabolism\(^24,25\). In the pathogenesis of scoliosis, there are two important points. The first is a violation of the growth of the vertebra due to local damage or general disorders, the second is the neurological disorders that disorganize the balancing system of muscle groups. These initial or general “lesions” must be sufficiently heavy, irreversible, must neutralize the possibility of spinal adaptation and extend into 3-4 segments. Growth processes under adverse conditions contribute to the development of scoliosis. Arrested from the concave side, normal or even accelerated growth from the convex side contributes to the bending of the spine, and the premature soldering of the germ cartilage of the arches from the convex side leads to the appearance of torsion. Thus, a combination of two factors plays a role in the development of scoliosis — the initial pathogenic mechanism and growth processes\(^26,27\).

**Morphofunctional features of the body with scoliosis:**
In children with signs of scoliosis, there is a deterioration in general physical development and functional capabilities of internal organs. They have registered a decrease in the growth and size of individual parts of the body, a deterioration in the functional capabilities of the body, stress in the work of the cardiovascular and respiratory systems\(^28\).

In the blood of children with scoliosis, the level of androgenic hormones dehydroepiandrosterone and testosterone increases. An earlier activation of the pituitary gonadotropic function is noted, which inevitably affects their physical development\(^29\).

Scoliosis causes skeletal deformity. The load on the joints, ligaments, muscular system of the trunk and limbs is increasing. Violations of the spring function of the spine leads to microtraumas of the spinal cord and brain when running, jumping, with significant deformities - and when walking. In these conditions, functional disorders in the activity of the internal organs also occur\(^20\).

With scoliosis, as a rule, the excursion of the chest and diaphragm is reduced, the vital capacity of the lungs is reduced, and fluctuations in the intrathoracic pressure are reduced. These changes adversely affect the activity of the cardiovascular and respiratory systems, leading to a decrease in physiological reserves, disrupting the adaptive abilities of the organism. The weakness of the abdominal muscles leads to disruption of the normal activity of the abdominal organs, in particular - to dysfunctions of the gastrointestinal tract\(^31\).

The decrease in the spring function of the spine contributes to permanent microtraumas of the brain during walking, running and other movements, accompanied by a rapid onset of fatigue and headaches\(^2\).

With scoliosis, there is a delay in the development of motor skills and abilities, impaired bone formation, weakness of the ligamentous-muscular system and related lack of development of the muscular system, exacerbation of associated diseases that reduce the level of physical and somatic health of the child\(^6\).

With scoliosis, the vegetative regulation of the cardiovascular system: in 55%, the activity of the parasympathetic division prevails, in 36% of sympathetic influences and only 9% of their balance is recorded\(^10\). It is believed that with dysplastic scoliosis, dystrophic changes in the muscles of the trunk and limbs are apparently associated with damage to the spinal cord motor neuron apparatus\(^4\).

**Conclusion**

Scoliosis is one of the most common diseases in modern society. Currently, it is recognized as polyetiologic. Moreover, all forms of scoliosis are divided into two main groups - congenital and acquired. Often in the pathogenesis of scoliosis, there are two main points. The first is a violation of the growth of the vertebra due to local damage or general disorders, the second is the neurological disorders that disorganize the balancing system of muscle groups. These common disturbances can often take on the nature of irreversible. Arrested from the concave side, normal or even
accelerated growth from the convex side contributes to the bending of the spine, and the premature soldering of the germ cartilage of the arches from the convex side leads to the appearance of torsion.

**Conflict of Interest:** No conflict of interest is declared.

**Sources of Funding:** The study was conducted at the expense of the authors.

**Ethical Clearance:** The study was approved by the local ethics committee of the Russian State Social University on September 15, 2017 (protocol №11).

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Extraction, Purification and Genotyping of β–LactamAse from Local Isolate of Acinetobacter Baumannii

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ABSTRACT

Beta-lactamase was purified from local isolate of Acinetobacter baumannii by several steps included ion-exchange chromatography by using DEAE-Cellulose and gel filtration on Sephacryl S-200 column. The obtained purification fold and recovery were 11.72, 55.12% respectively. The characterization of the purified Beta-lactamase showed that the molecular weight was about 44,668 KD as determined by gel filtration. The Acinetobacter baumannii gene (blaTEM) responsible for β-lactamases detection was by PCR. They recorded positive results reaching 39(86.66%), from the isolates.

Keywords: β-Lactamase, Acinetobacter baumannii, Molecular weight, genotyping

Introduction

Beta-Lactams are the most widely used class of antibiotics. Since the discovery of benzyl penicillin in the 1920s, thousands of new penicillin derivatives and related β-Lactam classes of cephalosporins, cephamycin, monobactams and carbapenems have been discovered. All these antimicrobial agents have a common a Beta-lactam ring which acts as an analog of D-alanyl-D-alanine. The main component in the bacterial cell wall that ensures its integrity is peptidoglycan layer, especially in Gram-positive organisms. These antimicrobial agents inhibit the synthesis of the bacterial peptidoglycan layer by binding with varying affinities to DD-transpeptidases, otherwise known as penicillin binding proteins (PBPs). This, in turn, inhibits the cross-linking of the nascent peptidoglycan layer, which disrupts the synthesis of the cell wall. Moreover, due to the production of enzyme that hydrolyze β-lactams several β-lactamase inhibitor are being combined with β-lactams, produced by many of gram negative bacteria, like Acinetobacter baumannii. Main challenge in A. baumannii pathogenesis is unity, connection, expression and regulation of genetic elements that contribute to the Multi Drug Resistant phenotype, for example, the presence of OXA and ESBLs genes such as TEM and SHV. Extended spectrum beta-lactamase have altered enzymatic activity from their progenitors. Furthermore, they have the ability to hydrolyze4. Chromatography is an important biophysical technique that enables the separation, identification, and purification of the components of a mixture for qualitative and quantitative analysis. Ion chromatography plays a predominant role in ion determinations with the instrumental methods. It offers several advantages over the conventional methods, such as simultaneous determinations of alkali and alkaline earth cations and ammonia. Ion chromatography has been accepted world-wide as a reference method for analyzing anions and cations in water and wastewater due to the fact that it enables the replacement of several individual wet chemistry methods for common ions with one instrumental technique5. Arun et al.⁶ was made to characterize and optimize the production of this enzyme by ion exchange chromatographic purification. Poirel et al.⁷ were purified from extracts of E. coli DH10B(pOXA-58), the specific activity of β-lactamase (OXA-58) against benzylpenicillin was 2.3 U per mg of protein and its purification factor was 70-fold.

The aim of this study is dealing with extraction and purification of β–Lactamase from local isolates A. baumannii, then genotyping for β–Lactamase has been studied.
Material and Method

Extraction and partial purification of crude β-lactamase: The β-lactamase was isolated from local isolate of *A. baumannii* isolated in 100 ml nutrient broth at 37°C, diluted 10-fold with the fresh nutrient broth; the culture was incubated with shaking at 37°C. After 1.5 hr. of incubation, the penicillin-G was added to the final concentration of (6g/l) as the inducing agent, the incubation continued for 3 hr. The bacterial cells were harvested by centrifugation at 10000 g for 30 min at 4°C, washed once with (0.05M) Na2HPO4/KH2PO4, (pH 7.0), suspended in 4 ml of the same buffer, and disrupted by ultra-sonicator for 30 min in an ice-water bath. The disrupted cells suspension was centrifuged at 10000g for 15 min at 4°C, and the crude enzyme extract (the supernatant) was lyophilized by freeze dryer, then stored at -20°C until use.

Detection of β-lactamase activity: *Beta*-lactamase activity was determined by a micro-iodometric assay according to modification method described by8,9. The reaction mixture (total volume (2225µl)) consisted of:

a. Starch-iodine reagent 1000 µl was added to.


c. Crude or pure enzyme1000 µl.

d. Starch solution 200 µl.

These components were mixed in small test tubes, blue color developed immediately due to the reaction of iodine with starch. Rapid decolorization indicated β-lactamase production. Control solution was made up by replacing the enzyme in phosphate buffer solution, and the absorbance was read spectrophotometrically at 620 nm.

Determination of Protein Concentration: Protein concentration was determined according to the method of10. A 20µl of β-lactamase crude was mixed with 50µl of 1 M NaOH with shaking for 2-3 minutes then 1 ml of Bradford solution, was added with shaking. The absorbance was measured at 595 nm by spectrophotometer.

Purification of β-Lactamase:

A. Cells harvest and disruption

B. Separation with ionic exchange by using diethyl Aminoethyl- cellulose (DEAE-cellulose): Ten ml of solution was loaded on ion exchange column, the separated fractions were collected at flow rate 60 ml/hour (approximately, 5ml for each fraction), the wash was obtained by use of phosphate buffer solution. (the same buffer used in equilibration), the elution was achieved by the same buffer with gradual increase in concentration of sodium chloride, the flow rate was 60 ml/hour too, the protein concentration of the fractions was measured at wavelength 280 nm to the washed and eluted fractions, protein concentration then was calculated and the enzymatic activity was assayed.

C. Gel filtration Sephacryl–S200: Sephacryl – S200 column (87 x1.5cm) was prepared and packed according to the instructions of the manufacturing company (pharmica Sweden). The column was equilibrated with (20mM) phosphate buffer solution (pH 7.0). A (5ml) sample of each concentrated partially purified β- Lactamase enzyme was added to the column, carefully using pasture pipette. Elution of Tris- base A (5ml) fraction was collected of each enzyme activity then protein concentration was estimated by measuring the absorbance at (280nm).

Determination of Molecular Weight of β-Lactamase by Gel Filtration Chromatography: The method of gel filtration on a column Sephacryl S-200 was followed to estimate the molecular weight of the β- Lactamase enzyme, using a standard protein by drawing the relationship between the logarithm of a standard protein molecular weight and size of recovery volume size of Void volume (Ve/V0).

Genotyping study: DNA was extracted from all (61) *A. baumannii* clinical isolates using a commercial purification system (Genomic DNA Mini Kit (Geneaid, Taiwan). DNA was stored at - 4°C until used for molecular detection. Conventional PCR was used for detection of blaTEM gene. Forward primer 5-CATTTTCGTGTCGCCCTTAT-3, and reverse primer 5- CATCCATAGTTGCCTGACTCC-3. Concerning the conventional PCR reaction, designed primers were used for gene detection. The condition of PCR blaTEM gene of 796 bp PCR prduct were: initial denaturation 94 °C for 5 min, cycling condition (32) included denaturation 94 °C for 45 sce, annealing 57 °C for 40 sce, extension 72 °C for 45 sce, and the final extension 72 °C for 6 min.
Results and Discussion

Extraction and purification of β-lactamase enzyme:
Beta-lactamase isolated from local isolate of \textit{A. baumannii}, was isolated in ml nutrient broth at 37°C, and washed with (0.05M) Na$_2$HPO$_4$/KH$_2$PO$_4$, (pH 7.0), then lysis, breaking the cell wall of bacteria according to procedure. After that estimate the enzyme activity was in crude supernatant. The enzyme activity was 1.56 unit/ml, and specific activity 1.07 unit/mg protein.

Ionic Exchange Chromatography: This is one of the most useful methods for protein purification. Depending on the surface molecule charge, the protein and the buffer conditions, the protein will have net a positive or negative charge$^{11}$. β-lactamase enzyme was obtained by using buffer solution(0.05M) Na$_2$HPO$_4$/KH$_2$PO$_4$. Absorbance of eluted fractions were measured at 280 nm upon the arrival of absorbance to the line of zero (line base), then same buffer with the NaCl gradient (0-2M) was used to elute the bounded protein. Ionic exchange chromatography patterns showed one protein peak in wash and two peaks in gradient elution, represented enzymic activity (tubes 40-43). Those fractions were pooled and tested for specific activity (6.36U/mg) a fold purification of (5.94) and enzymic yield of (78%) in parts. figure (1). and this result is in agreement with that reported by$^{12,13}$.

![Ionic exchange chromatography](image)

Figure 1: Ionic exchange chromatography for β-lactamase enzyme activity from \textit{A. baumannii} through DEAE cellulose column (1.5X7) cm. The column was calibrated with buffer solution(0.05M) Na2HPO4/KH2PO4, PH (7), flow rate 60 ml/hrs and 5ml fraction

Purification of β-lactamase enzyme by gel filtration chromatography: Purification of β-lactamase enzyme by gel filtration chromatography was done by passing the sample through Sephacryl S-200. Enzymes fraction from DEAE cellulose were pooled and passed through gel filtration column. Column was washed by buffer solution (0.05M) Na2HPO4/KH2PO4and then sample passed, fractions were collected up to 30 fractions. The fractionation yielded two protein peaks as absorbance reading at 280nm (wave length), only one peak appeared when reading absorbance at wavelength of 280 nm and when determined for enzyme activity in resulting parts enzyme activity recorded in$^{8,14}$, the specific activity reached (12.54U/mg), fold of (11.72) and a yield (55.12%) as mentioned in table (1) and Figure (2) and this result is in the finding of agreement with$^{12}$. 
Figure 2: Gel filtration chromatography for purified \(\beta\)-lactamase enzyme from \textit{A. baumannii} by using Sephacryl S-200 column (1.5x87) cm. The column was calibrated with (0.05M) \(\text{Na}_2\text{HPO}_4/\text{KH}_2\text{PO}_4\) pH 7; flow rate 60 ml/hrs and 5 ml/fraction.

Table 1: Purification steps of \(\beta\)-lactamases produced from \textit{A. baumannii}

<table>
<thead>
<tr>
<th>Step</th>
<th>Volume (ml)</th>
<th>Enzyme activity (U/ml)</th>
<th>Total activity (Units)</th>
<th>Protein (mg/ml)</th>
<th>Specific activity (U/mg)</th>
<th>Fold</th>
<th>Yield (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crud extract</td>
<td>20</td>
<td>1.56</td>
<td>31.2</td>
<td>1.45</td>
<td>1.07</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>DEAEcellulose Ionic-exchange</td>
<td>15</td>
<td>1.622</td>
<td>23.43</td>
<td>0.225</td>
<td>6.36</td>
<td>5.94</td>
<td>78</td>
</tr>
<tr>
<td>Gel-filtration Sephacryl-S200</td>
<td>10</td>
<td>1.719</td>
<td>17.19</td>
<td>0.137</td>
<td>12.54</td>
<td>11.72</td>
<td>55.12</td>
</tr>
</tbody>
</table>

Determination of molecular weight of \(\beta\)-lactamase: The molecular weight (MW) was determined by S-200 gel filtration depending on the size of the separate molecules with their charge\(^{11}\). Sephacryl S-200 (1.5 x 87) cm was used for estimation of the molecular weight of purified \(\beta\)-lactamase enzyme from \textit{A. baumannii} illustrated in figure (3). According to the logarithm molecular weight and elution volume/void volume (Ve/Vo) Table (2) standard curve the calculated molecular weight of the \(\beta\)-lactamase found to be 44,668 KD.

Table 2: Molecular weight of standard proteins

<table>
<thead>
<tr>
<th>Proteins Standard</th>
<th>Ve/Vo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pepsin (34.5 KD)</td>
<td>2.75</td>
</tr>
<tr>
<td>Bovine Serum albumin (67 KD)</td>
<td>2.15</td>
</tr>
<tr>
<td>Alkaline phosphatase (80KD)</td>
<td>1.6</td>
</tr>
<tr>
<td>Arginine Deaminase (125.892 KD)</td>
<td>1.558</td>
</tr>
<tr>
<td>Catalase (232KD)</td>
<td>1.2</td>
</tr>
</tbody>
</table>
Detection of β-lactamases using \( \text{bla}_{\text{TEM}} \): The prevalence of β-lactamases producing genes \( \text{bla}_{\text{TEM}} \) was detected and determined for each \( A. \text{baumannii} \) clinical isolates and the results were illustrated as follows: 39 (86.66%) for positive isolates, 6 (13.33%) for negative isolates, and the Sample Total number 45 (100%).

The Figure (4) indicated the PCR product of \( \text{blaTEM} \) gene which was 793 pb.

The production of β-lactamases, a family of enzymes that hydrolyze the β-lactam ring, thereby inactivating the antibiotic molecule prior to binding with penicillin binding proteins (PBP’s), is the principal mechanism of resistance to β-lactam antibiotics. They also play a major role in intrinsic and acquire resistance of bacteria, mainly in gram-negative.14
Conclusion

This study concluded that the obtained purification fold and recovery were 11.72, 55.12% respectively, and the characterization of the purified Beta-lactamase showed that the molecular weight was about 44,668 KD as determined by gel filtration. The molecular detection for Acinetobacter baumannii gene (blaTEM) responsible for β-lactamases was recorded that the positive results reaching 39(86.66%), from the isolates.

Conflict of Interest: None

Source of Funding: Self

Ethical Clearance: Not required.

REFERENCES


Release of Fluoride in Saliva the Use Chewing Gums with Different Fluoride Compounds NaMFP, SnF2 and NaF

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ABSTRACT

The goal of search determine the effect of use commercially chewing gums on fluoride kinetics in saliva. Using of three commercially chewing gums with fluoride from local markets, contains 3.38 mg of fluoride as marketed sodium mono fluorophosphates (NaMFP), Stannous fluoride (SnF2) and sodium fluoride (NaF) which are the three most common sources of fluoride used in currently fluoride dentifrices. Fifteen 7-9 year-old volunteers were instructed to chew the fluoridated gums. After starting chewing saliva collected at 0, 3, 6, 9 and 15 minutes. The Salivary fluoride analyzed by using of fluoride-specific electrode (201Fluoride E. Hanna instruments) after acid hydrolysis. The fluoride amount in the saliva samples after the use of chewing gum which contains Sodium mono-fluorophosphates (NaMFP) and Stanous fluoride (SnF2) , were 0.328 mg and 0.258 mg respectively which higher than after the use of chewing gum contains sodium fluoride (NaF) which was 0.041 mg in all experimental periods. The high fluoride presence in saliva after the use of chewing gum of (NaMFP) and (SnF2), are significant to prevent dental caries and this should be evaluated in clinical researches.

Keywords: chewing fluoride gum, fluoride kinetics, Stannous fluoride, Sodium mono fluorophosphates, sodium fluoride, fluorosis

Introduction

Cavities, technically called dental caries caused by a bacteria called Streptococcus mutan, this bacteria lives in the mouth and thrives on Sugar and other carbohydrates. The presence of carbohydrates, S. mutans produces acids that dissolve the enamel of eeth, causing cavities. Dental caries is one of public health diseases and have multifactorial causes. As a result of several studies carried out to understand the dental caries process as well as its risk factors, dental treatment emphasis has been moved from corrective to preventive methods. Fluoride is an extensively proven effective agent for the control of dental caries. Its cariostatic effect is related to its presence in the aqueous phase of the apatite crystals [1][2][3] Which inhibits demineralization and activates remineralization[4]. There are many studies supporting the frequent and repetitive use of low concentration and self-applied fluoride agents[5][6]. Stimulating the search for alternative devices to apply it in the mouth, such as professional products, at high fluoride concentrations (solutions, gels, pastes and varnishes) or through home care products, like toothpastes, mouth washes fluoridated mucocclusive tablets, and more recently fluoridated chewing gums[7][8]. The use of chewing gum increases the salivary flow, which helps to clean the oral cavity[9], and introduced as useful vehicles for fluoride, calcium, phosphate and chlorhexidine delivery[10]. Fluoride-containing chewing gums increase salivary and dental plaque pH, calcium and phosphate concentration and also act on enamel remineralization[11]. The chewing gums of (NaMFP), (SnF2) and (NaF) were introduced in the marketplace as an additional agent to prevent dental caries. Each piece of the product contains (3.38 mg) of fluoride as mono-fluorophosphates, Stannous fluoride or sodium fluoride. Despite the possibility of helping to prevent dental caries, a concern arises about its contribution as an additional source of fluoride intake when consumed by children in the age of risk for dental fluorosis. Dental fluorosis is a health condition caused by a child receiving too much fluoride during tooth development. The critical period of exposure is between 1 and 4 years old is more risky than children over 8 years old[12]. In its mild form, which is the most common, fluorosis appears as tiny white streaks or specks that are often unnoticeable. In its severe form, it characterized by black and brown stains, as well as cracking and pitting.
The severity of dental fluorosis depends on the amount of fluoride exposure, the age of the child, individual response, and nutritional and other factors. Although water fluoridation can cause fluorosis, most of this is mild (0.7–1.2 mg of fluoride/L) and not usually of aesthetic concern. Severe cases can be caused by exposure to water that is naturally fluoridated to levels well above the recommended levels, or by exposure to other fluoride sources such as brick tea or pollution from high fluoride coal. According to the centers for diseases control, 32% of American children now have some form of dental fluorosis, with 2 to 4% of the children having the moderate to severe stage (CDC 2005 USA). Thus, the aim of the present study was to analyze the amount of fluoride released in saliva after chewing the gums of (NaMFP), (SnF2) and (NaF) in Iraqi subjects.

Chemical Structure of Sodium mono-fluorophosphates

![Chemical Structure of Sodium mono-fluorophosphates](image)

Materials & Method

Experimental design: The study was carried out with fifteen 7-12 year-old children. All of them had good general health, the children chewed the fluoridated gum, each piece containing (3.38) mg of fluoride as mono-fluorophosphates, Stannous fluoride and sodium fluoride. The saliva was collected in cooled plastic containers at (0,3, 6, 9, and 15) min after 3 minutes starting chewing gum. During this period, the volunteers remained seated and were not allowed to have any food or drink. The samples obtained were stored in freeze at -5 °C until fluoride analysis.

Fluoride Analysis

Acid hydrolysis: The acid hydrolysis of fluoride was done because the samples of chewing gums contain fluoride as mono-fluorophosphates, Stannous fluoride and sodium fluoride which form complex with some of saliva components. The method used was adapted from the method proposed by [13] modified by [14] for the analysis of mono-fluorophosphates and sodium fluoride in saliva after using a dentifrice containing these fluoridated compounds. To 0.25 ml of each saliva sample, 0.25 ml of 2 mol L⁻¹ hydrochloric acid (Aanalytical reagent, Gainland chemical company, UK) was added, and the samples were kept for 1 hour at 45°C under agitation in water bath. Then, neutralization was accomplished with 0.5 ml of 1 mol L⁻¹ sodium hydroxide (Analytical reagent, Gainland chemical company, UK).

Fluoride measurement: Fluoride was analyzed by the direct method, using a fluoride specific Electrode (201 Fluoride E. HANNA instrument, China) and an ion analyzer. Prior to the samples analysis, a set of standards (ranging between 0.025-3.2 ppm F) was prepared in triplicate, using serial dilution from a 100 ppm NaF stock solution (E.Merck, Darmstadt, Germany). The millivoltage potentials converted to µg F using a standard curve.

Graph 1: showed the kinetic released of fluoride (mg/g) in saliva from chewing gum of NaMFP and NaF respectively at different periods (min).

Table 1: Shows the concentration of fluoride which released in saliva from fluoridated chewing gum which indicated a significant increase (P<0.05) in release from NaMFP and SnF2 compared with NaF.

<table>
<thead>
<tr>
<th>Collection period (min)</th>
<th>Fluoride conc. Released from NaMFP chewing gum (mg)</th>
<th>Fluoride conc. Released from NaF chewing gum (mg)</th>
<th>Fluoride conc. Released from SnF2 chewing gum (mg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0</td>
<td>0.26</td>
<td>0.025</td>
<td>0.20</td>
</tr>
<tr>
<td>3</td>
<td>0.06</td>
<td>0.007</td>
<td>0.05</td>
</tr>
<tr>
<td>6</td>
<td>0.004</td>
<td>0.005</td>
<td>0.004</td>
</tr>
<tr>
<td>9</td>
<td>0.003</td>
<td>0.003</td>
<td>0.003</td>
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</table>

Results

Graph 1 shows the mean total fluoride released (mg) with time. The comparisons showed that the chewing gums which contains (NaMFP) and (SnF2) released significantly higher amounts of fluoride when compared to chewing gum which contains (NaF), up to the 15 min collection time. The amount released decreased with time. Table (1): represents the total amount of fluoride released in saliva (mg), during the whole experiment, for the two gums, a significantly higher amount of fluoride was released when chewing gums which contains (NaMFP) and (SnF2) were chewed (0.328) mg and (0.258) of fluoride respectively when compared to chewing gum which contains NaF (0.041) mg of fluoride.
The contribution as a percentage, of one piece of each chewing gum to the maximum daily recommended fluoride intake (0.07 mg of fluoride/kg of body weight\(^{[18]}\)). For 1 to 7 years old children a single tablet of chewing sum of NaMFP and SnF\(_2\) represent 47% and 37% respectively, while NaF chewing gum represents 5.7 % of the maximum daily fluoride ingestion recommended for children aged 1 to 7.

<p>| | | | | |</p>
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<tbody>
<tr>
<td>15</td>
<td>0.001</td>
<td>0.001</td>
<td>0.001</td>
<td>0.328</td>
</tr>
<tr>
<td>6</td>
<td>0.041</td>
<td></td>
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<tr>
<td>9</td>
<td></td>
<td></td>
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<tr>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td>0.258</td>
</tr>
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</table>

*Fig. 1: Shows the relation between fluoride released in saliva & collection period*

**Discussion**

It is known that the frequent and repeated use of low fluoride concentration products, which promote low and constant salivary fluoride levels, is the most efficient way to prevent dental caries \(^{[11],[16],[10]}\). Levels between 1 and 10 ppm of fluoride reduce the enamel solubility and increase the remineralization rate, facilitating the precipitation of minerals on the enamel surface \(^{[11],[16],[10]}\). Found the greatest fluoride values in saliva between 5 and 10 minutes after the use of a fluoridated chewing gum. The subsequent periods, the fluoride concentration in saliva decreased gradually. In this study, the fluoride release was significantly higher at 0, 3 min compared to 6, 9 and 15 min when the fluoridated gum was chewed.

Although \(^{[10]}\) also suggest that the salivary flow stimulation may have a negative effect on the fluoride retention in the mouth, \(^{[13]}\) demonstrated that a single chewing gum tablet with 0.5 mg of fluoride can maintain high fluoride levels in saliva for at least 60 min.

\(^{[11]}\) sustained in their study that chewing a fluoridated gum with only 0.1 mg of fluoride five times a day favors the remineralization of initial dental caries lesions, and that this frequency could maintain high fluoride levels in saliva during most part of the day. \(^{[17]}\) evaluated the effect of two commercially available Chewing gums with fluoride on the cariogenic micro biota of saliva and dental plaque. The gum Fluorite showed a faster pH recovery and a F release to saliva after up to 30 minutes. The potential anticariogenic effect of chewing gums containing fluoride has been proposed by \(^{[11]}\) and \(^{[10]}\). However, there are no data regarding the fluorosis risk that this type of product may promote. It has been suggested that the incidence and severity of dental fluorosis have become greater in the last decade in both optimally fluoridated and non-fluoridated areas in many countries, as well as in Brazil\(^{[18],[19],[20],[21],[22]}\). This attributed to an increase in the fluoride level of foods and beverages through processing with fluoridated water, inadvertent ingestion of fluoride toothpaste, and the inappropriate use of dietary supplements\(^{[7]}\). Considering that the highest risk factor for the development of dental fluorosis is the total amount of fluoride ingested, and that nowadays there are several available sources, the chewing gum of NaMFP can cause concern for children at the age of risk for dental fluorosis, which comprises 1 to 7 years of age. of NaF. One tablet of NaMFP chewing
gum could represent 47%, (NaMEFP is Easily soluble in water with strong hygroscopy, its solubility is 42gm/100 gm water at 25 °C) and one SnF2 tablet chewing gum could represent 37% of the maximum daily fluoride ingestion, (solubility 35g/100 gm water at 20 °C), while one NaF tablet chewing gum could represent 5.7% of the maximum daily fluoride ingestion (the relative constant solubility rate of NaF makes it an ideal source for the fluoride ion in treatment of municipal water supplies, solubility 0.76g/100gm water at 25 °C), This maximum daily ingestion was calculated, based on the literature, as being 0.07 mg of fluoride/kg of body weight and considering the use of a single tablet. Unfortunately, there is no data available on the consumption of chewing gum by children. However, it is possible that children use more than one tablet per day, which increases the risk of dental fluorosis development. Hattab et al. (23) (1989) demonstrated a mild increase of fluoride plasma levels after the use of a fluoridated chewing gum and concluded that this product offers a minimal risk of adverse effects. However, this study was carried out in fluoride deficient areas and with adult subjects, using a chewing gum with smaller amounts of fluoride (0.113 mg) when compared to that used by the present study (approximately 3.38 mg, according to the manufacturer). Therefore, other studies with children living in optimally fluoridated areas are necessary to observe the effect of chewing gum which contains NaMFP on the plasma fluoride levels.

**Conclusions**

This study indicated that:

1. The fluoride concentration in saliva samples after the use of chewing gum which contains (NaMFP) and (SnF2) were significantly higher than that observed after the use of chewing gum which contains (NaF) in all the experimental times. The fluoride release during the experiment were 0.47and0.37mg for chewing gum which contains (NaMFP) and (SnF2) respectively, while 0.041 mg for chewing gum which contains (NaF).

2. The high fluoride concentration in saliva after the use of chewing gum which contains (NaMFP) and (SnF2) may be important on dental caries prevention in children or adults, especially for individuals with compromised salivary flow or the ones who live in deficient fluoride areas. However, further clinical research is necessary to clarify this issue.

3. The use of chewing gum which contains (NaMFP) and (SnF2) should be avoided by children at the age of risk for dental fluorosis because the fluoride release varied from 47% and 37% of the maximum recommended daily intake for children aged 1 and 7 years old, respectively.

4. The use of fluoridated gum should be used to patient with high risk to caries.

**Conflict of Interest:** None

**Source of Funding:** Self

**Ethical Clearance:** Not required.

**REFERENCES**


“Go360”—A Fall Risk Assessment Smartphone Application for Older Adults

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ABSTRACT

Background: Globally, falls are the second leading cause of death and early identification of fall risk among older adults is very important to plan preventive measures. The literature has shown that a smartphone (SP) can be used for fall detection and fall risk assessment.

Objective: To develop a smartphone application (SA) for older adults to assess their fall risk based on clinical practice guidelines (CPG) and to pilot test the application.

Material and Method: A SA named “Go360” was developed with three main built-in sensors of the phone to assess the fall risk using Timed Up and Go Test (TUG), 30-Second Chair Stand Test (30SCST), and Four Stage Balance Test (4SBT) along with body sway and gait speed data. The SA was pilot tested with 8 older adults concurrently with standard manual tests.

Results: The results showed that SA overestimated the TUG, 4SBT stage 2 and 4SBT stage 3 test values. Conversely, there was no difference in 30SCST, 4SBT stage 1 and 4SBT stage 4 values. The fall risk matched with the manual test results.

Conclusion: The newly developed Go360 SA detects the fall risk using 3 evidence-based functional tests in agreeable level with the standard manual test and it can be used by older adults for self-checking.

Keywords: fall risk, smartphone application, older adults, Go360, timed up and go test, 30- second chair stand test, 4 stage balance test.

Introduction

Globally, falls are the second leading cause of death due to accidental or unintentional injuries¹. Older adults aged more than 60 years are more prone to death due to fall¹². Nearly one-quarter of the older adults reported to fall every year in developed and developing countries²⁻⁶. Falls prevalence was reported to be between 4.2% to 61% in the Malaysian community-dwelling older adults⁷. Muscle weakness, impaired balance and gait, side effects of medication, history of previous falls, advancing age, female gender, underlying medical conditions, visual problems, cognitive problems, physical inactivity, and environmental hazards were identified as risk factors for falls¹²⁻⁸. As exercise interventions have shown a reduced risk of fall, early identification of fall risk among older adults is very important to plan the preventive measures¹².

As the risk factors for falls in older adults are multifactorial, International Clinical Practice Guidelines (CPG) recommends that the fall risk assessment should be multifactorial⁸⁻¹¹. The algorithm commonly recommended in the CPG is to check the fall history in the first step followed by gait and balance assessment if no history of falls. If gait and balance results are abnormal, then a comprehensive multifactorial assessment should be carried out⁹⁻¹¹. However, these screenings can be possible only when older adults are seeking healthcare for any reasons. In Asian countries like Malaysia, it is very common that the older adults did not consider falls

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as serious and they did not seek medical help\textsuperscript{12}. Hence, there are more chances that fall risk assessment may be missed in the community-dwelling older adults. Hence a very simple screening tool to assess the fall risk in the community is needed to tackle this situation. As per a recent scoping review, the tools used to assess fall risk in Malaysia were similar to other countries\textsuperscript{7}.

Since the introduction of the first SP to the consumers in 1994, SP has been utilized in many fields for different purposes along with its primary role of telephone calls\textsuperscript{13}. Multiple sensors, mobile applications, and advanced features have made the SP one of the famous device in the healthcare industry\textsuperscript{14,15}. The literature has shown that SP can be used for fall detection, fall risk assessment and fall prevention through the function of its various sensors and Internet of Things (IoT)\textsuperscript{16–18}. However, most of the SA was designed to detect the falls and alert the caregiver or healthcare professional\textsuperscript{17}. Out of SA to assess the fall risk, most of them were developed for healthcare professionals use and some also utilize the wearable sensors along with SP for fall risk assessment\textsuperscript{17–20}. Hence this study was aimed to develop a SA for older adults use to assess their fall risk based on CPG. The developed SA was pilot tested among older adults with and without fall history.

**Material and Method**

**SA development:** A SA named “Go360” was developed with the help of an information technology expert to assess the fall risk of older adults based on the initial screening steps mentioned in the CPG and Stopping Elderly Accidents, Deaths & Injuries (STEADI) guidelines\textsuperscript{9–11,21}. The SA was designed to be simple, so that older adults and their caregivers can use it to assess the fall risk. However, it can also be used by a healthcare provider. The SA will collect fall history as a first step. The next step would be screening tests for gait and balance along with lower limb strength assessment. Based on the results, fall risk will be reported. The SA was developed for Android-based devices to record the information from the tests on a webpage. The SA was hosted at the google play store from Jan 2019 to April 2019 for testing. The details of the tests used in Go360 (TUG, 30SCST, 4SBT, body sway and gait speed) can be found elsewhere\textsuperscript{21,22}. The cutoff scores to detect the fall risk was based on the STEADI guidelines\textsuperscript{21}. The body sway and gait speed are not a separate test, nonetheless, it will be collected from the 4SBT and TUG test, respectively from all the participants to identify the normal and abnormal trends. Nevertheless, the SA does not decide fall risk based on these two values. The home page of Go360 SA is given in figure 1.

**Pilot testing:** After getting ethical clearance from INTI International University research ethics committee, a pilot test was conducted with 8 voluntary, community-dwelling older adults from the Nilai and Seremban town using Asus ZenFone 3 (ZE520KL) model. The functionally independent older adults aged 60 and above, irrespective of their fall history were selected by the convenience sampling method. Elderly who had a visual impairment, physical disabilities, mental disorders, mobility problems due to medical diagnosis, those using mobility aids and under regular medications which can affect their balance and gait were excluded. After obtaining the informed consent, an open-ended questionnaire was administered to collect basic demographic data and focused fall and medical history to identify the participants who fit the inclusion criteria. The participants were then requested to use the SA to test their fall risk. The manual tests were also concurrently administered using the STEADI guidelines to check the validity of the SA.

**Statistical Analysis:** The agreement between the SA method and the standard manual method was assessed
using Bland-Altman analysis. A zero bias indicates no difference between SA and standard manual test. Whereas a negative bias point to an underestimation of the SA test data (SA minus the manual test values); and a positive bias related to an overestimation of the SA test data. The Statistical analyses were performed using GraphPad Prism version 8 (GraphPad Software, San Diego, CA, USA).

Results

The participants were 8 older adults and details were given in the Table 1.

<table>
<thead>
<tr>
<th>S. No</th>
<th>Age</th>
<th>Gender</th>
<th>Fear of Fall</th>
<th>Fall history</th>
<th>No of falls</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>67</td>
<td>Male</td>
<td>No</td>
<td>No</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>83</td>
<td>Female</td>
<td>Yes</td>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>83</td>
<td>Female</td>
<td>Yes</td>
<td>Yes</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>83</td>
<td>Male</td>
<td>Yes</td>
<td>Yes</td>
<td>&gt;1 time</td>
</tr>
<tr>
<td>5</td>
<td>79</td>
<td>Female</td>
<td>No</td>
<td>No</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>79</td>
<td>Male</td>
<td>Yes</td>
<td>Yes</td>
<td>&gt;1 time</td>
</tr>
<tr>
<td>7</td>
<td>65</td>
<td>Male</td>
<td>No</td>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>72</td>
<td>Female</td>
<td>Yes</td>
<td>Yes</td>
<td>1</td>
</tr>
</tbody>
</table>

The Bland-Altman analysis results were presented in Table 2 and Figures 2 to 4.

<table>
<thead>
<tr>
<th>Test name</th>
<th>Bias</th>
<th>95% Limits of Agreement</th>
</tr>
</thead>
<tbody>
<tr>
<td>TUG</td>
<td>0.1313 seconds</td>
<td>-2.284 to 2.546</td>
</tr>
<tr>
<td>30SCST</td>
<td>0 standings</td>
<td>-1.048 to 1.048</td>
</tr>
<tr>
<td>4SBT stage 1</td>
<td>0 seconds</td>
<td>0 to 0</td>
</tr>
<tr>
<td>4SBT stage 2</td>
<td>0.125 seconds</td>
<td>-0.5680 to 0.8180</td>
</tr>
<tr>
<td>4SBT stage 3</td>
<td>0.25 seconds</td>
<td>-1.136 to 1.636</td>
</tr>
<tr>
<td>4SBT stage 4</td>
<td>0 seconds</td>
<td>0 to 0</td>
</tr>
</tbody>
</table>

The results showed that SA overestimated the TUG, 4SBT stage 2 and 4SBT stage 3 test values. Conversely, there was no difference in 30SCST, 4SBT stage 1 and 4SBT stage 4 values. The fall risk detection was positive for all the participants in both the SA and the standard manual test.

Discussion

Fall risk application is a crucial tool for the elderly so that their fall risks can be analyzed as quickly as possible and necessary precautions can be taken. In this pilot test, most of the participants had a history of fall and it is also reflected in the fall risk detection by Go360 SA.

The TUG test results of the SA have shown an acceptable agreement with the manual test considering the bias (0.1313 seconds) reported in this study are lower than the mean difference to detect falls (0.63 seconds) reported in the literature. Previous studies with mobile TUG tests were also shown that SA identifies the fall risk in an acceptable levels. The reason for the difference in scores could be due to delays in the SA’s timer cutoff.
at the end of the TUG when the participant returns to the original position of sitting which needs improvement. The 30SCST values of SA shown agreement with manual tests. Previously published studies also showed a strong correlation on the number of sit to stand repetitions between SA and motion capture system\(^{19}\).

The 4SBT stage 1 and stage 4 values matching with the manual test values since all the participants either completed or did not attempt the test. Conversely, 4SBT stage 2 and stage 3 reported the agreeable amount of bias referring to the STEADI guidelines which consider completion or non-completion of tandem standing for 10 seconds to assess the fall risk rather than the duration of tandem standing\(^{21}\). The difference could be due to sometimes the participant need to manually stop the timer during 4SBT if they break the test less than 10 seconds as the body sway may not be strong enough for the sensor to stop the SA timer. Furthermore, literature reported a correlation between SA and motion capture and force platform systems to detect the anteroposterior and mediolateral displacements during single limb stance test\(^{19}\). Similarly, Go360 app also captures the body displacements during the 4SBT, though, it needs improvement to capture the break of standing at any phase of 4SBT.

Previous studies also reported the gait measurement with SA\(^{20}\). Go360 also captures the gait data in the background during TUG. Nonetheless, the app is not set to calculate the fall risk based on the gait speed, which will be a future enhancement. The pilot test results of this SA shown that the Go360 SA can provide valid results about fall risk and its fall risk detection also matches with the standard manual tests. However, the small sample size is the limitation of this pilot test. Hence a large scale testing for reliability and validating with more gold standard testing like force platform is required. Also, warning about using the Go360 under supervision should be included as there are chances that some of the test components may predispose to fall. Currently, as the tests are conducted by placing the phone in the pocket, the body sway data are not recorded accurately since the phone may be in slanting position. Hence the future plan would be placing the phone at chest during testing using a chest strap and providing voice commands/instructions using the local language. As older adults aren’t necessarily using old fashioned mobiles, we can assume that the older population in Malaysia may be ready for an advanced tool to determine their fall risk\(^{30}\).

**Conclusion**

This study has developed and pilot tested a SA “Go360” to detect fall risk of older adults, which can be used by the older adults, caregivers or by healthcare professionals. Pilot testing indicates that the Go360 SA detects the fall risk using 3 evidence-based functional tests in agreeable level with the standard manual test. Nevertheless, further technical improvement and large scale testing are required for further enhancement.

**Conflict of Interest:** The authors declare that there is no conflict of interest.

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**Acknowledgement**

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Determination of Mercury (Hg) Risk Level (RQ) with Exposure through Fish and Drinking Water Consumption in Bulawa Sub-district, Bone Bolango District, Gorontalo Province, Indonesia

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ABSTRACT

Mercury (Hg) is a liquid metal element, silver at room temperature (25°C) and has a melting and boiling points at -38.87°C and 35.0°C, respectively. In traditional gold mining activities, Mercury (Hg) is used for gold purification (amalgamation). This study aims to determine the level of risk (RQ) in the community of Bulawa District who consume fish and drinking water sourced from the waters around traditional mining activities. This type of research is observational with an environmental health risk analysis design. Sampling was calculated using purposive sampling with the inclusion criteria by the researchers and resulted in 100 citizens. The results of the calculation of the level of Risk (RQ) of Mercury (Hg) consumption of fish and drinking water in the community of Bulawa District was 0.08 and 0.003, respectively, thus, RQ <1, meaning that it does not have an effect on health. However, this value can be used as a reference level of risk level (RQ) of Mercury (Hg) in people who consume fish and drinking water from the waters of traditional mining areas in Indonesia. Control measures can be taken to maintain the level of Risk (RQ) of Mercury (Hg) <1 through limiting the frequency of consumption and the rate of intake of fish and drinking water from surrounding waters. Warning signs of mercury contamination around mining waters can be also provided.

Keywords: Mercury (Hg), Mine, Risk Level (RQ), Society

Introduction

Mercury (Hg) is a liquid metal element in silver at room temperature (25°C), has a melting point of -38.87°C and a boiling point of 35.0°C. Mercury in aquatic environment comes from illegal traditional gold mining activities. Mercury in the mining sector is used for amalgamation process (gold refining). Pollution occurs because Mercury used to purify gold is disposed of freely in the waters. Over time, bioaccumulation of Mercury in water and fish causes increased mercury concentration. If humans consume water and fish, humans will also be exposed to mercury (Lestarisa, 2010)(1).

Mercury causes neurological symptoms, teratogenic effects, and increases the ratio of red blood cells to blood plasma. Methyl mercury has a high affinity for the sulfhidryl group which has a large effect on the dysfunction of the colinasetyl transferase enzyme. The result is acetylcholine deficiency which contributes to signs and symptoms of motor dysfunction (Broussard, 2002)(2).
According to the Food and Drug Administration/FDA (1996), the limit of mercury (Hg) in fish is 1 ppm (ATSDR, 1999)(3). The Food and Drug Administration/FDA (1997) also states that the limit of mercury in fish is ≤ 1 mg/kg (Permenkes, 2016)(4).

According to the Federal State Toxicology and Regulation Alliance Committee (1995), the standard concentration of Mercury in permissible drinking water is 2 μg/kg and based on the World Health Organization/WHO (1984), the limit of mercury concentration is 0.0001 mg/L (ATSDR, 1999)(3).

The results of the Singga study (2013), Mercury concentration in fish samples in Bulawak Subdistrict, Bone Bolango District, Gorontalo Province was 0.0298 mg/kg(5). This shows that Mercury concentration in fish in the area was still below the Threshold Value issued by the Indonesian National Standard (2009) by 0.3 mg/kg(6). In addition, the concentration of Mercury in drinking water is below the Threshold Value issued by the (Permenkes, 2010) by 0.001 mg/L(7).

Based on the previous research on the analysis of mercury exposure health risks in the community of Bulawa Subdistrict, Bone Bolango Regency, Gorontalo Province, the level of risk of exposure to Mercury through consumption of fish and drinking water in the community has not been performed. This makes the community of Bulawa District being exposed to mercury from fish and drinking water consumed. Based on the explanation above, the researchers measured the level of risk (RQ) exposure to Mercury (Hg) through consumption of fish and drinking water in the community of Bulawa District.

Materials and Method

This study aims to determine the level of risk (RQ) exposure to Mercury (Hg) through consumption of fish and drinking water in the community of Bulawa Subdistrict, Bone Bolango District, Gorontalo Province with non reactive research using the dose response approach and NOAEL. The number of samples was 100 citizens. Sampling was performed by purposive sampling method;i.e citizens of Bulawa Subdistrict, Bone Bolango District who consumed fish caught from Bulawa waters and had lived in the area for at least 1 year and used river water and ground water as drinking water.

The study began with a literature study on the calculation formula of the Reference Reference(RfD), non-carcinogenic intakes and the level of non-carcinogenic risk. Secondary data was then obtained; which includes respondent characteristics such as body weight, mercury exposure concentration(Hg), intake of fish and drinking water intake rates, duration of exposure, frequency of exposure and average duration of exposure which causes non-carcinogenic effects.

The variables in this study included the highest dose of toxin without causing effects on experimental animals (NOAEL) from Mercury(Hg), weight of experimental animals (W animals), body surface of experimental animals (BSA of experimental animals), workers’ body weight(W), workers’ height(h), workers’ body surface area (BSA), reference dose of Mercury(Hg) for workers(RfD), as and the rate of consumption of fish and drinking water. Data analysis in this study was carried out using quantitative analysis manually to determine the level of risk(RQ) of Mercury(Hg).

The level of risk(RQ) of Mercury (Hg) uses the following formula (Tualeka, 2019)(8):

\[ RQ = \frac{\text{Intake}}{\text{RfD}} \]

Where:
RQ: Risk Level
Intake: The amount of risk agent intake received by individuals(mg/kg/day)
RfD: Daily exposure estimation(mg/kg)

Findings

A. Characteristics and Surface Area of Experimental Animal Bodies: Experimental animals are used as a support in testing a compound toxicity. This is because the response of humans to toxic is qualitatively similar as the response of animals. Therefore, this fact is used as a basis for extrapolating from animal to human data.

<table>
<thead>
<tr>
<th>Experimental animal (white mice)</th>
<th>W (kg)</th>
<th>BSA (m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.140</td>
<td>0.024</td>
</tr>
<tr>
<td>2</td>
<td>0.140</td>
<td>0.024</td>
</tr>
<tr>
<td>3</td>
<td>0.141</td>
<td>0.024</td>
</tr>
<tr>
<td>4</td>
<td>0.141</td>
<td>0.024</td>
</tr>
<tr>
<td>5</td>
<td>0.139</td>
<td>0.024</td>
</tr>
</tbody>
</table>
Based on the data of white mice body weight (W), the body surface area was obtained by using the following formula:

$$\text{BSA} = 0.09 \ W^{0.67}$$

Where:
- BSA: Body Surface area (m$^2$)
- W: Weight (kg)

B. Characteristics, Surface Area, and Fish and Drinking Water Consumption Rate: The characteristics of the respondents used in this study included weight and consumption rate of fish and drinking water from 100 people in Bone Bolango District. The weight of the respondents was categorized into 40 kg, 45 kg, 50 kg, 55 kg, 60 kg, 65 kg, and 70 kg. For the average height of respondents, the researchers used the average Indonesian height of 159 cm. Data on body weight and average height were used to calculate the surface area of the respondent’s body. The surface area of the respondent’s body uses the following formula (Tualeka, 2013⁹).

1. Body surface area

$$\text{BSA} = \sqrt{w \ h / 3600}$$

Where:
- BSA: Body Surface (m$^2$)
- W: Weight (kg)
- h: Height (cm)

The calculation of the respondents’ body surface with body weight of 40 Kg, 45 Kg, 50 Kg, 55 Kg, 60 Kg, 65 Kg, and 70 kg are as follows:

**Table 2: Distribution of Respondents’ Weight and Body Surface Area (BSA)**

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Wb (kg)</th>
<th>h (cm)</th>
<th>BSA (m$^2$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>40</td>
<td>159</td>
<td>0.88</td>
</tr>
<tr>
<td>2</td>
<td>45</td>
<td>159</td>
<td>0.99</td>
</tr>
<tr>
<td>3</td>
<td>50</td>
<td>159</td>
<td>1.10</td>
</tr>
<tr>
<td>4</td>
<td>55</td>
<td>159</td>
<td>1.21</td>
</tr>
<tr>
<td>5</td>
<td>60</td>
<td>159</td>
<td>1.32</td>
</tr>
<tr>
<td>Average</td>
<td>55</td>
<td>159</td>
<td>1.21</td>
</tr>
</tbody>
</table>

The result of the analysis of the calculation of the surface area of the respondents in Table 2 show that the average body surface area of the respondents is 1.21 m$^2$.

2. Fish and Drinking Water Consumption Rate

- Rate of fish consumption:
  $$R = 0.2 \text{ kg/day}$$
- The rate of drinking water consumption:
  $$R = 2 \text{ Liter/day}$$

**Table 3: Distribution of Characteristics of Respondents and Rate of Fish and Drinking Water consumption**

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Wb (kg)</th>
<th>h (cm)</th>
<th>BSA (m$^2$)</th>
<th>R of fish (kg/day)</th>
<th>R of water (l/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>40</td>
<td>159</td>
<td>0.88</td>
<td>0.2</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>45</td>
<td>159</td>
<td>0.99</td>
<td>0.2</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>50</td>
<td>159</td>
<td>1.10</td>
<td>0.2</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>55</td>
<td>159</td>
<td>1.21</td>
<td>0.2</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>60</td>
<td>159</td>
<td>1.32</td>
<td>0.2</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>65</td>
<td>159</td>
<td>1.43</td>
<td>0.2</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>70</td>
<td>159</td>
<td>1.54</td>
<td>0.2</td>
<td>2</td>
</tr>
<tr>
<td>Average</td>
<td>55</td>
<td>159</td>
<td>1.21</td>
<td>0.2</td>
<td>2</td>
</tr>
</tbody>
</table>

The result of the calculation of the rate of consumption of fish and drinking water in Table 3 shows that the average rate is 0.2 kg/day and 2 L/day, respectively.

C. Merkury Concentration (Hg): The results of measurements of mercury concentration in Bulawa Subdistrict, Bone Bolango District, Gorontalo were 0.0298 mg/kg (0.0036 ppm). Based on the measurement results, the average concentration of Mercury (Hg) in the respondent’s drinking water in Bulawa District was 0.000478 mg/L (0.0000582 ppm). This concentration is still below the Threshold Value issued by the Minister of Health Regulation (2010)⁷ of 0.001 mg/L.

The highest distribution of Mercury (Hg) concentrations in respondent’s drinking water was
found in the Kaindudu Barat region of 0.00065 mg/L (0.000079 ppm) and the lowest was in drinking water in the village of Mamungaa by 0.000285 mg/L (0.00034 ppm).

D. Animal Km and Human Km: Determination of the reference dosage of toxin for residents of Bulawa Subdistrict of Gorontalo Province was carried out by counting Animal Km and Human Km.

Animal Km

\[
\text{Animal Km} = \frac{W_{\text{animal}}}{\text{BSA}_{\text{animal}}}
\]

where:

Animal Km: Km factor on animal
W: Weight of white mice
BSA: Body Surface Area of white mice

Table 4: Results of Calculation of Animal Km in Experimental Animals (White Mice)

<table>
<thead>
<tr>
<th>Experimental animal (White mice)</th>
<th>Animal Km</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5.81</td>
</tr>
<tr>
<td>2</td>
<td>5.81</td>
</tr>
<tr>
<td>3</td>
<td>5.82</td>
</tr>
<tr>
<td>4</td>
<td>5.82</td>
</tr>
<tr>
<td>5</td>
<td>5.80</td>
</tr>
<tr>
<td>6</td>
<td>5.82</td>
</tr>
<tr>
<td>Average</td>
<td>5.81</td>
</tr>
</tbody>
</table>

The calculation results of Animal Km in table 4 show that the average Animal Km in white animals is 5.81.

1. Human Km

\[
\text{Human Km} = \frac{W_{\text{human}}}{\text{BSA}_{\text{human}}}
\]

where:

Animal Km: Km factor on animal
W: Respondents’ weight
BSA: Respondents’ Body Surface Area

Table 5: Calculation Result of Human Km

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Human Km</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>45.28</td>
</tr>
<tr>
<td>2</td>
<td>45.28</td>
</tr>
<tr>
<td>3</td>
<td>45.28</td>
</tr>
<tr>
<td>4</td>
<td>45.28</td>
</tr>
<tr>
<td>5</td>
<td>45.28</td>
</tr>
<tr>
<td>Average</td>
<td>45.28</td>
</tr>
</tbody>
</table>

The results of the Human Km Calculation in table 5 show the average human Km for respondents in Bulawa District, Gorontalo Province by 45.28. The table of calculation results is as follows:

E. No Observed Adverse Effect Level (NOAEL) of Merkury (Hg): Determination of safe limits of chemical concentration begins with the determination of the highest dose without causing effects on experimental animals or No Observed Adverse Effect Level (NOAEL). According to the World Health Organization/WHO (2005)(9) the value of NOAEL Mercury (Hg) is 0.23 mg/kg.Day.

F. Reference Dose (RfD) of Merkury (Hg) Saridewi and Tualeka (2017)(9) stated that the reference dose (RfD) of toxin exposure is obtained using the formula from Shaw et.al (2007) as follows:

\[
\text{RfD} = \frac{\text{NOAEL}_{\text{Animal Km}}}{\text{Animal Km}} - \frac{\text{Human Km}}{\text{Human Km}}
\]

Based on the above formula, the RfD calculation results obtained from the NOAEL value of Mercury, the average Animal Km, and the Average Human Km are:

\[
\text{RfD} = \frac{0.23}{5.81} - \frac{45.28}{45.28} = 0.295 \text{ mg/kg}
\]

C. Merkury Intake(Hg): According to Tualeka (2013)(9), the following formula can be used to calculate intake through fish and drinking water:

\[
\text{Intake} = \frac{C \times R \times E \times Dt}{\text{WB} \times t \text{ avg}}
\]

Intake of Mercury through fish in respondents with a body weight of 40 Kg, 45 Kg, 50 Kg, 55 Kg, 60 Kg, 65 Kg and 70 kg is as follows:

The average intake of Mercury (Hg) in Fish based on table 6 is 000009 mg/kg/day. Calculation result
of the average intake of Mercury (Hg) in drinking water based on table 7 is 0.00008 mg/kg/day.

H. Risk Level (RQ) of Merkury (Hg): According to Tualeka (2019), the calculation of Mercury (Hg) level of risk (RQ) can use the following formula:

\[ RQ = \frac{\text{intake}}{\text{RfD}} \]

Risk Level (RQ) of Mercury (Hg) through fish in respondents with a body weight of 40 Kg, 45 Kg, 50 Kg, 55 Kg, 60 Kg, 65 Kg and 70 kg is as follows:

<table>
<thead>
<tr>
<th>Resp.</th>
<th>Wb</th>
<th>Intake (Ikan)</th>
<th>Intake (Air minum)</th>
<th>RfD</th>
<th>RQ (Ikan)</th>
<th>RQ (Air minum)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>40</td>
<td>0.0001</td>
<td>0.000001</td>
<td>363</td>
<td>0.005</td>
<td>0.11</td>
</tr>
<tr>
<td>2</td>
<td>45</td>
<td>0.0001</td>
<td>0.00001</td>
<td>363</td>
<td>0.004</td>
<td>0.10</td>
</tr>
<tr>
<td>3</td>
<td>50</td>
<td>0.0001</td>
<td>0.00001</td>
<td>363</td>
<td>0.004</td>
<td>0.09</td>
</tr>
<tr>
<td>4</td>
<td>55</td>
<td>0.0001</td>
<td>0.00001</td>
<td>363</td>
<td>0.003</td>
<td>0.08</td>
</tr>
<tr>
<td>5</td>
<td>60</td>
<td>0.00009</td>
<td>0.00001</td>
<td>363</td>
<td>0.003</td>
<td>0.07</td>
</tr>
<tr>
<td>6</td>
<td>65</td>
<td>0.00009</td>
<td>0.00001</td>
<td>363</td>
<td>0.003</td>
<td>0.07</td>
</tr>
<tr>
<td>7</td>
<td>70</td>
<td>0.00008</td>
<td>0.00001</td>
<td>363</td>
<td>0.002</td>
<td>0.06</td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td>0.00009</td>
<td>0.00008</td>
<td>363</td>
<td>0.003</td>
<td>0.08</td>
</tr>
</tbody>
</table>

The calculation of the Risk Level (RQ) of Mercury (Hg) average in Fish and Drinking Water based on table 8 is 0.003 and 0.08, respectively.

Discussion

Based on the results of this study, the value of the Risk Level (RQ) in the community consuming fish in Bulawa Subdistrict, Bone Bolango Regency, Gorontalo Province, Indonesia the waters surrounding traditional mining was 0.08 for fish and 0.003 for drinking water. The two results of this calculation indicate that the RQ value <1. The value of RQ <1 means that mercury has not affected the health of the community (Tualeka, 2013). The results of this study are smaller than the results of the study by Zolfaghari (2018) showing the Risk Level (RQ) value of fish consumption was 0.2. The results of RQ calculation on the average drinking water consumption in this study are also smaller than that of Hartati’s research by RQ > 1 of 1.1.

The value of risk level in the present study is (RQ) <1 which can be used as a guide for consumption of fish and drinking water. With the average fish consumption rate (R) of 0.2 kg/day and drinking water of 2 L day, the community has not been at risk of being affected by health problems due to Mercury. This is because the calculation of RQ uses RfD derived from Indonesian body weight data. In conclusion, this figure can be used as a reference for the Indonesian people in consuming fish and drinking water sourced from the waters around traditional gold mining areas in Indonesia.

Conclusion

The Mercury RfD (Hg) is 0.023 mg/kg. The intakes of fish and drinking water are 0.0009 mg/kg and 0.0008 mg/L, respectively. The results of the calculation of risk level (RQ) on fish consumption and drinking water are 0.08 and 0.003, respectively. Value of risk level (RQ) <1 which means it has not caused an effect on health.

Recommendation

Control can be performed by local policy holders by guiding the rate of safe consumption of fish and drinking water in the Bulawa Subdistrict area, mapping water territories contaminated by Mercury (Hg) as well as installing warning signs and symbols that waters are contaminated, and providing information about consumption of fish species allowed in the general public and vulnerable groups such as pregnant women and children. In addition, it is also necessary to limit the frequency of consumption of fish and drinking water from the waters around the mining site.

Conflict of Interest: All authors have no conflicts of interest to declare.

Source of Funding: This is an article “Determination of Mercury (Hg) Risk Level (RQ) with Exposure
through Fish and Drinking Water Consumption in Bulawa Sub-district, Bone Bolango District, Gorontalo Province, Indonesia” of Occupational Safety and Health Department that was supported by Activity Budget Plans 2019, Faculty of Public Health, Universitas Airlangga.

Ethical Clearance: The study was approved by the institutional Ethical Board of Health Polytechnic of Ministry Health, Kupang Indonesia.

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6. Indonesia SN. Batas maksimum cemaran logam berat dalam pangan. 2009;


ABSTRACT
Diphtheria is an acute infectious disease caused by the Corynebacterium diphteriae bacteria. This bacterium will produce a toxin that spreads systemically and attacks the upper respiratory system and can cause damage to the respiratory epithelium. Diphtheria cases in Indonesia increased from 2016 to 2017 by 339 cases and caused outbreaks in Indonesia. The most cases are in East Java Province with the number reaching 48%. This research is a review study. The purpose of this study was to identify the studies that had been conducted related to factors that influence the diphtheria in East Java. The results of the review show the factors that influence the diphtheria in East Java are the level of education, immunization status, physical condition of the home, population density, occupancy density, level of knowledge, and personal hygiene.

Keywords: Diphtheria, Factor Affecting, Scoping Review.

Introduction
Diphtheria is an acute infectious disease caused by the Corynebacterium diphteriae bacteria. This bacterium will produce a toxin that spreads systemically and attacks the upper respiratory system and can cause damage to the respiratory epithelium. This disease has symptoms of neck pain, fever, sore throat. Diphtheria is often characterized by the growth of a gray membrane that covers the tonsils and the respiratory tract causing difficulty breathing. Diphtheria generally attacks children aged 1-10 years.

Diphtheria cases in 2016 in Indonesia were 415 cases, while diphtheria cases that died from 415 cases were 24 cases. So, the Case Fatality Rate (CFR) of diphtheria was 5.8%. The highest case in Indonesia, occurred on Java Island. Reported cases of diphtheria in Indonesia, out of 415 cases, 50.2% of them did not get vaccinations. November 2017 recorded 95 regencies/cities reporting diphtheria cases and 11 provinces reporting diphtheria outbreaks in their area.

Results and Discussion
Table 1 shows the research that has been done on factors that influence the case of diphtheria in East Java. Based on the search results on the database obtained as many as six studies that meet the requirements of this review.
Table 1: Study Literature

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>Design Penelitian</th>
<th>Sample</th>
<th>Findings (Factor Affecting of Diphtheria)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arifin, I.F. and Prasasrtri, C.I</td>
<td>2017</td>
<td>Case Control</td>
<td>Case = 8</td>
<td>Tingkat pendidikan, status imunisasi DPT, dan kondisi lingkungan fisik rumah</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Control = 40</td>
<td></td>
</tr>
<tr>
<td>Mardiana, D.E.</td>
<td>2018</td>
<td>Cross sectional</td>
<td>Secondary data</td>
<td>Imunisasi dasar lengkap dan kepadatan penduduk</td>
</tr>
<tr>
<td>Izza, N. and Soenarnatalina</td>
<td>2015</td>
<td>Cross sectional</td>
<td>Secondary data</td>
<td>Imunisasi DPT3</td>
</tr>
<tr>
<td>Lestari, K.S.</td>
<td>2012</td>
<td>Case Control</td>
<td>Case = 31</td>
<td>Kepada hunian dan pengetahuan ibu</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Control = 93</td>
<td></td>
</tr>
<tr>
<td>Setiasih, A.</td>
<td>2011</td>
<td>Case Control</td>
<td>Case = 78</td>
<td>Status imunisasi</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Control = 78</td>
<td></td>
</tr>
<tr>
<td>Lia, A.B.G</td>
<td>2011</td>
<td>Case Control</td>
<td>Case = 14</td>
<td>Higiene personal</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Control = 42</td>
<td></td>
</tr>
</tbody>
</table>

Based on table 1, it can be seen that the factors that influence the case of diphtheria in East Java are education level, immunization status, physical condition of the home, population density, occupancy density, level of knowledge, and personal hygiene.

**Physical Environmental Conditions of Houses:** The results of a review of existing studies showed that respondents who have physical environmental conditions have a relationship with high cases of diphtheria in Bangkalan Health Center in 2016 with an OR of 4.18 which means that people with physical conditions that do not meet the requirements risk 4.18 times diphtheria compared to people with environmental conditions that meet the requirements. The physical environment of this house includes many factors, namely the condition of the walls of the house, the ceiling of the house, the floor of the house, humidity, lighting, ventilation and occupancy density.

Research outside East Java also showed the same results that the factors that influence the case of diphtheria are related to the home environment. The type of wall of the house has a significant relationship with the incidence of diphtheria with an OR value of 9.42. The type of floor of the house also has a significant relationship with an OR value of 20.7 which means that the type of floor is a risk factor for diphtheria.

**Immunization Completeness:** The results of the review of existing studies indicate that respondents who did not get complete DPT immunization had a risk of developing diphtheria by 4,667 times greater than respondents who did not get complete DPT immunization. The results of subsequent reviews also show that complete basic immunization can affect the prevalence of diphtheria in East Java by 0.33 times. The results of the last review, with spatial analysis showed that DPT3 immunization affected the occurrence of diphtheria. Regions that have low DPT3 immunization coverage have a high number of diphtheria.

**Population Density:** The results of the review indicate that population density can affect the prevalence of diphtheria in East Java by 0.01 times. Population density that is not balanced with its area, can result in the emergence of slums so that it can cause infectious diseases such as diphtheria, so the higher the population density in an area, the greater the chance of the spread of diphtheria. In general, diseases that can be transmitted through direct contact occur in communities in areas with high population densities. Blum states that environmental factors have a greater influence on public health compared to other factors of 45%.

**Education and Knowledge:** The results of a review of the research conducted by Arifin (1) showed that respondents who had a low education had the risk of developing diphtheria by 1.67 times compared to respondents with high formal education. Subsequent reviews showed that the mother’s poor knowledge had a risk of diphtheria of 0.088 times for diphtheria compared to good maternal knowledge.

Widyastuti states that someone who has a higher level of education will be more oriented to preventive measures, know more about health problems and also have better health status. Economic levels also have an
influence on one’s health. A person with low income will influence the level of his family’s ability to meet family needs for nutrition, education and other needs(17). Notoatmodjo(18) states different things that income does not have a significant influence in influencing a person’s health, but if someone earns quite a lot, then he is able to provide better facilities.

Personal Hygiene: The results showed that poor personal hygiene had a risk of 4.27 times greater for diphtheria(4). Behavior factor is a very strong factor affecting people to be healthy or sick. Not infrequently behavior is formed due to lack of knowledge or possessing certain cultures or customs. There are people who know that exercise is important, overeating is not good but is not able to resist temptation, they are easily affected by hypertension or diabetes. There are also people or people because of their ignorance, they become sick (ignorancy)(20).

Occupancy Density: The results of the review indicate that occupancy density that does not meet the requirements has a risk of 0.225 times for diphtheria compared to the density of occupancy that does not meet the requirements(5). A study in West Java in 2015 also states that home density has an OR value of 22.7 which means that if most children live with a better home density, then the possibility of the child not getting diphtheria by 22.7 times(21). Another study in Central Java also stated the same thing that the average density of house occupants could affect the number of diphtheria cases(22).

Conclusion

Factors that affect the case of diphtheria in East Java are based on the results of a review of the level of education, immunization status, physical condition of the home, population density, occupancy density, level of knowledge, and personal hygiene.

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REFERENCES

Physiologically Based Approaches to the Rehabilitation of Scoliosis

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ABSTRACT

Currently, scoliosis in humans is considered as one of the most common conditions that leads to various deviations from homeostasis and often to abnormalities in the functioning of internal organs. It becomes clear that scoliosis is manifested not only by the curvature of the spine, but also leads to a number of general changes in the body, not excluding the development of dysfunctions of the internal organs causing deterioration of the general condition, the occurrence of hypoxia and metabolic disorders in the tissues, which can cause a decrease in the overall resistance of the child’s body. The use of therapeutic physical culture, swimming and massage in scoliosis is reliable, long-term practice-proven methods for correcting the posture and treatment of scoliosis, which can restore slenderness and flexibility.

Keywords: rehabilitation, scoliosis, recovery, spine, exercise.

Introduction

Despite the serious progress of modern medicine, the pathological burden in society remains very high¹². The cardiovascular system¹, the lungs⁴ and the musculoskeletal system⁵ remain very affected. Currently, scoliosis is one of the most common diseases of the movement system, the frequency of which, according to different authors, reaches 20%. Such a high prevalence of scoliosis is due to the fact that violations of posture in the frontal plane are often considered as scoliosis⁶.

Close attention to scoliosis is due to the fact that in severe forms of this disease, significant disturbances occur in the most important systems of the body, leading to a decrease in life expectancy, reduced working capacity, and often disability⁷. Changes in the respiratory, cardiovascular and autonomic nervous systems are well studied in patients with severe scoliosis⁸⁹. There is evidence of impaired respiratory function, heart rhythm and metabolic processes in the myocardium, insufficient adaptation of the cardiovascular system to physical exertion, and a decrease in a number of physical development indicators in patients with I and II degree scoliosis¹⁰.

Due to the high risk of the effects of scoliosis on the lungs and the cardiovascular system, conditions are created in the body for insufficient supply of oxygen to tissues, especially the head mash¹¹¹². In this regard, the question of finding approaches to minimizing and eliminating the manifestations of scoliosis at any age is becoming more acute. This dictates the need to develop rehabilitation programs for the treatment of this pathology.

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Objective

To consider the physiologically sound approaches to the rehabilitation of scoliosis.

Rehabilitation for diseases of the spinal column should be based on the use of physical exercises, self-training, self-correction, often in combination with various additional physical effects\textsuperscript{13}.

There are different points of view between the specialists involved in organizing physical education with diseases of the spine, both on the forms of organization of classes, and on their maintenance and dosing of physical activity. It is believed that in case of dystogenetic states of the spinal column, it is necessary to attend classes of therapeutic physical culture\textsuperscript{14,15}.

The features of therapeutic physical culture in individuals with abnormal spinal development include, first of all, an increase in the functional capabilities of their organism as a whole\textsuperscript{16,17}. At the same time, great attention should be paid to improving pulmonary ventilation, increasing the mobility of the spine, strengthening the muscles of the trunk and limbs\textsuperscript{18,19}.

In the main part of the training, most of the means of therapeutic physical culture are used, aimed at fulfilling the main therapeutic tasks of this period of treatment. In this part of the exercises, exercises are used that ensure the production and training of general and strength endurance of the back muscles, abdominal muscles and chest to create a “muscular corset”, corrective exercises in combination with general developing and breathing exercises\textsuperscript{20}.

The final part includes running, walking, coordination exercises and breathing. In some cases, it is advisable to include the game of attention in this part of the class while maintaining the correct posture\textsuperscript{21,22}.

In the introductory period of the treatment course, the individual features of the individual course of the disease in humans are clarified, the functional capabilities of the musculoskeletal system, cardiovascular and respiratory systems are determined, and the level of physical fitness is determined. In this period of treatment against the background of general developmental exercises in the appropriate dosage, the therapeutic task of creating physiological prerequisites for restoring the correct body position and stabilizing the pathological process is solved. Provides a normalizing effect on the internal organs and body systems, increases its resistance to adverse environmental factors\textsuperscript{23}.

In the main period of the treatment course, which continues until the stabilization of scoliosis is achieved and other therapeutic tasks are satisfactorily completed, the human motor sphere is improved with the help of general developmental exercises, the quality of basic movements is improved, the stimulating and normalizing effect of physical exercises is provided\textsuperscript{24}. The widespread use of physical methods of action aimed at the development and strengthening of the muscular system allows, in the main period of treatment, to begin optimizing the functions of the spine. To the extent possible, taking into account the stage of scoliosis, the existing defect is corrected with the help of special corrective exercises\textsuperscript{25}.

The final period of the treatment course is used to consolidate the achieved results of treatment and to develop the necessary motor regimen and recommendations performed at home or in the hospital, as well as to evaluate the effectiveness of therapeutic exercise\textsuperscript{26}.

Using modern methods of organizing the process of physical education, it is necessary to significantly increase the level of functional capabilities of their body and, thus, it is possible to achieve positive changes in relation to the correction of the existing pathology\textsuperscript{18}. At the same time, it is necessary to take into account the biomechanical features of the affected spine when dosing physical loads\textsuperscript{27}.

In correction of scoliosis, special corrective gymnastic exercises of two types - symmetric and asymmetrical, are used to provide a corrective action. Symmetric corrective exercises include only those that maintain the median position of the spinal column\textsuperscript{28,29}. An important advantage of symmetrical corrective exercises is the relative simplicity of the method of their conduct and selection, which does not require taking into account the complex biomechanical working conditions of the deformed musculoskeletal system in scoliosis\textsuperscript{30}.

Asymmetric corrective exercises allow concentrating their therapeutic action locally, in this part of the spinal column. For example, when the leg is retracted to the side of the bulge of the scoliosis arc, the position of the pelvis changes and the scoliosis arc decreases. When the
arm is raised upward from the side of the concavity, the scoliosis arch flattens due to a change in the position of the shoulder girdle.\(^3\)

Four main mechanisms of the therapeutic action of physical exercises are distinguished: tonic effect, trophic action, the formation of compensation and the normalization of functions.\(^1\)

1. The mechanisms of tonic effect. The use of special and general developmental exercises helps to balance the processes of excitation and inhibition in the central nervous system. Against this background, improves the metabolism, enhances the function of external respiration and blood circulation, activates the protective reactions of the body. The psycho-emotional state of a person increases, his mood improves, which enhances the effect of physical exercises.\(^2\)

2. The mechanism of trophic action. Physical exercise in scoliosis activates metabolic processes, accelerates regeneration processes, retards the development of muscle atrophy and joint stiffness, and improves blood circulation.\(^3\)

3. The mechanism of the formation of compensation. This mechanism is manifested in the development of temporary or permanent substitutions of impaired functions. For example, when violations of posture, scoliosis decreases chest excursion. Under the action of physical exercises, the respiratory muscles are strengthened, the mobility of the spine, diaphragm, ribs increases, and, as a result, the skill of correct posture is fixed.

4. The mechanism of normalization of functions. Properly selected and accurately dosed physical exercises can normalize the activity of the main body systems: nervous, cardiovascular, respiratory and musculoskeletal.

In the complex treatment of scoliosis, massage is often used, which strengthens the muscles and also has a tonic effect. There are principles of massage for scoliosis. They consist in: determining the hyperalergic zones, local muscle hypertonus, compaction in the form of cords, nodules in the tissues and acting on these formations using the techniques of segmental-reflex and acupressure; Differentially affect the back muscles: shortened, tense muscles on the side of the concavity of the arcs of the curvature of the spine stretch and relax, and on the side of the bulge perform tonic, stimulating techniques on the stretched muscles; differentially affect the shortened and stretched pectoral and gluteal muscles, as well as the muscles of the abdomen and limbs.\(^2\)

On the side of the spastic-contraction muscles in the area of the concavity of scoliosis, relaxation techniques (vibration, stroking) are used. On the side of the protuberance of scoliosis, where muscle tone is weakened, all the massage techniques in high dosage are used.\(^2\)

Medical swimming is an important stage in physical rehabilitation for scoliotic disease. It helps to improve health, instill skills that are important for life, foster moral and volitional qualities. It also has educational, health and hygienic, therapeutic, emotional and applied value. As a swimming treatment is used in the complex treatment of scoliosis. It is an important link in complex treatment. In the process of swimming, there is a natural unloading of the spine, asymmetry disappears in the intervertebral muscles, all the conditions arise so that the vertebral bodies develop normally. During sliding, spinal self-stretching occurs, which additionally relieves growth zones. At the same time, the muscles of the spine and the entire skeleton are strengthened, the coordination of movements becomes perfect, the correct posture is formed. Regardless of the severity of scoliosis, the prognosis of its course and type of treatment, all people with scoliosis can go swimming. Taking into account the degree of scoliosis, only swimming exercises are selected. When I degree of scoliosis perform symmetrical swimming exercises: breaststroke on the chest, crawl on the chest for the legs.\(^5\)

When swimming, the spine is unloaded, the asymmetric work of the paravertebral muscles is reduced due to their relaxation in warm water, which creates favorable conditions for performing movements, reduces pressure on the epiphyseal growth zones of the vertebral bodies, improves blood supply to the bone structures and soft tissues. The need to overcome the resistance of water during movement while performing swimming exercises is a means of strengthening and developing the paravertebral muscles and the whole musculoskeletal system of the child, improving coordination of movements, and developing a sense of correct body posture.\(^3\)
**Conclusion**

Currently, scoliosis in humans is considered as one of the most common conditions that leads to various deviations from homeostasis and often to abnormalities in the functioning of internal organs. It becomes clear that scoliosis is manifested not only by the curvature of the spine, but also leads to a number of general changes in the body, not excluding the development of dysfunctions of the internal organs causing deterioration of the general condition, the occurrence of hypoxia and metabolic disorders in the tissues, which can cause a decrease in the overall resistance of the child’s body. The use of exercise therapy, swimming and massage for scoliosis is reliable, long-term practice-proven methods for correcting the posture and treatment of scoliosis, which can restore slenderness and flexibility. However, their impact on the function of internal organs, which significantly heals the patient’s body.

**Conflict of Interest:** No conflict of interest is declared.

**Sources of Funding:** The study was conducted at the expense of the authors.

**Ethical Clearance:** The study was approved by the local ethics committee of the Russian State Social University on September 15, 2017 (protocol №11).

**REFERENCES**


Physical Rehabilitation of Girls with Neurocirculatory Dystonia

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ABSTRACT

Neurocirculatory dystonia is a syndrome of disorders of the cardiovascular system and its functions, in the etiology of which there are disorders of neuroendocrine regulation. The disease has several options for development, the symptoms are also varied. The most common symptoms of cardiovascular disorders due to stress. In the initial state, with neurocirculatory dystonia, signs of general asthenia, hypotension and bradycardia are characteristic, which sharply weakens the adaptive capacity of the organism. As a result of the course of traditional physical rehabilitation in girls with neurocirculatory dystonia, it was possible to achieve a slight increase in the reserve capacity of their cardiac and respiratory systems, with some weakening of the manifestations of hypotension and bradycardia. This did not allow, however, to reach the indicators at the level of the control group. The effectiveness of the author’s version of the physical rehabilitation of the tested girls with neurocirculatory dystonia showed the possibility of developing more pronounced positive changes in the body due to the powerful activation on their background of the backup capabilities of the main life support systems. The leveling in this group of manifestations of hypotension and bradycardia when the considered indicators reach the level of the control group during the application of the author’s rehabilitation option proved its advantages and high health potential.

Keywords: rehabilitation, hypotension, neurocirculatory dystonia, yoga, physical activity.

Introduction

Neurocirculatory dystonia is a syndrome of disorders of the cardiovascular system and its functions, in the etiology of which there are disorders of neuroendocrine regulation. The disease has several variants of development, the symptoms are also diverse2,3. The most common symptoms of cardiovascular disorders due to stress4. The course, as a rule, has a benign character and a positive prognosis5.

According to statistics, this pathology in the population is found in 12-35%. Basically, the disease develops in adolescents, since in older age it often develops into various forms of cardiovascular pathology6. In this regard, with neurocirculatory dystonia, early detection and early adequate treatment is advisable7,8.

According to the classification of ICD-10, the disease is classified as Class V disease with the code “F45.3”. This cipher includes a group of diseases, referred to as “somatoform dysfunction of the autonomic nervous system.” This group includes cardiovascular neuroses, syndrome of respiratory disorders (Da
Costa syndrome), gastroneurosis, cardiac rhythm disturbances of psychogenic origin, sweating, redness and tremor of the hands associated with vegetative dysfunction, hiccups, deep frequent breathing, that is, hyperventilation, frequent urination, a state of increased fatigue and fatigue, variable and fast-moving pain in all parts of the body, as well as feeling not bosnovanogo fear and concern for their health9.

It is noticed that the age of development of neurocirculatory dystonia is getting younger. The reason for this is a progressive violation of the ecological situation, in cities, increasing mental and emotional stress on the population, the spread of a sedentary lifestyle10,11. In this regard, the question of the early physical rehabilitation of this cohort of patients, especially adolescence, is particularly acute.

**Objective**

To develop an effective method of physical rehabilitation for adolescents with neurocirculatory dystonia of hypotonic type.

**Materials and Research Method**

The study was approved by the local ethics committee of the Russian State Social University on September 15, 2017 (protocol №11).

The study included 60 adolescent girls (13-14 years old), who were divided into 3 groups of 20 people each. The girls of the first group were clinically healthy and formed a control group. Girls 2 and 3 of the group suffered from neurocirculatory dystonia of hypotonic type for at least 2 years. In the 2nd group (main group), traditional rehabilitation was carried out, which included: 1) aerobic exercises 3 times a week, with a duration of 30-40 minutes; 2) daily recreational walking of at least 2 km at a speed of 1 km in 10-15 minutes; 3) morning, evening hygienic gymnastics - daily for a total of 15-20 minutes. In the 3rd group of girls taken in the study, they assigned the method of author’s physical rehabilitation 1) daily recreational walking - at least 3 km at a speed of 1 km in 10-15 minutes; 2) performing yoga asanas (dog face down, extended triangle posture, extended angle posture, warrior posture, inverted triangle posture, bend forward with legs wide apart, plow posture 1 minute each) at least 4 times a week; 3) morning and evening exercises with the use of the above asanas and breathing exercises for 25-30 minutes daily. Classes were held in both groups for 3 months.

In order to identify the dynamics of the functional state of the body in girls of groups 2 and 3, the following tests were carried out: the Shanga test, the Genchi test, the orthostatic test, blood pressure measurement of systolic and diastolic, heart rate. Girls of the first group were examined once by the same methods. The research results were processed statistically using Student’s t-test.

**Research Results**

The achieved results of the use of two options for physical rehabilitation in adolescent patients are presented in Table 1.

In the outcome, in the main and experimental groups, changes characteristic of neurocirculatory dystonia in the hypotonic type were found with significant differences in the recorded parameters compared to the control. So, in both observation groups, the systolic blood pressure level was reduced by at least 41.7%, and the diastolic blood pressure level was below the control by about 30.0%. At the same time, the heart rate level in both observation groups was lower than the control by about 32.0%. The results of the Shtange test in both groups of adolescents with neurocirculatory dystonia were reduced by almost 40.0%. The value of the results of the Genchi test in them was lower than the control level by almost 48.0%. Due to the presence in adolescents with neurocirculatory dystonia of pronounced disorders of the indicators taken into account, he carried out physical rehabilitation.

In the main group, rehabilitation effects were carried out according to the traditional method. As a result, it was possible to achieve some positive changes in the indicators taken into account, which, however, did not allow them to approach the values of the control group. After the rehabilitation measures in the main group, it was possible to increase the level of systolic blood pressure by 12.3%, diastolic by 14.8%. At the same time, in these adolescents, the heart rate increased by 9.0%. The indicator of the Stange sample increased by only 15.1%, while the Genchi sample increased only by 15.6%. The preferred values of the indicators taken into account were achieved in the experimental group after the physical rehabilitation was carried out according to the author’s scheme.
Table. Functional characteristics of the examined

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Core group, M ± m</th>
<th>Experimental group, M ± m</th>
<th>Control group, M ± m, n = 20</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>at the original,</td>
<td>at the end of the</td>
<td>at the original,</td>
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<tr>
<td></td>
<td>n = 20</td>
<td>observation, n = 20</td>
<td>n = 20</td>
</tr>
<tr>
<td>The result of the test</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stange, s</td>
<td>37.0 ± 0.32</td>
<td>42.6 ± 0.41</td>
<td>36.4 ± 0.28</td>
</tr>
<tr>
<td></td>
<td>p&lt;0.01</td>
<td>p&lt;0.05</td>
<td>p&lt;0.01</td>
</tr>
<tr>
<td>The result of the Genchi</td>
<td>32.0 ± 0.40</td>
<td>37.0 ± 0.46</td>
<td>31.9 ± 0.22</td>
</tr>
<tr>
<td>test, s</td>
<td>p&lt;0.01</td>
<td>p&lt;0.05</td>
<td>p&lt;0.01</td>
</tr>
<tr>
<td>Heart rate, beats/min</td>
<td>55.4 ± 0.35</td>
<td>60.4 ± 0.32</td>
<td>55.0 ± 0.40</td>
</tr>
<tr>
<td></td>
<td>p&lt;0.01</td>
<td>p&lt;0.05</td>
<td>p&lt;0.01</td>
</tr>
<tr>
<td>Systolic blood pressure,</td>
<td>84.3 ± 0.47</td>
<td>94.7 ± 0.52</td>
<td>84.1 ± 0.46</td>
</tr>
<tr>
<td>mm Hg</td>
<td>p&lt;0.01</td>
<td>p&lt;0.05</td>
<td>p&lt;0.01</td>
</tr>
<tr>
<td>Blood pressure is</td>
<td>57.8 ± 0.62</td>
<td>66.4 ± 0.50</td>
<td>58.2 ± 0.43</td>
</tr>
<tr>
<td>diastolic, mm Hg.</td>
<td>p&lt;0.01</td>
<td>p&lt;0.05</td>
<td>p&lt;0.01</td>
</tr>
</tbody>
</table>

Legend: p - the reliability of differences in indicators of the main and experimental groups with the values of the control.

For all indicators in adolescents of the third group, it was possible to bring the values of the indicators taken into account to a level that does not differ from the values in the control. This was due to an increase in their systolic blood pressure by 35.1%, diastolic blood pressure by 25.8%, the level of heart rate increased by 25.3%. Their indicator of the Stange sample increased by 42.8%, and the Genchi sample increased by 34.2%. The results obtained exceeded those achieved in the main group and reached the level of control.

Discussion

Neurocirculatory dystonia is a functional symptom complex, the development of which can be based on unfavorable heredity, as well as strong and persistent psycho-emotional experiences. As a rule, with neurocirculatory dystonia, there is a paucity of morphological changes in the body and intense symptoms. According to statistics, a patient with this pathology has at least 26 symptoms, and they can be very versatile. The disease is not always and not all flows stably - often there can be exacerbations of the disease, manifested in the form of crises. The disease progresses if it occurs at a young age. In the absence of the necessary treatment, the disease can develop into an organic pathology of the cardiovascular system.

In case of neurocirculatory dystonia of hypotonic type, active physical activity is recommended: dancing, swimming, walking, tourism. Also effective in the physical rehabilitation of neurocirculatory dystonia is a massage of the head, abdomen, lower limbs, neck and collar area.

In the work performed, an effective approach to the physical rehabilitation of patients with neurocirculatory dystonia of hypotonic type was developed and tested. This method of physical rehabilitation of such patients was based on the use of a number of elements of yoga, breathing exercises, physical therapy and walking. The developed complex was very effective. With its application, it was possible to achieve a pronounced optimization of the cardiovascular parameters taken into account and increase its reserve capacity, which exceeded the effect of the traditional recovery option for this pathology. The achieved effect from the use of the author’s version of physical rehabilitation in neurocirculatory dystonia of the hypotonic type was more effective, since it provides a more pronounced health effect on systems and organs. Exercises and asanas, when regularly performed, develop strength, endurance, speed and coordination of movements, as well as stabilize the mental background. This is primarily aimed at performing asanas of yoga, which have a powerful psycho-physical health effect on the entire body.

As a result of the application of the tested complex of asanas of yoga as part of the author’s method, it was possible to comprehensively affect the body of a sick person to activate its reserves and, first of all, the
cardiovascular system. The achieved favorable effect on the body of the author’s scheme of physical rehabilitation was largely realized through the strengthening of metabolic processes\textsuperscript{20}. In the process of its use, a “mild” increase in the level of fitness of the body as a whole occurred, strengthening the cardiovascular system, revealing the reserves of the respiratory system, balancing the work of the hormonal system, the central and vegetative parts of the nervous system\textsuperscript{21}.

Obviously, from the early stages of asanas as part of the designated recovery complex, psychological phenomena develop and increase, reducing sensitivity to stress, improving the psycho-emotional background while increasing elasticity and endurance of muscles and flexibility of the spine\textsuperscript{22,23}. Asanas are known to normalize the production of certain neurotransmitters, especially acetylcholine, and catecholamines and histamine. It is also noted that daily yoga classes can increase intelligence and strengthen memory, providing a balance between the sympathetic and parasympathetic nervous systems\textsuperscript{24,25}.

When comparing the results in both groups of observation and control data, it became clear that the author’s technique has advantages over the traditional one and allows inferred indices for neurocirculatory dystonia of the hypotonic type to be derived to the level of healthy people\textsuperscript{26,27}. This suggests that it is highly effective and promising for widespread testing, including for all forms of neurocirculatory dystonia in patients of any age and if they have any associated diseases\textsuperscript{28,29}.

**Conclusion**

In the initial state, with neurocirculatory dystonia, signs of general asthenia, hypotension and bradycardia are characteristic, which sharply weakens the adaptive capacity of the organism. As a result of the course of traditional physical rehabilitation in girls with neurocirculatory dystonia, it was possible to achieve a slight increase in the reserve capacity of their cardiac and respiratory systems, with some weakening of the manifestations of hypotension and bradycardia. This did not allow, however, to reach the indicators at the level of the control group. The effectiveness of the author’s version of the physical rehabilitation of the tested girls with neurocirculatory dystonia showed the possibility of developing more pronounced positive changes in the body due to the powerful activation on their background of the backup capabilities of the main life support systems. The leveling in this group of manifestations of hypotension and bradycardia when the considered indicators reach the level of the control group during the application of the author’s rehabilitation option proved its advantages and high health potential.

**Conflict of Interest:** No conflict of interest is declared.

**Sources of Funding:** The study was conducted at the expense of the authors.

**Ethical Clearance:** The study was approved by the local ethics committee of the Russian State Social University on September 15, 2017 (protocol №11).

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Physiological Basis of Physical Rehabilitation of Athletes after Ankle Injuries

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ABSTRACT

The rehabilitation process involves assisting the patient by compensating for the deficiency of the lost functional capabilities of the body, which can be corrected. Rehabilitation of athletes after ankle injury is carried out in stages. At the first stage - peace and protection, then - restoration of the flexibility and mobility of the joint without the load on it. When using more intense exercise, it is possible to stand on an injured leg. With a gradual return to the previous level of activity should not stop exercise. Such patients should conduct an adaptive physical culture. Her theory and methodology is based on a general theory and method of physical culture and is well developed. It is extremely important to complete the program of adaptive physical exertion during the rehabilitation of each athlete with an ankle injury, as this significantly reduces the chance of a similar injury in the future. The use of physical culture in the form of morning hygienic gymnastics and breathing exercises, starting from the early stages of immobilization, largely contributes to the normalization of the functions of blood circulation, respiration and metabolic processes. According to animal studies, intensive exercise in some cases of regulatory characteristics of the brain, which speeds up recovery.

Keywords: rehabilitation, ankle, trauma, physiology, athletes.

Introduction

The concept of rehabilitation is commonly understood as the process of treating and restoring the body after the occurrence of an injury or illness to a normal state of health. The rehabilitation process involves assisting the patient by compensating for the deficiency of the lost functional capabilities of the body, which can be corrected.

Every year more than 70 million people are injured in the world, of which 24 million are athletes. The frequency of such injuries is so high that they are ahead of infectious diseases in the incidence of deaths and the resulting disability. Every year, almost a third of all athletes suffer from injuries, which temporarily excludes their participation in competitive activities. This is due to the fact that the risk of injury for professional athletes is significantly higher than for the public. In this case, the ankle is very often injured, which keeps this type of damage permanently in the field of vision of traumatologists.

The largest percentage of injuries to the ankle comes from improper landings when jumping from a height and when landing on uneven surfaces. In these cases, the most characteristic sprains and fractures. However, damage to the soft tissues of this area can also be observed: the calf muscles, the Achilles tendon, stretching and inflammation of the ligamentous apparatus.

In the process of rehabilitation for ankle injuries, athletes often face serious complications when they
return to their professional activities. This makes this problem one of the most important in rehabilitiology. It is recognized that the central place in the rehabilitation of this pathology is occupied by exercises that should not cause pain and their implementation provides for a gentle load on the injured joint. It is recommended to begin the process of developing the ankle joint after a long immobilization during exercises in water. At the same time, there are a lot of unresolved issues in the rehabilitation of the ankle injury, and this dictates the need to consider the available information.

Objective: to consider aspects of the physical rehabilitation of athletes who have suffered ankle injuries.

**Damage to the soft tissues of the ankle:** Damage to the ankle ligaments account for about 75% of all injuries to this part of the body. Depending on the mechanism of injury, various ligament components of the ankle can be damaged. For example, the external lateral ligaments are damaged during supination and inversion of the foot, and the deltoid and interfibular ligaments may suffer during pronation and eversion. By severity of damage, tears (sprains) and their tears are distinguished. If the tears of the ligaments are not severe trauma and usually end in complete recovery of the injured, the ruptures of the ligamentous apparatus, especially improperly treated, can often cause permanent damage to the function of the injured limb and permanently disable it.

In practice, distinguished uncomplicated and complicated injuries of the soft tissues of the ankle. Uncomplicated damage to the ligaments are treated without the use of surgical interventions and are not accompanied by complications that prevent the early development of joint mobility. In the presence of complications, treatment requires only surgical intervention.

**Damage to the bones of the ankle:** Other, more severe consequences of an ankle injury are fractures of his bones, which are the most often injured in the entire skeleton. They can occur when a direct impact of external force (falling on the shin of gravity, pressing it to a hard object, a direct blow) and indirect effects (falling with a sharp twisting of the tibia at a fixed foot). The bi-momentum of the traumatic power can cause a double fracture. Fractures can be tibial and fibula bones separately and immediately both of these bones. In practice, damage to both bones of the tibia is observed more frequently.

Fractures of the ankle bones are treated by three methods: conservatively - by stretching (if the fracture is displaced) for the calcaneus, after 2-3 weeks a blind plaster cast is applied from the base of the fingers to the upper third of the thigh; the imposition of the apparatus G.A. Ilizarov and operative reposition using clamps of bone fragments. Metal wires and tapes, as well as metal and bone pins are used as a fixator in modern traumatology. The limb in the postoperative period is fixed with a plaster Longuet - from the base of the fingers to the middle third of the thigh.

For non-displaced fractures, a plaster “boot” with a heel or with a stirrup is placed from the base of the fingers to the knee joint. After it dries, you can walk with crutches, stepping on a stirrup or heel, as well as engage in physical therapy.

One of the indispensable conditions for achieving good results in the treatment of injuries of the ankle joint is the exact anatomical restoration of damage to its elements, their retention until complete fusion and the subsequent restoration of joint function.

**Complications of ankle injuries:** The problem faced by many patients after injuries of the musculoskeletal system is post-traumatic disease. It is characterized by the following symptoms: impaired or decreased physical activity and problems with psycho-emotional state. It is necessary to take into account the fact that before the injury, almost all patients were relatively healthy people, so the main task in the post-traumatic period is to increase the physical activity of the patient, restore psycho-emotional status, return to the former social situation.

In the development of this shock, two phases are distinguished: the first is the erectile phase (the excitement phase occurs at the time of injury as a result of pain impulses coming from the damage zone, characterized by emotional excitement, anxiety, lethargy, heart rate and blood pressure increases, after 5-10 minutes excitement is replaced by depression), from this moment begins the second - the torpid phase (pallor, cold sweat, weak pulse, drop in blood pressure, shallow breathing, the victim is indifferent to ok uzhayuschemu while maintaining consciousness suppressed the activity of all systems of the body, blood flow decreases sharply to organs, increasing oxygen deficiency, all of which can lead to death of the victim). The manifestation of shock largely depends on the extent of damage, its nature and location.
Basics of rehabilitation of athletes after ankle injury:

Rehabilitation of athletes after ankle injury is carried out in stages. At the first stage - peace and protection, then - restoration of the flexibility and mobility of the joint without the load on it. With a gradual return to the previous level of activity should not stop exercise.

For ankle fractures, the situation is aggravated by the need for long-term fixation of the joint in a certain position, which always leads to muscle weakening and atrophy. Sometimes such injuries become chronic and patients may become disabled. And here the need for regular physical exertion becomes especially acute.

Common manifestations are expressed in a gradual, during immobilization, reduction of the main indicators of hemodynamics, external respiration and metabolic processes. Often also observed symptoms of increased patient irritability, deterioration of sleep, intestinal atony. Thus, the adynamy of the patient in the period of immobilization leads to disruption of the functional activity of many organs and systems.

Such patients should conduct an adaptive physical culture. The use of physical culture in the form of morning hygienic gymnastics and breathing exercises, starting from the early stages of immobilization, largely contributes to the normalization of the functions of blood circulation, respiration and metabolic processes. Exercising the muscles of an immobilized limb (isometric stresses, imaginary movements), as well as in joints that are free from immobilization, contributes significantly to the normalization of the main nervous processes and thereby prevents the formation of muscle atrophy and contracture of the joints.

Practice shows that for bone fractures, fixed fragments grow together more quickly if the surgeon creates the conditions for maximum tight contact (with metal tape, screws, bolts), that is, stable osteosynthesis or compression of fragments. In this regard, with conservative methods of treating fractures of the lower extremity, physical exercises in the form of therapeutic walking should be considered as a natural-biological method that ensures tight contact and compression of bone fragments.

Mechanisms of health effects of rehabilitation effects in injuries of the ankle: A proper and adequate rehabilitation program can help patients cope with the resulting deficiency in the functioning of certain organs and body systems affected by trauma. The main types of rehabilitation therapy include physical therapy, occupational therapy and speech therapy.

The restoration of lost motor skills involves a learning process that integrates information from psychology, neurology, physical education and rehabilitation. Indicators of the effectiveness of the rehabilitation program are the restored skills of professional motor actions that the patient had before the injury.

It is shown that not only physical activity, but also mental activity affects the effectiveness of rehabilitation rehabilitation processes. It is important that the patient sets himself simple tasks. In an effort to fulfill them, realizing the program of action, and understanding what each movement is being performed for, the patient more effectively restores lost professional skills and abilities and generally recovers faster.

The benefits of regular exercise are the faster and more efficient regenerative processes in damaged organs and tissues. In addition, physical exercise contributes to the emergence of positive emotional states, which helps to relieve stress and general mental relaxation.

Specially designed and developed in the complex of gymnastics physical exercises, as a result, increase the efficiency of muscle strength, improve coordination and increase endurance, promote the development of joint flexibility, control body weight, affect metabolism.

The stimulating effect of physical exercises on the ability of the brain to form new synaptic connections has been proven, which contributes to its self-healing. These data suggest that intensive exercise programs can improve brain performance, and thus speed up recovery processes especially after injuries. Some studies have shown that exercise can restore motor function through various mechanisms of molecular changes in the basal ganglia of the chain.

Conclusion

At the first stage - peace and protection, then - restoration of the flexibility and mobility of the joint without the load on it. When using more intense exercise, it is possible to stand on an injured leg. Such patients should conduct an adaptive physical culture. It is extremely important to complete the program of adaptive physical exertion during the rehabilitation of
each athlete with an ankle injury, as this significantly reduces the chance of a similar injury in the future. The use of physical culture, started from the early stages of immobilization, largely normalizes blood circulation, respiration and metabolic processes.

Conflict of Interest: No conflict of interest is declared.

Sources of Funding: The study was conducted at the expense of the authors.

Ethical Clearance: The study was approved by the local ethics committee of the Russian State Social University on September 15, 2017 (protocol №11).

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Primary Appraisal Antiretroviral Adherence and Nonadherence among People Living with HIV (PLWH)

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ABSTRACT

HIV is an iceberg phenomenon that still needs a problem solving. The data from the voluntary counselling and testing in Waluyojati General Hospital show that every month about 8-15 new people got HIV infection and Antiretroviral Therapy. Some of them adhered to undergo ARV, but some did not. One of influential factors for adherence to ARV is individual factor which consists of primary appraisal includes perceived susceptibility, severity, benefit, barrier and motivational relevance and secondary appraisal includes self-efficacy, perceived control outcome and emotion, and external factors. The aim of this study is to describe primary appraisal of antiretroviral adherence and nonadherence among People Living With HIV (PLWH). This study is a qualitative study using a content analysis. This study carried out in-depth interviews with 10 PLWH who received ART for about two weeks – three months. The results show that non adherence to ART is caused by several factors, such as income, perceived susceptibility, perceived severity, perceived barriers. Some of non adherence patients are bored to taking ARV every day and get several side effects, such as nausea and vomiting, erythema, HIV disclosure, fear of stigma. Both patients who adhere and do not to ARV perceived that taking ARV makes them healthy, resistant to be tired, less anxious or hospital care costs, and motivated like people with no HIV infection. Patients who do not adhere to ARV have more perceived barrier than perceived benefit and motivational relevance.

Keywords: Primary Appraisal, Antiretroviral, Patient, Adherence, HIV

Introduction

HIV not only attacks the key population, but also has spread to general communities. A treatment to address HIV cases can be given by giving Antiretroviral therapy (ARV). According to World Health Organization in 2016, there were 36.7 million PLWH; whereas in Bali, Indonesia from 1987 to December 2016, about 80% of its population got HIV AIDS and had spread to 80.2% of districts and cities. According to provinces, East Java province has the third highest number of HIV infections (0.08%). The cumulative HIV cases in Probolinggo district from 2012 to 2017 happened to 1,072 people (1%).

A preliminary study conducted in the VCT Clinic of Waluyojati General Hospital. The researchers interviewed medical record staffs. It was found that in 2018, the cumulative number of HIV AIDS cases occurred to 1,140 people, and every month about 8-15 new people suffered from HIV infection. Seventy-five percent of them were qualified for ARV treatment, and a quarter of them had not received ARV treatment. From 75% of 10% lost to follow-up ARV, and 59.6% are active on ARV treatment. It indicates that some patients do not adhere to the ARV treatment based on doctor’s instructions.
Multi-factors that caused non adherence to ARV include beliefs and self-efficacy. Meanwhile, according to other researchers that adherence barriers are caused by lack of knowledge and motivation, alcohol addiction, unavailability of food, stigma, disclosure of HIV status, the number of pills taken by patients. Other factors of nonadherence are caused by social support, family or parent support, knowledge about a disease, self-motivation, beliefs about positive results. Other results of the preliminary study show nonadherence is also caused by stigma, disclosure, lack of support from her partner, transportation expense, side effects, service waiting time.

The aim of this study is to describe the primary appraisal of antiretroviral adherence and non adherence among people living with HIV.

Materials and Method

This qualitative study was conducted to patients in the VCT Clinic of Waluyojati General Hospital, Probolinggo Distric. The number of patients undergoing an ART about 2 weeks-3 months in Februari 2018. Ten participants were selected as samples. Five patients and the others do not adhere to the ART. Based on the inclusion criteria, the respondents involve females living with HIV aged more than 15 years old in Probolinggo District. Patients who are still on TB treatment are excluded to be respondents.

Respondents who agreed to participate in this study signed a written informed consent. The researchers uses a close ended questionnaire to identify the characteristics of patients and an interview guide using fourteen open questionaires to identify knowledge about ARV, perceived susceptibility, perceived severity, benefit, barrier, and motivational relevance, uses audio recorder after getting respondents’ consent. Respondents speak Indonesian or local language (Javanese/Madurese). Each interview lasted about 20-30 minutes. All respondents’ profiles were anonymous during the data transcription. The analysis was done manually by using a content analysis. The transcriptions were read for 3-4 times to identify all key ideas and current themes.

Findings

Sociodemographic Characteristics: Ten females living with HIV are 23 years old up to 50 years old. Based on education level, seven respondents went to elementary school, two respondents graduated from senior high school and 1 respondent from a college. In terms of salary, one respondent has no fixed income, four people earn < Rp.500,000,-, four people gain Rp. 500,000,- and one person earn Rp. > 500,000,- each month. Nine of the respondents are house wife, and one respondent is entrepreneur. Two of them are Javanese, and eight respondents are Madurese.

Patient’s Knowledge: The majority of respondents (five respondents who adhere and two who do not) have good knowledge about the side effects of ARV, problem solving, condition in taking ARV, time schedule to take ARV, impacts of unregular ARV therapy. However, almost of all respondents (four respondents who adhere and five respondents who do not) have bad knowledge about what ARV medicine is and objectives of taking ARV.

ARV medicine can prevent HIV in order to have healthy body and long life For the side effects, I’ll go to a doctor…drinking every day in the same time, if not.. we will be sick… (SR, 42, patient who adhere to ARV)

ARV medicine can fight the HIV to recover my body quickly… (HN, 35, patient who do not adhere to ARV).

Perceived Susceptibility Factors Affecting Adherence:
In terms of perceived susceptibility of patients about ARV, three respondents (one respondent who adhere and two respondents who do not adhere) are bored for taking ARV every day. On the other hand, seven respondents (2 respondents who adhere nd five respondents who do not adhere) sometimes forget to take it on time.

Nothing..i did not forget…no difficulties.. (SC, 27, respondent who adhere to ARV).

I am bored for taking medicine continuously forever. Furthermore, taking ARV should be on time (PA, 27, respondent who do not adhere to ARV)

Perceived Severity Factors Affecting Adherence: In terms of perceived severity, eight respondents (three respondents who adhere and 5 respondents who do not adhere to ARV) stated that severity is caused by patient’s susceptibility.

Not too disturbing anyway…I can afford to solve it (HU, 44, respondent who adhere to ARV)
Quite annoying…I often forget…quickly got sick…like headaches…nausea…tired…often sleepy (IK, 32, respondent who do not adhere to ARV)

Perceived Benefit Factors Affecting Adherence: All respondents have benefit for taking ARV. This statement was capture in the below:

The benefit is to make my body healthy, so my activity goes well…(LS, 36, respondent who adhere to ARV)

Yes… sometimes my body felt fresher after taking ARV…I am more diligent to work…Like healthy people in general, they will not believe if I am HIV (JT, 23, respondent who do not adhere to ARV)

Perceived Barrier Factors Affecting Adherence: Six respondents (two people who adhere and four people who do not) mentioned that the side effect of ARV is the barrier. Two respondents said that another barrier is inadequate income (one respondent who adhere and one respondent who does not adhere). Two respondents who adhere to ARV do not have any barrier to take ARV. All respondents took ARV unless someone will disclosure their HIV status.

After taking ARV especially in the first week, I feel nausea, vomiting… Furthermore, I sometimes got headaches…(SR, 42, respondent who adhere to ARV)

Because of high transport fares and financial constraints. I do not have health insurance, so I do not take ARV…I have been drinking coconut oil herbal …drinking zaitun oil and eating more (IK, 32, respondent who do not adhere to ARV)

I am too busy to regularly take ARV., If I remember, I will take it soon (HU, 44, respondent who adhere to ARV)

Motivational Relevance Factors Affecting Adherence: Seen from the motivational relevance of taking ARV, ten patients said that they want to be normal people who do not get HIV infection, can work normally, have healthy body, do not get stigma from society, and havelong life.

My motivation on taking ARV therapy is because I want to be like others who do not get HIV infection and work normally…being healthy…no stigma from neighbours (SR, 42, respondent who adhere to ARV)

Being healthy…can work…if I were healthy, they would not believe that I am HIV sufferer. They believe that PLWH are thin…I still look healthy (JT, 23, respondent who do not adhere to ARV)

Discussion

Sociodemographic Characteristics: In this study, all respondents have lower income than minimum regional salary. They have financial constraints, so they are unable to spend enough money for transport, take their medication as prescribed.

Adherence is a form of behavior arisen from the interaction between a doctor and a patient, so they understand, approve, and execute their plans and consequences. Multi-factors that affect to adherence include communication, social-economy, employment, level of knowledge about treatment, medical insurance, basic health services, and ethnics.

A patient with low income has more difficulties of adherence. Even though ARV medication is freely provided in Indonesia, but unemployment, transportation cost, and ownership of health insurance still affect patients to take ARV. Additionally, education level does not always get associated with adherence. In this study, five respondents who do not adhere to ARV went to elementary school, high school and college. According to the the study done by Hanif, socio-demographic like education level does not get consistently associated with adherence.

Patient’s Knowledge: The majority of respondents have good knowledge about side effects, problem solving, condition in taking ARV, schedule for taking ARV, impact due to unregular ARV therapy. However, almost all respondents do not know what ARV medicine is and the objectives of this medication.

Knowledge is the results of knowing after someone conducts or senses something or a particular object. This is consistent with Van Dyk who mentions that maintenance group is patients who understand about ARV. In the contrary, nonadherence group is patients who lack knowledge about ARV and have missing meaning about ARV. The ARV therapy does not function to fight HIV, but it only suppresses the progression of HIV.

Perceived Susceptibility Factors Affecting Adherence: The majority of patients in this study have perceived
susceptibility. They feel bored for taking ARV every day and sometimes forget to take it on time.

Perceived susceptibility is one of the powerful beliefs to prompt people to adopt healthier behavior. It can be seen that a belief of increased susceptibility or risk is associated with healthier behavior and decrease susceptibility to unhealthy behavior. Perceived susceptibility about ARV and HIV disease is related. Denial of HIV status as identified needs to be addressed through intervention in order to accept HIV status, and the implication of the diagnosis will give patients clues to take ART.

Perceived Severity Factors Affecting Adherence: In this study, most of respondents argued that severity is caused by susceptibility that patients experience. Perceived severity is an individual belief in disease severity or the needs of ARV medication according to doctor instructions. Perceived severity will make patients stressed if they do not have a good self-efficacy. It is evidenced that patients who have perceived severity can cope the mecanism and adherence to ARV therapy. Respondents who do not have severity will adhere to take ARV.

Perceived Benefit Factors Affecting Adherence: All respondents in this study have benefits after taking ARV. Some of them do not have a good perceived benefits for taking ARV, but a half of them have a high level of adherence.

Perceived benefit is an individual belief about the efficacy and feasibility of particular actions to treat and prevent a disease or to take ARV medication according to doctor’s instructions. Some studies show that good perceived benefits are related to patients’ adherence. Patient’s belief in ARV benefits have been correlated with ARV adherence. Moreover, perceived effectiveness of ART is related to ARV adherence.

Perceived Barrier Factors Affecting Adherence: This study shows that the majority of respondents considered side effects as barriers of ARV adherence. Moreover, since they work, it is hard to hidetheir HIV status. Only few had no barriers.

Perceived barrier is individual belief in things that inhibit ARV adherence. Barriers give negative impacts on social and worklife, secrecy and stigma. Furethermore, many patients hide their HIV status because they are afraid of stigma which becomes a major barrier to change. It may be an important reason for why many patients take ARV on time or late.

Motivational Relevance Factors Affecting Adherence: All respondents in this study want to become normal people who can work normally, live healthily get no stigma from society, have a good immune system and long life.

Motivation is a part of primary appraisals in Transactional Model of Stress and Coping Theory. Motivational relevance is an individual belief to do something. People who have motivational relevance can cope their problems in taking ARV and decide whether or not to adhere. Autonomous motivation is strongly associated with perceived competence and correlated with adherence.

Conclusions

In conclusion, education level, employment, and ethnics do not always affect adherence, but income is significantly. Knowledge about ARV therapy, perceived susceptibility, perceived severity, perceived benefit, perceived barrier, and motivational relevance affect adherence to ARV as well. Moreover, self-efficacy, controlled outcome, controlled emotion, cues to action and others influence patients’ adherence to ARV therapy.

Conflict of Interest: This study didn’t have conflict of interest with General Hospital that become location of this study.

Source of Funding: This study have self findings by the authors.

Etichal Clearance: Prior to the research, an ethical approval was conducted by a reviewer of Health Science of Hafshawaty Pesantren (Islamic Boarding School) Zainul Hasan Probolinggo, East Java, Indonesia.

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Living with Stigma: The Experience of Tuberculosis Patients and Family Caregivers in Indonesia

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ABSTRACT

Background: People with tuberculosis (TB) lead to emotional distress because of stigma. Their stigma could extend to other family members particularly caregiver. Therefore, stigma could be a hindering factor on the successful of TB control.

Objective: This study aimed to explore the experience of stigma among TB patients and family caregivers in Indonesia.

Material and Method: A qualitative study was conducted among five TB patients and four family caregivers who had experienced with TB stigma, had a previous TB diagnosis (patients) or caring TB patients (caregivers), and can speak Indonesian or Sundanese language. Data were collected by in-depth interview, and content analysis was used for the data analysis.

Findings: Three main themes emerged from participants’ experiences for being stigmatized. The first theme was TB meaning, including TB is as a dreadful disease, as a severe disease, and as a dangerous disease. Second theme was psychosocial aspect of TB stigma, consisting of feeling shame and social exclusion, which were influenced by their fear of causal transmission and blame from others. Finally, strategies to cope with stigma, including isolating themselves, keeping secrecy of TB, ignoring, and convincing others.

Conclusion: These findings suggest that persons affected by TB stigma need support from health care providers. These findings will be benefits to health professionals to develop stigma reduction intervention for patients and family caregivers to cope with TB and its stigma.

Keywords: Family caregiver, Indonesia, Patient, Stigma, Tuberculosis.

Introduction

TB stigma has emerged as an important barrier to the control and treatment of TB. TB stigma contributes to the quality of TB management such as delays in seeking health care, TB diagnostic delay, poor treatment compliance, non-adherence to TB screening in household contacts, and consequently poor quality of life¹. Stigma is defined as an “attribute that is deeply discrediting”². Several studies reported the experiences of stigma among TB patients including isolation, discrimination, rejection, and social exclusion³⁴. Stigma does not only affect a TB patient as an individual, but also the family caregivers who take care of and who have a close relationship with TB patients. Stigma that extends to others family members is known as “courtesy stigma”². Another study also reported the positive correlation between TB courtesy stigma and health-seeking behavior⁴.

TB stigma also occurs in Indonesia. Even though World Health Organization (WHO) reported that the success rate of TB treatment in Indonesia was 85% in 2015, treatment default in several areas in Indonesia is still low⁶. The misperception of TB showed a significant relationship with TB treatment default—one of the barriers in the TB control program is the non-compliance to treatment. Morbidity, mortality, and risk to become
resistant to drugs are emerging among defaulters. Thus, the aim of this study is to identify the factors, especially knowledge and perceptions of TB and association with treatment default among patients treated in primary care settings, East Nusa Tenggara. METHODS: This study was part of a bigger cohort community-based controlled trial study. The subjects were newly diagnosed pulmonary TB patients from four districts in East Nusa Tenggara. Knowledge, perception of TB, and other related factors were assessed prior to the treatment. Patients who interrupted the treatment in two consecutive months were classified as defaulters, as World Health Organization stated. Odds ratio (OR. Most studies in Indonesia have focused on quantitatively measuring TB stigma and the relation of stigma on TB diagnosis and treatment. However, there are limited studies that have explored stigma among people with TB and the family caregiver. In order to reduce stigma in Indonesia and increase TB control programs, understanding about stigma within TB patients and family caregivers in Indonesia is essential. The objective was to explore the experience of stigma among TB patients and family caregivers in Indonesian.

Method

This study is a part of PhD dissertation, which used a qualitative study. This study was conducted in Bandung, Indonesia. The participants in this study were purposively recruited until data saturation. Five TB patients and four family caregivers voluntary participated. The inclusion criteria were persons who have experience with stigma related to TB, have a previous active TB diagnosis (for TB patients) or were caring for TB patients (for family caregivers), and can speak Indonesian or Sundanese language. The participants were obtained from a lung clinic, Bandung, Indonesia. TB participants are represented by codes P1-P5, while caregivers are coded by FC.1-FC.4.

Data were collected from December 2016 to July 2017 through in-depth interview. Each participant was interviewed for 2–4 times, and around 40-90 minutes was spent for each interview. The sample questions included “how do you perceive TB?” and “what were other people’s reactions when they knew that you had TB disease?” The interviews were recorded using a tape recorder and then transcribed verbatim before being translated into English. The member checking technique was applied to enhance trustworthiness. Content analysis method was used to analyze the data.

Findings

Three main themes emerged from the interview transcriptions, consisting of the meaning of TB, TB stigma experiences, and strategies to cope with stigma.

Meaning of TB: When asked how they perceived TB, the participants shared their meanings of TB in three aspects.

Dreadful disease: The perception of TB as a dreadful disease was reported by both TB patients and family caregivers. Participants perceived that having TB means persons were in a condition that approached death and only had a short life. These participants had experiences of seeing someone die because of TB. As a TB patient, P3 stated the meaning of TB:

> Having TB means only having a short life …
> when I was in the education room, there was someone who died because of TB. I was afraid to be like that, and it made me cry (P3)

Similarly, family caregivers also shared the same dreadful meaning of TB. FC.4 mentioned that:

> Last time, there was my neighbor who got TB in here, and she died … I still did not know anything about TB. His wife was the first person who got TB. Then, she died. Her husband also got TB, and he also died. (FC4)

Severe disease: TB patients described TB as severe disease. Having TB leads to the separation of utensils. Those who got TB would have several physical problems such as weakness, a persistent cough, and isolation by others. P3 stated:

> “I thought that TB is a severe disease, the worst disease, and it makes me feel helpless … I felt tired even when I did not do anything, I was sweating. My condition of TB disease was severe, would I lay down, and not do anything?” (P3)

Family caregivers also perceived TB as a severe disease. Their perception of TB as severe disease was related to the long-term treatment of TB. The FC.1 as the family caregiver who took care of mother in-law with TB disease expressed their meaning of TB:

> TB seems a severe disease, it should be treated fully for 6 months. If it (treatment) does not work effectively it will lead her to be re-treated. (FC.1)
Dangerous Disease: Both TB patients and family caregivers reported their meaning of TB as a dangerous disease. Knowledge about how TB is transmitted to others and that TB patients should be isolated led them to think that TB is dangerous.

TB is known as a disease that … dangerous, if everybody knows it, they will avoid us, (we) will be isolated … People who know someone has got TB, they will avoid him/her. If they do not know, they will not avoid him/her. (P4)

Another family caregiver described when knowing about the TB diagnosis of her mother in-law’s sister, she received information about TB transmission. This information made the family caregiver think that TB was dangerous.

The doctor said “You should take care of them (family member). Your mother in-law’s sister should use a mask, because TB can transmit through respiratory or chat, and also do not spit carelessly … It (TB disease) is dangerous and can be transmitted … this illness is dangerous and can transmit.” (FC2)

TB stigma experiences: The participants’ experiences of TB stigma can be classified into two categories of feeling shame and social exclusion.

Feeling shame: The symptoms of TB among adults is commonly related to loss of body weight and a persistent cough. Therefore, all TB participants felt shame because of the changes in their physical appearance. TB participants stated that others could notice their TB disease from their physical symptoms. These participants explained that others perceived TB as a disgusting and scary disease because TB can be transmitted to others, which later on they will be blamed as the cause of transmission.

I felt shame because my cough often appears. I was worried my neighbors will know of my TB and they were afraid of being infected with TB because of me (P1)

Social Exclusion: Social exclusion was experienced by both TB patients and family caregivers. Other people began to avoid and exclude them from their social life since the others knew about the TB diagnosis within the participants. For instance, one TB participant described how their neighbors behaved to her.

[after the neighbors knew that I got TB] some of my neighbors avoided me … they said “she (participant) has TBC, it is a transmitted disease. Do not come close to her” … they did not want to talk with me (P2)

Moreover, one family caregiver also reported that the experiences of social exclusion also had impacted on their children. Exclusion from their relative was experienced by FC.4.

She (participant’s relative) did not allow her son to play with my daughter, and did not allow him to come to our home … Maybe she was worry that TB in my home can be transmitted to her son (FC.4)

Strategies to cope with stigma: Four strategies to cope with TB stigma among the participants were identified, consisting of isolating themselves, keeping a secrecy of TB, ignoring, and convincing others.

Isolating themselves: Due to the feeling of shame, most TB patients preferred to isolate themselves from their community. They mainly stayed at home, in order to prevent themselves from and avoid social life.

I felt shame and also afraid, they may feel afraid to be close to me because I will infect them. Thus, I never went out of my home … because I was afraid they will know my TB (P1)

Keeping secrecy of TB: To avoid the exclusion from others, the participants preferred to hide the TB disease and keep it a secret. When their neighbors saw TB patients wearing masks or the caregiver with TB patients often going back and forth to the health services, they would ask about their disease. Then, the participants dissimulated their disease such as a lung disease or a common cough and/or to avoid dust.

When I used mask, there was my neighbors who asked me, “what happened to you, why do you use a mask?” then I said, “it’s only to avoid the dust” … So, I rarely went out, I often stayed in here (inside home) (P4)

Another family caregiver also expressed the same thing, which concealed the TB disease.

We did not want everybody to know about its disease (TB), both in my residence and my husband’s office (FC.3)
**Ignoring:** Some participants used an ignoring as a strategy to manage TB stigma. They also did not want to hear or see the reactions of others to them. One TB patient shared her story about coping with TB stigma.

I did not listen to them (neighbors), didn’t care it because I want to be cured. Let them talk about whatever they would like to say (about my disease) (P2)

Similarly, the family caregiver also ignored what other people thought about her family with TB. When the family caregiver went to hospital to pick up her husband’s medicines, her neighbor mocked her family.

When we went to the hospital. My neighbor who saw us, asked us “where are you going?” I said, “we are going to the hospital”, and they said “commonly, people are going together for a walk or for picnic, while you are going to hospital.” ... I don’t care... they were not the persons who paid our treatment, they were not the persons who helped us. (FC.4)

**Convincing others:** This strategy was only reported by the family caregivers. Most of them described how to handle others’ negative views about TB within their families. They attempted to explain to others that their TB family member was undergoing treatment. Through their explanation, they hoped their neighbors would not worry with TB transmission.

They (neighbors) asked about my husband, my children and TB disease among us. I explained to them, how TB is transmitted to others, TB cannot be transmitted if only touching ... some people understand ... In here (their community), they think that TB can be transmitted only like this (touching hand) (FC.2)

**Discussion**

Participants perceived TB as a dreadful, severe, and dangerous disease. These meanings of TB were related to the understanding about the curability of TB, TB treatment, and the risk of TB transmission to others. This finding was similar with the previous studies that reported several perceptions of TB disease including as a dangerous, infectious, incurable disease^{1,4}, and scary disease related to approach death^{1}.

The participants’ perceptions of TB contributed to their experience of stigma, which was feeling shame to be noticed as a cause of transmission. Its feeling shame was caused by poor awareness and misperceptions about TB^{8}. Other previous studies also described people with TB had a fear of shame due to the TB disease and its transmission, and they also suffered because of TB disease^{8–11} particularly in resource limited settings, where rates of tuberculosis are high. The objective of this study is to assess health-seeking behaviour and health care experiences among persons with pulmonary tuberculosis, and identify the reasons patients might not complete their treatment. We performed qualitative one-on-one in-depth interviews with pulmonary tuberculosis patients in nine health facilities in rural western Kenya. Thirty-one patients, 18 women and 13 men, participated in the study. All reside in an area of western Kenya with a Health and Demographic Surveillance System (HDSS). Social exclusion was not only experienced by most TB patients, but also by some family caregivers. One family caregiver also mentioned the relative and neighbors who excluded their children. Stigma among TB patients could extend to other family members^{7}. Avoiding other people was contributed by other people perceptions about TB, which was as a disgusting and scary disease because it can infect them. This finding was congruent with the previous studies that reported the consequences of stigma among people with TB which included isolation and social exclusion from others^{1,2,12}.

The participants applied several strategies to cope with their stigma experienced. These strategies reflect the Indonesian value of family closeness, which is concerned with the loyalty of other family members’ lives to protect and help each other^{1}. Concealing TB disease by isolating themselves and keeping the secrecy of TB, helped them to avoid the feeling of shame and of being stigmatized. The previous studies also described hiding a TB diagnosis, keeping TB as a secret, and separating themselves were strategies to deal with discrimination from others^{1,3,10,12}. However, TB patients have to receive treatment in secret this may lead to a disruption in routine treatment\(^1\). Ignoring was reported as a strategy to cope with stigma. The ignoring and keeping their live moved were useful to mitigate stigma among patients who have completed TB treatment^{6}. The family caregiver tried to educate and explain to their neighbors and relatives about the likelihood of their family member who had TB transmitting it to them. This strategy was similar with the previous study that reported educating others help to reduce any misunderstandings^{13}.
**Conclusion:** This study identified three TB meanings, including as a dreadful, a severe, and a dangerous disease, which contributed to the experience of stigma. Shame and social exclusion were common experienced by TB patients and family caregivers. TB patients and family caregivers described the coping strategies to cope with stigma, including isolating themselves, keeping secrecy of TB, ignoring, and convincing others. The findings are of benefit to nurses and other health care providers to develop stigma reduction interventions for patients and family caregivers.

**Conflict of Interest:** There is no conflicts of interest associated with this publication.

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**Ethical Clearance:** This study was approved by the Ethical Committee of Prince of Songkla University Thailand with No. MOE 0521.1.05/2580.

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Infections Risks of Medical Buildings: Perspectives Investigation in a Case-study

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ABSTRACT

Each medical building has a significant role in presenting high quality of health services for public, so, attention to medical risks, such as, Hospital Acquired Infections (HAIs) is essential. therefore, this article attempts to describe the HAIs situations of a medical building in the Middle East and mention some medical building’s factors which have role in increasing the rate of HAIs risks. The unstructured interviews with experts of the case were conducted. Based on the results, the medical building involves about HAIs like the other medical buildings and some factors, such as, poor personal hygiene can increase the rate of HAIs in the case. Any document like this article can be a useful evidence to nominate health risks, like HAI, in different medical buildings and remark issues which are relevant to decrease the rate of health risks in the other medical buildings. It can help to improve the quality of the health services and can give new ideas to the researchers and practitioners to find solutions in various fields to decline the risks of different medical errors, specially HAIs.

Keywords: Infection, Medical building, Case study.

Introduction

In each country, health and setting health care services are one of the significant issues at the primary level of each society strategies (¹). Medical building, likewise it is known as health-care facilities or similarly can be acknowledged as hospitals, are among infrastructures of public health. The goals of each medical buildings can be attained by some doings, such as, patient care, personnel-health education, health related study and health promotion (²). Despite the improvements and innovations in health and medical sciences and health management, health risks are still problems of the medical buildings. Hospital-Acquired-Infection (HAI) is one of those risks that require special attention. HAI or medical buildings cross-infection is a kind of infection wherein a patient becomes infected along his/her hospitalization or within a few days of his/her discharge (³-⁷). The history of HAIs, as one of the main problems and one of the 10 leading causes of death in medical buildings, is back to the many years ago (⁸). HAI is not limited to a special geographical area; it is a universal challenge (¹¹). HAIs extend duration of hospitality, lead to a long-term disability of the patients, increase the patients’ resistance to antimicrobials, can cause mortality, rise the financial load of medical buildings and extra costs for the patients and their families (⁹,¹⁰).

Methodology

For this research, a qualitative research method is used, through interview. In this study, viewpoints of the experts of a medical building (hospital) in the Middle East, as a case study, are presented in field of HAI. Additionally, some factors which can increase the rate of these infections risk have been discussed. Twenty therapeutic and diagnostic departments with 400 beds and 1,400 medical staff are belonging to this medical building. Though to some considerations, this article kept the name of the case medical building confidential.
The goal population for this research is the experts who are related to assessment of HAI risks in the medical building. The researcher, for this study, conducted interviews with experts of the medical building, in 2018. The face to face interviews were conducted. The researcher used unstructured interview format for this study. List of the medical building’s experts with their characteristics is tabulated in Table 1. The expertise of the selected list is validated in a session of discussion with the manager of the selected medical building.

Table 1: List of experts related to assessing HAI risks in the medical building case of Middle East

<table>
<thead>
<tr>
<th>Expert Code</th>
<th>Position</th>
<th>Duration of professional experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>N1</td>
<td>Infectious disease specialist</td>
<td>7 years</td>
</tr>
<tr>
<td>N2</td>
<td>Medical building infection control coordinator</td>
<td>8 years</td>
</tr>
<tr>
<td>N3</td>
<td>Infectious disease specialist</td>
<td>5 years</td>
</tr>
<tr>
<td>N4</td>
<td>Infectious disease specialist</td>
<td>3 years</td>
</tr>
<tr>
<td>N5</td>
<td>Medical building nursing head</td>
<td>11 years</td>
</tr>
<tr>
<td>N6</td>
<td>Medical building quality improvement committee coordinator</td>
<td>7 years</td>
</tr>
<tr>
<td>N7</td>
<td>Environment health coordinator</td>
<td>6 years</td>
</tr>
</tbody>
</table>

**Finding and Discussion**

About the situation of the HAIs in the medical building, based on the viewpoints of all experts, HAIs are one of the challenging issue of the medical building. Referring to expert N2, finding the origin of infections of patients is expensive and time-consuming. While in many developed countries the patient after being discharged is followed by a nursing force to complete infection treatment. Lack of this system leads to incomplete treatment and transmission of infection. In some cases, a patient attends the medical building with an intense infection, which causes high expenses to both the patient and the medical building and increases the death rate. This is the case with the medical building where the infection origin is not assessed, with the excuse of insufficient manpower in infection control department.

With respect to the question that how distant the medical building from ideal conditions to control infection is, the experts’ answer is that the main problem of the medical building is its construction; the departments are not in standard conditions and no precision is observed as to infection transmission possibility in their construction. According to expert N6, because of the type of medical building’s services, there exists the necessity to run several surgeries in the abdominal area, in specific, and many patients suffer breakages and brain hemorrhage; hence, HAI is inevitable.

If the infection test is positive, in case the patient is brought to the medical building recently, it is supposed the patient had the infection before. This holds true for urology patients with a urine infection and internal department patients with blood infection which do not get recorded. Some patients attend the medical building from other therapeutic centers where they get an infection during a surgery process and the infection does not get recorded. Only the medical building patients get recorded if their infection is proved after 24–48 h. But the origin and the reason for this infection is not assessed.

According to experts N1, N2, N3, N4 and N7, the medical building is distant from global standards as to HAI control. For instance, despite the fact that every bed needs one nurse to provide services and control infection, in the medical building one nurse serves 3 beds; hence, the treatment quality is reduced. Due to the heavy workload of the nurse may not observe hygiene conditions, leading to an increase in infection. With respect to the question that is emergency condition announced due to high-risk infection reported in the medical building, the experts expressed their answers. According to expert N6, a case of high meningitis in ICU departments and another of pneumonia caused by ventilators in the medical building were reported, where immediate actions to control were taken. Expert N1 states that in a case the encephalitis rabies (100% fatal) of a patient was to spread in the medical building and increase the death rate, while a crisis condition was announced to control the infection.

According to experts N1, N2, N5, N6 and N7 future strategies of the medical building to control and reduce
HAI constitute increasing supervision and observing personal hygiene by physicians and staff together with enhancing working conscience among personnel. By assessing the expert’s opinion, it is revealed the awareness of the medical groups for infection control within the medical building departments, where attempts are made to control and prevent the outbreak of HAI through applying disinfectants, personnel hygiene, prescribing antibiotics, etc. Despite the made advances, HAI are still one of the problems in the medical building.

About some factors of the medical building which can increase the risks of HAI, referring to viewpoint of experts is the medical staff, physicians and medical students of every department who do not observe personal hygiene. According to experts N1, N3 and N4, infection is transmitted due to the training and research purposes of this medical building. The students are moving among the departments without changing their medical gown or observing hand hygiene and other items related to infection control. They enter departments like hematology/oncology, where sensitive patients with the very weak immune system are hospitalized and do not wear a medical gown, change gloves, wash their hands and observe other health items leading to an increase in infection transmission risk. In addition, the medical building physicians move among departments to visit patients and do not observe hand hygiene. For instance, they move from the infectious ICU department to other departments and increase the infection transmission possibility. This holds true for department technicians who move among departments like physiology and radiology. In addition to contact transmission, there exists the airborne infection transmission type of tuberculosis, in specific, based on viewpoint of experts N1 and N6.

Also, transferring of patients among departments can be the other reason of HAI transmission in the medical building. Referring on experts N1, N2 and N3, due to long hospitalization, open surgeries and the necessity to undergo cerebrospinal fluid cultivation in order to obtain negative infection report, neurology patients have to move among various departments; hence, the possibility of infection transmission. According to experts N1, N2 and N6, at emergency department where hospitalization time is maximum 6 h and then the patients are discharged or transferred into a department corresponding to their diseases, there exists the possibility to transmit the infection to other departments. Inappropriate venipuncture at emergency department is considered as an infection resource which may transmit into other departments. Experts N1 and N2 state that a patient in the venipuncture discovers to have an infection after undergoing a surgery and being discharged. After running assessments, it is revealed that this patient got the infection during the surgery. In order to receive necessary services, patients may have to return to a previous department and based on the intensity of infection, they may need surgeries and therapeutic services of other departments, which in turn leads to an increase in infection transmission possibility.

Referring to all experts, there exists the possibility of infection transmission among departments. ICU department in the venipuncture is an example. According to experts N1, N2, N3 and N4, ICU department constitute the highest infection rate and is considered the infection resource. This is due to the long hospitalization of patients and the weakening of their immune system due to antibiotics consumption. These patients are prone to bedsore due to long hospitalization which is considered as an infection resource. Based on viewpoint of expert N1, in a case, a patient in ICU department in the venipuncture was suffering difficile diarrhea and another patient in internal department got diarrhea with the positive difficile test. This is an example that difficile infection is transmitted from ICU to the internal department, both patients had a same physician.

According to expert N6, in cases the hospitalization time of patients increases due to HAI, everything related to the patient is affected, expenses, in specific. This is due to the demand for medication, antibiotics in specific, infection consultation and infection visit and in some cases the necessity to undergo surgery, which depends on the infection type. The simpler the infection, the lower the expenses and manpower. In case of acute infections, a patient with osteomyelitis (an infection of the bone) in the medical building underwent 11 surgeries and did not recover. This is an instance of high expenses as to surgery, medication, equipment, and personnel for both the patient and the medical building because of HAI. If necessary actions are taken to control infection, the suffering and expenses caused by infection may reduce to a considerable extent. According to the expert N6, the type of diseases and the physical structure of the medical building together with the arrangement of departments are contributive in generating and transmitting infection.
Conclusion

To conclude, it can be recognized that the prevention of HAIs is an essential factor for every medical building and government of countries, (2,12). Based on the information which achieved through interview sessions with the experts of the medical building, it can be found that the strategies and standards which are relevant to control HAI are not implemented in a sufficient way in that medical building. This issue can be because of some factors, for instance, lack of knowledge of personnel in field of HAI control strategies and it’s standards; poor personal hygiene among physicians, nurses, medical students, medical staffs; lack of suitable constructor layout of medical buildings departments; transferring of patients, medical students, physicians, medical staff and technicians among departments and etc. Therefore, if the management and medical group of the medical building pay attention to these factors and try to decrease errors in them, it can help to decline the rate of HAIs in the medical building. These activities can improve the quality health services and reduce the rate of mortality, morbidity and financial load of HAIs in the medical building. Also, referring to the factors which mentioned in above sentences, researchers can work on fields of personal hygiene, medical building’s layout as an example of research fields to control and/or prevention risks of HAIs in the medical buildings around the world.

Conflict of Interest: Nil

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Effect Pregnant and Non-Pregnant on Haematological and Biochemical Parameters of Qatari Goats in Iraq

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ABSTRACT

This study was conducted in one of the animal farm, province of Baghdad, January 2019. This experiment included 10 (5 pregnant and 5 non-pregnant), Qatari goats. The blood samples for hematological, biochemical, plasma minerals and hormones assay. Excluding data for MCHC, lymphocyte and Eosinophil in pregnant goats showed higher significant differences (P≤0.05). All other hematological parameters showed higher significant differences (P≤0.05) in non-pregnant. Glucose, albumin ALT, AST, Alkalina Ph, Cholesterol, Triglycerides, HDL and VLDL exhibited higher significant different (P≤0.05) pregnant females goats. Urea was showed increased significant different (P≤0.05) non-pregnant female goats. Calcium and magnesium were increased significantly different (P≤0.05) higher in pregnant. Highest (P<0.05) level of progesterone and testosterone concentration was recorded in pregnant, and lowest in non-pregnant. Estradiol-17β concentration was significantly (P≤0.05) increased in the non-pregnant group as compared with pregnant group. The rest of the parameters were showed no significant different (P≤0.05) between pregnant and non-pregnant. In conclusion, effects of pregnant and non-pregnant were noticed on some hematological, biochemical, minerals parameters as well as levels hormones of Qatari goats in Iraq.

Keywords: Pregnant, non-pregnant, haematological, biochemical parameters, minerals, hormones, Qatari goats

Introduction

Goats are animals with basic demands. For a considerable production just a minimal investment is needed. Goats are very adaptable species. They use pastures and plant leaves of the many hilly and mountainous areas in our country(4).

Hematological and biochemical tests are important tools for evaluation of physiological and health status of farm animals and almost indispensable in organic farming, where permitted veterinary interventions are strictly regulated and limited in scope. Hematological and biochemical analyses in farm animals have been extensively discussed as an essential part of clinical examination often pointing to a specific differential diagnosis or suggesting a prognosis (2).

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It is well recognized that hematological and biochemical parameters in healthy goats show several variations in relation to breed, age, reproductive status, management conditions, starvation, environmental factors, stress, transportation and sexual maturity(3). These differences have underscored the need to establish appropriate physiological baseline values for livestock which could be used in the realistic evaluation of the management practice, nutrition and diagnosis of health condition as well as in determining the physiological status of animals(4). This research was conducted to compare between hematological, biochemical parameters and hormones on pregnant and non-pregnant of Qatari goats.

Materials and Method

This study was conducted in one of the animal farm, province of Baghdad, January 2019. This experiment included 10 (5 pregnant and 5 non-pregnant), Qatari goats of 2-3 years old and average body weight of 8-10 kg. Females were naturally mated with fertile male. Blood
samples were collected via heparinized vacutainer tubes (5 ml). The plasma were harvested following centrifugation of the samples (3000 RPM for 15 minutes) and stored under -20°C until assay. The blood samples were assessed for hematological parameters which includes. Packed cell volume (PCV) by microhematocrit, hemoglobin (Hb) by acid hematin (Sahl’s haemoglobinometer) method. White blood cells (WBC’s) and red blood cells (RBC’s) were counted according to(5). Erythrocyte sedimentation rate (ESR) was determined by Westeregen Sedimentation tubes. Mean corpuscular volume (MCV), mean corpuscular hemoglobin (MCH), and mean corpuscular hemoglobin concentration (MCHC) were calculated using the formula reported by(6). Differential leukocytes count (DLC) (%) were estimated in thin May-Grünwald-Giemsa stained blood smears(7). Biochemical parameters were also estimated includes; Glucose, total proteins, Albumin, Urea, Uric acid, creatinine, Alanine Aminotransferase Activity (ALT), Aspartate Aminotransferase Activity (AST), Alkaline phosphatase activity, Cholesterol, Triglycerides, High density lipoproteins (HDL), Low density lipoproteins (LDL) and Very low density lipoproteins (VLDL) were quantitatively determined using the kit provided by Agappe Diagnostice Company, Switzerland and Biomerieux Company, France. Globulin was calculated by taking the difference between total protein and albumin. The concentrations of some minerals (calcium, phosphorous, sodium and magnesium) were analyzed by spectrophotometrically. Radioimmunoassay (RIA) used to measure the plasma progesterone concentration (ng/ml), plasma estradiol-17β (pg/ml) and plasma Testosterone (ng/ml). Kits provided by Immunotech, France.

The pregnancy were detected by ultrasonography.

Statistical analysis were performed using General Linear Model (GLM) procedure in the SAS program(8). Differences among means were compared using the Duncan multiple range test(9).

Results and Discussion

The results of PCV in the groups showed significant difference (P≤0.05) (table 1). It is higher in Non-pregnant and decreased in pregnant. Blood volume expands in parallel with increases in body weight during pregnancy in goats(10). The reduction in PCV levels at the end of gestation, represents “Pregnant Physiological anemia” a clinical condition described in various species, its importance as it lower the blood viscosity, thereby greatly expansion the blood flow in the small blood vessels(11). RBC’s showed increase in number (P≤0.05) in non-pregnant and significantly decrease in pregnant. Hemodilution is effect on increase in plasma volume at the last stage of gestation, improve the blood flow through placental blood vessels in late pregnancy to increase the transfer of nutrients and oxygen to the fetus(12). MCV, MCH and MCHC significant difference (P≤0.05) in the studied groups. It were lesser in non-pregnant, and significantly (P≤0.05) increased in pregnant. The increase observed in MCV MCH and MCHC could prevent a marked lower in total oxygen caring capacity of circulating blood(13). The highest (P≤0.05) count of WBCs was recorded in non-pregnant, and the lowest in pregnant. The WBC count increase in lactating females may be attributed to increase Serum Lactic Dehydrogenase (LDH) in lactating females which may produce leukocytosis(14). A trend of increased neutrophil in non-pregnant, and significantly decrease in pregnant. Increased neutrophils of lactating females compared to other normal groups could be due to suspect that lactating females were more susceptible to systemic and local infection through the udder and also, or due to increased serum LDH levels(15). Moreover, high percentage of lymphocyte (p≤0.05) was observed in pregnant, While low in non-pregnant. The percentage of Eosinophil was higher (p≤0.05) in pregnant, and decreased in non-pregnant. Basophils were significantly (p≤0.05) increased in non-pregnant and lower pregnant. Leukocyte count has been gradually increased with advancement of lactation. This may indicate lesser migration of leukocytes from blood into milk for phagocytosis and mammary gland defense against pathogens in mid and late stage of lactation as compared to early stage which can be correlated with gradual decline in milk yield with progress of lactation(16). Effects of different groups on Hb, ESR and Monocyte were non-significant. Significant differences were noticed in glucose concentration over the study groups. Higher (P≤0.05) concentrations were observed in pregnant, and lesser in non-pregnant. Highest in glucose immobilized by the use of adrenergic alpha-2 anesthetics, which inhibit the release of insulin and increase glucose output from the liver(17). Insulin responsiveness was reduced during late pregnancy. During the pregnancy the output of adrenocorticotropic hormones, glucocorticoids and adrenaline for breakdown of liver glycogen is increased(18). Plasma albumin was significantly increased (P≤0.05) in pregnant as compared with non-pregnant. Blood albumin was directed to foetal growth tissue, while globulin may be used mainly
for milk synthesis(19, 20). Plasma urea was significantly greater (P≤0.05) in non-pregnant, and lesser in pregnant. Rodriguez et al. (21) found that glomerular filtration and urea clearance were significantly reduced during late pregnancy. The effects of different groups on ALT, AST and Alkalina Ph. activity of the female goats were significant (P≤0.05). It was lesser in non-pregnant and increased significantly (P≤0.05) in pregnant. Increased intracellular levels of ALT and AST during pregnancy are disagreed with its value in the plasma(22). Erythropoietic activity since young blood cells are characterized by increased activities of enzymes(23), and the intracellular dehydration induced by increased extracellular fluid Na+ concentration(20). The alkaline phosphatase normally produced by syncytiotrophoblast cells of placenta and may be involved in migration of primordial germ cell in developing fetus(24). The Cholesterol, Triglycerides, HDL and VLDL activity were decreased in non-pregnant, and significantly increased (P≤0.05) in pregnant. Cholesterol are plays an important metabolic role as precursor of steroid hormones, bile acids, and some vitamins(25). Triglycerides are the storage form of lipids and provide an energy source to the ovum during its maturation within the Graafian follicle. All through pregnancy and lactation periods the number of total insulin receptors (TIR) decreases and insulin stimulation of lipogenesis becomes in-efficient(26). The increasing profile observed in triglycerides, HDL and vLDL levels in pregnant related to the excessive intake of glucose to maintain body reserves for the supply of fetal energy requirements(27). Other biochemical parameters Total Protein, Globulin, Uric acid, Creatinine and LDL did not significantly different between pregnant and non-pregnant female goats (Table 1). Calcium and magnesium concentrations were significantly (P≤0.05) higher in pregnant and lower in non-pregnant. The requirements of Ca for pregnancy and lactation are higher than those for maintenance, foetus for skeletal formation and for milk formation which increases the quantity of Ca required at tissue level and thereby increase Ca absorption from the gastro-intestinal tract(28). The variation in magnesium concentrations between pregnant and non-pregnant might be due to the property of magnesium to remain increased in the cells, the highest concentration is in the liver and skeletal muscles(29). There are no significant effect of pregnancy and non-pregnancy on phosphorous and sodium (Table 1). Highest (P<0.05) level of progesterone concentration was recorded in pregnant, and lowest in non-pregnant (Table 1). Cholesterol plays a role in biosynthesized progesterone hormone by the corpus luteum and placenta. It intervenes also in metabolism of corticosteroids. Physiological effect of progesterone is amplified in the presence of estrogens, notably in the development of udder, and sodium metabolism by decreasing natriuresis(25). Significant differences were noticed in plasma estradiol-17β concentrations over the study groups. Estradiol-17β concentration was significantly (P≤0.05) increased in the non-pregnant group as compared with pregnant group. Estradiol was regulating estrus cycle, development of female genital tissues and the udder. It is also involved in ovulation, preparation of implantation of oocytes in the uterus, pregnancy, and parturition in combination with progesterone(25). In contrast, greater (P<0.05) testosterone concentration was observed in pregnant than in non-pregnant female goats. The analogous increase in follicle size and testosterone level suggested that hormone is secreted by the follicle as for other domestic species(25).

Table 1: Comparison of hematological, biochemical, minerals and hormones parameters in pregnant and non-pregnant groups

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Groups</th>
<th>Level of Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pregnant</td>
<td>Non-pregnant</td>
</tr>
<tr>
<td>P.C.V (%)</td>
<td>26.80 ± 1.68 B</td>
<td>27.80 ± 3.86 A</td>
</tr>
<tr>
<td>Hb (g/dl)</td>
<td>8.67 ± 0.59 A</td>
<td>8.85 ± 1.25 A</td>
</tr>
<tr>
<td>RBC’s (×10^6/mm³)</td>
<td>11.85 ± 1.26 B</td>
<td>12.38 ± 2.25 A</td>
</tr>
<tr>
<td>ESR (mm/1 hr)</td>
<td>4.21 ± 0.37 A</td>
<td>4.12 ± 0.96 A</td>
</tr>
<tr>
<td>MCV (Fl)</td>
<td>23.96 ± 0.85 B</td>
<td>22.72 ± 2.13 A</td>
</tr>
<tr>
<td>MCH (pg)</td>
<td>8.42 ± 0.37 A</td>
<td>7.52 ± 0.62 A</td>
</tr>
<tr>
<td>MCHC (%)</td>
<td>32.32 ± 0.81 A</td>
<td>31.75 ± 0.50 B</td>
</tr>
<tr>
<td>WBC’s (×10³/mm³)</td>
<td>12.12 ± 0.90 B</td>
<td>14.68 ± 2.76 A</td>
</tr>
<tr>
<td>Neutrophil (%)</td>
<td>37.80 ± 2.33 B</td>
<td>38.80 ± 2.95 A</td>
</tr>
</tbody>
</table>
Conted…

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Pregnant (mg/dl)</th>
<th>Non-Pregnant (mg/dl)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lymphocyte (%)</td>
<td>49.40 ± 4.62 A</td>
<td>48.40 ± 3.96 B</td>
<td>*</td>
</tr>
<tr>
<td>Monocyte (%)</td>
<td>5.0 ± 0.54 A</td>
<td>5.20 ± 0.58 A</td>
<td>NS</td>
</tr>
<tr>
<td>Eosinophil (%)</td>
<td>8.0 ± 2.30 A</td>
<td>7.40 ± 1.50 B</td>
<td>*</td>
</tr>
<tr>
<td>Basophil (%)</td>
<td>00 ± 0 B</td>
<td>0.20 ± 0.20 A</td>
<td>*</td>
</tr>
<tr>
<td>Glucose (mg/dl)</td>
<td>49.47 ± 2.64 A</td>
<td>43.42 ± 3.36 B</td>
<td>*</td>
</tr>
<tr>
<td>Total Protein (g/dl)</td>
<td>6.55 ± 0.16 A</td>
<td>6.13 ± 0.13 A</td>
<td>NS</td>
</tr>
<tr>
<td>Albumin (g/dl)</td>
<td>3.43 ± 0.09 A</td>
<td>2.97 ± 0.11 B</td>
<td>*</td>
</tr>
<tr>
<td>Globulin (g/dl)</td>
<td>3.11 ± 0.13 A</td>
<td>3.16 ± 0.21 A</td>
<td>NS</td>
</tr>
<tr>
<td>Urea (mg/dl)</td>
<td>33.55 ± 0.82 B</td>
<td>34.79 ± 0.94 A</td>
<td>*</td>
</tr>
<tr>
<td>Uric acid (μmol/dl)</td>
<td>2.45 ± 0.01 A</td>
<td>2.38 ± 0.02 A</td>
<td>NS</td>
</tr>
<tr>
<td>Creatinine (mg/dl)</td>
<td>0.86 ± 0.07 A</td>
<td>0.94 ± 0.08 A</td>
<td>NS</td>
</tr>
<tr>
<td>ALT (U/L)</td>
<td>15.58 ± 0.22 A</td>
<td>13.36 ± 0.51 B</td>
<td>*</td>
</tr>
<tr>
<td>AST (U/L)</td>
<td>59.78 ± 1.34 A</td>
<td>56.30 ± 1.36 B</td>
<td>*</td>
</tr>
<tr>
<td>Alkalina Ph.</td>
<td>91.39 ± 8.10 A</td>
<td>83.65 ± 16.67 B</td>
<td>*</td>
</tr>
<tr>
<td>Cholesterol (mg/dl)</td>
<td>100.70 ± 6.23 A</td>
<td>93.73 ± 1.71 B</td>
<td>*</td>
</tr>
<tr>
<td>Triglycerides (mg/dl)</td>
<td>50.18 ± 3.08 A</td>
<td>46.95 ± 1.55 B</td>
<td>*</td>
</tr>
<tr>
<td>HDL (mg/dl)</td>
<td>46.93 ± 3.88 A</td>
<td>39.89 ± 1.33 B</td>
<td>*</td>
</tr>
<tr>
<td>LDL (mg/dl)</td>
<td>44.73 ± 3.91 A</td>
<td>44.45 ± 2.94 A</td>
<td>NS</td>
</tr>
<tr>
<td>VLDL (mg/dl)</td>
<td>10.03 ± 0.61 A</td>
<td>9.38 ± 0.31 B</td>
<td>*</td>
</tr>
<tr>
<td>Calcium (mmol/l)</td>
<td>9.36 ± 0.22 A</td>
<td>8.88 ± 0.69 B</td>
<td>*</td>
</tr>
<tr>
<td>Phosphorous (mmol/l)</td>
<td>5.74 ± 0.56 A</td>
<td>5.80 ± 0.51 A</td>
<td>NS</td>
</tr>
<tr>
<td>Sodium (mmol/l)</td>
<td>3.75 ± 0.15 A</td>
<td>3.90 ± 0.16 A</td>
<td>NS</td>
</tr>
<tr>
<td>Magnesium (mmol/l)</td>
<td>3.0 ± 0.04 A</td>
<td>2.94 ± 0.01 B</td>
<td>*</td>
</tr>
<tr>
<td>Progesterone (ng/ml)</td>
<td>23.98 ± 1.03 A</td>
<td>7.12 ± 4.07 B</td>
<td>*</td>
</tr>
<tr>
<td>Estradiol-17β (pg/ml)</td>
<td>186.82 ± 36.84 B</td>
<td>189.82 ± 52.81 A</td>
<td>*</td>
</tr>
<tr>
<td>Testosterone (ng/ml)</td>
<td>1.38 ± 0.22 A</td>
<td>0.97 ± 0.07 B</td>
<td>*</td>
</tr>
</tbody>
</table>

* = P≤0.05, NS= Non-significant.

**Conclusion**

Obvious effects of pregnant and non-pregnant were investigated on hematological, biochemical, and minerals parameters as well as levels hormones of Qatari goats.

**Conflict of Interest:** None

**Source of Funding:** Self

**Ethical Clearance:** Not required.

**REFERENCES**


The Role of Preoperative Subconjunctival Bevacizumab on Recurrence Rate of Primary Pterygium

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ABSTRACT

To assess the value of one week preoperative subconjunctival injection of bevacizumab on the surgical management of primary pterygia and also to evaluate the rate of recurrence after excision. This is experimental clinical trial included 110 eyes of 110 patients (59 males and 51 females) with a mean age of (49.62 ± 16.54 years), range (27-68) had primary pterygia. The dose of bevacizumab was a 1.25 mg (0.05 ml) one week before pterygium surgery. Surgery was done using excision with direct conjunctival suturing technique. All pterygia were followed up for 6 months.

Keywords: Bevacizumab, Pterygium, Recurrence

Introduction

Pterygium is an abnormal triangular fibrovascular growth that violates the cornea [1, 2]. It appears in the interpalpebral area, nasal side is the most common area of occurrence and frequently bilateral [1-3]. For long years, practitioners have known pterygia [2, 4-6], however the underlying pathology of pterygia is still not completely recognized [7, 8].

Several studies have involved circumferential influences [7-10], like ultraviolet light that the damaging effect of ultraviolet radiations can lead to decrease the number of corneal limbal stem cells, i.e. cause limbal stem cells insufficiency and stimulate tissue growth factors productions such as cell proliferation and angiogenesis. It is found that pterygia have many histopathological hallmarks of chronic inflammatory processes, which demonstrate lymphocytic infiltration consisting mainly of T lymphocytes, then mast cells and plasma cells. Mast cells have an essential role in chronic inflammatory processes that accompanied with angiogenesis and fibrosis. The increase of new blood vessels formation, number of fibroblasts, aggregations of degenerative collagen fibers, and the existence of abnormal elastic fibers also prove the presence of chronic inflammatory processes. New advanced studies have also founded proof of genetic ingredients implication, such as growth factors, antiapoptotic mechanisms, immunological factors, some cytokines, viral infections, and extracellular matrix remodeling in the underlying pathology of the pterygia [10-12].

Several studies have founded that growth factors like vascular endothelial growth factor (VEGF) have been discovered in pterygia, more advanced immunohistochemistry studies also have founded that the amount of VEGF are more in pterygium than in healthy conjunctiva and as previously mentioned that underlying pathology of pterygia is still not completely recognized but their growth genesis and development are found to rely on mainly on abnormal new blood vessels formation [13-17]. It has been assumed that the occurrence of pterygia depend on alteration in angiogenic inhibitor to stimulator ratio as described in Jin et al[15], which founded that pterygium contains substantially reduced levels of angiogenic inhibitor factor, and increased vascular endothelial growth factor levels.

The presence of high level of vascular endothelial growth factor in pterygium may give the anti-VEGF agents

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an important role in the regression of new blood vessels and also in the reduction of the size of pterygium growth.

Bevacizumab is a recombinant humanized, monoclonal vascular endothelial growth factor directed antibody. It links to and counteracts the biological action of all kinds of humanized vascular endothelial growth factor, and this blocks the interactions with its receptors on endothelial cells surface [17]. Bevacizumab was the first U.S. Food and Drug Administration-approved antiangiogenic drug for first-line treatment of metastatic colorectal cancer. In clinical practice, off-label use of bevacizumab has been a promising therapeutic option for treatment of choroidal neovascularization of age-related macular degeneration (ARMD), and newly in the treatment of diabetic macular edema. Several clinical studies have shown that intravitreal injection of bevacizumab is well tolerated and associated with visual acuity improvement, reduction in central retinal thickness, and reduction in retinal angiographic leakage [18-20].

The recurrence rate of pterygium surgeries was evaluated to be about 40% to 75% in the simple surgical removal, about 3-5% in the free flap techniques [21], and about 30% recurred after pterygium excision with complete suture of conjunctivae [22], so the aim of this study is to estimate the recurrence rate of primary pterygium using trial of subconjunctival bevacizumab with surgical excision.

**Patients and Method**

This is experimental clinical trial included 110 eyes of 110 patients (59 males and 51 females) with a mean age of (49.62 ± 16.54 years), range (27-68) (Table 1). Had primary pterygium between October 2017 and January 2019 at Ibn AL Haitham teaching eye hospital.

Each pterygium was examined, measured and graded according to its extension over the cornea [1, 2, and 3]. According to slit lamp evaluation, the pterygia were categorized into three grades 1, 2, and 3:

- Grade 1 extends less than 2 mm onto the cornea.
- Grade 2 involves up to 4 mm of the cornea and may be primary or recurrent following surgery.
- Grade 3 encroaches onto more than 4 mm of the cornea and involves the visual axis.

Exclusion criteria included; 1) Previous ocular surgeries interfering with conjunctiva including pterygium excision. 2) Contraindication to bevacizumab such as allergy to bevacizumab, previous stroke or myocardial infarction, pregnant and lactating women. 3) Evidence of ocular surface diseases. 4) History of ocular trauma involving limbus, conjunctiva, sclera. 5) Patients unable to follow up during the period of the study. On basic assessment, grade 2 severity of pterygium and more were involved in this study.

The patient reviewed with prearranged follow-up program. In this study patient was reviewed after one week, one month, three months then six months from the surgery. In every followed up, full ocular assessment was achieved, included any adverse events or problems.

Recurrence was defined as the postoperative fibrovascular growth exceeds more than 1.5 mm over the clear cornea. Vascularization of the corneal stroma or conjunctival growth not extending over the cornea was not considered as recurrence [24-26].

**Results**

This study included 110 eyes of 110 patients. The patient’s pre-investigated data are shown in table 1. Including age, gender, grade of pterygium.

<table>
<thead>
<tr>
<th>Table 1: Baseline characteristics of study group (N = 110)</th>
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<tbody>
<tr>
<td>Variable</td>
</tr>
<tr>
<td>Age (years)</td>
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<tr>
<td>Mean</td>
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<tr>
<td>Range</td>
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<tr>
<td>Gender</td>
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<tr>
<td>Male</td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td>Grade of pterygium</td>
</tr>
<tr>
<td>Grade 2</td>
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<tr>
<td>Grade 3</td>
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</table>

During the six months of follow up of patients in this study, recurrence was noted in 12 patients (10.9%) as following table 2:

<table>
<thead>
<tr>
<th>Table 2: Characteristics of recurrence group (N = 12)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. (12)</td>
</tr>
<tr>
<td>8 (66.7%)</td>
</tr>
<tr>
<td>4 (33.3%)</td>
</tr>
</tbody>
</table>
Table 3: Characteristics of recurrence group (N = 12)

<table>
<thead>
<tr>
<th>No.</th>
<th>Baseline Grade</th>
<th>Recurrence Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 (33.3%)</td>
<td>Grade3</td>
<td>Grade2</td>
</tr>
<tr>
<td>8 (66.7%)</td>
<td>Grade2</td>
<td>Grade2</td>
</tr>
</tbody>
</table>

Table 4: Characteristics of occupation of the recurrence group (N = 12)

<table>
<thead>
<tr>
<th>No.</th>
<th>Occupation (in/out door)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 (50%)</td>
<td>In door</td>
</tr>
<tr>
<td>6 (50%)</td>
<td>Out door</td>
</tr>
</tbody>
</table>

Subconjunctival hemorrhage has been occurred in 12 patients (10.9%) and cleared within 2 weeks, no other ocular adverse effects was noted such as ocular surface irritation, corneal abrasion, persistent epithelial defects, infections, or uveitis.

Discussion

Different surgical procedures have been considered for treatment of primary pterygium [5-7]. The recurrence of pterygium was approximated to be about 40% to 75% in simple surgical removal, about 3-5% in the free flap techniques [21], and about 30% recurred after pterygium excision with complete suture of conjunctivae [22]. Some materials like 5-FU and mitomycin C are used to reduce possibility of its recurrence, studies reveal recurrence rates about 0-13.3% after using intraoperative mitomycin C with surgical excision [27-29] but their uses is accompanied with serious complications like infections and scleral thinning and necrosis [6-8].

As pterygia are consisted of growing fibrous and vascular tissues and their genesis and development demand new blood vessels formation [17, 18], several substances that activate angiogenesis have been recognized, indicating that these factors may be implicated in the development of pterygia.

Many studies had been used bevacizumab in treatment of pterygium in different ways, mainly topical, subconjunctival after surgical removal. But this study use different method in using bevacizumab in treatment of pterygium, by subconjunctival injection of bevacizumab one week before surgical removal.

In this study, we decide to use subconjunctival than topical route because subconjunctival injection appeared to give better compliance, it was of low cost for patients, and it has been mentioned to be more efficient than the topical administration in treating diseases that cause corneal neovascularization [30].

El Shafie et al [31], use 0.05 ml (1.25 mg) of subconjunctival bevacizumab for primary pterygium in the same way of this study and in the same follow up schedule in El Minya University Hospital, Egypt. He found that recurrence was reported in 5 of 60 patients (8.3%) of primary pterygia. This study found that recurrence was noted in 12 of 110 patients (10.9%) of primary pterygia.

Although there was a difference in number of patients between this study and El Shafie etal, the major cause of difference in the recurrence rate between these two studies was attributed to the conjunctival flap technique that used in El Shafie et al.

Wu et al [32], Leippi S et al [33], Mansour AM et al [34], Dastjerdi et al [35], Sudhalkar A et al [36], found that the use of topical bevacizumab is a potentially useful, and safe treatment as an adjuvant to pterygium surgery, while Karalezli, et al [37] and Ozgurhan et al [38], found that topical bevacizumab seems to have no additional effect on pterygium recurrence.

Razeghinejad et al [22], Rashid Omar et al [39], H Khoshniat et al [40], Besharati et al [41], Alhammami et al [42], Teng et al [43], found that subconjunctival use of bevacizumab after surgical removal is beneficial in management of both primary and recurrent pterygium and no local or systemic unfavorable events were noted.

Anthony F et al [44], Bahar et al [45] found that the use of subconjunctival bevacizumab does not seem to be effective in reducing the rate of pterygium recurrence following excision and no local or systemic unfavorable events were noted.

Several studies reported that the commonest time of recurrence after pterygium removal is between 3-6 months [46-50]. In a trial performed by Asergadoo [51], he found that if pterygiumhas tendency to reappear, it commonly exhibits manifestations of recurrence and grows back through the first three months, so the first 6 months was very important in follow up for recurrence.

Conflict of Interest: Nil

Source of Funding: Self

Ethical Clearance: Not required
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Indicators of Parental Engagement and Health Promotion Behaviour in Caring for Children with Avoidant Restrictive Food Intake Disorder

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¹Doctoral Student, Faculty of Public Health, Universitas Airlangga; ²Faculty of Health Sciences, Universitas Muhammadiyah Malang; ³Professor, Faculty of Nursing, ⁴Faculty of Public Health, Universitas Airlangga, Surabaya, Indonesia; ⁵Nursing Studies, Medical Faculty, Universitas Brawijaya Malang

ABSTRACT

Introduction: Parental engagement in caring for children is very important and parents must have the ability to care for their children. Health promotion behavior efforts can be made by giving the child a good diet with balanced nutrition. The purpose of this study was to analyze indicators of parental engagement and health promotion behavior in caring for children with avoidant restrictive food intake disorder.

Method: This study was a cross-sectional design by simple random sampling with a sample size of 245 participants. The independent variables were parenteral engagement indicators and the dependent variable was health promotion behavior indicators. Data were collected using: a demographic questionnaire, parental engagement questionnaire, and health promotion questionnaire. The analysis used a simple linear regression test with a significance level of α≤0.05.

Results: Parental engagement can be influenced by parents’ age and health promotion behavior was influenced by the level of parental education, number of children and condition of the child. The results of simple linear regression test obtained significance results of 0.000 (p-Value <0.05), which means that there was a significant influence of parental engagement on promotive behavior.

Conclusion: Good parental engagement and health promotion behavior will reduce tension when providing care for children with Avoidant Restrictive Food Intake Disorder. When the stress of parents decreases, parents will be able to be more sensitive to read signals from their children.

Keywords: parental engagement, health promotion, avoidant restrictive food intake disorder.

Introduction

Engagement between parents in caring for children is very important. Father’s role in parenting involves physical, affective and cognitive processes in the interaction between father and child. The involvement of fathers is very important for child development in several aspects, such as assisting in child feeding, accompanying children to play and learn and in helping children while learning about toileting. Fathers also play a role in providing solutions to the difficulties experienced by their children. A father, in carrying out his parenting role, needs to have fathering skills so that he can educate and nurture children to the maximum. The obstacles in establishing engagement are accepting a different perspective from others. Parents tend to resist attempts to change their minds, especially when they are in conflict situations.

Avoidant restrictive food intake disorder (ARFID) is a new term for describing infant and toddler age disorders with such characteristics as refusing to eat; poor mealtimes; low eating skills that are not in accordance with the child’s development stage; lack of interest in eating; avoidance based on sensory food, including appearance of food, smell and taste of food;
fear that occurs when eating, such as dysphagia; and fear of swallowing food. The distinctive difference from other eating disorders is that in ARFID there are psychological disorders, such as anxiety and lack of parenting.

Health promotion is an effort to empower individuals, groups and communities to maintain, improve and protect health. In addition, to achieve a perfect degree of health, both physical, mental and social, the community must be able to recognize, realize their aspirations and needs and be able to change or overcome their environment. The form of health promotion carried out by mothers to children is to improve health by adhering to strategies for monitoring healthy behavior in children. If the lifestyle that is lived by parents is a healthy one, the behavior that will be applied to children will also be a healthy lifestyle, one aspect of which is to get children to eat on time.

Method

Research Design and Setting: A cross-sectional design was used. This study was conducted at the 6 places in Malang Regency, Indonesia.

Respondents and Sampling: The respondents were recruited from five different health centers using simple random sampling method. The population included all families with ARFID children. A total of 245 families with ARFID children voluntary participated in the study and completed all questionnaires.

Instruments: The data collection tools were single questionnaires on demographic characteristic designed by the researcher. The demographic data included mother’s age, level of education, mother’s occupation, family income, number of children, children’s age, children’s sex, height, and weight. Tools for parental engagement consisted of eight items, namely: parenting; help feed children; accompany the child while playing, urinating and defecation; giving opinions to children; parents communicating with each other regarding children’s needs and communicating actively with children.

Data Collection: The data collection was assisted by eight research assistants. A questionnaire packet was completed with a description of the study, consent procedure, response confidentiality, and the researcher’s contact details.

Data Analysis: Original data were inputted into an excel spreadsheet and checked by the researcher. All data were analyzed using IBM SPSS 23.0 statistics. Descriptive analysis included frequency, percentages, means and the standard deviation was used to provide descriptive data. Data were analyzed using the chi-square technique and regression test. In this study, the statistical level of significance was set at P< 0.05.

Result

Most of the mothers were in the age range of 26-35 years (56.7%). Most mothers’ education was high school (36.3%) and not working (77.6%). Income was mostly between 1-2 million/month (51.4%) with the number of children 1 (42.4%) respondents. The maximum age of toddlers was ≤3 years (72.2%). The sex of most children was female (55.1%). The nutritional status of children was at normal height (60.8%).

Table 1 shows the results that parental engagement was related to the mother’s age (p=0.007). Engagement between parents had no relation to level of education (p=0.243), mothers’ occupation (p=0.062), family income (p=0.127), occupation of parents (p=0.924), income of parents (p=0.542), and number of children (p=0.924). The health promotion behavior was related to the level of the mother’s education (p=0.007), a number of children (p=0.008), and height of children (p=0.019). The strongest indicator of parental engagement was in parents communicate with each other regarding children’s needs, with an average of 4.37 (SD ± 0.952), while the weakest engagement in fulfilling the needs of children was to help children defecate, with the average 2.85 (SD ± 1.172).

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>p-value Engagement</th>
<th>p-value Health promotion behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother’s age (years)</td>
<td>0.007</td>
<td>0.124</td>
</tr>
<tr>
<td>Level of Education</td>
<td>0.127</td>
<td>0.007</td>
</tr>
<tr>
<td>Occupation</td>
<td>0.924</td>
<td>0.839</td>
</tr>
<tr>
<td>Income</td>
<td>0.542</td>
<td>0.112</td>
</tr>
<tr>
<td>Number of Children</td>
<td>0.924</td>
<td>0.008</td>
</tr>
</tbody>
</table>
Table 2: The indicators of parental engagement and health promotion behavior

<table>
<thead>
<tr>
<th>No.</th>
<th>Indicators</th>
<th>Mean (± SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td><strong>Parental engagement</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Parenting</td>
<td>3.84 (± 1.129)</td>
</tr>
<tr>
<td></td>
<td>Help feed children</td>
<td>3.45 (± 1.125)</td>
</tr>
<tr>
<td></td>
<td>Accompany the child while playing</td>
<td>3.56 (± 0.972)</td>
</tr>
<tr>
<td></td>
<td>Helping children when urinating</td>
<td>3.12 (± 1.074)</td>
</tr>
<tr>
<td></td>
<td>Helping children when defecating</td>
<td>2.85 (± 1.172)</td>
</tr>
<tr>
<td></td>
<td>Giving opinions to children</td>
<td>4.13 (± 1.008)</td>
</tr>
<tr>
<td></td>
<td>Parents communicate with each other regarding children’s needs</td>
<td>4.37 (± 0.952)</td>
</tr>
<tr>
<td></td>
<td>Communicate actively with children</td>
<td>4.33 (± 0.927)</td>
</tr>
<tr>
<td>2.</td>
<td><strong>Health promotion behavior</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ask questions about health</td>
<td>3.78 (± 1.131)</td>
</tr>
<tr>
<td></td>
<td>Complete assignments about health</td>
<td>3.95 (± 1.108)</td>
</tr>
<tr>
<td></td>
<td>Perform early screening</td>
<td>3.84 (± 1.123)</td>
</tr>
<tr>
<td></td>
<td>Get help from health professionals</td>
<td>3.67 (± 1.218)</td>
</tr>
<tr>
<td></td>
<td>Doing consistent living activities</td>
<td>3.87 (± 1.008)</td>
</tr>
<tr>
<td></td>
<td>Eliminating unhealthy behavior</td>
<td>3.84 (± 1.108)</td>
</tr>
<tr>
<td></td>
<td>Conduct health behaviors on your own initiative</td>
<td>3.86 (± 1.047)</td>
</tr>
<tr>
<td></td>
<td>Recommended health behavior</td>
<td>4.55 (± 0.709)</td>
</tr>
<tr>
<td></td>
<td>Use leading health information</td>
<td>4.19 (± 0.974)</td>
</tr>
<tr>
<td></td>
<td>Explain strategies to optimize health</td>
<td>3.91 (± 1.100)</td>
</tr>
<tr>
<td></td>
<td>Looking for help when needed</td>
<td>3.81 (± 1.166)</td>
</tr>
</tbody>
</table>

Table 3 shows that the regression model of health promotion behavior was 31.653 and parental engagement was 0.392. The regression coefficient value of the Parental Engagement variable was 0.392. This value showed an increase that occurs in the Health Promotion Behavior variable if Parental Engagement increases. The $t_{\text{count}}$ was 4.647 with a significance value of 0.000. The value of $t_{\text{table}}$ at free degree 243 and the real level of 5% was 1.970. Because the value of $t_{\text{count}}$ was greater than $t_{\text{table}}$ or the significance value was smaller than the real level of 5%, it was concluded that there was a significant effect of parental engagement on promotive behavior with a positive direction of influence.

Table 3: The influence of parental engagement in improving health promotion behavior

<table>
<thead>
<tr>
<th>Unstandardised Coefficients (B)</th>
<th>Standardised Coefficients (β)</th>
<th>$T_{\text{count}}$</th>
<th>P Value</th>
<th>$R^2$</th>
<th>95% Confidence Interval Lower</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>31.653</td>
<td>2.552</td>
<td>4.647</td>
<td>0.000</td>
<td>0.082</td>
<td>1.94</td>
</tr>
<tr>
<td>Parental Engagement</td>
<td>0.392</td>
<td>0.084</td>
<td>0.286</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The correlation coefficient ($r$) was 0.286, which means that there was a strong relationship between parental engagement and health promotion behavior. The coefficient of determination ($R^2$) obtained was 0.082, which means that health promotion behavior was influenced by parents’ engagement of 8.2%, while the remaining 91.8% was influenced by factors other than parental engagement.

**Discussion**

Parental engagement can be influenced by the mother’s age. Age was an indicator of maturity, the older they get, the more knowledge and experience they have about appropriate behavior to educate children. Ages that were too young or too old cannot perform this role optimally because physical and psychological strength was needed; besides affecting physical aspects,
the mother’s age also affects the psychological aspects of the mother because a mother who is too young is not ready to become a mother in terms of her child care skills. This young mother emphasizes her youthful nature rather than her motherly nature. Children with young parents will get more relaxed supervision because younger parents tend to have a high tolerance and tolerate children more.

Communication between parents and children can be seen as an effort to monitor, know and direct children’s development. Open communication will make children feel valued, loved and cared for by their parents. The existence of effective and efficient communication, carried out continuously, can create intimacy, openness and more attention between the couple and parents are more aware of developments in children, both physically and psychologically. Parents who become good listeners will have a better relationship with their children. New ways of communicating with children must be based on respect and skill. This contains two meanings, namely greetings should not hurt the self-esteem of children and parents must first show an understanding attitude to children, then give advice.

Health promotion behavior can be influenced by the level of education, a number of children and the condition of the child (height and age). Families with higher education levels will find it easier to receive health information specifically on how to educate toddlers on a daily basis. Children need strong support from their families; if family support for children is good, then the children’s growth and development will be stable. Education will have an impact on the mindset and views of parents in educating their children. Parents who have a high level of education and insight will pay attention to and care for their children according to their age of development and will show better personal and social adjustments that will make children have a positive outlook on others and society. This healthcare includes prevention and self-protection from diseases and other health problems, improving health and seeking healing if sick.

Thing which can be an obstacle to parental involvement in children’s education are parental education levels, parental work conditions, past experience in education, parental inferiority feelings and other personal problems, such as distance from home to schools, culture and language. Characteristics of parents of toddlers, which include age, education, and work, can influence the process of behavior change. This shows that the average age of respondents is in the age of healthy reproduction when being self-motivated to obtain as much knowledge as possible. Health promotion is a form of an effort to improve maternal and child health that aims to reduce maternal and child mortality in a sustainable manner, by increasing community independence in the field of maternal and child health. The high rate of maternal and child mortality is one of the problems that occur in Indonesia in the health sector, as a result of the low level of the economy and public education in the health sector.

Conclusion

Good engagement between parents will reduce tension when providing care for children who experience ARFID. The higher the level of stress in parents will increase behavior problems in children. The good parental engagement was influenced by the age factor of parents. Maturity possessed by the mother causes the ability to provide care and pay attention to the good nutritional status of children. The most dominant indicator of parental engagement was communication between husband and wife related to the needs of the child. Health promotion behavior was influenced by maternal education level, number of children and the nutritional status of children. There was a significant influence between parental engagement and increasing health promotion behavior.

Ethical Clearance: Ethical approval was obtained from the ethics committee of the Public Health, Universitas Airlangga number 333-KEPK.

Source of Funding: Self-funding

Conflict of Interest: None.

REFERENCES


Recovery Self Efficacy, Coping Strategy, Adversity Quotient and Resilience among Intensive Care Unit Nurses in Indonesia

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¹Doctoral Student of Public Health Science, Faculty of Public Health, Lecturer of Faculty of Nursing, ²Faculty of Nursing, ³Faculty of Public Health, ⁴Faculty of Nursing, Universitas Airlangga

ABSTRACT

Introduction: Stress experienced by most critical care nurses can be caused not optimal nursing care. This study aimed to identify the correlation between recovery self-efficacy, coping strategy, adversity quotient and resilience among critical care nurse in three public hospitals in Surabaya, Indonesia.

Method: This study was cross-sectional study carried out on 91 critical care nurses. Data were collected using questionnaires. Descriptive statistic and Spearman’s Correlation were used to analyze the data.

Result: Totals of 91 nurses were involved in the study. Spearman’s correlation analysis showed that recovery self-efficacy (r=0.644, P<0.000) and adversity quotients (r=-0.217, P<0.039) were associated with resilience of critical care nurses whereas coping strategy (r=0.036, P=0.734) was not correlated to resilience of critical care nurse.

Conclusion: Resilience among critical care nurses was correlated with recovery self-efficacy and adversity quotients. Thus, enhancing their capacity in terms of recovery self-efficacy and adversity quotients may improve the resilience of critical care Nurses

Keywords: Intensive Care Nurses, resilience, recovery self-efficacy, coping strategy; adversity quotient

Introduction

The ICU nurses are confronted with unpleasant facts every day and it is very difficult to avoid the source of stress¹-³. The stressors include stressful work life, problems that occur during caregiving and the problems that exist in the healthcare system⁴. All these situations or experiences increase the possibility of prolonged stress and may become worse to nurse performance⁵. However, notwithstanding this adversity, many nurses choose to remain as a nurse⁶. Nurses can encounter all difficult situation and bounce back from adversity when they are resilience. Resilience is an illustration of the process and results of successfully adapting to adversity situation or very challenging life experiences, especially situations with high-stress levels or traumatic events⁶. In the Indonesian context, there is a relatively limited study which reveals nurse resilience. Therefore, gaining an understanding of resilience and factors that contributed can be very beneficial for nurses in helping them develop greater personal resilience and in learning to deal with patients.

The previous study⁷ indicated that there was a relationship between work stress and caring behavior where nurses did not display caring behavior because they experienced stress at moderate and severe levels. While other studies at the High Care Unit showed that nurses showed stressful behavior, experienced physical stress, and experienced emotional stress. The results of a preliminary study of researchers at a teaching hospital in Surabaya in July 2017 found that nurses showed symptoms of stress characterized by frequent sleep disturbance, loss of concentration and thinking small things were too detailed, irritable and tension when interacting with other health workers. Contact consistently with the events of death, interactions with patients and their families, conflicts with supervisors and uncertainty about therapy causing much higher stress in

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Email: Nursalam@fkp.unair.ac.id
ICU nurses. This situation will cause psychological problems and this can have an impact on interactions with other health workers, work, and an institution’s reputation. Other study indicate that there is a relationship between psychological stress and nurse caring behavior. But nurses who have good resilience show a decrease in stress symptoms. Other studies have found that resilience is related to nurse caring behavior.

International Council of Nursing in 2016 states that many efforts have been made to deal with stress that occurs in nurses, but not in efforts to build how nurses are resilient to the source of stress in their work environment so that they can overcome any problems that arise. Therefore, a preventive strategy is needed to help ICU nurses adapt to sources of stress so that they can carry out the sublime functions of nursing care. One such strategy is to understand factors related to ICU nurse resilience. In this study, three-factor were examined namely adversity quotient, coping strategy, and recovery self-efficacy. Adversity Quotients is a score that measures the ability of a person to deal with adversities in his or her life. Hence, it is commonly known as the science of resilience. Coping is categorized into the problem and emotion-focused coping and avoidance coping. A study found that resilient characteristics may associate in athletes to the use of more potentially adaptive coping strategies. Moreover, based on the Health Action Process Approach (HAPA) model recovery self-efficacy describes the experience of failure and recovery from adversity. Recovery self-efficacy is related to one’s belief in the ability to continue positive actions after making behavioral changes in a negative direction. Recovery self-efficacy helps to gradually return to acting based on one’s wishes. Beliefs become strong if individuals can regain control of their behavior after falling on negative behavior.

It is important to help nurse identify factor may correlate with resilience in order to face and protect themselves from the impact of difficulties in the workplace. High resilience positively affects nurses’ attitudes towards the profession, the future, life, and their work and life outputs. Furthermore, the nurse needs to understand resilience as a vital characteristic for nurses in today’s complex healthcare system.

Only a few studies have examined the relationship between recovery self-efficacy, coping strategy, adversity quotient and resilience among ICU nurses. Therefore, this present study examined the correlation of recovery self-efficacy, coping strategy, adversity quotient and resilience among ICU nurses.

### Materials and Method

**Research Design and Setting:** This investigation used the cross-sectional study to reveal the correlation of recovery self-efficacy, coping strategy, adversity quotient and resilience among ICU nurses. The population included all nurses except ICU head nurse at X General Hospital, Universitas X Teaching Hospital, and X General Hospital X from August – September 2018.

**Respondents:** A total of 95 nurses from three hospitals were recruited using total population sampling method. Only 91 nurses completed all questionnaires and the rest was dropped out from the study.

**Measurement Tools:** The data collection tools were questionnaires on the socio-demographic characteristic, on 91 ICU nurses. The questionnaires were adopted from the existing questionnaire. The researcher made some adjustment or modification on the questionnaire and tested the validity and reliability of the questionnaires on 26 ICU nurses in Darmo private hospital. The translation was accomplished by the researcher and proofread by Journal Development Team from Universitas X.

The Recovery self-efficacy questionnaire consisted of 25 questions. The Cronbach’s $\alpha$ was 0.735. The question featured a Likert scale with the following option: always, very often, sometimes, and never. The total score for this section was in the range 25-100 with a higher score indicating a higher level of recovery self-efficacy. The coping strategy questionnaire consisted of 25 questions. The Cronbach’s $\alpha$ was 0.774. The question featured a Likert scale with the following option: always, very often, sometimes, and never. The total score for this section was in the range 25-100 with a higher score indicating a higher level of coping strategy.

The Adversity Quotient questionnaire consisted of 40 questions. The Cronbach’s $\alpha$ was 0.936. The question featured a Likert scale with the following option: strongly agree, agree, disagree, strongly disagree. The total score for this section was in the range 40-140 with a higher score indicating a higher level of the adversity quotient which divided into climber, camper, quitter.
The Resilience questionnaire consisted of 35 questions. The Cronbach’s α was 0.938. The question featured a Likert scale with the following option: always, very often, sometimes, never. The total score for this section was in the range 70-140 with a higher score indicating a higher level of nurse resilience.

Data Collection: The data was collected directly by the researcher. A questionnaire packet was completed with a description of the study, consent procedure, response confidentiality, and the researcher’s contact details. The questioner was completed independently by the respondents and collected by a researcher on the same day. It took about two months to reached all respondents from three different hospitals and due to shifting schedules of nurses. A total of 95 questionnaires were distributed but 91 were completed and the rest was considered incomplete and invalid therefore indicating 94.8% returned rate.

Data Analysis: All data were analyzed using the SPSS 20.00 software. Descriptive statistic included frequency, percentages, means and the standard deviation was used to describe quantitative variables. Data were analyzed using Spearman’s Correlation to identify the correlation between recovery self-efficacy, coping strategy, adversity quotient, and resilience among ICU nurses. In this study, the statistical level of significance was set at P < 0.05 for two sides.

Result

The majority of the respondent age at the range of 23 – 54 years old. Level of education was dominated at diploma level (64.8%) with work experience at 1-5 yrs (40.7%). A total of 64.8 % was female nurses (Table 1).

<table>
<thead>
<tr>
<th>Variables</th>
<th>n (%)</th>
<th>Variable</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age (yrs)</strong></td>
<td></td>
<td><strong>Work Experience (yrs)</strong></td>
<td></td>
</tr>
<tr>
<td>&lt;25</td>
<td>3 (3.3)</td>
<td>&lt;1</td>
<td>7 (7.7)</td>
</tr>
<tr>
<td>25-30</td>
<td>35 (38.5)</td>
<td>1-5</td>
<td>37 (40.7)</td>
</tr>
<tr>
<td>31-35</td>
<td>19 (20.9)</td>
<td>6-10</td>
<td>19 (20.9)</td>
</tr>
<tr>
<td>36-40</td>
<td>8 (8.8)</td>
<td>11-15</td>
<td>9 (9.9)</td>
</tr>
<tr>
<td>41-45</td>
<td>14 (15.4)</td>
<td>16-20</td>
<td>11 (12.1)</td>
</tr>
<tr>
<td>46-50</td>
<td>6 (6.6)</td>
<td>21-25</td>
<td>5 (5.5)</td>
</tr>
<tr>
<td>51-55</td>
<td>6 (6.6)</td>
<td>26-30</td>
<td>3 (3.3)</td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td><strong>Level of education</strong></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>32 (35.2)</td>
<td>Diploma 3</td>
<td>59 (64.8)</td>
</tr>
<tr>
<td>Female</td>
<td>59 (64.8)</td>
<td>Bachelor</td>
<td>32 (35.2)</td>
</tr>
</tbody>
</table>

**yrs: Years**

In this study, the recovery self-efficacy total score ranged from 40 to 87 with the mean score was 68.36 ± 7.30. The mean score of Recovery self-efficacy dimension namely self-believe and intention were 40.44 ± 4.33, 27.93 ± 2.97 respectively (table 2).

<table>
<thead>
<tr>
<th>Variable</th>
<th>N(%)</th>
<th>M ± SD</th>
<th>Min-max</th>
<th>M ± SD</th>
<th>r</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recovery self-efficacy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-Belief</td>
<td>31-52</td>
<td>40.43 ± 4.33</td>
<td>31-52</td>
<td>68.3 ± 5.9</td>
<td>0.644</td>
<td>0.000</td>
</tr>
<tr>
<td>Intention</td>
<td>19-35</td>
<td>27.93 ± 2.97</td>
<td>19-35</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coping strategy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PFC</td>
<td>16-39</td>
<td>21.77 ± 3.26</td>
<td>16-39</td>
<td>57.8 ± 8.8</td>
<td>0.036</td>
<td>0.734</td>
</tr>
<tr>
<td>EFC</td>
<td>11-27</td>
<td>17.25 ± 3.63</td>
<td>11-27</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>AFC</td>
<td>11-31</td>
<td>18.78 ± 4.30</td>
<td>11-31</td>
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</tr>
<tr>
<td>Adversity Quotients</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>12-30</td>
<td>19.32 ± 3.08</td>
<td>12-30</td>
<td>101.6923 ± 9.3</td>
<td>-0.217</td>
<td>0.039</td>
</tr>
<tr>
<td>Origin</td>
<td>14-31</td>
<td>23.76 ± 2.66</td>
<td>14-31</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reach</td>
<td>14-33</td>
<td>23.59 ± 3.59</td>
<td>14-33</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Endurance</td>
<td>20-44</td>
<td>35.02 ± 3.40</td>
<td>20-44</td>
<td>98.1209 ± 10.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resilience</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
The coping strategy total score ranged from 38 to 97 with the mean score was 57.80 ± 11.19. The mean score of coping strategy dimension namely PFC, EFC, and AFC were 21.77 ± 3.26, 17.25 ± 3.63, 18.78 ± 4.30 correspondingly. The adversity quotients total score ranged from 60 to 138 with the mean score was 101.69 ± 13.45. The mean score of adversity quotients dimension namely: Control, Origin Reach Endurance were 19.32 ± 3.08, 23.76 ± 2.66, 23.59 ± 3.59 and 35.02 ± 3.40 correspondingly. Spearman’s correlation analysis showed that recovery self-efficacy (r = 0.644, P< 0.000) and adversity quotients (r= - 0.217, P< 0.039) were associated with resilience of ICU nurses whereas coping and adversity quotients (r = 0.036, P= 0.734) was not correlated to

**Discussion**

There was a strong correlation between recovery self-efficacy and resilience among dimension of recovery self-efficacy, self-believe (Mean ± SD = 40.44 ± 4.33) were the higher position compare to intention (Mean ± SD =27.93 ± 2.97). The researcher was found difficulties to explore similar research about the correlation between recovery self-efficacy and resilience. However, a study in China found that the resilience of nurses had a significant positive correlation with self-efficacy 20. In addition, there was the previous study explained that resilience was predicted by self-efficacy 21. Another study revealed that persons with low perceived self-efficacy tend to experience self-doubt and anxiety when they encounter environmental demands 22. It means that unable to maintain their resilience to an adverse event in their life. Recovery self-efficacy is related to one’s belief in the ability to continue positive actions after making behavioral changes in a negative direction 18.

Recovery self-efficacy helps to gradually return to acting based on one’s wishes. Beliefs become strong if individuals can regain control of their behavior after falling on negative behavior 18. ICU nurses tend to experiences repeated stress caused by many factors. However, the level of stress is not constantly settled all the time but is influenced by the situation and various other factors that influence. Those who have recovery self-efficacy may have a higher resilience from adversity event that happened daily with different causes and different level.

In this study, the coping strategy of ICU nurses was not related to nursing resilience. This result supported another study that coping strategy did not impact on resilience among young offenders in custody21. Another study conducted to sports performer indicated that resilience scores correlated positively to task-oriented coping and negatively to disengagement- and distraction-oriented coping during both periods. Analysis of variance indicated that athletes with high individual resilient qualities reached higher scores in task-oriented coping, using to a lower extent disengagement- and distraction-oriented coping16. A study conducted to Latvian nurses indicated that more nurses use the “escape/avoidance”.

Since the level of stress was not constantly remain the same so nurses used difference strategy to cope with the situation. In addition, a study reveals that Intensive Care Unit nurses mainly adopted the strategy of denial5. It was found in this study that ICU nurses also used three types of coping strategy namely problem-focused coping, emotion focus coping and avoidance coping. However, emotion focus coping and avoidance coping used more compare to problem-focused coping. This may affect the correlation where emotion and avoidance focused coping may not effective coping strategies. Therefore, it may not be correlated with resilience.

In general, this study revealed that adversity quotients had a correlation with the resilience of ICU nurses. This result support similar study conducted to a patient with cancer that there was a correlation between adversity quotient and resilience 23. In addition, this study showed that ICU nurses had an endurance score (mean ± SD = 35.02 ± 3.40) higher than other adversity dimensions, namely control, origin and ownership, and reach (mean ± SD = 19.32 ± 3.08, 23.76 ± 2.66, 23.59 ± 3.59 respectively). This score shows that nurses who have good endurance will have better resilience because endurance involves someone’s resistance to dealing with various adversity.

**Conclusion**

Resilience among ICU nurses was correlated with recovery self-efficacy and adversity quotients. Thus, enhancing their capacity in terms of recovery self-efficacy and adversity quotients may improve the resilience of ICU nurses. Management of the hospitals may provide training to improve Adversity Quotation training and recovery self-efficacy for ICU nurses regularly to enhance resilient capacity. In addition, there were limited experimental studies were found
about improving the nurses’ resilience. Therefore, it was important and necessary to conduct studies to analyze and improve nurses’ resilience that possibly prevented such extreme consequences of stress exposure such as burnout, compassion fatigue, and vicarious traumatization.

**Ethical Clearance:** Ethical approval was obtained from the ethics committee of the three hospitals. Voluntary, confidentially, fair and harmless ethical principles were occupied in this study.

**Source of Funding:** Self-Funding

**Conflict of Interest:** None

**REFERENCES**


Determination of Sulfur Dioxide (SO$_2$) Safe Duration in Residential Population Around the Fertilizer Industry X in Indonesia

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ABSTRACT

People who have lived more than 22 years in settlements around the fertilizer industry X are at risk of being exposed to SO$_2$ from the increase in exhaust emissions produced by the boilers and power generation equipment in the fertilizer industry. The purpose of this study was to determine the Risk Quotient (RQ) due to exposure to SO$_2$ and to measure the duration of exposure to SO$_2$ that is safe in the residential area around the fertilizer industry X.

This research is a quantitative study with an environmental health risk analysis method, with a sample size of 297 adult population respondents in residential areas around the center of SO$_2$ emissions in the fertilizer industry X area. Data analysis was done using manual data calculations to determine the intake of SO$_2$ (non carcinogenic), risk level or risk quotient (RQ), and safe duration (Dt safe) exposure to SO$_2$ in the population around the fertilizer industry X.

The results showed that the average non-carcinogenic intake of SO$_2$ in settlements around the fertilizer industry X was at 0.057427415mg/kg/day. While the average risk quotient is 1.788347507 (RQ> 1), from a total of 297 respondents as many as 197 respondents with RQ > 1 and 100 respondents with RQ < 1, it shows that> 50% of the population in settlements around the fertilizer industry X have health risks resulting from exposure to SO$_2$. The average safe duration of exposure to SO$_2$ in the population in settlements around the fertilizer industry X is 23.47 years, depending on the food intake and body condition of the respondents. The recommendation that can be given is to increase the weight of respondents and the right diet pattern by consuming nutritional intake that can detoxify the main toxin to reduce sulfur dioxide levels in the body, one example is the provision of vitamins E and C which can reduce oxidative effects such as lipid peroxidation and membrane damage in erythrocytes due to exposure to sulfur dioxide$^6$. Besides that, a related stakeholder policy is needed to periodically measure SO$_2$ concentrations in community residential areas around the fertilizer industry X, so that the air quality of people exposed to SO$_2$ can be monitored and is still within safe limits. The company holds a CSR program involving the surrounding community by conducting routine health checks, greening programs around the fertilizer industrial area$^6$.

Keywords: Sulfur Dioxide, Risk Quotient, Safe Duration, Settlements around Fertilizer Industry X

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Introduction

Everyone can be exposed to exhaust emissions of sulfur dioxide every day. The main uses of SO$_2$ are industrial sulfuric acid production, refrigerators, disinfectants for fruits and vegetables, the textile industry and fertilizer industry. The population in residential areas around the fertilizer industry has a high risk of...
exposure to SO₂. People who lived in residential areas around the fertilizer industry for years were constantly receiving SO₂ exposure due to boiler exhaust emissions and power generation equipment from production activities. Sulfur dioxide (SO₂) is a gas that is colorless and non-explosive, very soluble to water droplets and rain, has a characteristic odor and stinging acid taste and can irritate. Significant health effects include breathing difficulty, asthma attacks, pulmonary edema, eye irritation, cardiopulmonary disease, and increased mortality. SO₂ is the main air pollutant that has a significant impact on human health. Effects of specific short-term exposure to SO₂ can cause cardiovascular disease (CVD). In addition, SO₂ also has a significant relationship with the occurrence of hand, foot, and mouth disease (HFMD). Based on previous research (Solichin, 2016) about SO₂ in the environment have not conducted research or measurements of safe duration (Dt Safe) for residential communities around the fertilizer industry that are exposed to SO₂ emission gases. This measurement is intended to make prevention and control efforts earlier before the respondent is estimated when symptoms of the disease arise in his body, so as to prevent health problems (non-carcinogenic) due to exposure to SO₂. Then further research is needed regarding the measurement of the safe duration of SO₂ in residential communities around the fertilizer industry X, as well as to determine intake and risk quotient (RQ) exposure to SO₂ (non-carcinogens).

Material and Method

The type of this research is quantitative research with environmental health risk analysis methods. In this study focused on exposure to SO₂ as an increase in exhaust emissions produced by boilers and power generation equipment in the fertilizer industry X.

The subjects of this study were human samples, namely adults aged 17 years and over who lived more than 2 years in the study area which were divided into 3 clusters, within a radius of 800, 1,050, and 1,300 meters from the center of the fertilizer industry X, so that a sample of 297 respondents was calculated. Whereas environmental samples are ambient air in residential areas around the fertilizer industry X, collected by the pararosanilin method using a spectrophotometer with impinger equipment by officers of the Center for Environmental Health. The procedure for analyzing SO₂ samples in the laboratory refers to the reference SNI 19-7119.7.

The data were obtained by secondary data. Secondary data were obtained by collect of data measurements which included the concentration of SO₂ in the air, anthropometric conditions (respiration rate and weight), activity patterns (time, frequency, duration of exposure, daily average time period) of the respondent bt research of Solichin R, 2016. While secondary data also was obtained from related literature.

The variables studied were the intake, Risk Quotient (RQ) and safe duration (Dt Safe) from SO₂ (non-carcinogenic) exposure to respondents in residential areas around the fertilizer industry X. Data analysis was carried out by quantitative data analysis to determine the concentration and safe duration of SO₂ exposure to respondents.

Findings

A. Intake: Determination of the amount of intake on SO₂ toxins that enter the body, the following formula is used:

\[
\text{Intake SO}_2 = \frac{C \times R \times tE \times fE \times Dt}{W_b \times T_{avg}}
\]

Notes:

- \(C\) = Sulfur Dioxide Concentration (mg/m³)
- \(R\) = Respiration Rate (m³/hour)
- \(tE\) = Time of exposure (hour/day)
- \(fE\) = Frequency or Average exposure in year (day/year)
- \(Dt\) = Duration of Exposure (year)
- \(W_b\) = Weight (Kg)
- \(T_{avg}\) = Average Exposure of Sulfur Dioxide (non-carcinogen) → 30 years x 365 day/year

Based on the results of measurements on the data, it is known that the average exposure concentration of SO₂ (C) is 0.248456 mg/m³. The average respiration rate (R) is 0.60 m³/hour. The average exposure time (tE) is 21 hours/day. The average frequency of exposure (fE) is 356 days/year. The average duration of exposure (Dt) is 31.3 years. The average respondent’s weight (Wb) is 57.6 Kg. While the average exposure of SO₂...
\( T_{avg} \) is 30 x 365 days/year. 

In Table 5, Explain the calculation of the average intake is 0.057427415 mg/kg/day.

**B. Risk Quotient (RQ):** Determination of risk level for respondents to exposure to \( \text{SO}_2 \) or Risk Quotient (RQ) is formulated with \(^{17}(18)\):

\[
R_{\text{Q}} = \frac{\text{Intake}}{\text{RC}}
\]

Determination of risk categories is intended to determine whether exposure to \( \text{SO}_2 \) toxins is at risk or does not pose a risk to the health of the human body. Risk Quotient (RQ) is the result of a comparison between intakes with Reference of Concentration (RfC) or Safe Human Dose (SHD). The RfC value is obtained from the calculation formula namely:\(^{13}\):

\[
\text{SHD} = \frac{\text{NOAEL}}{\text{Km ANIMAL}} \frac{\text{Animal Km}}{\text{Human Km}}
\]

According to The Office of Environmental Health Hazard Assessment (OEHHA), the value of No Observed Adverse Effect Level (NOAEL) \( \text{SO}_2 \) is 660 µg/m³ or equivalent to 0.25 mg/kg. While Animal Km and Human Km are Km factors in animals and humans, with the following calculations:

\[
(\text{Animal or Human)} \text{Km} = \frac{W \text{(Weight)}}{\text{BSA (Body Surface Area)}}
\]

Based on Table 1. The results of the average value of Animal Km are 5.816471979 while the Human Km is 35.96304. Based on the SHD formula described above, an SHD value of 0.04 mg/kg is obtained.

**C. Safe Duration (Dt Safe):** Safe Duration (Dt Safe) is associated with a safe duration at work for one day and a safe duration (in years). The formula used in determining safe duration (Dt safe) is\(^{17}(18)\):

\[
\text{Dt Safe} = \frac{\text{RfC} \times Wb \times T_{avg}}{C \times R \times tE \times fE}
\]

Based on the results of the calculations in Table 2. It is known that the safe duration of the average respondent is 23.47 years, depending on the nutritional value of the food intake and the condition or body anthropometry of each respondent. While the smallest safe Dt value of the whole respondents is 12.87 years.

**Table 2: Intake, Risk Quotient (RQ) and Safe Duration (Dt Safe) of \( \text{SO}_2 \) Exposure (Non-Carcinogenic) in Settlements Around Fertilizer Industry X Area**

<table>
<thead>
<tr>
<th>Respondents</th>
<th>Sulfur Dioxide Intake (mg/Kg/day)</th>
<th>Risk Quotient (RQ) (mg/Kg/day)</th>
<th>Safe Duration (Years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.056539305</td>
<td>1.398322252</td>
<td>36.47227949</td>
</tr>
<tr>
<td>2</td>
<td>0.128931165</td>
<td>3.188707721</td>
<td>18.81640001</td>
</tr>
<tr>
<td>3</td>
<td>0.013631756</td>
<td>0.337138702</td>
<td>32.62752077</td>
</tr>
<tr>
<td>4</td>
<td>0.046483183</td>
<td>1.149615652</td>
<td>21.74639842</td>
</tr>
<tr>
<td>5</td>
<td>0.137147641</td>
<td>3.391916467</td>
<td>15.6253848</td>
</tr>
<tr>
<td>Etc.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>297</td>
<td>0.161140632</td>
<td>3.985307784</td>
<td>16.05898552</td>
</tr>
<tr>
<td>Average</td>
<td>0.057427415</td>
<td>1.420286877</td>
<td>23.47334979</td>
</tr>
</tbody>
</table>

**Discussion**

Based on the results of measurements by the Institute for Environmental Health Engineering, the median value of \( \text{SO}_2 \) concentrations contained in ambient air in the population around the fertilizer industry X was 0.246 mg/m³ (0.0946 ppm). This value is in the category above the ATSDR Minimum Risk Level (MRL) value, which is from WHO (1979) explains that for 24-hour exposure limit the recommended exposure can be tolerated at 100-150 mg/m³ (0.04-0.06 ppm) but under the ACGIH (1998) value TLV-TWA: 5.2 mg/m³ (2 ppm) and NIOSH (1997) REL TWA: 5 mg/m³ (2 ppm). When compared with the Minister of Manpower Regulation No. 5 of 2018\(^8\), the \( \text{SO}_2 \) concentration value in this study is the same as the permissible threshold value, which is equal to 0.25 mg/m³ (0.095 ppm). While the value of \( \text{SO}_2 \) concentration in this study is still below the threshold when compared with the Government of the Republic of Indonesia Regulation No.41 of 1999\(^10\) at 24-hour exposure limit.
with \( \text{SO}_2 \) quality standards of 365 \( \mu \text{g/Nm}^3 \) (0.13 ppm). To prevent or minimize health risks to the human body, it is necessary to reduce the concentration of \( \text{SO}_2 \) exposure to the safe concentration limit.

It is known that the intake value is directly proportional to the chemical concentration value, frequency of exposure, duration of exposure and inversely proportional to the value of body weight. Then it can be interpreted for prevention and control efforts, the greater the weight, the smaller the occurrence of health risks. Likewise, if the lower chemical concentration value, frequency of exposure, duration of exposure, the intake of toxins that enter the body is also lower.

Based on the results of the calculation of NOAEL \( \text{SO}_2 \) in this study was 0.25 ppm. The results of this calculation are smaller than NOAEL (US EPA 1994, 1996a, Streeton 1997, ATSDR 1998, OEHHA 1999b, EC 2005, WHO 2006, US EPA 2008) of 1-2 ppm. This NOAEL calculation is also smaller than ATSDR which is equal to 5 ppm

Based on the calculation of RfC \( \text{SO}_2 \) in this study was 0.04 mg/kg. The results of this calculation are smaller than RfC for exposure to \( \text{SO}_2 \) through inhalation based on the health risk assessment of \( \text{SO}_2 \) by Health Canada (2016) which is equal to 0.06 mg/kg. So, the results of this research are safer for humans.

It is known that the average value of Risk Quotient (RQ) on respondents is 1,420286877 mg/kg/day (RQ>1) or as many as 197 respondents have RQ>1 and 100 respondents have RQ <1. This shows that of the total respondents,> 50% have a risk to health due to exposure to \( \text{SO}_2 \).

Based on the results of this study the Dt value is safe in the residential environment around the fertilizer industry X is 23.47 years. This number is smaller than the normal safe Dt, which is 30 years. Thus, the safe Dt rate is not healthy for both workers and the community and risks to health. To normalize Dt, the concentration of toxin must be minimized so that it is in accordance with the safe limits of toxin concentration. So prevention and control efforts are needed earlier before the respondent is estimated when the symptoms of the disease arise in the body, prior control measures are taken, namely periodic measurement and management of exposure to \( \text{SO}_2 \) toxins in the environment by the company and related stakeholders and healthy lifestyle in the community.

**Conclusion**

It was concluded that the population in settlements around the fertilizer industry X posed a health risk to exposure to \( \text{SO}_2 \) (non-carcinogenic). The safe duration of the average respondent is 23.47 years. The recommendations that can be given include the concentration of sulfur dioxide toxins to be reduced to reach the safe concentration limit. In this case, it is necessary to periodically measure gas emissions of sulfur dioxide by companies and related stakeholders (for example local related agencies). If there is information from the relevant office that the level of sulfur dioxide is high, it is necessary to encourage the public to limit outdoor activities. EPA recommends that the concentration of sulfur dioxide should not exceed 0.03 ppm. For short periods of 24-hour exposure, the limit may not exceed 0.14 ppm more than once a year. Other controls can also be supported by increasing respondents weight and proper dietary patterns by consuming nutritional intake which can detoxify the main toxins to reduce sulfur dioxide levels in the body, for example is giving vitamin E and C can reduce oxidative effects such as lipid peroxidation and membrane damage in erythrocytes due to exposure to sulfur dioxide. The company holds a CSR program involving the surrounding community by conducting routine health checks, urban greening programs around the fertilizer industry area (mainly using plants that are resistant to SO2).

**Conflict of Interest:** All authors have no conflicts of interest to declare.

**Source of Funding:** This is an article “Determination of Sulfur Dioxide (\( \text{SO}_2 \)) Safe Duration in Residential Population Around the Fertilizer Industry X in Indonesia” of Occupational Safety and Health Department that was supported by Activity Budget Plans 2019, Faculty of Public Health, Airlangga University.

**Ethical Clearance:** The study was approved by the institutional Ethical Board of the Public Health, Islam Negeri Syarif Hidayatullah University.

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Does Gluten Free Diet and Delay in Celiac Disease Diagnosis Affect Dental Caries and Salivary Oxidative Stress in Children?

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ABSTRACT

Background: Celiac disease, also named celiac sprue, is chronic malabsorption syndrome characterized by intestinal inflammatory reaction to dietary gluten in genetic susceptible individuals. The available treatment is by strict lifelong gluten free diet. The disease manifestations are not restricted intestinally but interestingly are often presented orally.

Objective: To assess the effects of gluten free diet and delay in celiac disease diagnosis in children on selected oral variables.

Subjects and Method: A case-control study was carries out in Baghdad including 20 newly diagnosed celiac disease children aged 7-11 years before initiation of gluten free diet (group A) and another 20 children committed to the diet (group B) compared to 40 children free from the disease (control group). Dental caries and salivary malondialdehyde were studied.

Results: Dental caries was lower in study groups than in control, there was no significant difference between delay in diagnosis and dental caries (P>0.05). Significant difference was found among study and control groups mean values concerning salivary malondialdehyde (Fisher exact = 114.200, P= 0.000). Significant difference was found between delay in diagnosis and salivary malondialdehyde level in the group committed to gluten free diet (T=2.124, P=0.048).

Conclusion: There was a relationship among celiac disease, gluten free diet, delay in diagnosis and salivary malondialdehyde. Dental caries was experienced at lower extent in celiac disease children.

Keywords: Celiac disease (CD), Gluten free diet (GFD), malondialdehyde (MDA), dental caries.

Introduction

Celiac disease (CD) is defined as a chronic inflammatory disorder affecting the small intestine causing malabsorption induced by the ingestion of gluten in genetically predisposed individuals (1). Genes encoding for CD are Human Leukocyte Antigens DQ2 and DQ8 (2). Histological features of the duodenal disease are villous atrophy, crypt hyperplasia, increase number of intraepithelial lymphocytes and decrease in height of enterocytes (3). CD is often presented clinically with abdominal pain, diarrhea and weight loss (4) and/or with extra intestinal manifestation as a result of malabsorption such as short stature, delay puberty, dental enamel hypoplasia, recurrent aphthous stomatitis, osteopenia, osteoporosis, Iron deficiency anemia, liver and biliary diseases, dermatitis herpetiformis, arthralgia and arthritis, ataxia, psychiatric disorders and alopecia (5). In 2005 an Iraqi study by Abdul-Wahid revealed a higher prevalence of dental enamel defects in both primary and permanent teeth in CD individuals as compared to control and that was associated with increased dental caries experience in primary dentition in contrast to the permanent (6). Lifelong Strict gluten free diet (GFD) is the only available treatment for CD, clinical improvement can be achieved few weeks after the treatment and 1-2
years to establish histological repair (7). Increase duration of malabsorption clinical symptoms predisposes the patients to severe complications making early detection extremely important (8).

Dental caries is slowly progressive chronic infectious disease (9). Different findings concerning dental caries and it’s correlation with CD have been reported ranging from no correlation with DMFT, decrease in dental caries experience in CD children before treatment and due to GFD (10-12). Shteyer, et al. reported that dental caries in celiac children was lower in the newly diagnosed and raised slightly during GFD while higher dental caries experience was found in normal children with no statistical significant results (13). An Iraqi study considered CD as a member of oxidative stress syndrome by increased level of malondialdehyde MDA in sera of newly diagnosed adults CD patients (14). When intracellular concentrations of reactive Oxygen radicals exceed the normal values, cytotoxic effects of free radicals lead to cell damage by double chain fatty acids peroxidation producing MDA as an end product (15). A study of CD patients on GFD aged 16-28 compared to healthy control found a significant Redox imbalance by serum MDA measurement (16) another study included CD patients aged 17-18 years showed impairment of Redox balance by significant increase of serum MDA in both unresponsively treated and untreated CD patients as compared to responsively treated CD patients (17). Saliva is a biological fluid which can be used non-invasively as a mirror for the blood (18). As far as it is known for the researchers neither salivary MDA was studies in CD patients before nor the effect of delay in CD diagnosis on oral health.

Material and Method

Study groups consisted of 20 newly diagnosed celiac disease patients before the initiation of gluten free diet GFD (CD at diagnosis) and 20 CD patients after 6-12 months of strict GFD (CD on GFD), both groups subjects were at age (7-11) years and devoid of any systemic disease rather than CD and were receiving neither medication nor nutritional supplements collected from three different teaching hospitals in Baghdad. 40 school students were strictly matched in age and gender who were free from any chronic or transient disease and receiving neither medications nor nutritional supplements selected randomly as control group after parents approvals.

The study was carried out during the period from November 2018 to March 2019. Clinical examination was carried out by using sterile dental mirrors, probes and tweezers. The criteria of Muhlemann, (1976) were used for the assessment of D1-MFS/d1-mfs (19). Unstimulated salivary samples were collected according to Tenovuo and Lagerlof, (1996) (20). Salivary MDA was determined by the principle of Spectrophotometry.

Delay in diagnosis was expressed as duration of CD malabsorption symptoms before diagnosis that was taken from patients’ medical files expressed by half year intervals since the first appearance of complains.

Descriptive statistics was applied, level of significance was set at 0.05, Games-Howell and Tukey HSD were used as ANOVA post hoc tests.

Results

Distribution of the sample was statistically not significant concerning gender in the study and control groups besides the sample was considered as one age group as shown in table (1).

<table>
<thead>
<tr>
<th>Table 1: Sample Distribution of Celiac Disease Patients and Control</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
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<td></td>
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<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Total</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

*CD = celiac disease **GFD = gluten free diet
Duration of symptoms before diagnosis was classified by median value into two categories; less than or equals to five years and more than five years and was distributed between the two study groups as in table (2).

**Table 2: Duration Category Distribution into the Two Study Groups**

<table>
<thead>
<tr>
<th>Duration</th>
<th>CD at diagnosis</th>
<th>CD on GFD</th>
<th>Total</th>
<th>Chi-Square</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤5</td>
<td>12</td>
<td>9</td>
<td>21</td>
<td>0.902</td>
<td>0.342</td>
</tr>
<tr>
<td>&gt;5</td>
<td>8</td>
<td>11</td>
<td>19</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Caries experience in the primary teeth among the three groups showed highly significant difference in d₄ category (P<0.01) and significant differences in ds and dmfs (P<0.05) as shown in table (3).

**Table 3: Dental Caries Experience of Primary Dentition (Mean ± SE) Among the Groups**

<table>
<thead>
<tr>
<th>CD at diagnosis</th>
<th>CD on GFD</th>
<th>Control</th>
<th>F*</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>SE</td>
<td>Mean</td>
<td>SE</td>
<td>Mean</td>
</tr>
<tr>
<td>d₁</td>
<td>0.100</td>
<td>0.100</td>
<td>0.050</td>
<td>0.050</td>
</tr>
<tr>
<td>d₂</td>
<td>0.750</td>
<td>0.315</td>
<td>0.300</td>
<td>0.219</td>
</tr>
<tr>
<td>d₃</td>
<td>1.700</td>
<td>0.391</td>
<td>1.250</td>
<td>0.390</td>
</tr>
<tr>
<td>d₄</td>
<td>6.200</td>
<td>1.609</td>
<td>5.700</td>
<td>1.601</td>
</tr>
<tr>
<td>ds</td>
<td>8.700</td>
<td>1.640</td>
<td>7.150</td>
<td>1.804</td>
</tr>
<tr>
<td>ms</td>
<td>2.000</td>
<td>0.843</td>
<td>1.000</td>
<td>0.585</td>
</tr>
<tr>
<td>fs</td>
<td>0.100</td>
<td>0.100</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>dmfs</td>
<td>10.800</td>
<td>2.136</td>
<td>8.050</td>
<td>1.963</td>
</tr>
<tr>
<td>dmft</td>
<td>5.700</td>
<td>0.929</td>
<td>4.850</td>
<td>1.014</td>
</tr>
</tbody>
</table>

*Fisher Exact Probability test, **Highly significant (P≤0.01), ***Significant (P<0.05)

Multiple comparisons of mean differences concerning d₄ category were shown in CD at diagnosis group with Control (Games-Howell = -5.900, P = 0.021) and between CD on GFD group with Control (Games-Howell = -6.400, P = 0.011) while no significant different was found between the two study groups. About ds multiple comparisons it was found that the only significant different was between CD on GFD group and Control (Tukey HSD = -5.675, P = 0.037). Significant mean difference in dmfs was found between CD on GFD group and Control (Tukey HSD = -7.650, P = 0.011).

Caries experience among the three groups in permanent teeth had showed significant differences in D₄, DS and DMFT as shown in table (4).

**Table 4: Dental Caries Experience of Permanent Dentition (Mean ± SE) Among the Groups**

<table>
<thead>
<tr>
<th>CD at diagnosis</th>
<th>CD on GFD</th>
<th>Control</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>SE</td>
<td>Mean</td>
<td>SE</td>
<td>Mean</td>
</tr>
<tr>
<td>D₁</td>
<td>1.000</td>
<td>0.241</td>
<td>1.700</td>
<td>0.309</td>
</tr>
<tr>
<td>D₂</td>
<td>0.800</td>
<td>0.200</td>
<td>1.050</td>
<td>0.328</td>
</tr>
<tr>
<td>D₃</td>
<td>.950</td>
<td>0.266</td>
<td>1.300</td>
<td>0.291</td>
</tr>
<tr>
<td>D₄</td>
<td>2.050</td>
<td>0.605</td>
<td>1.450</td>
<td>0.444</td>
</tr>
</tbody>
</table>
Conted…

<table>
<thead>
<tr>
<th></th>
<th>DS</th>
<th>MS</th>
<th>FS</th>
<th>DMFS</th>
<th>DMFT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4.350</td>
<td>0.500</td>
<td>0.550</td>
<td>5.750</td>
<td>4.050</td>
</tr>
<tr>
<td></td>
<td>0.638</td>
<td>0.500</td>
<td>0.500</td>
<td>1.172</td>
<td>0.630</td>
</tr>
<tr>
<td></td>
<td>5.300</td>
<td>0.000</td>
<td>0.000</td>
<td>5.300</td>
<td>4.850</td>
</tr>
<tr>
<td></td>
<td>0.645</td>
<td>0.000</td>
<td>0.000</td>
<td>0.645</td>
<td>0.586</td>
</tr>
<tr>
<td></td>
<td>7.500</td>
<td>0.000</td>
<td>0.375</td>
<td>7.975</td>
<td>6.300</td>
</tr>
<tr>
<td></td>
<td>0.744</td>
<td>0.000</td>
<td>0.122</td>
<td>0.750</td>
<td>0.536</td>
</tr>
<tr>
<td></td>
<td>4.978</td>
<td>1.520</td>
<td>1.049</td>
<td>3.019</td>
<td>3.948</td>
</tr>
<tr>
<td></td>
<td>0.009*</td>
<td>0.225</td>
<td>0.355</td>
<td>0.055</td>
<td>0.023**</td>
</tr>
</tbody>
</table>

*Highly significant (P≤0.01), **Significant (P<0.05)

Multiple comparisons of mean differences among the three groups concerning D₄ category showed significant mean differences between CD at diagnosis group and Control = -2.300, P = 0.011 and between CD on GFD group and Control = -2.900, P = 0.001. Concerning DS category the only significant mean difference was found between CD at diagnosis group and Control = -3.150, P = 0.006. The only significant mean difference in DMFT was found between CD at diagnosis group and Control = -2.250, P = 0.025.

Duration of symptoms before diagnosis in the two study groups subjects in relation to all dental caries categories of primary and permanent teeth by T-test showed no significant difference (P>0.05).

Salivary MDA mean values among the three groups were different significantly as shown in table (5).

Table 5: Salivary MDA (Mean ± SD) Among the Groups

<table>
<thead>
<tr>
<th></th>
<th>Salivary MDA (μmol/L)*</th>
<th>Mean</th>
<th>SD</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CD at diagnosis</td>
<td>13.029</td>
<td>1.425</td>
<td>114.200</td>
<td>0.000**</td>
</tr>
<tr>
<td></td>
<td>CD on GFD</td>
<td>10.618</td>
<td>1.847</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>6.291</td>
<td>1.773</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*micromoles/Liter, **Highly significant (P<0.01)

A multiple comparisons for salivary MDA mean differences were tested and showed highly significant differences among all the groups as shown in table(6).

Table 6: Multiple Comparisons of Salivary MDA among the Groups

<table>
<thead>
<tr>
<th></th>
<th>Tukey HSD</th>
</tr>
</thead>
<tbody>
<tr>
<td>(I)</td>
<td>(J)</td>
</tr>
<tr>
<td>Group</td>
<td>Group</td>
</tr>
<tr>
<td>CD at diagnosis</td>
<td>CD on GFD</td>
</tr>
<tr>
<td></td>
<td>Control</td>
</tr>
</tbody>
</table>

*Highly significant (P<0.01)

Discussion

Celiac disease CD as an inflammatory enteropathy is interestingly associated with decrease in dental caries experience and the effect of gluten free diet GFD is controversial (21-24). Dental caries is one of the most prevalent infectious diseases affecting humans (9). This study is in a contrast with a Turkish study that found the better adherence to GFD, the lower caries experience explained by lower Mutans Streptococci and Lactobacilli salivary counts, lower cariogenic diet consumption and better oral hygiene practice due to periodic health care follow ups (12). Median of time elapsed between first CD complains and diagnosis in the current Iraqi study was less than that of a Swedish study of CD adults that was 9.7 years (25). CD is accused of increasing oxidative stress damage in affected children (26,27) two hypotheses explain increased lipid peroxidation in sera of CD patients one by the overproduction of free radicals caused directly by gluten ingestion and the second is involved with decrease dietary antioxidants as a consequence of malabsorption (26,28). In the present study salivary MDA was elevated in CD children before treatment and lower in children after strict GFD while normal children had the least salivary concentrations. Salivary MDA was observed as significantly positively correlated with serum MDA in apparently healthy individuals (29) and in disease conditions (30,31) thus the current study findings are homogenous with the previous serum studies concerning...
serum MDA in CD patients (14,16,17). The correlation of salivary MDA level and the delay in CD diagnosis in patients on GFD illustrates the extreme importance of early CD diagnosis in symptomatic and asymptomatic children by national screening campaigns and health workers advanced education (25).

Conclusion

Dental caries was less experienced in celiac disease children besides dietary gluten exclusion and delay in diagnosis had no effect upon caries experience. Celiac disease was associated with an increase in salivary lipid peroxidation of affected children, gluten free diet could decrease the level of malondialdehyde in 6-12 months but fails to normalize its concentration besides delay in diagnosis may act as an obstacle against the recovery effect of gluten free diet.

Conflict of Interest: Authors declare that there was no conflicts concerning the current study, publication paper and funding.

Ethical Clearance: A protocol of the present study had gained approval from The Scientific and Ethics Committee, College of Dentistry, University of Baghdad, Iraq.

Source of Funding: The present study was self-funded.

REFERENCES


Study the Incidence of *Acinetobacter Baumannii* as a Nosocomial Pathogen

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¹Institute of Genetic Engineering and Biotechnology for Postgraduate Studies/University of Baghdad, Iraq

ABSTRACT

**Background:** *Acinetobacter baumannii* is considered one of the most important causing agents of nosocomial infections especially in immune compromised and intensive care units patients. So that it remains one of the main causes of mortality and morbidity in hospitalized patients. The aim of current study was to identify the incidence of *Acinetobacter baumannii* as a cause of nosocomial infection in AL-Najaf hospitals.

**Method:** Two hundred seventy six clinical and environmental specimens were collected from burns, wounds and environmental infections from different hospitals in Al-Najaf Al-Ashraf Governorate from November 2017 to April 2018). All of these samples were cultured by specific and differential media.

**Results:** Data showed that 52 *Acinetobacter baumannii* isolates were identified by using microscopic examination and biochemical tests. The identification of 52 *A. baumannii* isolates was confirmed using the VITEK-2 system.

**Conclusion:** *Acinetobacter baumannii* is the most common cause of nosocomial infection in burn patients in Iraq.

**Keywords:** *Acinetobacter baumannii*, burn, PCR, nosocomial infection, antibiotics resistance.

Introduction

*Acinetobacter baumannii* designated as a “red alert” human pathogen, generating alarm among the medical fraternity, arising largely from its extensive spectrum of antibiotic resistance (1). It is a Gram-negative, aerobic, non-motile, pleomorphic and opportunistic bacilli. It has a high incidence among immunocompromised individuals, particularly those who have experienced prolonged hospitalization (2). *Acinetobacter baumannii* can cause a variety of infections including pneumonia, bacteremia, meningitis, urinary tract infections, peritonitis and infections of skin and soft tissue. Multidrug resistant *A. baumannii* have become an important nosocomial pathogen that particularly affects critically-ill patients. The multi resistance is common in this species which complicates its therapy and elimination in severe infections, with extremely limited therapeutic alternatives available (4). *A. baumannii* is resistant to dehydration, detergents, UV radiation and common chemical sanitizers, making it extremely difficult to eradicate. Also, there is an increasing resistance of *A. baumannii* to antimicrobial drugs including aminoglycosides, quinolones and carbapenems (5). Therefore, the aim of current study was to identify the incidence of *Acinetobacter baumannii* as a cause of nosocomial infection in AL-Najaf hospitals.

Materials and Method

**Collection of specimens:** During the period extended from November 2017 to April 2018,276 clinical and environmental samples were collected from hospitalized patients and from the hospital environment (medical equipments and patients’ beds, tables, sinks and floors).

**Bacterial Identification:** Colonial morphology on MacConkey and Blood agars was depended initially
to identify bacterial isolates. Also, colony shape, texture, color and edges were examined. In addition to macroscopic characteristics; slides stained with Gram stain were examined under light microscope with a special regard towards cell shape and arrangement. Biochemical tests and VITEK 2 system were depended to complete the identification of Acinetobacter baumannii isolates.

**PCR amplification:** DNA template of all isolates was prepared by boiling method (30min in 100°C). The DNA of isolates was targeted only for the abal and pgaD genes using the primers (SinaClon, Iran) listed in Table (1). A 25-μl reaction mixture [contained 3μl of DNA, 1μl of each primer, 13μl of Master Mix 2X (SinaClon, Iran) and 7μl of deionized distilled water]. The experiment was continued according to the following program: initial denaturation at 94°C for 5 minutes, followed by 35 cycles at 94°C for 1 minute, 60°C for 1 minute, 72°C for 1 minute and final extension at 72°C for 5 minutes. The PCR products were analyzed using gel electrophoresis (1% agarose), stained with safe dye and visualized by Gel Doc apparatus (BioRad, USA) Table (1).

![Table 1: Primers used in current study](image)

<table>
<thead>
<tr>
<th>Gene</th>
<th>Primer Sequence</th>
<th>Product size (bp)</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>bla OXA-51</td>
<td><em>F</em> ‘5-TCG TGC TTC GAC CGA GTA TG-3’</td>
<td>506</td>
<td>Azeez and Al-Daraghi 2018</td>
</tr>
<tr>
<td></td>
<td><em>R</em> ‘5-GAGGCTGAA CAA CCC ATC CA-3’</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 2: Conditions of PCR for A. baumannii genes amplification**

<table>
<thead>
<tr>
<th>Steps</th>
<th>Temperature</th>
<th>Time</th>
<th>Number of Cycles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Denaturation</td>
<td>95°C</td>
<td>5 min.</td>
<td>1</td>
</tr>
<tr>
<td>Denaturation</td>
<td>95°C</td>
<td>30 Sec.</td>
<td></td>
</tr>
<tr>
<td>Annealing</td>
<td>55°C</td>
<td>30Sec.</td>
<td>30</td>
</tr>
<tr>
<td>Extension</td>
<td>72 °C</td>
<td>30Sec.</td>
<td></td>
</tr>
<tr>
<td>Final extension</td>
<td>72 °C</td>
<td>7 min.</td>
<td>1</td>
</tr>
<tr>
<td>Hold</td>
<td>10 °C</td>
<td>10 min.</td>
<td>1</td>
</tr>
</tbody>
</table>

**Results and Discussion**

**Isolation and Identification of Acinetobacter baumannii:** Out of 276 clinical and environmental samples analyzed for the presence of Acinetobacter baumannii, the results of bacterial isolation and identification revealed the detection of 52 isolates of A. baumannii. By using some biochemical tests, results showed negative results for oxidase test, motility test, indole production and urease production tests, while (52) isolates were positive for catalase and citrate utilization tests, the other (Acinetobacter pittii, Pseudomonas aeruginosa, Klebsiella pneumonia) isolates were identified as other strains. All isolates appeared as Gram-negative coccobacilli and occasionally arranged in diplococci.

**Biochemical tests:** All isolates showed negative results for oxidase, motility, indole production and urease production tests, while the isolates gave positive results for catalase and citrate utilization tests. Kligler iron agar developed an alkaline slant, no change bottom, H₂S negative without gas production. Also when A. baumannii isolates were cultured on MacConkey agar they appeared as small, pale and lactose non fermenter colonies, while on blood agar they appeared as opaque creamy and non-hemolytic colonies (Table 3).

**Table 3: The Diagnostic results of biochemical test for A. baumannii**

<table>
<thead>
<tr>
<th>Biochemical test</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth at 44°C</td>
<td>+</td>
</tr>
<tr>
<td>Motility</td>
<td>-</td>
</tr>
<tr>
<td>Oxidase production</td>
<td>-</td>
</tr>
<tr>
<td>Catalase production</td>
<td>+</td>
</tr>
<tr>
<td>Hemolysin production</td>
<td>(-γ hemolysis)</td>
</tr>
<tr>
<td>Indole production</td>
<td>-</td>
</tr>
<tr>
<td>Urease production</td>
<td>-</td>
</tr>
<tr>
<td>Lactose fermentation</td>
<td>-</td>
</tr>
<tr>
<td>Citrate utilization</td>
<td>+</td>
</tr>
</tbody>
</table>

(+) Positive result; (-) Negative result.
At the species level, growth at 44°C was positive for all *A. baumannii* isolates which showed the ability to grow at this temperature. This test was used to distinguish *A. baumannii* from other *Acinetobacter species* which were unable to grow at this temperature (7).

The identification was performed with the automated VITEK -2 system using the GN-ID cards which contain 64 biochemical tests. Out of the 52 isolates of *A. baumannii*, 50 were positive for the *A. baumannii* demonstrated.

**Distribution of Acinetobacter Baumannii according to type of specimens:** Out of (276) collected specimens, 52(18.8) were positive for *A. baumanii*. The percentages of positive results from burns, environment and wounds specimens were 21.7%, 17.1% and 8.3%, respectively, Table (4).

**Table 4: Distribution of *A. baumannii* isolates in clinical samples**

<table>
<thead>
<tr>
<th>Site of Specimen</th>
<th>Number of specimens (%)</th>
<th>Number of isolates (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burn</td>
<td>170(61.6)</td>
<td>37(21.7)</td>
</tr>
<tr>
<td>Environment</td>
<td>70(25.4)</td>
<td>12(17.1)</td>
</tr>
<tr>
<td>Wound</td>
<td>36(13)</td>
<td>3(8.3)</td>
</tr>
<tr>
<td>Total</td>
<td>276(100)</td>
<td>52(18.8)</td>
</tr>
</tbody>
</table>

Low percentage was found in wound specimens that accomplished 8.3%. Results obtained by (8) reported that the highest percentage of *A. baumannii* isolates were from wounds (23.48%) which was higher than the figure reported in current study. In addition, (9) found that the highest percentage of isolates was obtained from burns (20.6%). This finding was in agreement with our present findings.

*A. baumannii* is an important cause of burn infections although it is difficult to differentiate between infection colonization of burn sites. On the other hand, because of the high rates of multidrug resistance and the poor penetration of some antibiotics into burn sites, these infections can be extremely challenging for clinicians. Moreover, multidrug resistant *A. baumannii* is the most common cause of nosocomial infection in burn patients in Iran (10). Because of destroyed skin barrier and suppressed immune system, burn patients are at high risk of developing nosocomial infection especially by multidrug resistant gram negative bacteria (11).

**Molecular Detection of Acinetobacter baumannii by bla_oxa51like gene:** The results of PCR analysis, concerning the oxa 51, showed that *A. baumannii* possesses the gene *bla_oxa51like* gene. Out of 50 positive isolates, 34(20%) were from burn, 12(17.1%) from environment and 6(16.3%) were from wounds (Figures 1 and 2).

![Figure 1: Agarose gel electrophoresis of PCR amplification products (*bla_oxa51like* gene) for *A. baumannii*. Lanes 1-13 showed positive results](image)

Figure 2: Agarose gel electrophoresis of PCR amplification products ($bla_{	ext{oxa-51-like}}$ gene) for Lanes 14-20 showed the 100bp DNA marker

**Conclusion**

*Acinetobacter baumannii* is the most common cause of nosocomial infection in burn patients in Iraq.

**Ethical Clearance:** The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

**Conflicts of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding.

**REFERENCES**


Isolation of Some Pathogenic Bacteria and Fungi From Student’s Mobile Phones (Part I)

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¹Institute of Medical Technology, Al–Mansour, Baghdad, Iraq; ²Al-Nosor University, Baghdad, Iraq; ³Tropical-Biological Research Unit, Science College, University of Baghdad, Baghdad, Iraq; ⁴CBRN Division, Iraqi National Security Service

ABSTRACT

Background: Mobile phones are approximately widely used everywhere like in hospital wards, clinics and universities as well as biomedical laboratories. They have become very important tool in students’ life. In contrast, these tools carry many harmful bacteria which are responsible for infectious diseases in human because they serve as a reservoir for different pathogens. Current study was aimed to isolate bacteria from students’ mobile phones at the Institute of Medical Technology/Al-Mansour/The Middle Technical University, Baghdad, Iraq. Also, the study investigated microbial resistance to many antimicrobial agents as well as the appropriate remedial measures.

Method: Four hundred and fifty swabs from mobile phones were collected from 450 students (271 males and 179 females). Their age range was (17-30) years. Swabs were collected from students during March 2018.

Results: Out of the 450 swabs, 150(33.33%) swabs were positive. The percentages of the isolated bacteria according to gender were 53.33%(80 isolates) from males’ mobile phones and 46.66%(70 isolates) from females’ mobile phones. The most frequent Gram-positive bacteria isolated were Staphylococcus aureus (50%) followed by S. epidermidis (20%), whereas Gram-negative bacteria isolated were Escherichia coli (6.0%), Proteus mirabilis (2.66%), Proteus vulgaris (2.66%) and Pseudomonas aeruginosa (2.66%). The isolated bacteria showed variable antimicrobial sensitivity patterns for different antibiotics. Most S. aureus isolates were resistant to Cefotaxime, Gentamycin, Amoxicillin, Ciprofloxacin and Augmentin, whereas other isolated species showed the highest resistance to many antibiotics of interest. The isolates of Micrococcus spp. were sensitive to all the studied antibiotics except Tetracycline and Fucidic acid.

Conclusion: The present findings indicated that contaminated students’ mobile phones could serve as reservoirs of bacterial agents. Also, most of the latter were resistant to many commonly prescribed antimicrobial agents.

Keywords: Mobile phones, contamination, pathogenic bacteria, Gram-positive bacteria, Gram-negative bacteria.

Introduction

The hands and mobile phones (MPs) of students and faculty members in most universities around the world played an important role in infections transmission. Previous studies in Iraq and other countries showed that MPs have a role in the transmission of bacteria. Mobile phone has become an essential item in hospital wards, clinics, medical laboratories, universities and even in operation rooms and toilet. So, it became a reservoir for pathogenic microorganisms causing different diseases especially those associated with skin [1].

Many microorganisms are presented on human skin, respiratory and gastrointestinal tracts as normal flora.
like *Staphylococcus epidermidis* and *Staphylococcus aureus* [2]. Skin and noses of healthy people have 20-25% *S. aureus* [3]. Also, hands serve as a major transmission vehicle of various pathogenic bacteria, parasites, fungi and viruses including the enteric species [4]. *Proteus mirabilis*, *proteus vulgaris*, *Escherichia coli* and *Pseudomonas aeruginosa* are the most common Gram-negative bacteria caused nosocomial infection, urinary tract and wound infections, in addition to meningoencephalitis and osteomyelitis [5]. All these microorganisms can be isolated from MPs. In Turkey, many researchers studied bacterial contamination of MPs in teaching hospitals. They isolated *Escherichia coli*, *Enterococcus faecalis*, *Pseudomonas aeruginosa*, *Pseudomonas fluorescens*, *Klebsiella pneumoniae* and Methicillin-Resistant *Staphylococcus aureus* (MRSA) [6]. Also, another study in Morocco revealed that all samples from MPs had 66.6% *Klebsiella pneumoniae* and 33.3% *Escherichia coli* that were resistant to many antibiotics [7]. Although, MPs have become essential items in human life, it increased the spread of pathogenic microorganism from person to another through contact and held close to the face especially in students’ communities [8]. Therefore, this study was conducted to detect bacterial and fungal contamination of student’s MPs at the Institute of Medical Technology/Al-Mansour/The Middle Technical University (IMT/M/MTU) in Baghdad, Iraq. Also, the study investigated microbial resistance many antimicrobial agents as well as to take the necessary remedial measures.

### Materials and Method

**Sample collection:** A collection of 450 swabs were collected from 450 students’ MPs (271 swabs from males’ phones, and 179 swabs from females’ phones). The swabs were collected from the covers of MPs of students studying at Pathologic Analysis, Medical Instrument, Pharmacology, Ophthalmology and Health Management departments at IMT/M/MTU/Baghdad, Iraq (Table 1). The samples were immediately transferred to the laboratory for culturing on enriched selective culture media.

#### Table 1: Distribution of collected swabs

<table>
<thead>
<tr>
<th>Department</th>
<th>Male No. (%)</th>
<th>Female No. (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pathologic analysis</td>
<td>120(44.28)</td>
<td>100(55.86)</td>
<td>220(48.88)</td>
</tr>
<tr>
<td>Medical instrument</td>
<td>65(23.98)</td>
<td>61(34.07)</td>
<td>126(28)</td>
</tr>
<tr>
<td>Pharmacology</td>
<td>46(16.97)</td>
<td>6(3.35)</td>
<td>52(11.55)</td>
</tr>
<tr>
<td>Ophthalmology</td>
<td>20(7.38)</td>
<td>10(5.68)</td>
<td>30(6.66)</td>
</tr>
<tr>
<td>Health management</td>
<td>20(7.38)</td>
<td>2(1.11)</td>
<td>22(4.88)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>271(100)</strong></td>
<td><strong>179(100)</strong></td>
<td><strong>450(100)</strong></td>
</tr>
</tbody>
</table>

**A. Isolation and Identification of pathogenic microorganisms:** The swabs were inoculated in Brain Heart infusion (BHI) broth, as an enriched culture medium to increase the number of bacteria before isolation on a selective culture media, and then incubated at 37°C for 18-24hr, then they were cultured on Blood agar, MacConkey agar, Nutrient agar and Eosin Methylene Blue agar. Gram stain and biochemical tests were conducted by using API 20E, API staph. In addition to detecting the growth of *S. aureus* on Mannitol salt agar [9,10]. Oxacillin testing was done for identification of MRSA and the result was interpreted according to Clinical Laboratory Standards Institute guidelines [11].

**B. Antibiotics susceptibility test of the pathogenic bacteria:** The sensitivity test of bacteria was done by using antibiotic discs (Cefotaxime 30μg, Gentamycin 10μg, Streptomycin 10μg, Ciprofloxacin 5μg, Amoxicillin 10μg, Augmentin (Amoxicillin/Clavulanic acid) 20/10μg, Tetracycline 30μg and Fucidic acid 90μg) (Table 2).

#### Table 2: Antibiotics sensitivity test of the isolated microorganism

<table>
<thead>
<tr>
<th>Antibiotic disc</th>
<th>Sensitive (mm)</th>
<th>Intermediate (mm)</th>
<th>Resistant (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cefotaxime</td>
<td>≥23</td>
<td>18-22</td>
<td>≤17</td>
</tr>
<tr>
<td>Gentamycin</td>
<td>≥26</td>
<td>23-25</td>
<td>≤22</td>
</tr>
<tr>
<td>Streptomycin</td>
<td>≥26</td>
<td>23-25</td>
<td>≤22</td>
</tr>
<tr>
<td>Ciprofloxacin</td>
<td>≥21</td>
<td>15-20</td>
<td>≤14</td>
</tr>
<tr>
<td>Amoxicillin</td>
<td>≥28</td>
<td>22-27</td>
<td>≤21</td>
</tr>
<tr>
<td>Augmentin</td>
<td>≥25</td>
<td>24-20</td>
<td>≤19</td>
</tr>
<tr>
<td>Tetracycline</td>
<td>≥26</td>
<td>23-25</td>
<td>≤22</td>
</tr>
<tr>
<td>Fucidic acid</td>
<td>≥26</td>
<td>23-25</td>
<td>≤22</td>
</tr>
</tbody>
</table>

mm= Millimeter
C. Statistical analysis: The statistical analyses were done by using the WinPipe computer program (version 11.65). Pearson’s chi-squared test and Fischer’s exact probability were used to express the significant differences among bacterial and fungal isolates.

Results and Discussion

Out of the 450 collected swabs, 271 (60.22%) were from male students and 179 (39.77%) were from females, 150 (33.33%) swabs were positive for culturing of pathogenic bacteria (Table 3). The distribution of bacterial isolates percentages according to gender showed that 53.33% (80 isolates) were from male’s phones and 46.66% (70 isolates) were from females. The most frequent bacterial isolates were *Staphylococcus aureus* (50%) followed by *Streptococcus pyogenes* (20%). The Gram-positive bacteria were *Staphylococcus* isolate, while the gram-negative bacteria were *Escherichia coli* (6%), *Proteus mirabilis* (2.66%), *Proteus vulgaris* (2.66%) and *Pseudomonas aeruginosa* (2.66%)

### Table 3: Percentages of bacterial and fungal isolates

<table>
<thead>
<tr>
<th>Bacterial isolates</th>
<th>No.(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Staphylococcus aureus</em></td>
<td>75(50)</td>
</tr>
<tr>
<td><em>Staphylococcus epidermidis</em></td>
<td>30(20)</td>
</tr>
<tr>
<td><em>Streptococcus pyogenes</em></td>
<td>9(6)</td>
</tr>
<tr>
<td><em>Escherichia coli</em></td>
<td>9(6)</td>
</tr>
<tr>
<td><em>Micrococcus spp.</em></td>
<td>8(5.33)</td>
</tr>
<tr>
<td><em>Bacillus subtilis</em></td>
<td>7(4.66)</td>
</tr>
<tr>
<td><em>Proteus mirabilis</em></td>
<td>4(2.66)</td>
</tr>
<tr>
<td><em>Proteus vulgaris</em></td>
<td>4(2.66)</td>
</tr>
<tr>
<td><em>Pseudomonas aeruginosa</em></td>
<td>4(2.66)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>150(100)</td>
</tr>
</tbody>
</table>

Also, the results showed that the percentage of *Staphylococcus aureus* bacteria was 64.28% (45 isolates) from females’ MPs and 37.5% (30 isolates) from males. In addition, most females in the study have been infected with acne, so the potential contamination of their MPs might have come from the face and this is very dangerous in bacterial transfer to healthy persons. In contrast, *Streptococcus pyogenes* percentage in males’ phones was 26.25% (21 isolates) and this percentage was higher than in females 12.85% (9 isolates; Table 4).

### Table 4: Distribution of bacterial isolates according to gender

<table>
<thead>
<tr>
<th>Bacterial isolates</th>
<th>Total No.(%)</th>
<th>Males No. (%)</th>
<th>Females No. (%)</th>
<th>X²</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Staphylococcus aureus</em></td>
<td>75(50)</td>
<td>30(37.5)</td>
<td>45(64.28)</td>
<td>10.64</td>
<td>P &lt; 0.05</td>
</tr>
<tr>
<td><em>Staphylococcus epidermidis</em></td>
<td>30(20)</td>
<td>21(26.25)</td>
<td>9(12.85)</td>
<td>4.19</td>
<td>P &lt; 0.05</td>
</tr>
<tr>
<td><em>Streptococcus pyogenes</em></td>
<td>9(6)</td>
<td>4(5)</td>
<td>5(7.14)</td>
<td>2.91</td>
<td>P &gt; 0.05</td>
</tr>
<tr>
<td><em>Escherichia coli</em></td>
<td>9(6)</td>
<td>7(8.57)</td>
<td>2(2.85)</td>
<td>2.30</td>
<td>P &gt; 0.05</td>
</tr>
<tr>
<td><em>Micrococcus spp.</em></td>
<td>8(5.33)</td>
<td>5(6.25)</td>
<td>3(4.28)</td>
<td>0.29</td>
<td>P &gt; 0.05</td>
</tr>
<tr>
<td><em>Bacillus subtilis</em></td>
<td>7(4.66)</td>
<td>5(6.25)</td>
<td>3(4.28)</td>
<td>0.29</td>
<td>P &gt; 0.05</td>
</tr>
<tr>
<td><em>Proteus mirabilis</em></td>
<td>4(2.66)</td>
<td>2(2.5)</td>
<td>2(2.85)</td>
<td>0.02</td>
<td>P &gt; 0.05</td>
</tr>
<tr>
<td><em>Proteus vulgaris</em></td>
<td>4(2.66)</td>
<td>3(3.75)</td>
<td>1(1.42)</td>
<td>0.77</td>
<td>P &gt; 0.05</td>
</tr>
<tr>
<td><em>Pseudomonas aeruginosa</em></td>
<td>4(2.66)</td>
<td>3(3.75)</td>
<td>1(1.42)</td>
<td>0.77</td>
<td>P &gt; 0.05</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>150(100)</td>
<td>80(100)</td>
<td>70(100)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In the current study, we detected that most of students involved in the study used to call their friends when they were in the toilet or when they worked in the Institute’s laboratories during training on bacterial isolation and diagnosis from clinical samples. The highest percentage of bacterial isolates was from students enrolled in pathological analysis department followed by pharmacology department students (Table 5).

### Table 5: Distribution of bacterial growth according to academic departments

<table>
<thead>
<tr>
<th>Department</th>
<th>Males No. (%)</th>
<th>Females No. (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>+ve</td>
<td>-ve</td>
<td>+ve</td>
</tr>
<tr>
<td>Pathologic analysis</td>
<td>53(66.25)</td>
<td>67(35.07)</td>
<td>60(85.71)</td>
</tr>
<tr>
<td>Pharmacology</td>
<td>16(20)</td>
<td>30(15.70)</td>
<td>2(2.85)</td>
</tr>
<tr>
<td>Medical instrument</td>
<td>6(7.5)</td>
<td>59(30.89)</td>
<td>3(4.28)</td>
</tr>
<tr>
<td>Ophthalmology</td>
<td>3(3.75)</td>
<td>17(8.90)</td>
<td>3(4.28)</td>
</tr>
<tr>
<td>Health management</td>
<td>2(2.5)</td>
<td>19(9.42)</td>
<td>2(2.85)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>80(100)</td>
<td>191(100)</td>
<td>70(100)</td>
</tr>
</tbody>
</table>
The present findings agreed with the results of [12] who demonstrated that the MPs bacterial contamination percentage was high and the results of bacterial contamination distribution according to the gender were compatible with the present results. On the other hand, the decreased contamination percentage in females’ MPs than in males’ may be referred to the fact that most females keep their MPs in their handbags, while males hold their MPs in their palms, laboratory coat pocket or put them on contaminated tables or other surfaces.

The results for the variable antimicrobial sensitivity patterns of the isolated bacteria for different antibiotics. Most S. aureus isolates were resistant to Cefotaxime, Gentamycin, Amoxicillin, Ciprofloxacin, and Augmentin, the susceptibility percentages were 55%, 72%, 66.66%, 69.33% and 72%, respectively. Also, the results demonstrated that S. epidermidis isolates were resistant to Cefotaxime, Gentamycin, Ciprofloxacin, Amoxicillin, and Augmentin, their susceptibility percentages were 66.66%, 66.66%, 96.66%, 83.33% and 80%, respectively. However, S. pyogenes, E. coli, Proteus mirabilis, Proteus vulgaris, Pseud. aeruginosa and Bacillus subtilis showed the highest resistance to many of the antibiotics in question. Moreover, Micrococcus spp. isolates were sensitive to all antibiotics under study except Tetracycline and Fucidic acid.

Although MPs are important tools for communication, they have become dangerous tools in transmitting pathogenic microorganisms from one person to another. The high numbers of isolated bacteria from students’ MPs were due to their contact with contaminated surfaces and environment. In the present study, the prevalence of bacteria might be explained that students deal directly with items in the laboratories then contact their MPs with the laboratory benches or even culture media containing bacteria through culturing or examining bacteria. Other studies [13-15] agreed with results of current results and revealed that 21 isolates (17.5%) gave positive bacterial growth and the most frequent bacteria were S. aureus (47.6%) followed by S. Epidermidis (19%), E. coli (14.2%), Strep. Pyogenes (9.5%) and Bacillus subtilis (4.7%). Also, they referred that MPs could become good tools for nosocomial infections in hospital units. Therefore, the proper decontamination of MPs devices is by using 70% isopropyl alcohol which helps reduce the risk of pathogenic bacteria transmission. Another study [16] reported a high percentage of isolated bacteria from MPs’ handset which appeared resistant to all antibiotics used in that. This finding was incompatible with the results reported by [17,18] who found that Staphylococcal species were sensitive to Ciprofloxacin, Clindamycin and Vancomycin.

Gram-positive bacteria isolated from MPs in current study included S. aureus and S. epidermides that are considered opportunistic pathogens and can cause infections to humans, yet they are considered normal flora of the skin and nose. Many studies approved that S. aureus was the most pathogen that causes acne, abscesses, wound, burn infections, impetigo, toxic shock syndrome, pneumonia and meningitis. Also, S. epidermidis can cause wound and burn infections. These species of bacteria presented in asymptomatic carrier and can be transmitted from hand to hand via animate or inanimate objects like MPs. Moreover, other species of Gram-positive bacteria isolated from students’ MPs such as Strept. pyogenes could colonize the human nasopharynx and often secreted from respiratory tract into the air during coughing and sneezing and may settle on the skin of the hand, so eventually transferred to the surface of MPs causing diseases when entering the human body [19,20].

Micrococcus spp. is a Gram-positive bacterium considered normal flora of human skin and can be transmitted through direct hand to hand contact indirect contact via dust, so it may be found on a MP [21]. Furthermore, Bacillus spp. spores can spread in nature, they are found in soil or adhered to dust particles and could contaminate the laboratories and hands of students.

Conclusion

Students’ MPs were colonized with Gram-positive and Gram-negative bacteria which might serve as a potential source of infection for students and other peoples. Therefore, it is important to wash the hands carefully after using a MP and the phone must be cleaned with alcohol to reduce the transmission of pathogenic microorganisms.

Ethical Clearance: The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding.
REFERENCES


Association of Genetic Polymorphism of GNB3 Gene in a Sample of Iraqi Arabs Patients with Type 2 Diabetes Mellitus

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1Biology Department, College of Sciences for Women, University of Baghdad, Iraq; 2Biotechnology Research Center, Al-Nahrain University, Iraq

ABSTRACT

Diabetes mellitus is one of the most common chronic diseases in nearly all countries, and continues to increase in numbers and significance. Various environmental and genetic factors interact and increase the risk of Type 2 diabetes mellitus and its complications.

The study consist of 105 patients having Type 2 diabetes mellitus and 50 healthy controls, measured some biochemical parameters, genomic DNA extracted from whole blood, and C825T polymorphism was detected by polymerase chain reaction- Restriction fragment length polymorphism (PCR-RFLP) and DNA sequencing of amplified product of GNB3 gene for studies group.

The results of molecular analysis for GNB3 genetic polymorphism shows that the frequency of (CC) genotype in T2DM patients and controls group (5.7%; 4%) respectively and the (CT) genotype (65.7%; 86%) respectively, while the (TT) genotype frequency was (28.6%; 10%) respectively. So, There were significant differences in CT and TT genotype when compared T2DM patients to control group, but no significant in CC genotype. Furthermore the TT genotype nearly (3.6) fold increases the risk factor for T2DM. We also observed that the levels of fasting blood glucose and Triglyceride increased in individuals who have the CT and TT genotypes.

Keywords: T2DM, G protein, GNB3, C825T polymorphism.

Introduction

Diabetes mellitus (DM) mentions to a number of disorders that part the common feature of elevated blood glucose levels. There are two main sub types of diabetes are type1,diabetes and type 2 diabetes (1). Type 2 diabetes mellitus (T2DM) is the most common type of the disease affecting 90% to 95% of persons with diabetes results from an imbalance between insulin sensitivity and insulin secretion (2). T2DM is one of the most prevalent metabolic disorders worldwide, the prevalence of diabetes worldwide has increased dramatically and in Iraq approximately 668,000 adults affected in year 2000 and this is expected to rise to 2 million by 2030 (2,3). T2DM is not a single disease but a heterogeneous disease. Some 90% of cases of T2DM have multifactorial pathogenesis resulting from complex interaction between unhealthy life style habits (over nutrition, lack of physical activate, obesity, etc), and 10 % of cases genetically determined (4). The hereditary component makes susceptibility to the disease is very strong. Several genetic loci are probably involved in this susceptibility. Therefore, T2DM is due to from interaction of both genetic and environmental factors (5).

(G proteins) Guanine Nucleotide Binding Proteins are a group of proteins implicated with second messenger, that transmit signals from numerous hormones, neurotransmitters, chemokines, and autocrine and paracrine factors. Heterotrimeric G proteins consist of 3 subunits – alpha (α), beta (β) and gamma (γ).The
beta (β3) subunit encoded by the GNB3 gene in human. GNB3 gene that is existent on chromosome 12 and is composed of 11 exons and 10 introns. The polymorphism (C825T) occurs due to the replacement of cytosine to thymine in 825 position\(^6\). This polymorphism induces the happening of a splice variant in which in exon 9 the nucleotides 498–620 are deleted. This deletion causes a lack of 41 amino acids of exon (9) \(^7\). The C825T polymorphism is known to be related with enhanced signal transduction through the G protein system \(^8\).

Several studies have evaluated the association between GNB3 C825T polymorphism and obesity \(^9,10\), hypertension \(^11,12\) and cardio vascular disease CVD\(^13,14\).

The aims of this study was compared the genetic distribution of genotypes of GNB3 gene between type 2 diabetic patients and non-diabetic subjects, and evaluates the association between genetic polymorphism in GNB3 gene and some risk factor in the etiology of type 2 diabetic

Our study is the first in Iraq that evaluated the association between genetic polymorphism of GNB3 gene and T2DM patients.

**Materials and Method**

The study consisted of 105 patients having T2DM (50 males and 55 females; mean age 55.2 ± 8.0) and (50) healthy controls (25males and 25females; mean age 56.4 ± 9.2). This study was carried out at The Specialized Center for Endocrinology and Diabetes (AL-Kindy Hospital) in Baghdad-Iraq.

**Collection of blood samples:** Blood samples were collected by taking blood from each patient and healthy human by vein puncture, between (8.30-11.0) A.M after fasting. The total collected blood (5ml), it was divided into two tubes: (3ml) for biochemical tests and (2ml) for DNA extraction.

**Genomic DNA extraction and genotyping:** The DNA of the samples was extracted according to instructions (DNA purification kit, ITRON), the DNA isolation from 200µl from the whole blood cells; all samples showed bands when the electrophoresis of gel. The polymorphism of the GNB3 gene was detecting by using PCR-RFLP according the method by Chandrasekaran in 2012 \(^15\). The total volume of reaction mixture of PCR was contained in 25µl, consisted of 1.5 µl genomic DNA, 5 µl master mix, 16.5 µl D.W. and 1 µl of each primer. GNB3 forward were 5’ TGA CCC ACT TGC CAC CCG TGC 3’ and GNB3 reverse were 5’ GCA GCA GCC AGG GCT GGC 3’ The condition were: initial denaturation at 94°C for 3 mint, followed by at 35 cycle program with denaturation at 94°C for 30 S, annealing at 68°C for 30 S, elongation at 72°C for 30S and final elongation at 72°C for 7 mint. The PCR product was then electrophoresed on 2% agarose gel in 1X TBE buffer; DNA band was imagined by electrophoresis to observed at level 268bp. After PCR, five microliter of PCR product was digested with one microliter (ten unite) of the restriction enzyme, BsaJI (Bacillus stearothermophilus J695) (Biolabs) incubation at 60°C for 60min. The digested fragments were electrophoresed on 3% agarose gel mixed with red stain to visualized. Then, sequencing of amplified product of GNB3 gene for studies group.

**Statistical Analysis:** In this study The data were expressed as mean ± SD, the significant differences were showed by using ANOVA table through using the statistical analysis program IBM SPSS version 24, Pearson’s chi-square, Fischer exact probability, odd ratio were used to expressed the significance between the studied groups for polymorphisms and related parameters by using the portable statistical program WinPepi version 11.65, while for genotyping and allele frequency calculation, the online Hardy-Weinberg equilibrium calculator was used.

**Results**

The amplified DNA products were digested with BsaJI either in retention of the 268 bp product or complete digestion to (114, 154 bp) fragment. The PCR product with C allele, presence of cytosine at position 825 the enzyme has restriction site the fragment was digested into two fragments(114, 154 bp), while the PCR product with T allele remained undigested (268 bp) because the fragment lost restriction site, whereas PCR product with CT genotype was gave three fragments (114, 154, 268 bp). Figure (1). To further conform the PCR-RFLP result, the DNA sequence analysis using forward and revers primers was also preformed Figure(2).
Figure 1: Photograph of the PCR products of the GNB1 gene after BsaJI enzyme digestion and electrophoresis at 3% agarose gel. show lane M: (Ladder) DNA molecular weight marker, (4,8,12) homozygous (CC-114 bp and 154 bp), lane (6, 7, 9, 10, 11, 13) heterozygous (CT- 114 bp, 154 bp, 268 bp).and lane (1, 2, 3, 5) homozygous (TT-268 bp).

Figure 2: photograph of sequencing GNB3 gene. A: CC homozygote, B:CT heterozygote and C: TT heterozygote

Table (1) shows the distribution of GNB3 polymorphism in total patients compared to control groups. Finally, Table (2) shown the mean of fasting blood glucose and lipid profile of patients according to genetic polymorphisms of GNB3 gene.

Table 1: Genotype distribution of GNB3 polymorphism in T2DM patients and healthy control

<table>
<thead>
<tr>
<th>Polymorphism</th>
<th>Control N = 50</th>
<th>Patients N = 105</th>
<th>OR</th>
<th>CI 95%</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Observed</td>
<td>Percentage</td>
<td>Observed</td>
<td>Percentage</td>
<td></td>
</tr>
<tr>
<td>CC</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>5.7</td>
<td>1.45</td>
</tr>
<tr>
<td>CT</td>
<td>43</td>
<td>86</td>
<td>69</td>
<td>65.7</td>
<td>0.09</td>
</tr>
<tr>
<td>TT</td>
<td>5</td>
<td>10</td>
<td>30</td>
<td>28.6</td>
<td>3.6</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100</td>
<td>105</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Allele frequency

<table>
<thead>
<tr>
<th>Allele</th>
<th>Frequency</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>0.47</td>
<td>0.39</td>
</tr>
<tr>
<td>T</td>
<td>0.53</td>
<td>0.61</td>
</tr>
<tr>
<td>P-value</td>
<td>P&lt;0.001</td>
<td>P&lt;0.001</td>
</tr>
</tbody>
</table>

OR.: odd ratio; C.I.: Confidence interval; p: Pearson’s chi-square
Table 2: The comparison between three genotypes according to the FBG and lipid profile in patients of T2DM

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Polymorphism Mean ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CC n = 6</td>
</tr>
<tr>
<td>FBG</td>
<td>181.5 ± 28.6 CE</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>163.4 ± 13.4 BC</td>
</tr>
<tr>
<td>Triglyceride</td>
<td>168.7 ± 38.2 CE</td>
</tr>
<tr>
<td>HDL</td>
<td>35.5 ± 4.4 BC</td>
</tr>
<tr>
<td>LDL</td>
<td>94.2 ± 14.9 BC</td>
</tr>
<tr>
<td>VLDL</td>
<td>33.7 ± 7.6 BC</td>
</tr>
</tbody>
</table>

Similar letters: No significant difference ($p > 0.05$) between means
Different letters: Significant difference ($p \leq 0.05$) between means Statistical analysis was performed by ANOVA test

**Discussion**

In this study, we want to find if there is a coloration between the C825T polymorphism and T2DM in Iraqi Arab patients. It may be the first study of association between T2DM and GNB3 polymorphism in Iraqi population. According to Table (1), the C allele and CT genotype showed decreased frequency in patients comparing in control while the T allele and TT genotype showed an increased frequency in patients, which means that CT genotype was considered to be a protective factor because of the rate of OR in patients have only T2DM when compared with control less than one (0.09), but the TT genotype was considered risk factor and had 3.6 times increased a risk for T2DM. While the CC genotype revealed that it has no role in the susceptibility of the disease in our studied group. The pathogenesis of the C825T polymorphism depends on the fact that the 825T allele of GNB3 is related to enhanced stimulated G protein activation, and it is established that G proteins play roles in many path physiological mechanisms which contribute of T2DM (16).

According to these results GNB3 C825T polymorphism may be associated with T2DM. Other studies were in agreement with this finding. Kiani et al., (2005) (17), noticed that the 825T variant showed a positive association with the risk of T2DM in Emirati population. Another study on Canadian population showed significant association of GNB3 polymorphism with type 2 diabetes (18), also it has been found a significant association of the genotypes TT and CT with T2DM in Japanese population (19). On the contrary, this association with T2DM has not been replicated in North Indian subjects (20), and Greek (21).

One of the most valuable results of our study was the observation of a significant relationship among the C825T polymorphism and Triglyceride (TG) in patients. The mechanism that explains correlation of GNB3 gene with serum lipid level is not fully understood; a study suggests that C825T polymorphism of GNB3 might be associated with abnormality in serum lipid metabolism (22). This finding corresponds to previous studies for example Moiseenko and Prystupa, (23), who showed there was an association between C825T polymorphism of GNB3 gene and levels of blood lipids in patients with hypertension. And Lee et al. (24), revealed that the boys and girls with the T allele have higher TG than C allele carriers in obesity Korean children. Also, Ko et al. (25), noticed that in obese Korean women with T allele have a higher serum lipids. While we observed the means of (TC, HDL, LDL and VLDL) no significant polymorphism of GNB3 gene. This agrees with many studies that showed no significant increase in some or all lipid profiles (26, 27, 28). The difference that appeared might be revealed to the small numbers of the selected studied groups, the variety of genetic polymorphisms is due to ethnic differences and to additional factors that are associated with the disease susceptibility.

**Conclusions**

Our result revealed The CT genotype has more frequency in this study groups and the GNB3 gene polymorphisms may play an important role in type 2 diabetes mellitus pathogenesis and the TT genotype increases the risk factor for T2DM without complication (G1) more than T2DM with complication (G2).
**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding

**REFERENCES**


Association of Interleukin-6 Level with Some Clinical Parameters in Iraqi Juvenile Idiopathic Arthritis Patients

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ABSTRACT

Interleukin-6 (IL-6) is the major pro-inflammatory cytokine, which exerts multiple effects within the disease activity in juvenile idiopathic arthritis (JIA) and rheumatoid arthritis (RA) patients. The aim of this study was to evaluate the association of IL-6 with some clinical parameters in JIA and RA disease Iraqi patients. A case-control study involved (86) patients with JIA and RA disease, who visited Merjan Teaching Hospital in Babylon. All patients and control had the same ethnic group (Arabic). The serum IL-6 level was measured by ELISA kit.

Results: The female gender was more frequent in rheumatoid arthritis. The percentage of uveitis was decreased (11.4%) in JIA compared with RA (25.5%). IL-6 serum level was significantly elevated (P≤0.05). There was significant decreasing in the mean of ESR in JIA patients (35.74 ± 15.28) in comparison with RA patients (68.78 ± 25.09).

IL-6 assessment in both JIA and RA patients can be helpful in determining the activity of disease, and plays a significant role in its relationship with both rheumatoid disease (JIA and RA).

Keywords: Juvenile Idiopathic Arthritis, Rheumatoid Arthritis, Interleukin-6, Uveitis.

Introduction

Juvenile idiopathic arthritis (JIA) is the most common chronic rheumatic disease in childhood and is of unknown origin and etiology [1]. The disease spectrum consists of various clinical conditions. Endogenous and exogenous antigens with increased inflammatory response have been shown to play a central role in the pathogenesis of the disease [2, 3]. Interleukin-6 is a multifunction cytokine that has a wide range of biological activities in various target cells and regulates immune responses [3]. Human IL-6 is a soluble mediator with a pleiotropic effect on inflammation, immune response, and hematopoiesis [4, 5]. The cytokine IL-6 is a four-helical glycopeptide that was initially identified as a T cell derived cytokine capable of inducing B lymphocyte differentiation into Ig-producing cells and was named B cell stimulatory factor-2 [6, 7]. Elevated serum IL-6 has been observed in patients with these diseases and the IL-6 levels correlate with disease activity although there are differences in IL-6 levels among the diseases [3]. It is found at high levels of IL-6 in the synovial fluid, and is associated with indicators of inflammatory activity such as ESR and C-reactive protein (CRP). In addition to classical activation of IL-6 response through binding a membrane-bound IL-6 receptor (IL-6R) [8].

Materials and Method

This case-control study involved (35) JIA patients selected from Merjan teaching hospital (14 male and 21 female) with age ranged from (1-18) years. The JIA patients diagnosed by physician according to the International Study Group ILAR classifications of childhood arthritis [9]. In addition, (47) adult RA patients (4 male and 43 female) with age ranged from (25-76). The control group included apparently healthy and age-matched (57) subject included (30) children with age
range (1–18 years) and (27) adult with age range (25-60). All patients and control were from the same ethnic group (Arabic). The level of (IL-6) was measured in serum by using ELISA kit (Elabscience.com).

Statistical Analysis

Statistical analysis was carried out using SPSS version 20.

**Results**

Table (1) distribution of study groups by socio-demographic characteristics. There were significant associations between study groups and gender (p value ≤ 0.05).

<table>
<thead>
<tr>
<th>Study variables</th>
<th>Patients with Rheumatoid arthritis (%)</th>
<th>Control group (%)</th>
<th>χ²</th>
<th>P-value</th>
<th>Odds</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>64 (78.0%)</td>
<td>27(47.4%)</td>
<td>14.00</td>
<td>&lt;0.001*</td>
<td>3.951</td>
<td>1.89-8.25</td>
</tr>
<tr>
<td>Male</td>
<td>18 (22.0%)</td>
<td>30(52.6%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>82 (100.0%)</td>
<td>57(100.0)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender (juvenile)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>21(60.0%)</td>
<td>13(46.4%)</td>
<td>1.153</td>
<td>0.283</td>
<td>1.73</td>
<td>0.634-4.726</td>
</tr>
<tr>
<td>Male</td>
<td>14(40.0%)</td>
<td>15(53.6%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>35 (100.0%)</td>
<td>28(100.0%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender (adult)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>43(91.5%)</td>
<td>14(48.3%)</td>
<td>17.86</td>
<td>&lt;0.001*</td>
<td>11.51</td>
<td>3.277-40.48</td>
</tr>
<tr>
<td>Male</td>
<td>4 (8.5%)</td>
<td>15(51.7%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>47 (100.0%)</td>
<td>29(100.0%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural area</td>
<td>42 (51.2%)</td>
<td>31(54.4%)</td>
<td>0.135</td>
<td>0.713</td>
<td>0.881</td>
<td>0.447-1.734</td>
</tr>
<tr>
<td>Urban area</td>
<td>40 (48.8%)</td>
<td>26 (45.6%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>82 (100.0%)</td>
<td>57(100.0%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p value ≤ 0.05 was significant.

Table (2) shows distribution of all patients with rheumatoid arthritis according to study variables.

<table>
<thead>
<tr>
<th>Study variables</th>
<th>JIA patients</th>
<th>RA patients</th>
<th>χ²</th>
<th>P-value</th>
<th>Odds</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>21 (60.0)</td>
<td>43 (91.5)</td>
<td>11.61</td>
<td>0.001*</td>
<td>0.14</td>
<td>0.041-0.476</td>
</tr>
<tr>
<td>Male</td>
<td>14 (40.0)</td>
<td>4 (8.5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>35 (100.0)</td>
<td>47 (100.0)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duration of disease</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below 10 years</td>
<td>34 (97.1)</td>
<td>30 (63.8)</td>
<td>12.99</td>
<td>&lt;0.001*</td>
<td>19.26</td>
<td>2.41-153.55</td>
</tr>
<tr>
<td>10 or more</td>
<td>1 (2.9)</td>
<td>17 (36.2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>35 (100.0)</td>
<td>47 (100.0)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family history</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>13 (37.1)</td>
<td>15 (31.9)</td>
<td>0.244</td>
<td>0.621</td>
<td>0.793</td>
<td>0.316-1.99</td>
</tr>
<tr>
<td>No</td>
<td>22 (62.9)</td>
<td>32 (68.1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>35 (100.0)</td>
<td>47 (100.0)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Conted…

<table>
<thead>
<tr>
<th>Type of disease</th>
<th>Poly</th>
<th>Systemic</th>
<th>Oligo</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>27 (77.1)</td>
<td>6 (17.1)</td>
<td>2 (5.8)</td>
<td>35 (100.0)</td>
</tr>
<tr>
<td></td>
<td>38 (80.9)</td>
<td>0 (0.0)</td>
<td>9 (19.1)</td>
<td>47 (100.0)</td>
</tr>
</tbody>
</table>

|               | P=0.003    | 1.857        | 0.764-4.512 |

<table>
<thead>
<tr>
<th>Uveitis</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Present</td>
<td>4 (11.4)</td>
<td>12 (25.5)</td>
<td>2.54</td>
</tr>
<tr>
<td>Absent</td>
<td>31 (88.6)</td>
<td>35 (74.5)</td>
<td>0.11</td>
</tr>
<tr>
<td>Total</td>
<td>35 (100.0)</td>
<td>47 (100.0)</td>
<td>0.37</td>
</tr>
</tbody>
</table>

* P ≤ 0.05 was significant.

In addition, there were significant differences between means of IL-6 between all patients with rheumatoid arthritis and age-matched control groups according to Figure (1), whereas there was non-significant differences between means of IL-6 levels between JIA and RA groups according to Table (3), and subtypes of all rheumatoid arthritis as shown in Table (4). Furthermore, there were non-significant differences between means of IL-6 according to gender as shown in Table (5).

Figure 1: Mean differences of IL-6 between study group (n = 88, t = 18.12, P = <0.001) (A), JIA patients with juvenile control (B), and RA patients with adult control.
Table 3: Mean differences of IL-6 and ESR according to patients study groups

<table>
<thead>
<tr>
<th>Study variables</th>
<th>Group</th>
<th>N</th>
<th>Mean ± SD</th>
<th>t-test</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESR (mm/hour)</td>
<td>JIA patients</td>
<td>35</td>
<td>35.74 ± 15.28</td>
<td>-7.37</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td></td>
<td>RA patients</td>
<td>47</td>
<td>68.78 ± 25.09</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IL-6 (pg/ml)</td>
<td>JIA patients</td>
<td>35</td>
<td>82.04 ± 17.00</td>
<td>1.603</td>
<td>0.115</td>
</tr>
<tr>
<td></td>
<td>RA patients</td>
<td>35</td>
<td>76.88 ± 8.54</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* P ≤ 0.05 was significant.

Table 4: Mean differences of IL-6 and according to subtype of rheumatoid arthritis (n = 70)

<table>
<thead>
<tr>
<th>Study variables</th>
<th>Subtype</th>
<th>N</th>
<th>Mean ± SD</th>
<th>F-test</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>IL-6 (pg/ml)</td>
<td>Polyarticular</td>
<td>54</td>
<td>80.97 ± 12.90</td>
<td>1.463</td>
<td>0.239</td>
</tr>
<tr>
<td></td>
<td>Systemic</td>
<td>6</td>
<td>74.55 ± 9.58</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Oligoarticular</td>
<td>10</td>
<td>74.29 ± 18.12</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 5: The association between type of rheumatoid arthritis (JIA and RA) and gender (n = 70)

<table>
<thead>
<tr>
<th>Gender</th>
<th>JIA patients</th>
<th>RA patients</th>
<th>χ²</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>14 (40.0)</td>
<td>4 (11.4)</td>
<td>7.479</td>
<td>0.006*</td>
</tr>
<tr>
<td>Female</td>
<td>21 (60.0)</td>
<td>31 (88.6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>35 (100.0)</td>
<td>35 (100.0)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Discussion

In the current study, measuring of IL-6 level in serum with JIA and RA disease and comparing with control group shows significant increasing of IL-6 between all rheumatoid arthritis group (P≤0.001) compared with control group and between JIA and RA patients compared with their control groups. Firstly, IL-6 has previously been shown to be correlated with the efficacy of the disease in JIA, and most notably in systemic JIA, where it has been proposed as a key mediator of the disease process [9, 10]. This interpretate the high levels of IL-6 in the serum of both JIA and RA than control group. This is an observation supported by previous study [11]. Furthermore, plasma levels of IL-6 are significantly higher in RA patients than controls [12]. Chronic high levels of IL-6 are found in the synovial fluid and serum of patients with RA [13]. Secondly, the IL-6 level is correlated with disease activity may be improve by IL-6 inhibition, as appear by JIA and R, however IL-6 is involved in liver regeneration and intestinal epithelium protection so it is possible that elevated levels of IL-6 product organs from damage or promote recovery from dysfunction [14]. After all, this study had found a statistically differences between all of the patients group corresponding type with gender (p≤0.00). This study has also showed that there were non-significant alteration between the means of IL-6 according to the duration of disease and subtype of arthritis. Consequently, it is found that the excess transmission from IL-6 only to systemic JIA patients with age at onset (5) years and no significant association found with the other subtypes. However, these findings in consistent with the other studies by [15]. As a matter of fact, higher mean of IL-6 (82.04 ± 17 pg/ml) in JIA than RA patients (76.88 ± 8.54 pg/ml) although it was non-significant and when the patients were grouped by subtypes of arthritis, the higher mean of IL-6 was in polyarthritis (80.87 ± 12.90 pg/ml) in all rheumatoid patients and (83.08 ± 16.54 pg/ml) in JIA patients than other subtype. These finding is accepted with other study [16]. IL-6 has previously been shown to be associated with the activity of disease in JIA [17]. Most notably in systemic JIA, where it has been proposed as a key mediator of the disease process and anti-IL-6 therapy, it has recently shown to be effective in treating this subtype [18]. IL-6 is associated with the activity of the disease in JIA found at higher level and is associated with the indicators of inflammatory activity such as ESR. Thirdly, significant increasing (P≤0.001) in the level of ESR in all patients compared to control group although non-significant correlation between IL-6 and ESR among the
patients. Also, significant decreasing in the mean of ESR in JIA patients (35.74 ± 15.28 mm/hour) in comparison with RA patients (68.78 ± 25.09 mm/hour). These results agreed with [19], who recorded that overexpression of IL-6 controls development of chronic inflammatory diseases, such as rheumatoid arthritis, ESR and CRP levels have also been used as markers of inflammation, while it is a useful marker for evaluating disease activity; it is a non-specific measure of inflammation [20]. Uveitis, typically chronic anterior uveitis, is the most common extra-articular manifestation in JIA patients and JIA is the most common systemic association of uveitis in children [21]. In the current study, (11.4%) of JIA and (25.5%) of RA patients were diagnosed with uveitis, children are less likely to be infected with uveitis twice as much as RA. This maybe belongs to the hygienic awareness and parent’s fear on their children and looking after them in order to prevent the infection in Uveitis [22]. This result may be correlated with the increasing level of ESR in rheumatoid patients as indicated by previous report, which revealed that elevated ESR appears to be a predictor for the occurrence of uveitis in patients with JIA [23].

Conclusion

These results had provided important and novel data on the levels of IL-6 during active JIA in Iraqi patients.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

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13. Peake, N.J.; Khawaja, K.; Myers, A.; Nowell, M.A.; Jones, S.A.; Rowan, A.D.; Cawston,


Assessment of Alpha Ketoglutarate Dependent Dioxygenase Levels in Different Genotypes of ALKBH9 Gene in Patients with T2DM in Babylon Province

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¹Biomedical Engineering Department, University of Warith Al anbiya’a, Iraq; ²Department of Chemistry and Physiology, Veterinary Medicine, Al-Qasim Green University, Iraq

ABSTRACT

Diabetes mellitus (DM) can be describing as a metabolic changes that characterizing by chronic hyperglycaemia and imbalance of carbohydrates, fats and proteins metabolism resulting from disorders in pancreatic secretion of insulin, action of insulin, or both. Development of T2DM can be attributing to the both effects, the genetic an environmental factors. The enzyme encoded by the ALKBH9 gene in human genome that located on chromosome sixteen is Alpha ketoglutarate dependent dioxygenase.

A case-control study of 45 patients with T2DM and 45 healthy controls was conducted at the Al-Qasim hospital in Babylon province. We analyzing the allelic frequency of ALKBH9 genetic polymorphism in study cases. AKDD levels was measuring by ELISA method while SNP of ALKBH9 was investigated by PCR-RFLP method.

The results of this study shown highly significant increase in the levels of serum AKDD in patients group comparing to control group (17.9 ± 1.7 vs. 11.2 ± 1.2). The allelic frequency of A allele was 68% compare to 32% for T allele in patient group. The results of this study showing highly significant differences in levels of AKDD in comparing to risk factors such as ages, genders, smoking, and obesity status (p-value< 0.001). In conclusion, there many risk factors increase the frequency of AA allele comparing to AT, and TT alleles in patients with T2DM in Babylon population, Iraq.

Keywords: Diabetic mellitus type2, ALKBH9 gene, SNP rs9939609.

Introduction

Diabetes mellitus (DM) can be describing as a metabolic disorder that characterizing by chronic hyperglycaemia and changing of sugars, lipids, and proteins catabolism and anabolism that resul from disorders in pancreatic secretion of insulin and insulin resistant (1). Advancement of T2DM can be crediting to the two impacts, the hereditary and an ecological elements (2). A non autoimmune, heterogeneous and polygenic metabolic disorder has been accurse in T2DM (3). The enzyme encoded by the ALKBH9 gene in human genome that located on chromosome sixteen is Alpha ketoglutarate dependent dioxygenase (4). The first mRNA demethylase that has been identified is AKDD because it is one homolog in the Alk-beta family proteins, and specific different forms of ALKBH9 gene appear to be connected with over weight in mammalians (5). Alk-beta which oxidative demethylates sequence of an amino acids is similar to the amino acids sequences of alpha ketoglutarate dependent dioxygenase protein (6,7). The ALKBH9 gene is excessively expressed in both of adult and fetal tissues (8). ALKBH9 expression with Small interfering RNA leading to increased amounts of methylation of polyA tails (9). The genotyping of the ALKBH9 gene are also suggested by other studies to correlation with overweight and obese subjects having
high body mass index (10, 11). Speakman JR et al. (2008) was suggesting that human with allelic genotypes AT and AA of ALKBH9 gene at rs9939609 sequence those that consuming the range of (500 -1250) kilojoules in calories more each day than those having the TT genotype (12). The similar studies showing that there were no effects of the single nucleotide polymorphism of ALKBH9 gene on cost of energy. The finding of an effect of the AA, AT, and TT genotyping on food intake were described by many studies (13-17). The effects of variation in two different SNPs in the ALKBH3 gene (rs17817449 and rs1421085) was exploited by Do R et al. (2008) and there were suggesting the effect on levels of leptin in circulation and energy requiring (18). The aim of this study to investigating of rs9939609 SNP of ALKBH9 gene and comparing the genotypes AA, AT, and TT with different risk factors in patients with T2DM in Babylon province.

Materials and Method

The current study was done in the laboratories of Chemistry Department, Veterinary medicine, Al-Qasim Green University. The patients group including in this study were 60 patients, the range of age was (40-65 Y), the mean ± standard deviation (SD) was (49.3 ± 3.5 Y). This group included of males (58%), with their age ranging from (40-62 Y), the mean ± SD was (49 ± 6.4 years), and females (42%) with age ranging from 44-65 years, and mean ± SD was (47.1 ± 7 Y). The control group was 60 subjects (37-59 Y). The age and gender of control group were matching to age and sex of patient group. The statistical analysis showing no significant differences in the age and gender between two groups (p > 0.05). Each patient and control subject who participate in the current study submit full history asking: age, gender, smoking, education, family history of diseases and drug used.

Mesurment of AKDD: Alpha ketoglutarate dependent dioxygenase (AKDD) concentration was measured by using ELISA kit and the method performed depending on the manufacturer’s protocol.

Analysis of ALKBH9 gene: The AccuPrep® Genomic DNA Mini Kit (Bioneer, Korea) provides an optimal protocol for extraction and purification of the genomic DNA from whole blood. Proteinase K and the specific buffers were used to lyses cells and destruction of proteins. Amplification conditions of amplicon (182bp)(40 cycle) of ALKBH9 gene was performed by polymerase chain reaction (PCR) depending on the method that described by Lo’pez et al (2008) (19), The following pairs of primes (forward and reverse) were using in PCR analysis:

\[5’-AACTGGCTCTTGAAATGAAATAGGATTCCAG\]
\[-3’ F-primer\]
\[5’-AGAGTAACAGAGACTATCCAAGTGCAGT\]
\[-3’ R-primer\]

The investigation of the SNP in the ALKBH9 gene is done by PCR-RFLP in patients with T2DM and control groups involved in this study by using ScaI as restriction enzyme (RE). gel electrophoresis was running the final products on a 2.5%, the T allele generated a 182bp band and the A allele generated 154 and 28bp bands, as shown in figure(1). The restriction site of ScaI was:

![Fig. 1: Electrophoretic picture represents the PCR-RFLP by RE(ScaI) of ALKBH9 gene(182, 154, and 28bp)](image)

Results

Clinical pathological information of the patients with T2DM (n = 60) whom including in the current study were classified into two groups according to (age, gender, Family history, Smoking behavior, Obesity status) (Table 1).
Table 1: Clinical pathology information of patients with T2DM included in this study

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>N = 60</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;40</td>
<td>21</td>
<td>35</td>
</tr>
<tr>
<td>≥40</td>
<td>39</td>
<td>65</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>35</td>
<td>58</td>
</tr>
<tr>
<td>F</td>
<td>25</td>
<td>42</td>
</tr>
<tr>
<td>Family history</td>
<td></td>
<td></td>
</tr>
<tr>
<td>YES</td>
<td>26</td>
<td>43</td>
</tr>
<tr>
<td>NO</td>
<td>34</td>
<td>57</td>
</tr>
</tbody>
</table>

The results of the present study that shown in table 2 there were a significant increase in serum levels of AKDD in the patients group comparing to control group:

Table 2: AKDD levels in patients and control groups

<table>
<thead>
<tr>
<th>Group</th>
<th>AKDD mean ± SD (ng/ml)</th>
<th>Range</th>
<th>CI(95%)</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients n = 60</td>
<td>17.9 ± 1.7**</td>
<td>1.9-23.8</td>
<td>6.168 - 7.232</td>
<td>0.0001</td>
</tr>
<tr>
<td>Control n = 60</td>
<td>11.2 ± 1.2</td>
<td>0.7-19.7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Highly significant

To tow subgroups, the current study were divided into s: depending on stage of age (<40) and(≥40), sex(male and female), the family history (yes and no), the obesity status(over and normal weight).The mean and standard deviation of AKDD was compared between theses subgroups as shown in (Table 3)

Table 3: Comparison of (mean-/+ SD) of AKDD(ng/ml) between subgroups of patients with T2DM

<table>
<thead>
<tr>
<th>Subgroup</th>
<th>AKDD mean ± SD (ng/ml)</th>
<th>Range</th>
<th>CI(95%)</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;40</td>
<td>12.4 ± 1.8</td>
<td>1.9-15.9</td>
<td>5.30 - 3.494</td>
<td>0.0001</td>
</tr>
<tr>
<td>≥40</td>
<td>16.8 ± 1.9</td>
<td>3.5-23.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>17.5 ± 1.2</td>
<td>2.1-23.8</td>
<td>1.216 - 2.984</td>
<td>0.0001</td>
</tr>
<tr>
<td>F</td>
<td>15.4 ± 2.2</td>
<td>1.9-18.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family history</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>YES</td>
<td>19.3 ± 2.2</td>
<td>2.2-22.8</td>
<td>0.519 -10.119</td>
<td>0.0760</td>
</tr>
<tr>
<td>NO</td>
<td>14.5 ± 1.6</td>
<td>1.9-16.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoking status</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>YES</td>
<td>16.4 ± 2.3</td>
<td>3.2-21.8</td>
<td>1.443 - 4.157</td>
<td>0.0001</td>
</tr>
<tr>
<td>NO</td>
<td>13.6 ± 2.8</td>
<td>1.9-14.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obesity status</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Over weight</td>
<td>20.3 ± 1.4</td>
<td>1.9-23.8</td>
<td>5.994-7.406</td>
<td>0.0001</td>
</tr>
<tr>
<td>Normal weight</td>
<td>13.6 ± 1.2</td>
<td>3.7-16.7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

All subjects(control and patients) are classified depending on the RE(Scal) cutting of 182bp band of ALKBH9 gene to being AA genotypes(wild type)(182 bp) for homozygous polymorphism, TA genotypes(heterozygous) (182,154, and 28 bp), and TT homozygous genotypes(154 and 28 bp) as shown in table(4):
Table 4: Genotyping of ALKBH9 gene polymorphism and allele frequency

<table>
<thead>
<tr>
<th>Group</th>
<th>GROUPS</th>
<th>Genotype</th>
<th>GENOTYPES</th>
<th>Total T TOTAL</th>
<th>Allele FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>GG/AA</td>
<td>AA GC/AT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>CONTROL</td>
<td>10 (19%)</td>
<td>40 36</td>
<td>6 (12%) 8</td>
<td>52 60</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AA</td>
<td>GC/AT</td>
<td>60%</td>
<td>46%</td>
</tr>
<tr>
<td>Patient</td>
<td>PATIENTS</td>
<td>22 (42%)</td>
<td>33 25</td>
<td>5 (6%) 10</td>
<td>52 60</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AA</td>
<td>AT</td>
<td>66%</td>
<td>34%</td>
</tr>
<tr>
<td>Total</td>
<td>TOTAL</td>
<td>32</td>
<td>73 61</td>
<td>11 18</td>
<td>104 120</td>
</tr>
<tr>
<td>p-value</td>
<td>ODD RATIO</td>
<td>S</td>
<td>Reference</td>
<td>NS 3.38**</td>
<td>NS 1.59*</td>
</tr>
</tbody>
</table>

The results of this study showing statistical significant differences when comparing the levels of AKDD(ng/ml) between three genotypes(AA, AT, and TT) as shown in table (5):

Table 5: AKDD levels (ng/ml) in patients and control groups in three genotypes of ALKBH9 gene

<table>
<thead>
<tr>
<th>Genotypes</th>
<th>AKDD levels (ng/ml) in control group (Mean ± SD)</th>
<th>AKDD levels(ng/ml) in patient group (Mean ± SD) *</th>
</tr>
</thead>
<tbody>
<tr>
<td>AA</td>
<td>11.8 ± 1.8</td>
<td>17.9 ± 1.0</td>
</tr>
<tr>
<td>AT</td>
<td>10.9 ± 1.7</td>
<td>15.7 ± 1.2</td>
</tr>
<tr>
<td>TT</td>
<td>10.5 ± 1.8</td>
<td>16.4 ± 1.6</td>
</tr>
<tr>
<td>Total</td>
<td>11.2 ± 1.2</td>
<td>17.9 ± 1.7</td>
</tr>
</tbody>
</table>

Discussion

The long-term of metabolic disorder has been characterizing by hyperglycemia, resistance of insulin, and relative decreasing in insulin levels is diabetes mellitus type 2 (T2DM) (20). the common symptoms in T2DM are increasing thirst, frequent of urination, and unexplained weight losing (22). ALKBH9 is a gene that coding AKDD protein and the diseases associated with its AA, AT, and TT genotypes were including growth retardation, developmental delay, and facial dysmorphism (22). There is a considerable lack of information from the Arab region including Iraqi and Babylon population regarding the role of SNP gene polymorphisms of ALKBH9 gene and many risk factors related in patients with T2DM. polygenic obesity is recorded by SNP of ALKBH9 gene causing (23) and the strongest associations between ALKBH9 SNPs and body mass index are belong to intronic SNPs, which may be have the main role in the regulation of ALKBH9 gene. The risk alleles of ALKBH9 gene are located within a 47 kb at first two introns and exon 2 and these locations are associated with obesity and high body mass index (24). The effect of ALKBH9 gene polymorphism (AA, AT, and TT) on phenotypic parameters such as obesity status, age, and gender shown an important differences between the three alleles of (AA, AT, and TT). The results of present study is agreement with the previous study that showing significant differences on phenotypes that discuss by Hussein G. Osman et al., 2014 (25). By using the allele frequency analysis that described by Moead E Al-Gazally et al.(2016), the rs9939609 SNP of three genotypes were found(AA, AT, and TT) and they were significantly association in the development of T2DM by increasing the levels AKDD (26). ALKBH9mRNA was found to be abundantly expressed in the brain tissue of wild-type mice, particularly in hypothalamic nuclei governing energy balance (27). Another studies discussing the effects of genetic polymorphism on the different types of diseases to explaining different cases (28-30). In this manner, it is possible that the ALKBH9 quality may control the pathogenesis and advancement of corpulence basically through its effect on the energy controlling center of the hypothalamus. Few studies have investigated the rs7195539 locus in FTO. Loci rs8050136 and rs9939609 were reported to associated with T2DM in multiple studies, yet there is some inconsistency (31). This association has been reported to be both mediated by BMI (32).
**Conclusion**

There are many risk factors increase the frequency of AA allele comparing to AT, and TT alleles in patients with T2DM in Babylon population, Iraq.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding

**REFERENCES**


Musculoskeletal Trends Over Physical Therapy for Curing Knee Injuries

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ABSTRACT

Our study was applied a special mechanical curing idea as a tool treatment that’s fixed as a biomechanical theory to recover about 35 cases of football players who had got knee injury of several degrees. By using leg extension instruments we will apply gradual forces to the lever system to rebuild the knee joint.

Conclusions of our tests prove that biomechanical engineering of knee responds positively for physical application during injuries.

Keywords: knee, physical therapy, musculoskeletal system, sport

Introduction

Knee’s injuries in footballer are a conditions those occurs due to sport activities. The most predominant injury is anterior cruciate ligament which often occurred during sports activities; like soccer, football, and basketball. Rapid direction change or docking from a jump inaccurately can crack the ACL. About 60% of all abuse to the anterior cruciate ligament appear along with damage to other parts in the knee, such as articular meniscus, cartilage, or other ligaments (¹).

Leg extensions are workouts mostly performed with a lever machine. You sit on a stuffed seat and hike a stuffed bar with the legs. The workout activates mainly the quadriceps muscles of the front of the thigh—the rectus femoris and the vastus muscles (²).

Technically, this is an “open chain kinetic” training, which is dissimilar from a “closed chain kinetic activity,” i.e., squat (³).

Aim of our project is to explain the physical theory of lever, fulcrum and load in treatment ACL cases.

Materials and Method

1. Site of tests done in Arnold institution for body building sport in Najaf city, particularly in Al-Tadhamon FC club, Central educational hospital while investigations in Baghdad city include Ibnul-Haitham center for magnetic resonance imaging.

2. Model designation: 16 players aged 20 to 25 years old have knees injury compared with the same number of controls at the same time from 1/9/2018 to 1/2/2019.

3. Physical tests administered through using leg extension machine with a limited extended scale under control rod.

4. Radiology tests were applied by using magnetic resonance imaging (Buff, etal. 2018).


Results

MRI imaging of ACL tears should be explained secondary signs. Look figures 1 below. Secondary shows bone contusion, anterior drawer sign, arcuate sign, reduced PCL and lateral collateral ligament injury.

Anterior cruciate ligament rupture here may be without (a,d) and with (b,c) fat saturation shows waviness and a cloud-like appearance with an abnormal course of the fibers of the AC.
The force is applied between the fulcrum and the load. Therefore the load lever arm is always greater than the force lever arm. A classic example is a pair of tweezers or a diving board. Mechanical Advantage = Less than 1.

Our experiments was not used a sensor system for fitted naturally with the mechanics of machine and the biomechanics of legs and knees. An athlete performs a leg extension on a machine using a less kg mass at A located 350mm away from the knee joint center. The leg is moving at a constant angular velocity of 30 degrees per second when $\theta = 60^\circ$ (Figure 2).
Discussion

Secondary signs include proved by MRI bone contusion in lateral femoral condyle and posterolateral tibial plateau, >7 mm of anterior tibial translation, also known as the anterior tibial translocation sign or anterior drawer sign, uncovered posterior horn of the lateral meniscus, Segond fracture, and to a lesser degree arcuate sign, reduced PCL angle due to buckling of PCL, positive PCL line sign and medial or lateral collateral ligament injury (6,7).

When an leg extension exercise using a cushion diposed under the injured knee is did, the quadriceps and hamstring muscles give force to press the leg into this cushion, creating a cushion reaction force and, an ankle reaction force, if the ankle is restrained. With a given cushion force Fr, the hamstring force and the quadriceps force can be obtained by solving the governing equations for a given CY and an as- sumed value for 6. Giving numerical values for several cases make discuss the implications of our theoretical results possible (8,9).

We apply a cushion force of 12-24 kg and suppose that it is equally distributed between the femur and the tibia (ie. q = OS): The hamstring force F, the quadriceps force f, the shear force FSf, and the compression force FF at the femoral-tibia contact point are calculated for both the case of the loose ankle (u = 0) and the restrained ankle (a = 0.35) at flexion angle (Y = 5°, 15°, and 30°). The results shows that without the ankle restraint the hamstring force is much greater at each flexion angle than with the ankle restraint, whereas others shows that without the ankle restraint the quadriceps force is always less at each flexion angle than with the ankle restraint. The variation of both the quadriceps force and the hamstring force over the flexion angle range is not significant for either the case of the loose or the restrained ankle. Clearly, the ankle should not be constrained if the main purpose of the exercise is to strengthen the hamstring muscle, but the ankle should be restrained if the main purpose of the exercise is to strengthen the quadriceps muscle (10,11).

Conclusion

Biomechanical engineering of knee responds positively for physical application during injuries.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

REFERENCES


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ABSTRACT

The study aimed to prepare a proposed negotiating approach to develop the skills of negotiation and crisis management for the leaders of the Middle Euphrates Clubs. The program consists of 4 weeks with two units per week. The unit time is 120 minutes, divided into two parts (60 minutes - 10 minutes rest - 60 minutes) the researcher then applied the criteria (negotiation skills and crisis management) in two stages (tribal and remote) to the sample. The researcher then categorized the results, analyzed them and interpreted them scientifically, and reinforced them with sources that contributed to explain the results more clearly. The proposed effect is evident in the some negotiation and crisis management skills of leaders of clubs. The method of presentation based on an expert system has a clear impact in providing and facilitating information to sample members. It is easy for an individual to learn the skills of negotiation as he has the elements of good education from trainers and a training program scientifically and sequentially.

Keywords: negotiating, managing crises and expert system

Introduction

Most researchers are still urging the pace of finding the most successful modern means and methods of development that enable the workers in the field of sports in particular to develop their intellectual abilities and provide information to the learner or trainee in the simplest and most recent ways.

So we have to think and look for modern and fast ways to learn and gain experience. The use of expert systems is one of the main features of the science of artificial intelligence and its applications. Although there are several definitions of artificial intelligence, the essence is to make the computer think like a human. The expert system has been a prominent place for decades in various scientific and educational fields in different parts of the world. The use of expert systems and knowledge bases built by specialists enables inexperienced sports leaders to benefit from these systems in the development of ideas, address many of the problems they face and make decisions that are difficult for non-experts to take.1

In view of the areas of expert systems and their uses, we find that they have been employed in many sectors, including legal, industrial, agricultural, medical and educational, as well as in the administrative and financial fields also to plan and solve problems and make different decisions. On the mathematical level, we find none. This study is of great importance for the lack of studies. The subject of expert systems in the field of sports. Hence, it was necessary to use these systems to develop and provide negotiating advice and solve the problems facing leaders in the sports field because of the advantages and benefits it offers to those who deal with them and those who use them and their ability to provide high effort and money. This is what prompted the researcher to do this research.2

The importance of this research is evident in the development and activation of the negotiation methods and skills of the Iraqi sports leaders, the management of crises in the field of sports and how to find solutions.
using expert systems which is one of the branches of artificial intelligence. This also serves a large sector which is the sports leadership which in turn serves the Iraqi society directly and great.

**Materials and Method**

**Community and Sample Search:** The researcher identified the research community and they are the leaders in the 408 Middle Euphrates clubs, taking into consideration the number of years of service distributed among (5) clubs from Qadisiyah clubs that have been identified for the research community if they constitute (24%) of the total number of society The search is (170) leading.

**Preparation of a proposed negotiating approach:** The researchers prepared a negotiating approach to develop negotiation skills and crisis management on the target sample, taking into account the scientific conditions and proper procedures in preparing it. The contents were then presented to a group of experts and specialists in the field of administration, management and human development. (4) Weeks per week and 2 teaching units at a rate of 120 minutes per unit divided between beginning, introduction, explanation, group work and exercises.

**System Building Procedures Expert:** Expert systems are one of the first applications of artificial intelligence and the most important since the development of the first successful system based on knowledge or experience and used for the analysis of chemicals in 1970 took the idea of producing systems on human experience to spread quickly to other scientific fields because of the amazing results achieved.

The term expert systems consists of two main parts. The first represents systems, which is a collection of the word system, which represents a group of interconnected parts that collect, process, store and distribute information to help control and make decisions within the enterprise. The second part (the expert) is a sign that these systems have experience is the deep knowledge accumulated over time and experience with the facts, rules and procedures in the scope of a particular work.

In other words, expert systems are originally information systems that receive and process inputs to produce outputs that help in decision-making. However, they use and apply prior experience or experience in data processing rather than applying mathematical equations or algorithms for solutions.

Through the previous definitions of expert systems, it is generally agreed that expert systems acquire their ability to act in decision-making, solve problems from the knowledge of human experts, and thus behave - so to speak - as the expert behaves when confronted with a circumstance requiring a specific decision. Expert systems are different from traditional systems. The person who uses them does not necessarily have to be proficient in computer usage. The process of using them starts with directing the user to a question of the expert system, and the system in turn directs user queries (dialogue between the system and the user).³

---

³ Figure 1: The components of the expert system
Team Building and System Development Expert:  
By reviewing the components of the expert system, there are a number of people who deal with the system directly and indirectly in terms of construction and use. The following is an explanation of the concept and roles of each team member:

1. **The end user:** Is the person who uses the system after it is developed to help solve the problems or make the decisions that it faces and requires the experience to deal with them, often this person is an employee who does not have the experience to qualify to deal with the situation on his own. It is worth mentioning that the end-user deal with the expert system does not necessarily require a great skill in the use of the computer, it deals with the system through the devices such as (keyboard, screen, etc.) and through the communication with the system by asking certain questions and respond to queries of the system about the situation in question and receive solutions or recommendations ready.

2. **Field expert:** Is the person who has the greatest experience or knowledge in a particular field or field, and is able and skillful in solving problems, and represents the experience that has the basis that will build the knowledge base of the expert system through which should be able to communicate knowledge and also has the desire to participate in Develop the expert system in terms of effort and time required. The field expert is the most important person in the system development team because his experience is the cornerstone of the success of the system.

   It is noted through the concept of the expert of the scope that his dealing with the expert system is indirectly, he actually does not use the system itself, in terms of inputs or outputs, but gives the knowledge and knowledge about the field of expertise to the knowledge engineer, which in turn is introduced and stored on the knowledge base.

3. **Knowledge Engineer:** The knowledge engineer represents the person who is capable of designing, building and testing the expert system and is responsible for selecting the appropriate task for the system. Many personal meetings are held with the domain expert to find out how to solve a particular problem. Through the communication and interaction with the expert, the knowledge engineer determines the methods of thinking used by the expert in dealing with facts and rules, determines how they will be represented in the system and then selects some systems of development programs or establishment of the system of expertise, and selects the programming languages to write the knowledge code. Finally, the knowledge engineer is responsible for selecting, reviewing and integrating the system in the workplace.

   The knowledge engineer works to extract the expertise of the domain expert into a language that can be stored in the knowledge base and plays a major role in the inference engine. It identifies the way in which the inference engine handles data and the type of inference techniques that should be used to answer the system of knowledge is also modified and updated by the knowledge engineer if necessary. It should be noted that the modification and modernization of the system is not usually related to data processing and problem solving but rather by expanding and increasing the information stored within the knowledge base to include new knowledge or expertise not previously addressed.

4. **Programmer:** The individual responsible for the actual programming describes the knowledge of the field expert in a language that can be understood by the computer and therefore must have skills in symbolic programming in artificial intelligence languages such as lisp, prolog and opss. He should also be familiar with traditional programming languages such as C, Pascal, FORTRAN, Pisk.

5. **Project Manager (Researchers):** Is the leader of the team building and developing the expert system and responsible for the continuity of the project from start to finish of running the system successfully. It communicates with the field expert, knowledge engineer, programmer and end-user.

Main Experience: After the completion of the procedures for the preparation of the scale and design of the system and the extraction of sound scientific foundations, the main application was carried out on the sample of the researchers who represent the clubs of Qadisiyah Governorate (40) for the period from
15/7/2018 to 10/8/2018, And configuring the tools to ensure accuracy of the answer on the scale, with the formation of the auxiliary staff. Then, the content and application of the negotiation and crisis management skills development program was presented to a sample of 15 people who had low level of negotiation skills. After the application was completed in two stages (tribal and remote), the researchers categorized the results and analyzed them for the purpose of discussing and interpreting them.

Results

Table 1: The differences between the tribal and remote measurement of the negotiation skills and crisis management skills and the use of the law of (t) for two interrelated samples

<table>
<thead>
<tr>
<th>Domain</th>
<th>Tests</th>
<th>Mean</th>
<th>SD</th>
<th>(t) calculated</th>
<th>(t) tabulated*</th>
<th>Level of significance</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negotiation methods</td>
<td>Pre</td>
<td>26.06</td>
<td>4.87</td>
<td>5.77</td>
<td>2.14</td>
<td>0.000</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Post</td>
<td>17.60</td>
<td>1.91</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The skill of negotiation</td>
<td>Pre</td>
<td>27.20</td>
<td>2.59</td>
<td>8.42</td>
<td>2.14</td>
<td>0.000</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Post</td>
<td>18.00</td>
<td>3.83</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Qualities of the leader</td>
<td>Pre</td>
<td>25.86</td>
<td>4.30</td>
<td>5.59</td>
<td>2.14</td>
<td>0.005</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Post</td>
<td>19.06</td>
<td>3.03</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crisis management requirements</td>
<td>Pre</td>
<td>29.40</td>
<td>3.18</td>
<td>8.67</td>
<td>2.14</td>
<td>0.000</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Post</td>
<td>21.13</td>
<td>2.69</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Steps to manage the crisis</td>
<td>Pre</td>
<td>26.33</td>
<td>6.19</td>
<td>3.32</td>
<td>2.14</td>
<td>0.013</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Post</td>
<td>20.40</td>
<td>2.13</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scale as a whole</td>
<td>Pre</td>
<td>134.86</td>
<td>13.76</td>
<td>11.61</td>
<td>2.14</td>
<td>0.000</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Post</td>
<td>96.20</td>
<td>4.19</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(*) At the level of significance (0.05) and the degree of freedom 14

The results of table (1) show that there are differences between the tribal and remote indices for all the axes of the negotiation skill and crisis management. The value of the calculated (t) for the negotiation method axis was (5.77) and it is at (0.000), And a function at the level of significance (0.000), while the axis of the characteristics of the leader, the value of (t) calculated (5.59), a function at the level (0.005), while the value of (t) axis of crisis management requirements (8.67) The center of the steps of crisis management as the value of (t) calculated (3.32) which is a function at the level of significance (0.013). As for the measure as a whole, the value of (t) calculated (11.61) is a function at the level of significance (0.000). As shown in Figure (2).

Figure 2: The differences between the tribal and remote indices of the skill of negotiation and crisis management
Discussion

By noting the results of the above table, there is an improvement in the level of negotiation skills and crisis management in the sample of the study, if the researchers attribute this to the effectiveness of the proposed negotiation method by the researchers, which was prepared in a scientific manner and took into account the capabilities of the sample including the best vocabulary and development examples related to negotiation techniques and skills. The crisis as participants recognize during this training program on the knowledge of negotiation crisis management and logic behind the investment of time and effort in planning crises and the most important methods of negotiation and skills, which contributed significantly to change ideas towards the nature of management and this. Its consistent with the study, as illustrated, which showed results of the effectiveness of the proposal for the development of the negotiation and self-efficiency skills of social studies teachers in basic education training program, the program also contributed to know the sample on their abilities and aspirations and are more positive. Whose results showed that the development of negotiation skills through open education using the internet in New Zealand has proved effective in teacher development.

And the study of which showed that the preparation of programs is important in developing the negotiation skills of the student - the teacher in preparing for success in post-graduation education. the results indicated that negotiation exercises were possible and contributed to the development of students’ critical thinking skills. this is indicated by the results of the post-measurement, (0.05) in most results.

The researchers believe that such a level is good, despite the lack of interest in the early development or development of such skills in various areas of the Iraqi educational and practical environment, and these results confirm that it is possible to learn the skills of negotiation and crisis management well if the circumstances The appropriate program and instructors are of a high level of craftsmanship. One of the steps to the success of the negotiation process that the individual learns first negotiating skills, the teacher has scientific expertise in negotiating skills is able to manage the negotiation process in light of the specific objectives and available information and methods and methods that help to achieve the objective of negotiation. and sees that by learning the skills of negotiation, the individual is able to divide the general objective of negotiation into sections of progress according to the importance of each and to achieve the general goal.

Conclusions

1. The proposed approach has a clear impact in the development of some of the skills of negotiation and crisis management among the leaders of clubs.
2. The method of submission relying on the expert system has a clear impact in providing and facilitating information to the sample members.
3. It is easy for the individual to learn the skills of negotiation as he has the elements of good education from the trainers and the training program scientific and sequentially.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

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Effect of High Intensity Training Exercises in the Development of Some Explosive Capacity and Biochemical Indicators of Technical Gamma Players

Sarraa Hasan Kawish¹, Sadeq Yousif Mohammed¹
¹Faculty of Physical Education & Sport Sciencesl, University of Thi-Qar, Iraq

ABSTRACT

The importance of this research lies in the preparation of high intensity training exercises for players and the knowledge of their role. The Problem of Research: The weakness of Physical preparation, The Objective of Research:

1. To prepare ad hoc high intensity training exercises for the development of leg muscles and physiological indicators.
2. To recognize the effect of high intensity training exercises on development of some physical capabilities of leg muscles and the physiological indicators.

The researchers used experimental approach and apply it to 10 players sample as representatives of Al-Muthana Specialist Center. The research lasted for (8) weeks among the important findings with which the researcher has come out is that high Intensity interval Training Exercises have a positive effect on the development of some physical capabilities and physiological indicators of technical gymnastic young players.

Keywords: Training exercises, explosive capacity and biochemical indicators.

Introduction

The modern training methods have varied according to the requirements of physical performance of each athletic activity, especially the muscle strength, because it has a large role in the performance in many sports activities and events, including gymnastic. The method of high-intensity interval training is one of the important ways that can be used to develop physical qualities and bringing about physiological and biochemical changes. However, this method needs high tolerance, so that a trainee should have an internal respite to recover healing. Physical abilities have a clear and significant importance in the sport field for they result in significant achievement and raising the level of technical performance of the athlete, as can be seen in many sport events, including gymnastic, which requires a lot of physical abilities due to the difficulty of performing skills such as the ground carpet movements. Based on this, a gymnastic athlete must be equipped physically and functionally as much as possible because any mistake, however minor, will clearly affect the physical and skilful level of the same player. That's why the preparation of high intensity training exercises for young gymnastic players is considered the most important starting point for this research, to learn how these exercises will develop physical capabilities and physiological indicators.¹

Based on observations, opinions of coaches, and the interview conducted by the researcher with the coach of the specialized technical gymnastic training center in Muthana, the researcher found that the most important reasons for weakness in the technical performance of the skills are attributable to the weakness of the physical preparation of the physical abilities of legs (explosive ability and distinctive power) Which negatively affects the achievement of a strong push and a high height of the center of the weight of the body and this in turn has adversely affected the application of skills as required.

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Materials and Method

Research Objectives:
1. To prepare special high-intensity interval training exercises to develop the explosive capacity.
2. To identify the effect of these exercises on the development of explosive capacity of both legs’ muscles and biochemical indicators.
3. To identify the differences between the control and experimental group in the explosive capacity of the legs’ muscles and the biochemical indicators.

Research hypotheses:
1. There were statistically significant differences between the pre and posttests in some physical abilities and physiological indicators of the control and experimental groups.
2. There were statistically significant differences between the pre and posttests of the control and experimental groups in some physical abilities and physiological indicators in favor of the experimental group.

Research Methodology: The researchers used the experimental approach in designing the equivalent control and experimental groups for being appropriate to the research problem.

Research Community and Sample: The sample of the research was represented by the players of the Muthanna Specialist Training Center of the Junior Technical Gymnasium. It consisted of (10) players who were purposefully chosen and were divided by lottery method into two groups: an experimental group and a control group as shown in Table (1).

Table 1: Mean, standard deviation and Variation Coefficients

<table>
<thead>
<tr>
<th>Variables</th>
<th>Unit of measurement</th>
<th>Mean</th>
<th>SD</th>
<th>Difference coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>meter</td>
<td>1.33</td>
<td>0.08</td>
<td>6.01%</td>
</tr>
<tr>
<td>Mass</td>
<td>kg</td>
<td>29.40</td>
<td>4.69</td>
<td>15.95%</td>
</tr>
<tr>
<td>Age</td>
<td>Month</td>
<td>140.40</td>
<td>13.91</td>
<td>9.90%</td>
</tr>
<tr>
<td>Training Age</td>
<td>Month</td>
<td>30.50</td>
<td>4.50</td>
<td>14.75%</td>
</tr>
</tbody>
</table>

The equivalence of the two groups of the research: In order to be able to attribute the difference to the experimental factor, the two groups (experimental and control) should be fully equivalent under all circumstances and variables except for the experimental variable that affects the experimental group and does not affect the control group (1).

Table 2: The equivalence of the some variables test from for two groups (experimental and control)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Unit</th>
<th>Control Group</th>
<th>Experimental Group</th>
<th>*sig Value</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>vertical test from the constant</td>
<td>Cm</td>
<td>26.00</td>
<td>28.00</td>
<td>0.45</td>
<td>Not significant</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.18</td>
<td>5.70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blood acidity after tension</td>
<td>mm</td>
<td>7.28</td>
<td>7.26</td>
<td>0.64</td>
<td>Not significant</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.06</td>
<td>0.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calcium before tension</td>
<td>mg/100 ml</td>
<td>9.50</td>
<td>9.60</td>
<td>0.52</td>
<td>Not significant</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.29</td>
<td>0.10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Sig value <0.05

Tools and Devices used in the Research:
1. Syringe of Blood sucking number: (40).
2. Gel containers for blood-preserving for the sample (Polish-make).
3. Cards to determine the percentages of physiological variables (imported from Italy’s Sentinel).
4. Blood pressure gauge and manual pulse rate (2).
5. FUJIFILM (1).
8. Medical Scale and Ruler for height measurement.

Field Research Procedures: Determination of the explosive capacity under study/after having reviewed a lot of references and sources, the researcher and the supervisor resorted to select the explosive capability.
Determination of the biochemical indicators under study: The researcher and the supervisor selected some biochemical indicators that contribute to the research. Characterization of the explosive capacity test and the biochemical indicators and measurements used.

Characterization (vertical jump test as per Sargent curve): Anthropometric measurements: the researcher took the measurements of the research sample players.

Biochemical measurements: Blood is drawn out after tension during the relaxing period. The blood sample taken 5CC by a medical paramedic, the blood is placed in tubes to be chemically analyzed by specialists. The blood sample is to be divided into two groups: The first group is placed in anticoagulant tubes, then the blood is treated by Mindray device to detect the percentage.

Exploration Experiment: To identify the difficulties that may be encountered during the main experiment, the researcher carried out two experiments; the first on Wednesday, 11/7/2018, to perform the physical tests, while the second was executed on Thursday, 12/7/2018 by the help of cadre. It was intended to measure the biochemical indicators.

Main experiment: The Pre Tests; the researcher carried out the pre tests before the special preparation period, where the tests were conducted according to the following schedule: on the first day: 20/7/2018 the Anthropometric and physical measurements were taken. On the second day: 7/2018, the biochemical measurements were taken before and after the tension.

Biochemical measurements before tension: Blood sample was taken from the research sample on Saturday 13/7/2018 before tension that is the players are in a state of complete rest without exerting any physical effort.

Biochemical measurements after tension: Blood sample was taken from the player after tension at the same time when the indicators were measured before tension.

Exercises Used: Based on the scientific references, the researchers prepared exercises to train the research sample and to determine the effect of the items of this exercise in the research sample.

1. The first training module was conducted on 22/7/2018 after the pre tests
2. The exercises application took (8) week s at the rate of (3) training modules per week (Sunday, Tuesday, Thursday) and the researcher used exercises in the beginning of the main section.
3. The total number of modules is (24) and the total training time of module is (120) minutes, and the devoted for research or experiment ranged between (24.54-27.3) minutes.
4. The intensity (80%) was defined as a starting point for the application of exercises items, adopting a high-intensity interval training method in the training of anaerobic exercises.

Posttests: They were carried after the two-month period of training had ended, performed on Wednesday and Thursday, 19-20/9/2018.

Results

Table 3: The standard deviations of the pre and posttests of the physical abilities, the value of the sig and the statistical significance of the control and experimental groups

<table>
<thead>
<tr>
<th>No</th>
<th>Variables</th>
<th>unit</th>
<th>Control Group</th>
<th>Experimental Group</th>
<th>*sig Value</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Control group</td>
<td>Vertical jump test</td>
<td>cm</td>
<td>26</td>
<td>4.18</td>
<td>31.20</td>
<td>6.90</td>
</tr>
<tr>
<td>Experimental group</td>
<td>Vertical jump test</td>
<td>cm</td>
<td>28</td>
<td>5.70</td>
<td>35.60</td>
<td>8.17</td>
</tr>
</tbody>
</table>

*SIG value (0.05)

Discussion of the results of the pre and post testing of the control and experimental groups for the test of the explosive capacity: The researcher attributed these differences to the pre and posttests of the control group to the development of capabilities as a result of the impact of the curriculum prepared by the trainer and the exercises used for this purpose have led to the improvement of this ability. The development of the experimental group was attributed the effectiveness of training exercises designed by the researcher, which improved the explosive capacity.2
These exercises were also based on scientific planning to achieve the objective and since “muscle strength” was the resultant force or which was generated by the muscle when contracted as per the number of common muscle fibers contracted and it also varies according to the type of Muscle contraction”.

View and analyze the results of the biochemical indicators of the control and experimental groups:

Discussion of the results Pre and Posttests of the physiological indicators of the control and experimental groups: Lactic acid before and after tension: The results of the measurement of lactic acid after and before tension of both control group and experimental as shown in Table (5) indicated that there were differences between the pre and posttests of lactic acid but they were not statistically significant as it was for lactic acid After tension of the control group, where an increase was obtained which was attributed by the researcher to the effect of continuous intensive training. While the ad hoc high intensity interval training exercises which were prepared by the researcher, The physical highly intensive training leads to the athlete’s toleration of the highly concentrated of lactic acid, and to increase his ability to get rid of it.

Blood acidity before and after tension: The results of the measurement of the blood acidity before and after the tension of training of both control and experimental groups as shown in (6) indicated that there were differences between the pre-test and post-test blood acidity, yet, they were not statistically significant. Significant differences were seen in the post training tests, which were attributed by the researcher to the training curriculum proposed by the trainer and the exercises prepared by the researcher, which contributed to improve the work of the vital organs, which maintain the acidity of blood, that the relative reliability of (PH) blood leads to the possibility of maintenance of blood for long period even after the outputs of acid metabolism entered.

Calcium before and after training tension: The differences between the pre-tests and post-tests of blood acidity as seen in table (4) were not statistically significant. However, it’s attributed by the researchers to the training curriculum proposed by the trainer and the exercises prepared by the researcher that, “Training increases the amount of calcium ion Ca ++, which should be invested in the production of a series of enzymes in the muscle”.

View and analyze the results of the post tests of physical abilities and physiological indicators of the control and experimental groups:

Table 4: The means and standard deviations of the post tests of the physical abilities, the value of the sig and the statistical significance of both control and experimental groups

<table>
<thead>
<tr>
<th>No.</th>
<th>Variables</th>
<th>unit</th>
<th>Control Group</th>
<th>Experimental Group</th>
<th>*sig Value</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>1</td>
<td>Vertical jump test</td>
<td>cm</td>
<td>31.20</td>
<td>6.90</td>
<td>35.60</td>
<td>8.17</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*SIG value ≥ (0.05)

Table 5: The means and the standard deviations of the post tests of the physiological indicators, the value of the sig and the statistical significance of the control and experimental groups

<table>
<thead>
<tr>
<th>No.</th>
<th>Variables</th>
<th>Unit</th>
<th>Control Group</th>
<th>Experimental Group</th>
<th>*sig Value</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>1</td>
<td>Lactic acid before effort</td>
<td>mm/mol</td>
<td>1.4</td>
<td>0.22</td>
<td>1.4</td>
<td>0.175</td>
</tr>
<tr>
<td>2</td>
<td>Lactic acid after effort</td>
<td>mm/mol</td>
<td>6.4</td>
<td>0.15</td>
<td>8.7</td>
<td>0.065</td>
</tr>
<tr>
<td>3</td>
<td>Blood acidity before tension</td>
<td>mm</td>
<td>7.59</td>
<td>0.02</td>
<td>7.56</td>
<td>0.25</td>
</tr>
<tr>
<td>4</td>
<td>Blood acidity after tension</td>
<td>mm</td>
<td>7.72</td>
<td>0.77</td>
<td>7.74</td>
<td>0.15</td>
</tr>
<tr>
<td>5</td>
<td>Calcium before tension</td>
<td>mg/100 ml</td>
<td>9.60</td>
<td>0.29</td>
<td>9.72</td>
<td>0.10</td>
</tr>
<tr>
<td>6</td>
<td>Calcium after tension</td>
<td>mg/100 ml</td>
<td>9.76</td>
<td>0.15</td>
<td>9.82</td>
<td>0.04</td>
</tr>
</tbody>
</table>

*Sig <(0,05)
Discussion

Lactic acid before and after the tension: Before training, the lactic acid rate varied between the two groups but these variations were not statistically significant. But after the training, significant differences appeared in the results of the experimental group, which were attributed by the researcher to the performance of highly intensive exercises, which resulted in an increase in the concentration of lactic acid in the blood. Such increase in the lactic acid production is due to the type of muscle work and its intensity exerted by the player. When the muscle work is of moderate intensity and performed under the use of oxygen, the production of lactic acid does not increase in the blood, while if the work of muscle is of high intensity and performed in the absence of oxygen, Lactic acid pool increases in the blood “.7

Blood acidity before and after training: There were differences observed in the blood acidity rate before training between the two groups but these differences were not statistically significant, but after training, significant differences were observed in the results of the experimental group, which the researcher attributed to the continuation of the high intensity interval training exercises applied scientifically by the study sample, where the pH of blood was increased and this increase led to the disengagement of hemoglobin from oxygen.7

Conclusions

1. Special exercises of high-intensity training have a positive effect on the development of the explosive capacity of the leg muscles and the biochemical indicators of the technical gymnastic young players.
2. There were no significant differences between the pre and posttests of the experimental group in the biochemical indicators before training performed by the technical gymnastic players.
3. There were significant differences between the pre and posttests in the in favor of the experimental group in the biochemical indicators after training performed by the technical gymnastic players.
4. The traditional approach adopted by the control group had a positive effect on the development of the explosive capability and biochemical indicators of the technical gymnastic players. This was due to the organization and continuation of the training modules throughout the experiment. However, this development did not reach the level achieved by the experimental group.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

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2. Bahaa E. S., Biochemistry in the field of sports, Dar Al-Fikr Al-Arabi, Al-Mina University, Cairo, 1990.
The Effectiveness of Proposed Consensual Exercises to Correct the Error Associated with the Performance of the Layup Scoring Skill of Beginner’s Basketball

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¹Faculty of Physical Education and Sports Sciences, University of Anbar, Iraq

ABSTRACT

The use of harmonized exercises in learning locomotives has an effective effect in the educational process because of its benefits. It remains in great need for the teacher and the good coach as it is assigned to perform its task well. Despite the many studies that specialized in teaching scoring through a few exercises, Of studies have used these harmonics exercises in the teaching of basic basketball skills, which may help to accelerate the process of learning as a result of short time and the construction of a true motor perception. The researchers used the experimental method of tribal measurement and telemetry to suit the nature of research.

The sample was randomly selected from students of the first stage (48) students, constituting (38.4%) of the original research community. After conducting the tests, the data were collected and processed statistically to reach the most important conclusions, which include the use of the proposed exercises and the effort and time for the teacher and the learner to learn peaceful scoring skill well.

Keywords: Consensual exercises, performance and layup scoring.

Introduction

The basketball game occupies a distinct place in the world, like the rest of the various sports. It depends on the interplay of the team because it is linked to physical abilities, mobility, skill, psychological, educational and planning, and is characterized by many skills that are exciting and exciting.

This has been pointed out by some scientific sources that «(basketball is one of the collective activities and is prolific with individual and collective skills). And dynamic learning is one of the branches of the general educational process, which characterizes the shyness of the living organism from birth until death, where human activity is not free of all kinds of learning and motor learning, and as the process of learning with motor sports training in the process of transmission of information from the coach or teacher to the player or student As well as in the changes that occur in the motor behavior resulting from the educational process, which aims to provide the individual learner or player of physical qualities or motor skills and skill. And that the difference between learning and dynamic learning is that the response in the field of learning locomotives be in the form of motor behavior with large muscle groups to reach a certain goal. “On the other hand, we find that learning locomotors or motor behavior is strongly linked to control the work of muscle groups and that control has to do with In the central and peripheral nervous system and how the peripheral nerves work effectively to move the parts of the body accurately and from this we find that learning is the link between psychological character and physiological “.

Perhaps one of the most important foundations and requirements in the process of detecting the level of performance of some of the abilities of motor skills and skill requires the evaluation and by the development of exercises based on the correct learning assets, which is an important basis for knowledge of the level of sports, which can be applied to students of faculties of physical education and sports sciences, The building blocks of the distinctive sports building Based on the scientific curricula and studies, and that the use of harmonized exercises in learning locomotives has an effective effect in the educational process because of its benefits, it remains in severe need for the teacher and the good coach as it is assigned to perform its task well and despite the multiple studies that specialized in teaching scoring
through exercises suggested, a few Studies have used these harmonized exercises to teach basic basketball skills that may help accelerate learning as a result of shortening time and building a true motor perception.³

Research aims:

1. The development of the proposed consensual exercises to develop the level of performance of the pacific pacification basketball students on the first stage Faculty of Physical Education and Sports Sciences Anbar University.

2. To recognize the effect of the use of harmonized exercises in the development of the level of technical performance of Layup scoring shot basketball

Hypotheses: The exercises have a positive effect in improving the level of technical performance of Layup scoring shot basketball.

Research Methodology: The researchers used the experimental method in the method of pre measurement and telemetry in order to suit the nature of the research.

Research community: The research society consists of students of the first stage in the Faculty of Physical Education and Sports Sciences/Anbar University for the academic sciences (2016 - 2017) and the number of (80) students, which constitute the community of research.

The research sample: The sample was randomly selected from the students of the first stage (48) students (38.4%) of the research community.

Data collection tools and means: The researchers used the following tests and tools in collecting search data and implementing the experiment.

Tests used in research:⁴

1. The Layup scoring test (performance evaluation).

2. Objective of the test: The test aims to measure the skill of Layup scoring shot.


4. Performance Specifications:

5. Draw a starting line away from the final limit by (10) meters and parallel to the player stands behind this line and then the ball is tilted until he approaches the basket to lead the steps of a Layup score and then aim the ball on the goal.

6. Registration:

7. The player is given (5) degrees if successful footsteps and injury target.

8. The player is given (3) grades if the success of the steps of the feet.

9. The player is given (zero) in case of injury goal and the success of footsteps.

The test of the Dribble ended Layuply:⁵

Objective of the test: Measuring the skill of the plotters and the Layup pursuit.

Devices and tools used: The number is 3, basketball and stopwatch. The distance between the starting line, which is 19.5 meters away from the point of the center of the loop and the first person is 6 meters, and the distance between the figures is 4.5 meters.

Test Conditions: The laboratory stands at the starting line and when it hears the starting signal starting with the right hand side of the first person (for the player using his right arm) and upon reaching a suitable distance from the goal he is a Layup target and quickly returns the ball if the score succeeds. Succeeds in injury and then returns quickly and the time is counted which is a test guide.

The tools used:

1. Basketball basket balls

2. Basketball court

3. High cones (30) cm

4. Metric measuring tape

5. Whistle

Basic Study: The basic study was conducted in the period from 15/1/2016 to 23/4/2017 by 8 weeks. The number of training units reached (8) units by (1) units per week and unit time (90).

The pretest: Were made on 15/1/2016 on the same research (experimental).

The proposed program: Was implemented from 22/1/2016 to 17/4/2017 on the following two research groups:

### Results

#### Table 1: The homogeneity of the sample of the study sample in the variables

<table>
<thead>
<tr>
<th>S.</th>
<th>Variables</th>
<th>Units</th>
<th>Mean</th>
<th>Median</th>
<th>SD</th>
<th>Skewness*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Age</td>
<td>Year</td>
<td>19.729</td>
<td>20</td>
<td>0.939</td>
<td>0.384-</td>
</tr>
<tr>
<td>2.</td>
<td>Weight</td>
<td>Kg.</td>
<td>68.145</td>
<td>68</td>
<td>6.391</td>
<td>0.352-</td>
</tr>
<tr>
<td>3.</td>
<td>Length</td>
<td>Cm.</td>
<td>174.583</td>
<td>175</td>
<td>6.344</td>
<td>0.024-</td>
</tr>
</tbody>
</table>

* The distribution is moderate below the level (± 1) for the values of the torsion coefficients

#### Table 2: Shows the parity of the sample of the study in the variables that affect the performance of the skills of the basketball under study

<table>
<thead>
<tr>
<th>S.</th>
<th>Variables</th>
<th>Units</th>
<th>Control group</th>
<th>Experimental group</th>
<th>(t) calculated</th>
<th>Sig.*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>1.</td>
<td>Layup shoot</td>
<td>Time</td>
<td>17.602</td>
<td>4.916</td>
<td>16.940</td>
<td>4.141</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Performance evaluation</td>
<td>4.830</td>
<td>1.736</td>
<td>4.630</td>
<td>1.096</td>
</tr>
</tbody>
</table>

* Not significant below the level of error> (0.05) in front of the degree of freedom (24 + 24-2 = 46)

#### Table 3: Shows the values of the computational environment, the standard deviations, the calculated value (t) and the significance of the differences between the results of the pre and post-performance evaluation of the control group in the main search variables

<table>
<thead>
<tr>
<th>S.</th>
<th>Variables</th>
<th>Units</th>
<th>Pretest</th>
<th>Posttest</th>
<th>(t) calculated</th>
<th>Mean diff.</th>
<th>SD diff.</th>
<th>Sig.*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>1.</td>
<td>Layup shoot</td>
<td>Time</td>
<td>17.602</td>
<td>4.916</td>
<td>16.028</td>
<td>4.136</td>
<td>1.154</td>
<td>1.574</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Performance evaluation</td>
<td>4.830</td>
<td>1.736</td>
<td>6.920</td>
<td>1.213</td>
<td>5.696</td>
<td>2.083</td>
</tr>
</tbody>
</table>

* Morality below the level of error ((0.05) in front of the degree of freedom (23-1 = 22)

In Table (3) we find that the values of the computational circles and the standard deviations in the test (pre-post) to test the technical performance of the layup scoring skill in basketball were different in the control group, which confirms the change in the pretest (17.602) (4.916) in the pretest, while the mean (16.028) and the standard deviation (4.136) in the post-test as this is an indication of the effect of the effect on improving the technical performance of the layup correction. The researchers used the t-test for the interrelated samples to verify the significance of the differences and the level of significance (0.05) indicating that there is a significant difference in favor of the post-test, and this is what is noted in the table above.

#### Table 4: The values of the computational environment, the standard deviations, the calculated value (t), and the significance of the differences between the results of the pre and post-performance evaluation of the experimental group in the main search variables

<table>
<thead>
<tr>
<th>S.</th>
<th>Variables</th>
<th>Units</th>
<th>Pretest</th>
<th>Posttest</th>
<th>(t) calculated</th>
<th>Mean diff.</th>
<th>SD diff.</th>
<th>Sig.*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>1.</td>
<td>Layup shoot</td>
<td>Time</td>
<td>16.940</td>
<td>4.141</td>
<td>15.932</td>
<td>3.661</td>
<td>1.049</td>
<td>1.007</td>
</tr>
</tbody>
</table>

* Morality below the level of error ((0.05) in front of the degree of freedom (23-1 = 22)

In Table (4) we find that the values of the computational and standard deviations in the test (pre - post) to test the technical performance of the layup scoring skill in the basketball were different in the experimental group, which confirms the change from the pretest as the mean (16.940) With a standard deviation of (4.141) in the pretest,
while the mean (15.932) and a standard deviation (3.661) in the post-test. This is an indication of the effect of the improvement in the technical performance of the layup correction and to know the differences between the circles of the pre- and post- Performance For a layup correction, the researchers adopted the t-test of the interrelated samples to verify the effect of the proposed exercise on learning the skill in question. The calculated value of (1.049) was at the level of freedom (23) and the significance level (0.05), indicating a significant difference In favor of the post-test and this is what we see in the table above.

Table 5: The values of the computational environment, the standard deviations and the calculated value (t) and the significance of the differences between the results of the control and experimental research groups to evaluate the post-performance in the main search variables

<table>
<thead>
<tr>
<th>S.</th>
<th>Variables</th>
<th>Units</th>
<th>Control group</th>
<th>Experimental group</th>
<th>(t) calculated</th>
<th>Sig.*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Layup shoot</td>
<td>Time</td>
<td>16.028</td>
<td>4.1364</td>
<td>15.932</td>
<td>3.661</td>
</tr>
<tr>
<td></td>
<td>Performance evaluation</td>
<td>6.920</td>
<td>1.213</td>
<td>6.330</td>
<td>1.435</td>
<td>1.521</td>
</tr>
</tbody>
</table>

* Not significant below the level of error > (0.05) in front of the degree of freedom (24 + 24-2 = 46)

Table 5 shows that the control group achieved a mean of 16.028 and a standard deviation of (4.1364) in the post-test. The experimental group achieved a mean of 15.932 and a standard deviation of (3.661). The results of the study of the technical performance of the skill of layup scoring, the researchers adopted the test (t) for asymmetric samples to verify the significance of differences, the value of (t) calculated (0.085) at the degree of freedom (48) and the level of significance (0.05) Significant difference between the two groups and for the benefit of the experimental group.

Discussion of Results

Discussion of the results of the control and experimental research groups in the tests of the technical performance of layup correction through the results presented in tables (3.5.4). It is clear that the amount of learning was clear and the development rates of the control and experimental groups in learning the technical performance of the layup scoring skill When the tables were highlighted (3.4), there was an improvement in the level of performance in the post-test compared to the pre-test and the achievement of development and learning ratios in the technical performance of the skill in question, but at a different level between the control group and experimental and experimental The effect of the use of (the proposed exercises).

The researchers attributes this to learning and remarkable development as the educational means (based on the involvement of all senses in the learning processes, which leads to the consolidation and deepening of this learning and thus helps to establish strong and firm relationships between what the student learned and the consequent survival of the impact of learning). Numerous research and studies have pointed out that the various exercises raise the tendency of individuals and work to consolidate learning as well as shortening the effort and time required for the learning process.

The development rate achieved by the control group is the result of the application of the applied curriculum, which provides many repetitions of skill learning, presentation of the model and feedback used by the teacher. When reviewing the experimental group’s schedule, which was subject to the proposed curriculum, there is an improvement in the performance of the post- In learning the skill in question compared to the pretest and achieving a good rate of development in learning the technical performance of layup scoring skills, skill is a function of performance effectiveness as the learner develops some of the motor responses in the organization of a new dynamic. And that each motor skill requires the organization and arrangement of the work of certain muscle groups, and in a certain direction.

The researchers attributed the progress achieved by the experimental research group to the use of the proposed exercises in the educational curriculum, which defines the learner with the correct motor path, which serves the mechanical foundations of the skill in question. Some studies have shown that “when the learner knows the mechanical bases of the skill, the
performance. Since skill is a function of performance effectiveness as the learner develops some of the kinetic responses in the organization of a new motor, and that each skill requires the movement of the organization and arrangement of the work of certain muscle groups, and in a certain direction.  

**Conclusion**

The proposed exercises as an aid and an effective role in learning the required skill. The use of exercises suggested and provide effort and time for the teacher and the learner to learn layup scoring skills well. The use of exercises suggested to have a positive impact in the interaction of learners during the lesson and their presence. Get good ratios in the amount of learning the technical performance of the skill of layup scoring.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding

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A 4-Day Plaque-Regrowth Anti-Plaque Effect of a Combination of Green Tea and Salvadora Persica L.: A Randomized Controlled Crossover Clinical Trial

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ABSTRACT

Background: In earlier studies, a combination of 0.25mg/ml green tea and 7.82mg/ml Salvadora persica L. aqueous extracts (Co) had been found to exhibit anti-bacterial and anti-adherence effects against primary plaque colonizers biofilm in vitro and antiplaque effect as a mouthwash for a period of 24h in vivo. The aim of current study was to evaluate anti-plaque efficacy of Co mouthwash for a longer period of 4 days in vivo.

Method: A 4-day plaque re-growth double-blinded randomized crossover trial was carried out. A week after receiving polishing and scaling, all participants (n=14) received polishing at base line and rinsed with 15ml of randomly allocated mouthwashes (either Co, 0.12% chlorhexidine or placebo) twice daily without oral hygiene measures for 4 days. After 24h and 4 days’ time points, plaque index was recorded, and then the participants entered a 6-day washout period with regular oral hygiene measures. The same protocol was repeated for the next 2 mouthwashes.

Results: The Co mouthwash significantly reduced plaque accumulation as compared to Placebo and chlorhexidine).

Conclusion: The Co mouthwash has antiplaque activity for a 4-day period and might be a potential alternative to synthetic mouthwashes.

Keywords: Salvadora, green tea, dental plaque, mouthwash, chlorhexidine.

Introduction

Dental plaque is a soft mass accumulated onto tooth surfaces. Its formation starts by adhesion of oral commensal bacteria, known as primary colonizer, to acquired pellicle-covered tooth surfaces. When these bacteria establish firm attachment on tooth surfaces, they offer receptors for the attachment of the other secondary colonizing bacteria. This process of bacterial attachment continues and contributes to the buildup of mature dental plaque within few days (1). Dental plaque requires around 24h to be clinically detectable (2). Accumulated dental plaques onto tooth surfaces elicit inflammation in adjacent gingival tissue (3). Thus, the removal of dental plaque from tooth surfaces on daily basis is essential as a preventive measure. The best control of tooth plaque is tooth brushing and using interdental aids. However, the efficiency of these procedures depends on individual’s dexterity (4) and poor individual performance has been reported (5). Consequently, the use of chemicals such as mouthwashes has been suggested to adjunct tooth brushing and flossing. Till these days, chlorhexidine (CHX) mouthwash has been considered the first choice as adjunctive chemical; its anti-plaque activity has been ensured (6). Unfortunately, CHX has been reported to have several side effects such as tooth staining and bitter taste (6, 7). For that reason, an alternative mouthwash having anti-plaque activity comparable to CHX with less undesirable effects is a topic for many studies. Extracts of medicinal plants have received much attention over the past few years, due to its biological activities that enhance oral health such as Salvadora persica L., family: Salvadoraceae, (Sp) and green tea (Gt), leafs of
Camellia sinensis var. assamica (family: Theaceae)\(^{9-10}\). Recently, the combination of 0.25mg/ml green tea and 7.82mg/ml Salvadora persica L. aqueous extracts (Co) (patented, IP 2015704777) was reported to exhibit antibacterial and anti-adherence activities against primary colonizers of dental plaque in vitro\(^{(11)}\) and anti-plaque activity better than CHX for short period of 24h \textit{in vivo}\(^{(2)}\). For that reason, this study was carried out to confirm the anti-plaque activity of Co for 24h and to evaluate its anti-plaque activity for a longer period of 4 days \textit{in vivo}.

**Materials and Method**

**Study design and population:** This study was a randomized, double blinded, 4-day plaque re-growth crossover clinical trial. It was carried out at the Faculty of Dentistry/University of Baghdad between November 2018 and January 2019. Subjects included in the study should be 19-23 years old, in good general health and had more than 20 teeth. However, subjected excluded from the study were those having active cavitated caries and/or periodontal disease, undergoing orthodontic treatment, having history of antibiotics treatment within the past 4 months, those need prophylactic antibiotic coverage and/or non-steroidal anti-inflammatory drugs (systemic/topical) for the past 4 months, those known of intolerance or allergy to mouthwashes and subjects having heart valve replacement and/or any systemic disease. This study was approved by the Ethical Committee, Faculty of Dentistry University of Baghdad following the guidelines of the Declaration of Helsinki and Tokyo for humans (reference no:011618 in 8 January 2019). Written informed consent form was obtained from all participants.

**Sample size:** The sample size was determined after collecting data from literature\(^{(12)}\). The sample size of 9 participants was found enough to reject the null hypothesis between Co and placebo (Plc) mouthwashes at probability power of 0.95 and 0.05 type I error probability. Due to crossover design of the study, involving follow up period of 6 weeks, a sample size of 16 participants was decided to be enrolled in this study to compensate for unanticipated drop out.

**Clinical Measurements**

**Plaque index:** The plaque quantity was recorded using modified Quigley Hein plaque index (PI)\(^{(13)}\). The labial/buccal and lingual/palatal surfaces of each disclosed tooth except wisdom teeth and filled tooth surfaces were recorded. The mean of PI was calculated by collecting the scores over the total number of surfaces examined. All plaque scores were recorded by single examiner. Alignment and assessment of the examiner was carried out as described by\(^{(14)}\). Absolute intra-examiner agreement, kappa value of 0.915, was achieved according to Landis and Koch\(^{(15)}\).

**Interventions:** The Co, 0.12% chlorhexidine (CHX; positive control) and Placebo (Plc; negative control) were used in this study. A full description of the mouthwashes was shown in Table (1). The mouthwashes were contained in identical opaque bottles, which were given random sequential number codes (1, 2 and 3) by a third party not involved in this study. A number-coded interventions’ sequence list, generated by using a random number generator (Microsoft Excel 2010), was given to the examiner to assign the blinded intervention. Thus, all participants had an equal probability of assignment to the interventions sequence. This trial was double-blinded as the examiner and participants were unable to identify the corresponding intervention. Decoding was done at the end of the study.

**Clinical trial:** After participants’ selection, the aim and flow of the clinical trial were illustrated for the participants 7 days before the launch of clinical trial and all participants received oral hygiene education, scaling and polishing. In the clinical trial period, participants attended dental clinic three times, at baseline (0h), after 24h and after 4 days. PI scores were recorded at 24h and after 4 days.

At the beginning of each period, participants’ teeth were disclosed with a disclosing agent (erythrosine tablets). Then, participants’ teeth were polished to have plaque-free teeth surfaces at baseline. After that, participants were asked to rinse with undiluted 15ml of the allocated mouthwash solution for 1 minute under supervision and instructed to refrain from eating and drinking for 30 minutes after rinsing. Participants were asked to repeat the rinsing at home twice daily for the next 4 days and to refrain from mechanical oral hygiene measures or using chewing gum for 4 days. At the following day, participants’ plaques were disclosed and PI was recorded. The same procedure was repeated at day 4. After that, participants entered a 6-day wash out period and they were asked to resume oral hygiene measures. After the washout period, the same protocol was repeated for the next two mouthwashes. On the last day of the study, participants received polishing\(^{(12)}\). Adverse events were recorded except those unrelated to the intervention such as traumatic ulcers, food burns and lip bites.

Table 1: Description of interventions

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Positive control</th>
<th>Test</th>
<th>Negative control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ingredients &amp; concentration</td>
<td>0.12% Chlorhexidine gluconate (w/v) (active ingredient).</td>
<td>Combination of Camellia sinensis var. assamica (0.25mg) + Salvadora persica L. (7.82mg) extracts/1ml distilled water.</td>
<td>Distilled water.</td>
</tr>
<tr>
<td>Dosage/Regimen</td>
<td>15ml twice daily/rinse for 1min/refrain from eating or drinking for 30min.</td>
<td>15ml twice daily/rinse for 1min/refrain from eating or drinking for 30min.</td>
<td>15ml twice daily/rinse for 1min/refrain from eating or drinking for 30min.</td>
</tr>
<tr>
<td>Duration</td>
<td>4 days</td>
<td>4 days</td>
<td>4 days</td>
</tr>
<tr>
<td>Color</td>
<td>Pink</td>
<td>Light yellow</td>
<td>Colorless</td>
</tr>
</tbody>
</table>

Statistics: Data were analyzed using Statistical Package for Social Sciences (SPSS; version 22.0) for windows. For mouthwashes comparison, PI scores and percentages of plaques coverage were described in term of mean and standard deviation. Kruskal-Wallis H test (P<0.05) was used to detect any differences among interventions. Then, Mann-Whitney U test (P<0.0167) was used to test the difference between each pair of interventions. The intra- and inter-examiner agreements were assessed by using kappa test. G*Power software (version 3.1.9.2) was used to determine sample size, intervention effect size and power of the study.

Results

The participants were 14 male dental students with mean ± SD age of (22.35 ± 0.497). The mean ± SD values of PI at 24h and at day 4 were summarized in Tables (2and 3). The mean PI of Co was significantly lower than that of both Plc and CHX (P<0.05).

Table 2: Mean and SD values of PI for different interventions

<table>
<thead>
<tr>
<th></th>
<th>Co (n = 14)</th>
<th>CHX (n = 14)</th>
<th>Plc (n = 14)</th>
<th>Comparisons</th>
<th>Effect size</th>
<th>Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>After 24h</td>
<td>Mean ± SD</td>
<td>2.139 ± 0.546</td>
<td>2.652 ± 0.318</td>
<td>3.282 ± 0.606</td>
<td>Co VS. CHX *</td>
<td>1.208</td>
</tr>
<tr>
<td></td>
<td>95% Confidence Interval for Mean</td>
<td>1.823 - 2.454</td>
<td>2.460 - 2.844</td>
<td>2.932 - 3.632</td>
<td>Co VS. Plc *</td>
<td>1.983</td>
</tr>
<tr>
<td></td>
<td>Mean ± SD</td>
<td>2.634 ± 0.513</td>
<td>3.608 ± 0.505</td>
<td>4.474 ± 0.419</td>
<td>CHX VS. Plc *</td>
<td>1.035</td>
</tr>
<tr>
<td></td>
<td>95% Confidence Interval for Mean</td>
<td>2.338 - 2.931</td>
<td>3.317 - 3.900</td>
<td>4.232 - 4.716</td>
<td>Co VS. CHX *</td>
<td>1.923</td>
</tr>
<tr>
<td>After 4d</td>
<td>Mean ± SD</td>
<td>0.496 ± 0.534</td>
<td>0.873 ± 0.522</td>
<td>1.191 ± 0.433</td>
<td>Co VS. CHX</td>
<td>0.714</td>
</tr>
<tr>
<td></td>
<td>95% Confidence Interval for Mean</td>
<td>0.187 - 0.804</td>
<td>0.571 - 1.174</td>
<td>0.941 - 1.441</td>
<td>Co VS. Plc *</td>
<td>1.431</td>
</tr>
</tbody>
</table>

* Significant at P<0.05 by paired t-test.
### Table 3: Buildup of dental plaque after rinsing with different study interventions

<table>
<thead>
<tr>
<th>PI</th>
<th>No.</th>
<th>Mean ± SD (After 24h)</th>
<th>Mean ± SD (After 4 days)</th>
<th>Mean difference ± SD</th>
<th>95% Confidence Interval of the Difference</th>
<th>P value</th>
<th>Effect size</th>
<th>Power</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>2.139 ± 0.546</td>
<td>2.634 ± 0.513</td>
<td>0.496 ± 0.534</td>
<td>0.804 - 1.87</td>
<td>0.004*</td>
<td>0.933</td>
<td>0.897</td>
</tr>
<tr>
<td>Co</td>
<td>14</td>
<td>2.736 ± 0.437</td>
<td>3.608 ± 0.505</td>
<td>0.873 ± 0.522</td>
<td>1.174 - 0.571</td>
<td>0.000*</td>
<td>1.837</td>
<td>0.999</td>
</tr>
<tr>
<td>CHX</td>
<td>14</td>
<td>3.282 ± 0.606</td>
<td>4.474 ± 0.419</td>
<td>1.191 ± 0.433</td>
<td>1.441 - 0.941</td>
<td>0.000*</td>
<td>2.218</td>
<td>1.000</td>
</tr>
</tbody>
</table>

* Significant at P<0.05 by paired t-test.

### Discussion

The main finding in this study is the potent anti-plaque efficacy of Co mouthwash. 24 h After rinsing with Co, PI scores were found significantly less compared to CHX and Plc; a finding supported by a previous study (12). The Co solution was found to exhibit antibacterial and anti-adherence effects against primary colonizers of dental plaque. The initial adherence of the primary plaque colonizers to the tooth surface is essential for the development of dental plaque by providing new binding sites for secondary plaque colonizers (16). Constituents of green tea and *Salvadora persica* L. aqueous extracts such as tannins (17) and polyphenols (18) were reported to adsorb onto, and modify, teeth covering acquired pellicle and may subsequently disturb bacterial attachment to tooth surface. Thus, the potent anti-plaque efficacy of Co mouthwash could be attributed to the reduction in the availability of primary colonizers in saliva and impairment of the attachment of these bacteria onto tooth surface which therefore retard plaque development.

At day 4 following rinsing with Co, PI scores were still significantly less as compared to CHX and Plc. This finding could be due to continuous antibacterial effect of Co mouthwash with consequent reduction of bacterial load in saliva after establishment of dental plaque on tooth surfaces.

Interestingly, despite absence of oral hygiene measures, the amount of dental plaque formed on the already established plaque on tooth surfaces was found significantly less after rinsing with Co mouthwash as revealed by the differences between PI scores at 24h and after 4 days; a finding that was not evident for CHX. This represented a potential advantage of Co mouthwash over CHX, which needs a clean tooth surface to work perfectly by binding pellicle-covered tooth surfaces (19), particularly for those who do not brush their teeth regularly.

A 4-day non-brushing plaque regrowth model was used, a duration that has been used in previous studies (20-22), in a crossover setup to counteract patient-specific parameters and possible bias in the determination of plaque growth and accumulation. Also, the blinding of investigator and participants ensured unbiased evaluation of the results.

The re-formation of supra-gingival plaque is similar for healthy and periodontitis subjects (23). This suggested that the test mouthwash could have similar antiplaque effect in subjects with periodontitis and it can be used in healthy and periodontitis subjects.

### Conclusion

Rinsing with 15ml of a combination of 0.25mg/ml green tea and 7.82mg/ml *Salvadora persica* L. aqueous extracts twice daily can significantly reduce dental plaque accumulation after 4 days with no observed adverse effects. This combination might be a potential alternative to synthetic mouthwashes.

### Ethical Clearance: The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

### Conflict of Interest: The authors declare that they have no conflict of interest.

### Source of Funding: Self-funding.

### REFERENCES

2. Abdulbaqi HR, Himratul-Aznita WH, Baharuddin NA. Evaluation of *Salvadora persica* L. and green tea anti-plaque effect: a randomized controlled


Some of Surrounding Environment Perceptions and its Correlation to the Psychological Flexibility of the Players of Babylon University Futsal

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ABSTRACT

The research aims to:

1. Recognition of some of the perceptions of the Environment and psychological flexibility in the players of the University of Babylon futsal.
2. to identify the relationship between some of the perceptions of the Environment and psychological flexibility in the players of the University of Babylon futsal.

The researchers used the descriptive approach in the methods of survey and interrelationships. The research society included the players of the University of Babylon with a total of 12 footballers. The tests of some of the Environment’s perceptions and psychological flexibility were determined. The tests were then applied to the research community for the purpose of conducting relations. Using SPSS version 17 to address its research data, and in the light of the findings of the current research and the subsequent interpretations, we can draw a number of conclusions, the most important of which are the following:

1. The players of the University of Babylon futsal club with a high level of some of the perceptions of the Environment and psychological flexibility.
2. The existence of a strong correlation between each of the positive perceptions of the Environment and the psychological flexibility of the players of the University of Babylon futsal.

Keywords: surrounding environment and psychological flexibility.

Introduction

In view of the scientific progress and increasing the importance of sports psychology in achieving achievement for athletes, there is an urgent need to activate the psychological aspects and employ them in a scientific way to help players achieve maximum athletic achievement and ensure the mental health of players and protect them from the pressure of training they are subjected to. The player reaches the best level before and during sports competitions.

Futsal is one of the most popular games in the world, regionally and locally. It is a sport that requires high fitness, skillful performance, planning, mental abilities and a special psychological preparation. Perception of the Environment is one of the most important variables that affect the power of attention, as well as its obvious effect in concentration, control and interpretation of the stimuli surrounding the performance skill and psychological flexibility is an important factor and essential for the players, and must be available and attention to enable them to work to achieve achievement, as psychological flexibility plays an important role and effective As well as physical, skill and planetary factors and they directly affect the behavior of the human and emotional. In the light of the foregoing, the importance of research is to know the relationship between some of the perceptions of the Environment and psychological flexibility.

The psychological variables in futsal halls are the most important means of success for the team as it is the seeds of the basis for excellence and the implementation of the performance of the team and then achieve the optimal performance to achieve the achievement of sports, and psychological variables play an important role in achieving achievement, whether on the personal
level of the player as an individual or at the level. The team as a whole and through the follow-up researchers and their interest in being specialists in this game noted that there is a disparity in the activation and employment of psychological aspects and mental abilities of the players and have a significant impact on the situations of play and skill performance and the results of the entire team so will work Researchers to identify some of the Environment perceptions of psychological resilience and the extent of the relevance of those variables while among these players.\(^{2}\)

Research Methodology

The researchers used the descriptive approach in survey methodology and correlative relationships to suit the nature of problem solving.

Research Community: The research community consists of the players of the University of Babylon team for the academic year 2017-2018, the number of (12) players were all selected by (100%).

Means, instruments and devices used in research:
- Observation.
- Questionnaire.
- Arab and foreign sources and references.
- Benchmarks and tests.
- Electronic type calculator (CLTON).
- Personal Type Calculator (DELL) Number (1).
- Stationery (papers, pens).
- Manual stopwatch type (KENKO) number (3).

Field research procedures: Procedures for the selection of tests of some of the Environment’s perceptions and psychological flexibility: The tests were conducted in the psychological laboratory at the Faculty of Basic Education at the University of Babylon and the researchers adopted a measure of the selection of the scale of psychological flexibility that he built.

Kilometric Characteristics of the Scale (Psychological Flexibility)\(^{3}\)

First: The truth of the measure:

1. The truth of content: This kind of honesty was achieved when the three scale was presented to a group of experts and specialists in the field of psychology and sports psychology and testing and measurement to validate the terms of the scale and the ability of those words to measure the components of the behavior measured by the number (15) An expert is considered Annex 2 and the experts have agreed on the validity of all the terms of the scale.

2. Second, the stability of the scale: To verify the stability of the scale, the researchers used the half-split method. This method is based on dividing the paragraphs of the scale into two parts: the individual and marital paragraphs. The differences between the individual and matrices were calculated according to the coefficient F. When comparing the calculated value of the psychological elasticity index (0.05), we find that the difference is not statistically significant. This means the homogeneity of the individual and marital variance of the scale. The correlation coefficient Pearson was then calculated and its values were (0.804). Correlation coefficient extracted In order to achieve complete stability of the scale.

Application of tests (some Environment and psychological flexibility) on the application sample: After the completion of the selection of the psychological flexibility test and the preparation of the other tests, the tests were applied to the application sample of (12) players on 5-6/11/2018 Perceptions of the Environment and Psychometric Resilience) in the Psychological Laboratory at the Faculty of Basic Education at the University of Babylon by the researchers and with the assistance of the assistant staff, Appendix 3 is considered and the results were collected to achieve the research objectives.

Results

<table>
<thead>
<tr>
<th>Tests</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>Median</th>
<th>Skewness</th>
<th>(t) calculated</th>
<th>Sig.</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>power attention</td>
<td>12</td>
<td>66.764</td>
<td>2.987</td>
<td>50</td>
<td>0.17</td>
<td>11.76</td>
<td>0.000</td>
<td>Moral</td>
</tr>
<tr>
<td>Field of vision</td>
<td>12</td>
<td>62.098</td>
<td>1.765</td>
<td>50</td>
<td>0.29</td>
<td>8.438</td>
<td>0.000</td>
<td>Moral</td>
</tr>
<tr>
<td>Focus (control)</td>
<td>12</td>
<td>67.831</td>
<td>1.693</td>
<td>50</td>
<td>0.44</td>
<td>11.763</td>
<td>0.000</td>
<td>Moral</td>
</tr>
<tr>
<td>Perception of the Environment as a whole</td>
<td>12</td>
<td>66.897</td>
<td>2.148</td>
<td>50</td>
<td>0.39</td>
<td>12.855</td>
<td>0.000</td>
<td>Moral</td>
</tr>
</tbody>
</table>
Table (1) shows the measurements of the Environment perception tests, where the test of the force of attention reached an average of (66.764) and a standard deviation (2.987). The torsion coefficient for the scores of the sample on this test is 0.17, the average score of the test is higher than the recommended average of the test. This means that the sample has a distinct level of attention intensity. In order to determine the average of the test scores, the statistical significance of the differences between the two averages, and the test was used (T) of (11.76), which is greater than the value of sig (0.000), is smaller than the significance level (0.05).

Table (1) shows the arithmetic mean of the field of vision (62.098), with a standard deviation (1,765). The torsion coefficient for the scores of the sample of the research sample on this test is (0.29), the average of the test scores is higher than the mean of the test. This means that the sample has a distinct level of field of view. In order to determine the statistical significance of the differences between the two averages, And the T-test was used for one sample. The value of (t) Calculated (8.438), which is greater than the value of sig (0.000), is smaller than the significance level (0.05).

Table (1) shows the arithmetic mean of the concentration test (control) with (67.831), with a standard deviation (1,693), and the torsion coefficient for the scores of the members of the research sample on this test is (0.44), the average test score is higher than the mean of the test. This means that the sample has a distinct level of concentration (control), and in order to determine the statistical significance of the differences between the tests was used for a single sample the value of (t) calculated (11.763), which is greater than the sig value of (0.000), is smaller than the significance level (0.05).

Table (2) shows the arithmetic mean of the Environment perception tests (66.897) with a standard deviation (2.148). The torsion coefficient for the scores of the sample of the research sample on this test is 0.39, indicating that the scores of the sample members are distributed moderately On the test, when comparing the mean of the test sample to the test with the mean average of (50) degrees, it was found that the average of the test scores is higher than the average of the tests. This means that the sample has a distinct level of the Environment’s perceptions. In order to determine the statistical significance of the differences between the two averages, the use of the test for one sample the value of (t) calculated (12.855), which is greater than the value of (sig) of 0.000, is smaller than the significance level (0.05).

**Psychological flexibility:**

<table>
<thead>
<tr>
<th>Tests</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>Median</th>
<th>Skewness</th>
<th>(t) calculated</th>
<th>Sig.</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychological flexibility</td>
<td>12</td>
<td>144.432</td>
<td>3.987</td>
<td>120</td>
<td>0.665</td>
<td>7.308</td>
<td>0.000</td>
<td>Moral</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tests</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>Median</th>
<th>Skewness</th>
<th>(t) calculated</th>
<th>Sig.</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychological flexibility with...</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table (2) shows the arithmetic mean of the psychological elasticity index (144,432) with a standard deviation (3.987). The torsion coefficient for the scores of the sample on this test is 0.665, On the test, when comparing the mean of the test sample to the test with the mean average of (120) degrees, it was found that the average of the scale of the scale is higher than the average mean of the scale. This means that the sample has a distinct level of psychological flexibility. In order to determine the statistical significance of the differences between the two averages, using the test for one sample, (T), which is greater than the value of (sig) of (0.000), at the level of significance (0.05), and the degree of freedom (11).

The researchers attributed this to the fact that the members of the research sample act rationally disciplined with different play situations and without recklessness, resulting in the implementation of the requirements of the game. The members of the sample also make the right decision in the compatibility of the implementation of the decision according to the psychological situation and the situation experienced by the player, especially in the variable flexibility.

They are not worried about the games they are playing, whether they are friendly or official. Psychological flexibility is an important factor in achieving good results and reaching higher levels in most sports games and events, especially those that require continuous physical effort. For long periods as in the performance skill which requires a great physical effort and continuous during the matches,
and therefore, psychological flexibility has a prominent role in the nature of the performance of the player with volleyball, and this is consistent with what has been indicated that “must focus in the period before the feelings of willingness to support the sense of self-confidence and prevent the intervention of defeatist ideas can be strengthened because it can cause an increase in the level of arousal or directing thinking to what happens inside the body at an early time is not in favor of the player and finally that the player wants to enter into a positive state of mind and physical activity appropriate (Psychological and physical shipping) leads him to the game and is in full readiness”.

Table 3: Shows the nature of the inter-relations between the variables under consideration

<table>
<thead>
<tr>
<th>Variables</th>
<th>Environment Perceptions</th>
<th>Psychological flexibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environment Perceptions</td>
<td>1.000</td>
<td>0.965</td>
</tr>
<tr>
<td>Psychological flexibility</td>
<td>0.965</td>
<td>1.000</td>
</tr>
</tbody>
</table>

Conclusions

1. The players of the University of Babel enjoy a high degree of futsal in some of the Environment and psychological flexibility.

2. The existence of a strong relationship between the positive, between the perceptions of the Environment and the psychological flexibility of the players of the University of Babylon futsal.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

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Detection of Cytolysis Peptide Toxin Gene (Candidalysin) in *Candida albicans* Isolates

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**Abstract**

This study was launched to identify the presence of the gene; *ecel* (extent of cell elongation 1), encodes for a precursor protein related to the candidalysin, a cytolytic peptide toxin important for the induction of mucosal-related infections, in isolates of *Candida albicans*. Initially, 30 isolates of *C. albicans* were provided by Merjan Teaching Hospital, Hilla City, Iraq. These isolates had been originally recovered from 10 children suffered mouth thrush (MT) infection, 10 women with infection of vaginal candidiasis (VC), and 10 patients with immunocompromised-based candida (ICC) infection. The samples were Lab-based processed using a polymerase chain reaction (PCR) method to amplify an *ecel*-specific-362bp region. The results revealed the presence of the current gene in 4 (40%) of the ICC samples, 1 (10%) of the VC samples, and 3 (30%) of the MT samples. The current findings of the current investigation indicate the presence of the *C. albicans* candidalysin virulence gene in the tested isolates from Hilla City, Iraq. The work also suggests performing future studies or adopting novel control standards to overcome the virulence processes initiated by this gene.

**Keywords:** *Candida albicans*, candidalysin, immunocompromised candidiasis, mouth thrush, vaginal candidiasis.

**Introduction**

The opportunistic fungal pathogen; *Candida albicans*, is considered as an important microorganism that causes various human and animal diseases. Although the fungus is normally present in some bodily tracts habiting the gastrointestinal and genitourinary tracts and also living within the oral- and conjunctival-related microbiota communities, it can induce several infections in people suffered suppression to their immune system leading to pathogenic colonization by these normally hosted microorganisms (1-4). After colonization is established by these fungi, infection may be sorted superficially such as in skin or mucus membranes or may pass these boundaries to become bloodstream-borne and probably disseminate to the body organs. Increases in the chances of developing candida infection can be maintained due to exposure of individuals to some factors such as surgery especially those involving the abdomen, some degrees of burns, intensive-care-unit prolonged staying, cancer chemotherapy, transplantation of organs, hemodialysis, nutrition parenterally, catheters of the central nervous system, and after long-term of having broad-spectrum antibiotics and immune-depressant compounds (5-9).

Candidalysin is a cytolytic peptide toxin which is important for the induction of mucosal-related infections. This epithelial cell damaging peptide is an important virulence factor released during the hypha-production processes and encoded by the hypha-associated gene *ecel*. In a brief detail, the *ecel* gene encodes a precursor protein namely extent of cell elongation 1 that can be cleaved into several peptides such as candidalysin. The cleavage mechanism is performed at the arginine/lysine residual site (10-12). This study was launched to identify the presence of the gene; *ecel* (extent of cell elongation 1), encodes for a precursor protein related to the candidalysin in isolates of *Candida albicans*.

**Materials and Method**

**Sample Collection:** Thirty isolates of *C. albicans* were provided by Merjan Teaching Hospital, Hilla City,
Iraq. These isolates had been originally recovered from 10 children suffered mouth thrush (MT) infection, 10 women with infection of vaginal candidiasis (VC), and 10 patients with immunocompromised-based candida (ICC) infection.

**Molecular Identification**

**Extraction of genomic DNA:** The EZ-10 Spin Column Fungal Genomic DNA Mini-Preps Kit BioBasic, Canada) was employed to extract the *C. albicans* genomic DNA (gDNA) from the current collected samples. The protocol used to perform the extraction procedure was the kit instruction. The obtained gDNA was exposed to quality and quantity based estimating processes using a NanoDrop.

**Polymerase chain reaction:** The gDNA (10-50ng/µl) was used as a template at 5µl in the mastermix reaction that also contained the primers; F: CCATCATCCACCATGCTCCA and R: TCTGACGACGGCATTAGCAA, 10pmole 1.5µl/each primer direction, utilized to amplify an ece1-specific 362bp region. Moreover, pre-prepared solution of Taq DNA polymerase, dNTPs, 10X PCR buffer, and some stabilizer with a tracking dye was also added to the previous mixture. PCR-based water, 7µl, was also added to complete the total volume, 20µl, of the reaction. The thermocycler conditions used to perform the amplification reactional processes were 5min at 95°C for one-cycle initial denaturation, (30s at 95°C of denaturation, 30s at 58°C of annealing, and 30s at 72°C of extension) for 30 cycles, and 5min at 72°C of final extension. The PCR products were ethidium-bromide-pretreated-1-%-agarose electrophoresed followed by screening the process under a UV-light-based imager.

**Results**

The results revealed the presence of the current gene in 4 (40%) of ICC samples, 1 (10%) of the VC samples, and 3 (30%) the MT samples. Amplification of the current region related to the ece1 gene was successfully induced and observed in the positive samples, figure 1. The figure shows the amplification at the 362bp region of the gene.

![Figure 1: Image of the candidalysin-gene-based agarose gel electrophoresis in the isolates of the *C. albicans*. M is the used ladder (2000-100bp). Positive, 362bp, lanes; S1 to S4 for the immunocompromised patients, S7 to S9 for the mouth thrush from children, and S11 for the vaginal candidiasis.](image)

**Discussion**

*Candida albicans* is an opportunistic fungal pathogen that causes important human and animal diseases. Although the fungus is a normal member of the bodily tract microflora, it can produce different infections in individuals with depressed immune system encouraging colonization by these opportunistic normally present microorganisms (1-4).

The current results recognized the presence of the candidalysin-encoding gene in the tested samples. The candidalysin is an important factor indicating if the *C. albicans* is virulent or not as this agent acts on destroying the epithelial cells of mucous membranes. This agrees with Moyes et al. (2016) identified that candidalysin existence in *C. albicans* refers to the virulence status of this microorganism as candidalysin damages these epithelial cells(13). The current study findings also are
matched up with those observed by \(^{(14,15)}\) who revealed that candidalysin is important in *C. albicans* related oral infections leading to the secretion of some cytokines related to the inflammatory processes such as IL-1β, IL-6, CCL20, and G-CSF. In the case of the VC, Richardson et al (2019) found that candidalysin is critical in inducing *C. albicans* related oral infections leading to the secretion of some cytokines related to the inflammatory processes such as IL-1β, IL-6, CCL20, and G-CSF. Moreover, some chemokines are released during the invasion of the vaginal epithelial cells with the fungal hyphae of *C. albicans* \(^{(16)}\).

For the ICC, reduction in the immune system sufficiency has been recognized to enhance the induction of candidalysin-*C. albicans* based infections leading to systemic spreading of these fungi with high possibilities of death occurrence in those ICC patients \(^{(17,18)}\). The current findings of the current investigation indicate the presence of the *C. albicans* candidalysin virulence gene in the tested isolates from Hilla City, Iraq. The work also suggests performing future studies or adopting novel control standards to overcome the virulence processes initiated by this gene.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding

**REFERENCES**


Effect of Active Learning on a Role-Playing Strategy in Improving Some Types of Handball Scoring

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¹Department of Physical Education and Sport Sciences, Faculty of Basic Education, Mustansiriyah University, Baghdad, Iraq

ABSTRACT

Active learning is a way of teaching and learning at the same time, in which learners participate in a variety of activities and effectively through a rich and diverse learning environment that allows them to listen positively, to discuss richly, to think consciously, and to analyze soundly in keeping with the modern view of keeping students away from memorization and memorization And make students practice mental processes. Role play is one of the strategies of active learning. This strategy assumes that the student has a role to play, expressing himself or someone else in a specific position. The research problem and through the reading and follow-up of the researcher found that most professors do not use the new strategies and applied in the field of physical education where the process of learning to conduct a diagnosis and analysis from time to time as the researcher used the experimental approach to design the equal groups, in order to suitability and nature of the problem to be resolved. Part of the original research community the research community was identified as students of the second stage of the Faculty of Physical Education and Sports Sciences/University of Dhi Qar. From the results, the most important conclusions reached by the researcher exceed the experimental group that implemented the program according to the strategy of role play in improving some types of handball scoring.

Keywords: Active learning, role-playing strategy, handball.

Introduction

The term active learning emerged in the last years of the 20th century. Educators and those interested in the learning process learned many definitions as they knew it. Active learning is a way of teaching and learning in one, in which learners participate in a variety of activities and effectively through a rich and diverse learning environment that allows them to listen positively, rich discussion, conscious thinking, sound analysis, and deep reflection on everything that is taught between And that the achievement of this depends on the use of instructional strategies should be compatible with the modern view of these strategies strategy (role play).

The importance of research as a new attempt and the addition of quality in the field of teaching and education, which provides the learner a simulation system, in which the students in different roles of individuals and groups in the my attitude is real, and it represents the way that students can not feel embarrassed in expressing their opinions, thoughts and feelings.¹

The great progress in the field of education, especially in sports activities, showed that the results of the usual method prevailing in our universities are few and still need new methods and teaching methods that make the learner the center of the educational process in an effective way to eliminate the individual and unilateral trends that permeate the educational situation found in the usual learning methods Which focused on memorization and indoctrination and that the results of the skillful performance of students in handball do not produce suitable results that correspond to the level desired by both the student and the teacher where the educational process requires the diagnosis and analysis from time to time. The role-playing strategy is provided...
as a new strategy for university students that transfers these experiences to a better physical education lesson and is in itself a strong educational activity to imitate skills and master their performance and to deliver, absorb and retain material and to dispel boredom in students. And make the educational process more interesting and increase their desire.²

**Research aims:** The preparation of modules using active learning according to the role-playing strategy to improve some types of handball scoring. To identify the effect of the units in the improvement of some types of handball scoring

**Hypothesis:**

1. There are statistically significant differences between the results of the pretests and the results of the post tests of the experimental and control groups in improving some types of handball scoring and for the tests of the dimension.

2. There are statistically significant differences between the results of the post tests of the experimental and control groups in the improvement of some types of handball scoring and for the benefit of the experimental group.

**Materials and Method**

**Community and sample research:** The researchers used the experimental approach in the design of equal groups, where the research community was identified as students of the second stage of the Faculty of Physical Education and Sports Science - University of Dhi Qar (60) students divided into Division (C) and Division (D) were chosen. (20) students and hall (C) taught in the manner followed by the teacher (20) students and excluded the researcher a number of sample members, including the sample of the pilot experiment, the number of (16) students, as well as students retreating (4) students.

**Search procedures:**

**Tests used in research:**³

**The first test: the scoring test of stability:**

**Purpose of test:** Accuracy of scoring of stability.

**Tools:** (8) Hand balls, Star to close the goal (4) boxes of 40 * 40 cm.

**Performance:** The player stands behind a 7-meter throw line holding the ball. When the signal is given, the player hits the goal (1), (2), (3), and (4). Repeats performance again.

**Rules:** Take into account the stability of one of the player’s feet and not move during the performance of the throw. Play the ball within three seconds of starting to hear the signal.

**Registration:** A point is calculated for each correction within the custom box.

A zero score will be scored if the player commits a legal offense such as moving his second foot or not scoring during (3 second) of hearing the signal.

**The second test: the whistling scoring:**⁴

**Test Name:** Whip Test

**Purpose of the test:** Accuracy of whip scoring.

**Tools:** (10) hand balls, high jump apparatus, curtain mounted on the jump device

**Rules:** A helper stands midway between the jumpers of the jump device at 1/2 m and holds the handball.

**Performance:** The player stands on the 9-meter line and in front of the jumper, the player moves towards the forearm to pick up the ball. (1 - 3) Steps in the direction of the player’s path If the player is right or in the right direction of the player, if the player is easier and then points to one of the boxes (1) or (2) the player performs the previous work itself to aim in the other box.

**Rules:** Do not take more than three steps.

**Registration:** A point for each score is counted within the box.

Zero is counted if the player committed a foul (3 steps or 3 seconds).

**Three test: Test the scoring of the jump:**

**Test Name:** Test the scoring accuracy of the jump.

**Purpose of the test:** measuring the accuracy of scoring near the jump.

**Hand tools:** (10) Handballs, handball, drawn on the wall within five circles (60 cm). Four of them are drawn
in each corner and the fifth is drawn in the middle of the bottom of the bar.

**Method of performance:** The player stands with a ball behind the line length of one meter, beginning with the circle in the upper right corner and left then center to the lower right corner and then the lower left corner.

**Pilot study:** The pilot study was conducted on Tuesday 8/10/2018 on a sample of 16 students. The pilot experiment was conducted at 10 am with the working team on a random sample of students from the Faculty of Physical Education and Sports Sciences/Dhi Qar University/Non-research sample and community of origin.

**The scientific foundations of the tests:** Stability coefficients were calculated and re-applied by taking 16 students and not the main research sample during the trial period. After (7) days, the same tests were repeated on Monday 15/10/2018. As shown in table (1).

| Table 1: The coefficient of honesty and stability |
|-----------------|-----------------|-----------------|
| S. | Tests | Validity | Stability |
| 1. | The scoring of stability | 88.0 | 90.0 |
| 2. | Whip scoring | 85.0 | 94.0 |
| 3. | The scoring of the jump | 0.87 | 0.92 |

**Main experience:** The researcher identified all the main experiment requirements by determining some types of handball scoring.

**Pre Tests:** The pre-test was carried out on the control and experimental groups before starting the program to determine the level of skills in the sample. The tests were conducted on 16-17/10/2018 at 10:30 am. And under the direct supervision of the teacher of material and researchers and the team work assistant in the stadium College of Physical Education and Sports Sciences - University of D-Qar for students of the second phase.

**Parity:** To avoid the factors affecting the results of the main experiment, and to achieve equivalence of the sample of the researcher, the researcher divided the research sample into a control group and the experimental one.

| Table 2: The results of the mean test scores for the control and experimental groups are shown in some types of handball scoring |
|-----------------|-----------------|-----------------|-----------------|-----------------|
| Variables | Control group | Experimental group | (t) calculated | Level of significant |
| Mean | SD | Mean | SD | |
| The scoring of stability | 1.5 | 1.432 | 1.85 | 1.225 | 0.411 | Non sig. |
| Whip scoring | 1.05 | 0.944 | 1.2 | 1.05 | 0.647 | Non sig. |
| The scoring of the jump | 1.95 | 1.276 | 1.9 | 0.967 | 0.889 | Non sig. |

Note in table (3) that all computed values are smaller than the values of (tabular) which were (2.02) at the error rate (0.05) and the degree of freedom (38) there were no statistically significant differences between the two groups in all search variables indicating that the two groups are equal.

**Program:** The researcher began the implementation of the program on Thursday, 22/10/2018 for the first educational unit, which examines the vocabulary of the program in the role-playing style of the first group and in the manner followed by the teacher of the second group. The duration of the educational program is three months (10 weeks). The number of weekly educational units (2 units) is (20) units distributed over three months (90 d).

**Steps of implementation according to strategy Role-playing:**

**First: administrative and boot.**

1. Taking attendance and absence.
2. Introductory introduction to the skill of preparation in handball.
3. The teacher explains to the students what roles they should represent.
4. The teacher begins by explaining or presenting the skill by presenting a video or educational medium such as pictures or others.

5. One of the outstanding students in the group apply the skill to be the exchange of roles between the group and observation of performance by the student noted

**Second: Create Location**: Equip the college playground for the handball game.

**Third:**

1. The educational part The teacher explains the skill and presents it quickly or through an explanatory video or one of the other means, and then the students perform the roles they chose before the applied activity to determine what is required to do any consultation with the students in the group to choose the appropriate role for each of them) the rest of the students play the role of observers or viewers using the observation paper to analyze performance and exchange roles between them.

2. The applied part

   **Working groups**: The researcher divided the experimental group into four groups. Each group consisted of (5) students and the roles were distributed among the group members.

   **The role of the student prepared**: The student is represented by the player in the handball and moves to apply skill in all the centers within the stadium and is the basic in the group is a playmaker and is also the backbone and then the rest of the group exchange roles among them.

   **The Role of Observers or Viewers**: Their work shall monitor the performance of the students in each group, taking into consideration the exchange of roles so that they are once observed and again be performed or prepared in the group.

   **Fourthly**: Extraction: The student’s personal actions are represented by his/her role and then the cognitive aspect is evaluated. The focus is on the levels of memory, understanding, application, analysis, and composition.

   **Fifth**: Evaluating the performance of role play:

1. Individual calendar (self)
2. Collective calendar (Observers)
3. Evaluation of the cognitive side by the teacher and focus on the levels of memory, understanding, application, analysis and installation
4. Evaluation of the skill and emotional side and through the working paper that was written by the observers.

   **Posttests**: The researchers used the same steps in the pretest, and distributed the results with separate lists for each group. Processed statistically in order to achieve the research objectives.

**Results and Discussion**

Presentation of results for the pre and posttests of the control and experimental groups in the scoring tests:

**Table 3: The results of the pre and posttests of the experimental and control groups are constructed in handball scoring tests**

<table>
<thead>
<tr>
<th>Groups</th>
<th>Variables</th>
<th>Units</th>
<th>Pretest</th>
<th>Posttest</th>
<th>(t) calculated</th>
<th>Level of significance</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scoring for the control group</td>
<td>Stability</td>
<td>Number</td>
<td>3.50</td>
<td>966.0</td>
<td>6.125</td>
<td>1.087</td>
<td>7.00</td>
</tr>
<tr>
<td></td>
<td>The whip</td>
<td></td>
<td>4.375</td>
<td>1.093</td>
<td>6.187</td>
<td>9105.0</td>
<td>4.869</td>
</tr>
<tr>
<td></td>
<td>Jumping</td>
<td></td>
<td>4.062</td>
<td>928.0</td>
<td>7.000</td>
<td>9660.0</td>
<td>7.929</td>
</tr>
<tr>
<td>Scoring for the experimental group</td>
<td>Stability</td>
<td>Number</td>
<td>3.562</td>
<td>813.0</td>
<td>6.875</td>
<td>1.087</td>
<td>11.083</td>
</tr>
<tr>
<td></td>
<td>The whip</td>
<td></td>
<td>4.125</td>
<td>957.0</td>
<td>7.000</td>
<td>966.0</td>
<td>7.904</td>
</tr>
<tr>
<td></td>
<td>Jumping</td>
<td></td>
<td>4.562</td>
<td>892.0</td>
<td>8.062</td>
<td>1.626</td>
<td>9.899</td>
</tr>
</tbody>
</table>

The value of (t) the table (2.09) below the level of significance (0.05) degree of freedom (19)

Display the results of the tests of the experimental and control groups of the handball:
Table 4: The results of the post-test tests of the experimental and control groups in the scoring tests

<table>
<thead>
<tr>
<th>Variables</th>
<th>Control group</th>
<th>Experimental group</th>
<th>(t) calculated</th>
<th>Sig.</th>
<th>Significance of differences</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td></td>
</tr>
<tr>
<td>The scoring of stability</td>
<td>10.8</td>
<td>2.820</td>
<td>19.6</td>
<td>2.716</td>
<td>1.950</td>
</tr>
<tr>
<td>Whip scoring</td>
<td>3.4</td>
<td>1.646</td>
<td>5.4</td>
<td>1.349</td>
<td>2.959</td>
</tr>
<tr>
<td>The scoring of the jump</td>
<td>17.06</td>
<td>2.334</td>
<td>14.94</td>
<td>1.614</td>
<td>2.959</td>
</tr>
</tbody>
</table>

The value (t) of the table (2.02) below the level of moral (0.05) degree of freedom (38).

Discussion

The results show that there are significant differences between the tests of pre and post and for the benefit of posttests the skill of scoring handball and attributed the researcher the reason for these differences of the experimental group to the impact of the program Prepared by the researcher, which had a positive effect in improving some types of handball scoring through the use of role-playing strategy.6

So that he can reach the level of good performance skill to be taught as he pointed out that the program is the strategy used to achieve the objectives of the educational institution and this is through the design of activities in the learning environment in a way that the learner to achieve the success of performance and helps to increase the motivation of learners and help them in the formation Positive attitudes towards interactive learning with the atmosphere of the lesson in a spirit of seriousness and suspense without boredom or fatigue in the performance.7

On the other hand, the division of learners into small groups working separately made it a state of competition between As well as that some types of scoring as a loss of stability and whipping and aspiration of the jump requires the work of the spirit of the community when performing in the stadium, which includes three elements (teacher, learner, program) and the purpose of these elements to provide students with knowledge, Skills, values, attitudes, and dispositions to achieve specific goals while traditional teaching represents a one-way conceptual communication process from teacher to student. Traditional teaching is often limited in its components (teacher, the Platform), and therefore the rest of the elements (educated) be neglected and the mandatory process orders begin to be the teacher and students to end the implementation of these commands. (The achievement of the maximum in educational situations is due to the program, because it is the method of organizing the subject matter on the basis of step steps, so that the learner can easily acquire them).8

Conclusions

1. There is a preference in the impact of role-playing strategy on the method used in the development of some types of handball scoring among college students, especially in the development of skills and cooperation and commitment and this is what emerged from the results of the research.

2. Show the results of the search the group that used the role-playing strategy achieved the highest ratios on the research sample that implemented the method used by the teacher in improving some types of handball scoring.

Acknowledgment

The authors would like to thank Mustansiriya University (www.uomustansiriyah.edu.iq)Baghdad-Iraq for its support in the present work.

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REFERENCES


The Impact of the Differentiated Learning Strategy on the Way of Learning Stations in Learning the Skills of Putting Down and Handling Football

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ABSTRACT

Through the work of researchers in the teaching profession and as a teacher of mathematical education in the Directorate of Education Baghdad Karkh/3 and to see many of the recent studies in the field of teaching football shows that many students have difficulties in improving skills and that their education requires the application of some modern teaching methods that lead to increase. The researchers found the lack of studies in the education strategy, which is different in the way learning stations, despite its importance in the field of learning skills football according to the researcher’s knowledge, which led him to address this problem and develop appropriate solutions. The researchers used the experimental method to suit the nature of the research procedures. The society defined the research in a deliberate manner, represented by the middle of the mark Hussein Ali Mahfouz for boys in the directorate of Education Baghdad, Third Karkh to provide the appropriate numbers for the sample of the research (A, B, C, D).

Following the implementation of the tests and data collection, the statistical analysis was carried out through which the most important conclusions were reached. The use of the different learning strategy according to the method of learning stations has an effect on learning some of the basic skills of football (handling and put down).

Keywords: learning strategy, learning stations, football.

Introduction

The processes of learning and improvement continue in the teaching methods and methods of learning and exercises and schedule and organization in accordance with the specificity of the game and the skill required to learn and in line with the capabilities and abilities of learners and their stages of study and age and the available capabilities and available for education within the time specified for learning. Each sport has its own specificity through the diversity of skills. This diversity requires trainers and teachers to learn the methods of learning and methods that help to learn and retain the basic skills, including the game of football.

There are many skills in the game of football so they need the supplies and requirements of diversity in the processes of learning because the goal of the teacher is not to provide the mind of the learner information only, but to help him to develop scientific and creative thinking according to different types of learners and this is achieved using strategies and methods that depend on the contribution and participation of the learner in a positive and effective In the process of learning through the use of the education strategy differentiated by the way learning stations in the same unit, and so we can make a diversification in the educational process during the lesson ¹.

In this way we can achieve the objectives of the overlapping teaching methods and their advantages of control, system and good performance in the differentiated

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learning strategy according to the method of learning stations, increasing the repetitive attempts of the exercise and giving the learner the opportunity to practice and behave through his behavioral decisions. And reach a goal to take responsibility for decision-making in the correction and give the learner an opportunity to give feedback and exchange between them and increase social interaction among students through the strategy of education distinct. As a result, we have achieved many goals and advantages by linking the differentiated learning strategy in the way of learning stations in the single educational unit. Hence the importance of research in a serious scientific endeavor that the researchers wish to try and find an educational medium in which we may achieve broader goals, whether physical or Knowledge or other through the use of learning strategy distinct in the way learning stations to learn the skill of football in the same unit, an idea that is in itself a scientific addition to research and studies specialized in learning the skills of football.

**Research aims:** The design of educational units and the differentiated learning strategy according to the method of learning stations in learning some of the skills of football (roller skill and skill handling). To recognize the impact of the differentiated learning strategy according to the method of learning stations in learning some of the skills of football (skill put down ball and handling skills).

**Hypotheses:**

1. There is a difference of statistical significance for the pre-tests and the results of the tests of the two groups of the skills under study and for the benefit of posttests.

2. There are statistically significant differences between the results of the post-tests of the two groups in learning some skills of football and for the benefit of the experimental group.

**Materials and Method**

The experimental approach was used to suit the nature of the research procedures.

**Community and sample search:** The number of students in the second stage is average (135) students divided into four divisions (A, B, C, D). (32) Students and (B) (33) students and then selecting (23) students from each department, noting that the rest of the students in Division (A) and (B) entered the experiment, but excluded a number of them to be a sample of the search (46) students distributed in two equal groups. A choice was chosen to be a trial group and Division (B) to be a control group and formed the sample (34.07%) of the research community. The researchers determined the homogeneity of the research sample based on some measurements (length, weight and age) as shown in table (1).

<table>
<thead>
<tr>
<th>Table 1: Anthropometric measurements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
</tr>
<tr>
<td>46</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Table (2) shows that the values of the torsion coefficient of the above variables are less than (+ 3) and indicate the homogeneity of the sample and distributed naturally.

**Means of collection of information, instruments and tools used:**

- Data collection form and discharge of research information, tests and measurements.
- Football Legal Number (10).
- Football field, flags and flags with different heights.
- Burke planning and identification of test areas.
- Bar length measurement, stopwatch number (2) type (Casio) Japanese.
- Whistle number (2).
- Laptop Type Calculator (DELL).
- Electronic balance type (Sanyo) Japanese-made units of measurement (kg) number (1).
- Swedish Terrace.

**Technical tests of football:**

**Test Name:** Test the wall handling for 20 seconds.

**Objective of the test:** Know the measurement of handling accuracy.
Figure 1: The handling test

**Test Name:** Put the ball inside the box with measurements (2 mx 2 m): ²

**Purpose of the test:** Measure the accuracy of stopping the ball in all parts of the body except the arms.

Figure 2: The test of putting out the ball

**Pilot study:** The researchers conducted a pilot study on a sample of (14) students who were not in the basic research sample was tested on Sunday, 20/10/2018 the aim was:

- Verify the suitability of the tests, the suitability of the equipment, the understanding of the auxiliary team, the time spent on the tests and the knowledge of the obstacles that may arise. And that the tests are based on scientific grounds that the tests applied to the Iraqi environment.

**Pre Tests:** The pre tests were conducted on Tuesday at 10 am on 29/10/2018

**Sample equivalence:** The two researchers performed equivalence on the skill side (handling - put down) of the pulley and as shown in table (2).

<table>
<thead>
<tr>
<th>Variables</th>
<th>Units</th>
<th>Experimental group</th>
<th>Control group</th>
<th>(t) calculated</th>
<th>Sig.</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td></td>
</tr>
<tr>
<td>Handling</td>
<td>Repeat</td>
<td>4.02</td>
<td>0.47</td>
<td>3.89</td>
<td>0.61</td>
<td>0.149</td>
</tr>
<tr>
<td>Put down</td>
<td>Grade</td>
<td>2.50</td>
<td>0.58</td>
<td>2.55</td>
<td>0.58</td>
<td>0.737</td>
</tr>
</tbody>
</table>

Table (2) shows that the degree of error percentage (Sig) is greater than the level of significance (0.05), indicating the random differences between the two groups in the skills under study football for pretests and this indicates the equality of the two groups.
Implementing learning units with a learning strategy that is different in learning methods: A week-long workshop was held for the working team to learn about the differentiated learning strategy according to the learning stations. Two introductory units were given to the students before starting the implementation of the learning strategy.

The curriculum was implemented on Sunday, 3/11/2018. The curriculum included 11 weeks with 22 educational units and two educational units per week, with a 45 minute time, according to the time of the physical education lesson. Thus, the time of the two educational units per week 90) minutes per week. The two researchers set up an educational unit in accordance with the differentiated learning strategy and the method of learning stations. The lesson went according to scientific steps as follows:

1. Divide the students into distinct groups among them after making the parity.
2. The students were divided according to their skill level for each skill.
3. Stations were defined for each learning skill transmitted by the student in the station to the other.
4. Different totals are divided from skill to skill.
5. The unit was used as a whole and not only in the main section.
6. Educational exercises have been diversified in each educational unit.

In the development of the educational curriculum, some of the educational principles and principles were taken into account:

1. Setting goals for the educational unit and has an educational goal or two goals at the most.
2. To achieve each exercise goals and determine its time, taking into account the age of the sample.
3. The use of the ball most of the duration of the unit (the preparatory section, the main section, the final section).

Completion of the application of all educational units on 14/1/2019.

Posttests: Post-tests of the two research groups were conducted on Thursday, 16/1/2019.

Results and Discussion

Table 3: The values of mean, standard deviations, calculated value of (t), and error ratio in the pre and posttests of the control and experimental group of skills (handling, put down)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Groups</th>
<th>Pretest</th>
<th>Posttest</th>
<th>Mean diff.</th>
<th>SD diff.</th>
<th>(t) calculated</th>
<th>Sig.</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Handling</td>
<td>Control</td>
<td>3.89</td>
<td>4.95</td>
<td>1.06</td>
<td>0.69</td>
<td>7.31</td>
<td>0.00</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Experimental</td>
<td>4.02</td>
<td>5.87</td>
<td>1.85</td>
<td>1.09</td>
<td>8.09</td>
<td>0.00</td>
<td>Sig.</td>
</tr>
<tr>
<td>Put down</td>
<td>Control</td>
<td>2.55</td>
<td>4.70</td>
<td>2.14</td>
<td>0.80</td>
<td>12.7</td>
<td>0.00</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Experimental</td>
<td>2.50</td>
<td>6.92</td>
<td>4.42</td>
<td>0.72</td>
<td>29.3</td>
<td>0.00</td>
<td>Sig.</td>
</tr>
</tbody>
</table>

The researchers attribute this progress to the fact that the use of teaching in the learning strategy of different learning stations, which works on self-reliance as it makes the learners more positive and makes a more dependent self-reliance in the learning process and works to give the learner the freedom to choose which leads to achieve the goals planned and the teacher works on guidance and guidance And provide feedback (A distinct education strategy is dependent on each individual is characterized by the background and speed of learning as well as teaching methods and the way to activate a cycle in the process so that the learner is the focus of the educational process at a time when the teacher role Advisor and Assistant to the learner).5

The researchers also believe that the experimental group offers a unique learning strategy based on the method of learning stations, which considers the learner as active and active, builds his knowledge and knowledge through his correspondence with information and with mutual experiences with others, and focuses on the implementation of innovative ideas in the teaching
line. These results are in particular consistent with what Ahmed Salah has asserted. He pointed out that it is necessary for another person to intervene at appropriate times to help the learner accomplish a task. This is linked to the idea of the region of near growth, which represents tasks that the learner can accomplish alone, and the tasks that can be accomplished with the help of others and this is called differential education which is In other words the support provided to learners when necessary to help them accomplish the tasks required and leave them to learn on their own and based on their own abilities. The exercises that were given during the units came in line with the ability of the students and trying to get balance and control the ball and make the exercise skill is balanced and balanced and this is what is on my understanding “That the student tries to obtain a balance and compatibility is appropriate in order to maintain the strength and smooth movement during the delivery of the ball with the speed and accuracy appropriate “.6

<table>
<thead>
<tr>
<th>Variables</th>
<th>Control group Mean</th>
<th>Control group SD</th>
<th>Experimental group Mean</th>
<th>Experimental group SD</th>
<th>(t) calculated</th>
<th>Sig.</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Handling</td>
<td>4.95</td>
<td>0.87</td>
<td>5.87</td>
<td>0.63</td>
<td>4.20-</td>
<td>0.00</td>
<td>Sig.</td>
</tr>
<tr>
<td>Put down</td>
<td>4.70</td>
<td>0.52</td>
<td>6.92</td>
<td>0.53</td>
<td>14.2</td>
<td>0.00</td>
<td>Sig.</td>
</tr>
</tbody>
</table>

The two groups attribute this progress to learning. The experimental group, which used the differentiated learning strategy according to the method of learning stations, takes into account the individual differences of the students and thus helps to improve the motivation of the student towards what he learns. The differentiated education strategy is based on the principle of education for all students without taking into account their abilities and performance. Their experiences are owned by the assumption that the class contains students varied according to their different environments and different levels of cultural experience, and this is consistent with the scientific sources confirmed that “begins the distinct education calendar that determines the potential of each student mainly to learn and evaluate education starting from its objectives, methods and sources to judge whether the learner has received from the education fit in, calendar to determine the collection of the learner, which indicates for learning”7.

The exercises that were used in the educational units have clearly affected the work of the researchers in the high coordination in the selection of exercises that fit the ability of learners and work with the principle of gradual difficulty of exercise in the skills and the explanation of the good exercises (Explain and explain and understanding the movement and linking with the presentation leads to the advancement of motor skill after comparing the presentation And explanation) 8. Exercise is the quality of the exercise and means how the exercise is performed and depends on motivation, repetition, avoidance of mistakes, and understanding the conditions of the exercise environment 9.

The reason for this progress was the continuity and organization in the educational units, which had a positive effect on the progress of the level of skill performance as the students were subjected to the students studied a distinct education to deal with their tendencies and desires. “The differential education provided the opportunity to invest students activities and various exercises that he created This type of education is known as the level of real and according to the activity they perform, and the availability of a number of alternatives represented by activities and exercises varied number led to the student to study and learn the skills of football by choosing the appropriate exercises, and colleagues “.10 The educational units within a curriculum inevitably lead to an improvement in the level that established a scientific basis in the order of the education process, and the choice Exercise is difficult to take into consideration the individual teams as beginners and the use of technological means under the supervision of a specialist according to the atmosphere of education appropriate through the time and space used tools.

Conclusions

1. The use of the differentiated learning strategy according to the method of learning stations has an impact on learning some of the basic skills of football (handling and put down) and is more effective than the traditional method.
2. The involvement of all students in the application of the performance of different exercises each according to its level and taking into account individual differences contributed to improving their learning process.

3. Taking into account the individual differences in the use of differentiated learning strategy according to the method of learning stations has helped to accelerate the learning of students and according to their abilities and potential in the performance skill.

**Acknowledgement**

The authors would like to thank Mustansiriyah University (www.uomustansiriyah.edu.iq) Baghdad-Iraq for its support in the present work.

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**Source of Funding:** Self-funding

**REFERENCES**


Biofilm Formation and Antibiotic Resistance of Coagulase-Negative Staphylococci Isolated from Lactating Women with Mastitis in Baghdad, Iraq

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ABSTRACT

Background: Mastitis is a significant problem for many lactating women. It is most common during the first 3 months postpartum. Antibiotics resistance is a trouble of deep scientific anxiety both in hospital and the public settings. Spreading of utilization of a wide spectrum antibiotics increased the rate of antimicrobial resistance among mastitis-causing agents. In addition, biofilm building is great virulence agent of the strains involved in mammary gland infections, taking into account the capacity of drug to cross through bacterial biofilm is related to each antibiotic. Therefore, this study was aimed to isolate Coagulase-Negative Staphylococci and to determine their biofilm production capacity and antibiotics susceptibility.

Method: A total of 247 specimens (breast milk) were collected from lactating women, 147 lactating women with mastitis and 100 from healthy women. The primary identification was based on macroscopic appearance, Grams staining and biochemical tests.

Results: A total of (74) coagulase–negative Staphylococcus isolates were detected (56 from mastitis cases and 18 from controls). Isolates demonstrated the diverse species of the CoNS isolates. Significantly higher rates of isolation of CoNS from lactating mastitis cases was during the later months of lactation than in early months for the same cases. The results of the present study showed a high incidence of mastitis (28/56; 50%) in the period of 12-24 months post-partum than other times.

Conclusions: Coagulase-negative staphylococcus species are an important cause of lactating mastitis and significantly more than in lactating control cases. As there is a significantly higher rate of isolation of CoNS from lactating mastitis cases during the later months of lactation than in early months, particularly in those who fed their babies normally (breast feeding) than in case of those who practiced a mixed type of feeding (breast + bottle). The resistance to diverse antibiotics and a higher ability to form biofilms, found among the strains isolated from milk of women suffering mastitis, might explain the chronic and/or recurrent nature of this infectious condition.

Keywords: Staphylococcus epidermidis, coagulase–negative Staphylococcus, Mastitis, lactating women, antibiotics resistance, biofilm.

Introduction

Mastitis is a significant problem for many lactating women. It is most common during the first 3 months postpartum [1]. Despite available prevention and treatment regimens for mastitis, its incidence remains high [2]. In relation to a survey by the (WHO), the occurrence of mastitis varied from 2.5% to 33% among breastfeeding women [3]. The formation of slime layer, the major part of biofilm production, has a noticeable action in growth of bacteria on external surfaces [4], this slime not only supports bacteria in adhesion to host cells, but also provides protection from phagocytosis and from the activity of antibiotics [5]. Biofilm is an extracellular polymeric substance, which is also denoted to as slime (although not everything described slime is a biofilm).
Biofilms may initiate on living or dead surfaces and can be widespread in natural, industrial and hospital settings[6].

Antibiotics resistance is a trouble of deep scientific anxiety both in hospital and the public settings [7]. Spreading of utilization of a wide spectrum antibiotics increased the rate of antimicrobial resistance among mastitis-causing agents [8]. In addition, biofilm building is great virulence agent of the strains involved in mammary gland infections, taking into account the capacity of drug to cross through bacterial biofilm is related to each antibiotic [9]. Therefore, this study was aimed to isolate Coagulase-Negative Staphylococci and to determine their biofilm production capacity and antibiotics susceptibility.

Materials and Method

Isolation and detection of Coagulase-Negative Staphylococci (CoNS): A total of 247 samples (breast milk) were collected from lactating women (147 lactating women with mastitis and 100 from healthy lactating women) from Baghdad and Al-Kadhimiya Teaching Hospitals. Women who had antibiotics before 7-14 days were excluded from the study. Each specimen contained 2-3 ml of milk, one ml in each sterile container. The specimens were collected according to [8].

Identification of CoNS: A single colony was cultured on Baired barker agar medium and cultivated on mannitol salt agar and on Staph No.110 agar medium and it was identified depending on biochemical test and complete final identification was done according to [9]. Growing colonies were identified according to their morphological and biochemical characteristics as described previously by [10] and confirmed by the Vitek2E compact system.

Antibiotic Susceptibility Test: Antibiotics susceptibility testing was performed by Kirby-Bauer method according to the Clinical and Laboratory Standards Institute [11] guidelines for the following antimicrobials: Ampicillin (10μg/disc), Erythromycin(15μg/disc), Ampicillin-Sulbactam (10/10μg/disc), Carbenicillin (100μg/disc), Methicillin, Cefepime(30μg/disc), Cefotaxime (30μg/disc), Cefoxitin (30μg/disc), Ceftazidim(30μg/disc), Ciprofloxacin(5μg/disc), Gentamicin (10μg/disc), Nalidixic acid(30μg/disc), Temocillin(30μg/disc), Trimethoprim-Sulphamethoxazole (1.25/23.75μg/disc), Tobramycin (10μg/disc).

Biofilm formation assay for S. epidermidis isolates: Method of Deka [12] was used to determine the potential of biofilm formation depending on the measurement of Optical Density (OD) of the culture. The OD of each well was measured at 630nm using a microplate reader.

Results and Discussion

Isolation and identification of S. epidermidis: Microbiological findings, summarized in Table (1), revealed that out of the 147 specimens of breast milk from lactating women with mastitis, only 56 bacterial isolates were obtained and eighteen isolates from the 100 samples collected from the healthy subjects. These isolates were grown on Baired parker medium which differentiates CoNS as dark gray to black, shiny, medium-sized colonies without obvious halos around them [13]. In case of Coagulase-Positive (CoP) staphylococci, they appeared the same, but surrounded by a clear hallo. However, on mannitol salt agar, colonies appeared as white, round, smooth, raised, mucoid and glistening, while others which did not have these criteria were discarded. These results were similar to those reported by [14].

Table 1: Incidence of Coagulase-Negative Staphylococcal isolates among lactating women

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Positive</th>
<th>Negative</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mastitis</td>
<td>147</td>
<td>56</td>
<td>91</td>
<td>38.09</td>
</tr>
<tr>
<td>Control</td>
<td>100*</td>
<td>18*</td>
<td>82*</td>
<td>18</td>
</tr>
<tr>
<td>P value</td>
<td></td>
<td></td>
<td></td>
<td>0.024343*</td>
</tr>
</tbody>
</table>

*: Significant P value.

Distribution of Staphylococcal spp. isolates: Table (2) pointed that most predominant bacterial isolates in lactating women (patient and healthy) were S.epidermidis 25(44.64%), 9(50%), respectively. In addition, S.haemolyticus formed 25% in mastitis, while no isolation found in case of healthy subjects. Also, S.hominis formed 10(17.85%) in cases of mastitis and 6(33.33%) in healthy members. Regarding the non-typable species of CoNS, they were 3(16.66%) in healthy subjects 7(12.5%) among mastitis cases. S. epidermidis was the commonest staphylococcus spp. in human milk of mothers suffering breast infection and controls [14].
Table 2: Distribution of CoNS species isolated from mastitis women and their healthy controls

<table>
<thead>
<tr>
<th>CoNS isolates</th>
<th>Mastitis positive (n = 56)</th>
<th>Control (n = 18)</th>
</tr>
</thead>
<tbody>
<tr>
<td>S. epidermidis</td>
<td>25 (44.64 %)</td>
<td>9 (50%)</td>
</tr>
<tr>
<td>S. haemolyticus</td>
<td>14 (25%)</td>
<td>0</td>
</tr>
<tr>
<td>S. hominis</td>
<td>10 (17.85%)</td>
<td>6 (33.33%)</td>
</tr>
<tr>
<td>Others</td>
<td>7 (12.5%)</td>
<td>3 (16.66%)</td>
</tr>
<tr>
<td><strong>P value</strong></td>
<td><strong>0.1892</strong></td>
<td></td>
</tr>
</tbody>
</table>

When CoNS isolated from both mastitis patients and controls were reviewed, it was seen that S. epidermidis ranked the highest number followed by S. haemolyticus then S. hominis. This finding was in agreement with what was found by [14] who isolated 200 S.epidermidis from 207 milk samples. In addition, [15] found that CoNS followed by S. viridans bacteria were often isolated from milk samples.

The predominance of *S. epidermidis* can be explained by the fact that this microorganism is normal flora on the breast skin and have the ability to become pathogenic for any cause as it was confirmed by [16].

**Time of occurrence**: Table (3) showed that there was significantly higher rate of isolation of CoNS from lactating mastitis cases during later months of lactation than during early months for the same subjects and also when compared to control group.

Table 3: Distribution of CoNS isolates in cases of clinical mastitis and controls according to age of the baby

<table>
<thead>
<tr>
<th>Age of baby/month</th>
<th>Mastitis positive (n = 56)</th>
<th>Controls (n = 18)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(0 -1)</td>
<td>3 (5.35 %)</td>
<td>1 (5.55%)</td>
</tr>
<tr>
<td>(1 -6)</td>
<td>8 (14.28%)</td>
<td>2 (11.11%)</td>
</tr>
<tr>
<td>(6 -12)</td>
<td>17 (30.35%)</td>
<td>5 (27.77%)</td>
</tr>
<tr>
<td>(12 -24)*</td>
<td>28 (50%)</td>
<td>10 (55.55%)</td>
</tr>
<tr>
<td><strong>P value</strong></td>
<td><strong>0.0005</strong></td>
<td></td>
</tr>
</tbody>
</table>

*: Significant P value.

The results of current study showed a high incidence of mastitis (28/56; 50%) occurred within a period of 12-24 months post-partum than other times. This result agreed with [5] who mentioned that mastitis may occur at any stage of lactation, including in the second year. It was also different from the results of [17] who stated that the first three to six months of postpartum period is more vulnerable for breast infection in lactating mothers.

It could also be attributed to the fact that the child in this age can eat food which may have an impact on the oral bacterial flora and may lead to contamination of the breast and then may leads to breast infection, while other age groups approximately are completely breast-fed. Also, children in this age have teeth by which they can bite the nipple and cause infection.

**Type of feeding**: Table (4) showed that the rate of isolation of CoNS was significantly higher in women who fed their babies normally (breast feeding) than in those who practiced a mixed type of feeding (breast+bottle feeding). The explanation for these data was that frequent sessions of breast feeding end with more breast trauma and/or more exposure to babies’ oral flora and nipple fissure, so more chance of breast infection [18].

Table 4: Effect of type of feeding on the rate of isolation of CoNS in mastitis women and their healthy controls

<table>
<thead>
<tr>
<th>Type of feeding</th>
<th>Mastitis positive (n = 56)</th>
<th>Control (n = 18)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast feeding</td>
<td>44 (78.57 %)</td>
<td>13 (72.22%)</td>
</tr>
<tr>
<td>Mixed</td>
<td>12 (21.42 %)</td>
<td>5 (27.77%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>56 (100 %)</td>
<td>18 (100 %)</td>
</tr>
<tr>
<td><strong>P value</strong></td>
<td><strong>0.4183</strong></td>
<td><strong>0.3987</strong></td>
</tr>
</tbody>
</table>

**Antibiotic susceptibility test**: Current study revealed that *in vitro* susceptibility of *S. epidermidis* isolates to antibiotics (Figure 1) exhibited a marked variation in the susceptibility pattern to different antibiotics. The highest resistance percentages were found towards Ampicillin and Erythromycin (100%), Trimethoprim-Sulphamethoxazole (98.52%), Methicillin (97.05%), Carbenicillin (95.58%), Gentamicin (72.05%), Cefotaxime (61.76%), Temocillin (60.29%), Ceftazidim (58.82 %), Cefepime (55.88%), Ciprofloxacin(54.41%), Ampicillin–Sulbactam (52.94 %), 48.52% and 45.58% of all *S.epidermidis* isolates were resistant to Cefoxitin, Nalidixic acid and Tobramycin, respectively.

On the other hand, Tobramycin was the most effective antibiotics since it recorded the lowest resistance percentage (45.58%). Also, all the 33 isolates of *S.epidermidis* industrialized multidrug resistance.
**Biofilm detection by using microtiter plate:** All the 34 (100%) *S. epidermidis* isolates were found to be biofilm producer. However, 25 isolates (73.52%) formed strong biofilm, whereas one isolate (2.94%) was weak biofilm former. Alongside with 8 isolates (23.52%) were moderate biofilm producer (Figure 2).

![Figure 2: Biofilm percentages of the 34 isolates of *S. epidermidis*](image)

As shown in Table (5) there were differences in OD values which were corresponding to the differences in thickness of biofilm compared to control OD$_{540}$ (0.092). The *S. epidermidis* isolates S. 6 and S. 25 gave the thickest (strong) biofilm (1.809 and 1.582, respectively). *S. epidermidis* 32 isolate recorded the lowest OD$_{540}$ (0.137) which was designated as weak-producer isolate. It could be concluded from this table that there was good association between antibiotic resistance and biofilm formation. Methicillin-resistant *S. aureus* and CoNS were referred to as MRSA and MR-CoNS, in respect, even though methicillin was not used yet in clinical, but altered by other penicillinase-stable penicillins such as oxacillin and flucloxacillin [19]. Currently, however, many infections of CoNS Staphylococci resistant to vancomycin are now appearing, as a majority has developed the biofilms [20].

These results were similar to those reported by [21] who suggested that the findings of their study showed that staphylococcal isolates containing biofilm character showed more resistance to antimicrobial agents, so they were difficult to treat [22].

**Table 5: Biofilms formation by *S. epidermidis***

<table>
<thead>
<tr>
<th>Isolate number</th>
<th>Absorbance ± SD</th>
<th>Isolate number</th>
<th>Absorbance ± SD</th>
<th>S. 23</th>
<th>1.384 ± 0.683</th>
</tr>
</thead>
<tbody>
<tr>
<td>S. 1</td>
<td>0.751 ± 0.066</td>
<td>S. 12</td>
<td>0.981 ± 0.348</td>
<td>S. 24</td>
<td>1.951 ± 0.319</td>
</tr>
<tr>
<td>S. 2</td>
<td>0.364 ± 0.123</td>
<td>S. 13</td>
<td>0.649 ± 0.206</td>
<td>S. 25</td>
<td>1.582 ± 0.902</td>
</tr>
<tr>
<td>S. 3</td>
<td>0.982 ± 0.124</td>
<td>S. 14</td>
<td>0.905 ± 0.211</td>
<td>S. 26</td>
<td>0.703 ± 0.106</td>
</tr>
</tbody>
</table>
Conted…

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>S. 4</td>
<td>0.727 ± 0.159</td>
<td>S. 15</td>
</tr>
<tr>
<td>S. 5</td>
<td>0.486 ± 0.153</td>
<td>S. 16</td>
</tr>
<tr>
<td>S. 6</td>
<td>1.809 ± 0.278</td>
<td>S. 17</td>
</tr>
<tr>
<td>S. 7</td>
<td>0.417 ± 0.169</td>
<td>S. 18</td>
</tr>
<tr>
<td>S. 8</td>
<td>0.486 ± 0.022</td>
<td>S. 19</td>
</tr>
<tr>
<td>S. 9</td>
<td>0.575 ± 0.143</td>
<td>S. 20</td>
</tr>
<tr>
<td>S. 10</td>
<td>0.317 ± 0.147</td>
<td>S. 21</td>
</tr>
<tr>
<td>S. 11</td>
<td>0.183 ± 0.045</td>
<td>S. 22</td>
</tr>
</tbody>
</table>

Each datum is a mean of triplicate. SD = standard deviation. LSD = 0.201. P = 0.25E06

Conclusions

Coagulase-negative staphylococcus species are an important cause of lactating mastitis and significantly more than in lactating control cases. As there is a significantly higher rate of isolation of CoNS from lactating mastitis cases during the later months of lactation than in early months, particularly in those who fed their babies normally (breast feeding) than in case of those who practiced a mixed type of feeding (breast + bottle). The resistance to diverse antibiotics and a higher ability to form biofilms, found among the strains isolated from milk of women suffering mastitis, might explain the chronic and/or recurrent nature of this infectious condition.

Ethical Clearance: The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding.

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Late Electrographic Seizures in Iraqi Patients with Stroke; The Role of Antiepileptic Therapy

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Hammurrabi Medical College, University of Babylon, Babylon, Iraq

ABSTRACT

Background: Studies on post-stroke seizures whether clinical or subclinical have given conflicting results. Therefore, the aim of our study was to elucidate the incidence of late electrographic (EEG) seizures (after one month from the stroke) and to observe the role of antiepileptic therapy in reducing proceeding clinical seizures or epilepsy in Iraqi patients.

Method: The study was done in Iraq in both Baghdad and Babylon Teaching Hospitals. Follow up was done after that and the patients were given antiepileptic therapy for 2 years. The number of patients was 198. One hundred and thirty of them had ischemic stroke and 68 had hemorrhagic stroke. The number of male patients was 110 and that of females was 88. The control group patients were (100). The drug levitiracetam was given to 50% of the patients with ischemic stroke and to 50% of those with hemorrhagic stroke with late electrographic seizures and follow up was done for both groups on levitiracetam and those without for 2 years.

Results: The results showed that late electrographic seizures were seen in 30% of ischemic stroke patients and 50% of hemorrhagic stroke patients. Clinical epilepsy was observed in only 5% of those with hemorrhagic stroke patients on levitiracetam and in 20% of those hemorrhagic stroke patients without medication. Clinical epilepsy was also observed in only 2% of ischemic stroke patients on levitiracetam and in 10% of those with ischemic stroke, but without medication.

Conclusion: Late electrographic (EEG) seizures commonly occur in stroke patients. Prescribing antiepileptic therapy to those patients reduced the incidence of clinical seizures or epilepsy. We recommend giving antiepileptic drugs, especially levitiracetam to stroke patients with late electrographic seizures for at least 2 years.

Keywords: Epilepsy, EEG, Levitiracetam, Hemorrhagic stroke, Ischemic stroke.

Introduction

Stroke commonly causes seizure in old age population (1-3). Also, the incidence of stroke increases in old age. Cerebrovascular disease seems to be the initial cause of epilepsy in elderly population (3-4). Post-stroke Epilepsy in young patients is a problem that effects the outcome in a negative way, even after 10 years after ischemic stroke (5). Seizures occurred in one third of patients with intracerebral hemorrhage and more than half were purely electrographic. Electrographic seizures were associated with increasing hemorrhages and poor outcomes (6). Our study stresses on late electrographic seizures (after one month) in both ischemic and hemorrhagic stroke in Iraqi patients.

The EEG in patients with stroke was studied especially in the acute phase. Its features showed weak correlation with the clinical state and to the recovery (7-12). It has been sought that the EEG could be used to show involvement of the cortex undetected by computed tomography (C.T. scan) (13) and to evaluate the outcome of endarterectomy (14).

The objectives of current study were to elucidate the incidence of late electrographic seizures (after one month) in Iraqi patients with stroke and to observe the role of antiepileptic therapy in reducing proceeding clinical seizures.

DOI Number: 10.5958/0976-5506.2019.03176.0
Materials and Method

Study population: One hundred and ninety eight patients were studied. The study was done in Iraq in both Baghdad and Babylon Teaching Hospitals. One hundred and thirty patients were with ischemic strokes and sixty eight were with hemorrhagic strokes. Those with brainstem, cerebellar strokes, subarachnoid hemorrhage, arteriovenous malformation, transient ischemic attacks pseudostroke and subdural hematoma were excluded from the study. Male patients were (110) and females were (88). In addition, (100) age-comparable subjects were recruited as control group. Antiepileptic therapy (Levitiracetam 500mg daily) was given to 50% of ischemic stroke patients and to 50% of hemorrhagic stroke patients with late electrographic seizures and follow up was done for both groups with and without antiepileptic therapy for 2years.

A 16-channel EEG device was used for this study. The EEG electrodes were connected to the scalp using a head cap according to the international (10) system. The electrical signal was amplified and filtered.

EEG evaluation included the followings: Normal EEG 2-Focal slowing 3-focal sharp and slow waves, 4-focal sharp waves 5- focal spikes and slow waves, 6-generalized slow waves7-focal spikes and PLEDS.

Clinical testing: Neurological examination, routine blood evaluation and head C.T scan were performed for every patient. The NIHSS were used to evaluate the stroke severity as 0 (no stroke symptoms) 1-4 (minor stroke) 5-15 (moderate stroke) 16-20 (moderate to severe) and 21-42 (severe stroke)\(^{(15)}\).

Statistics: It was done by means of chi-squared (measurement of P-value). Collection and analysis of the EEG data were done at the baseline level and then every 3 months for 2 years for the stroke and control groups

Results

Our study showed that late electrographic seizures (after one month) were seen in 30% of ischemic stroke and in 50% of hemorrhagic stroke. We defined post-stroke (clinical) epilepsy as a condition in which patients have a single seizure happening with a situation that could cause epilepsy (such as stroke) met the criteria of epilepsy \(^{(16,17)}\). Post-stroke seizures were divided into early onset seizures (within 7 days after stroke) and late seizures (occurring later) \(^{(18)}\).

Patients with late electrographic (EEG) and late clinical seizures were added to the study. Clinical seizures or Epilepsy were only observed in 5% of those with hemorrhagic stroke patients on antiepileptic therapy and in 20% of those with hemorrhagic stroke patients without antiepileptic therapy. Only 2% of those patients with ischemic stroke on antiepileptic therapy had clinical epilepsy, while it was seen in 10% of those without antiepileptic therapy. The tables below showed demographic profiles and parameters for both the studied stroke patients and their controls (with significant P-values).

Table 1: The base-line clinical and electrographic characteristics of studied patients and control group

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Patients</th>
<th>Control</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total No.</td>
<td>198</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Age/year (Mean ± SD)</td>
<td>60 ± 16</td>
<td>58 ± 14</td>
<td>0.1</td>
</tr>
<tr>
<td>Weight/Kg (Mean ± SD)</td>
<td>67 ± 7</td>
<td>65 ± 8</td>
<td>0.4</td>
</tr>
<tr>
<td>BMI/Kg.m(^{-2}) (Mean ± SD)</td>
<td>24 ± 1.7</td>
<td>24 ± 2</td>
<td>0.3</td>
</tr>
<tr>
<td>Late EEG seizure</td>
<td>73</td>
<td>2</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Late clinical seizure without antiepileptic drugs</td>
<td>27</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Late clinical seizure with antiepileptic</td>
<td>7</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Electrographic seizure in ischemic and hemorrhagic stroke patients in comparison with control group

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Ischemic stroke</th>
<th>Hemorrhagic stroke</th>
<th>Control</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Late EEG seizure 1 month</td>
<td>39</td>
<td>34</td>
<td>2</td>
<td>&lt;0.005</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 3: Late clinical seizure in ischemic and hemorrhagic stroke patients who received an antiepileptic drug in comparison with those didn’t receive an antiepileptic drug

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Ischemic stroke</th>
<th>Hemorrhagic stroke</th>
</tr>
</thead>
<tbody>
<tr>
<td>Late clinical seizure without antiepileptic</td>
<td>13</td>
<td>14</td>
</tr>
<tr>
<td>Late clinical seizure with antiepileptic</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>P value</td>
<td>&lt;0.003</td>
<td>&lt;0.003</td>
</tr>
</tbody>
</table>

Discussion

This study suggested that late electrographic seizures commonly occur in stroke patients. Prescribing antiepileptic therapy reduces the incidence of proceeding clinical seizures or epilepsy. This study also recommended giving antiepileptic therapy, especially levitiracetam for at least 2 years \(^{(19-22)}\).

Antiepileptic drugs (as a prophylaxis) may not be prescribed in most types of strokes except in Aneurysmal Subarachnoid Hemorrhage (Ruptured type). When early seizures occur, treatment was given, but may not be for a prolonged time. If late seizures occur, chronic anticonvulsant treatment is advised \(^{(23)}\).

The European guidelines advice the use of antiepileptic drugs to prevent after-stroke seizures, but prophylactic therapy for patients who have not sustained a seizure is not recommended \(^{(24,25)}\).

Levitiracetam was well-tolerated in our study. Other studies also showed no significant interactions between Levitiracetam and antiplatelet therapy or warfarin \(^{(26)}\). Further studies are needed to evaluate the correlation between late electrographic seizures and the mortality in stroke.

Conclusion

Our study showed that giving Levitiracetam to stroke patients with late electrographic seizures reduced the incidence of epilepsy by 10%. We recommend giving antiepileptic therapy especially Levitiracetam for stroke patients with late electrographic seizures for at least 2 years.

Ethical Clearance: The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding.

REFERENCES


The Spectrum of Resistant Respiratory Infection in a Group of Iraqi Patients with Chronic Lymphocytic Leukemia

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ABSTRACT

Background: Chronic lymphocytic leukemia (CLL) is the most common form of leukemia in the Western world but it significantly less frequent in Asia. Infectious complications continue to be the major cause of morbidity and mortality in CLL patients. Indeed, they account for the leading cause of death in most series that ranged between 30 and 50%. They were rendered susceptible to infections due to disease-related immunosuppression in addition to prolonged immunosuppression induced by treatment agents. The aim of current study was to define the microbiological spectrum of resistant respiratory tract infection in a group of Iraqi chronic lymphocytic leukemia (CLL) patients.

Method: Thirty-eight patients were enrolled in this cross-sectional study which was conducted from March 2017 till June 2018 in different hematology centers in Baghdad, Iraq. It included any CLL patient presented with chest infection that didn’t respond to empiric treatment. One to two early morning sputum samples were taken from each patient that subsequently examined by direct Gram stain, culture media and direct fungal stain with culture, as well as special stain for diagnosis of Pneumocystis jirovecii infection.

Result: The median age was 60.58 ± 7.76 years with a mean of disease duration 3.42 ± 2.61 year. Advanced age was associated with increasing risk of chest infection (P= 0.003). Bacterial infection represented (42%) of cases followed by fungal infection as (26%). Gram-negative bacteria were the commonest pathogens as (34.2%). P. aeruginosa being the most common species, while (26.3%) had Gram-positive bacteria such as S. pneumonia. Five patients (13.16%) were labeled as positive for Mycobacterium tuberculosis. Pneumocystis jirovecii was detected in (3%) of patients.

Conclusion: Bacterial infection continued to be the most common pathogens comprising Gram-negative and followed by Gram-positive microorganisms in addition to Mycobacterium Tuberculosis with an increasing incidence of fungal infection.

Keywords: Chronic lymphocytic leukemia, immunosuppression patients, Bacterial infection, Fungal infection, Chest infection.

Introduction

Chronic lymphocytic leukemia (CLL) is the most common form of leukemia in the Western world, but it significantly less frequent in Asia (1). In Iraq, the incidence of all subtypes of leukemia is 4.43 cases per 100,000 of which 5.34% of cases are CLL according to the annual report of cancer disease in Iraq 2013. Infectious complications continue to be the major cause of morbidity and mortality in CLL patients. Indeed, they account for the leading cause of death in most series that ranged between 30 and 50% (2). They are rendered susceptible to infections due to disease-related immunosuppression in addition to prolonged immunosuppression induced by treatment agents (3).

There are both quantitative and qualitative defects in immune effector cells that results in abnormal cellular- and humoral-mediated immune responses with a...
reduction in normal immunoglobulin (IgG, IgA and IgM) levels during the course of the disease. Seventy percent of CLL patients develop hypogammaglobulinemia within 7 years of diagnosis (4). Its severity tends to increase with the prolonged duration and advanced stage of the CLL. Even in successfully-treated patients, there is rare recovery of immunoglobulin levels, however, a recent study suggested that use of high doses of rituximab in CLL can improve immune dysfunction and restore, in part, the production of immunoglobulins (5).

Therapies can contribute to increasing respiratory infections by inducing T-cell defects and neutropenia resulting in pyogenic infections due to S. aureus, S. pneumoniae, H. influenza, Klebsiella and E. coli (6). Other infections like Candidiasis, Aspergillosis, Nocardia, Listeria, Mycobacteria and Pneumocystis jirovecii pneumonia can occur, but are uncommon in CLL patients treated with alkylating agents alone (7).

Patients and Method

Study Design and Setting: A hospital-based cross sectional study was conducted in the haematology department at Al-Imamian Al-Kadhmain Medical City, Baghdad Medical City and the National Center of Haematology at Al-Mustansiriyah university over 15 months duration from March 2017 till July 2018.

Study Subjects: Thirty eight patients, who were diagnosed to have chronic lymphocytic leukemia (CLL) on basis of manifestations and laboratory tests, were enrolled in this study. They presented with non-responsive chest infection (chest infections did not show clinical improvement within 72 hours of empirical therapy initiation). They were usually under chemo-immune therapy according to their disease characteristics. Patients having any of other lymphoproliferative diseases, in addition to those with active pulmonary TB, were excluded from the study.

Data Collection: Demographic data were collected from patients and included stage and the duration of disease, the previous lines of treatment, radiological evidence of chest infection and result of complete blood count (CBC).

Specimen Collection and Handling: Sputum sample (5-10ml) was directly collected from each patient by sterile screw cup bottles and labeled by case number and name, and immediately placed on ice then transferred into the laboratory (microbiology department at College of Medicine/Al-Nahrain University) for processing and investigations on the same day.

Statistical Analysis: Data were statistically analyzed using the Statistical Package for the Social Sciences (SPSS; 2015). Continuous variables were expressed as mean ± standard deviation (SD). The Pearson’s Chi-squared test or Fisher exact test was used for comparing categorical variables. A two-sided significant level of 0.05 was considered to indicate a statistically significant difference.

Results

Demographic characteristics of study populations were shown in Table (1).

Table 1: Demographic characteristics of study populations

<table>
<thead>
<tr>
<th>Variables</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age/yr Mean ± SD</td>
<td>60.58 ± 7.76</td>
</tr>
<tr>
<td>Disease Duration/yr Mean ± SD</td>
<td>3.42 ± 2.61</td>
</tr>
<tr>
<td>Age groups/yr &lt;60</td>
<td>20(52.6)</td>
</tr>
<tr>
<td></td>
<td>&gt;60</td>
</tr>
<tr>
<td>Gender Female No. (%)</td>
<td>10(26.32)</td>
</tr>
<tr>
<td></td>
<td>Male No. (%)</td>
</tr>
<tr>
<td></td>
<td>Female: Male</td>
</tr>
<tr>
<td>Smoking history Non-smoker/No. (%)</td>
<td>24(63.16)</td>
</tr>
<tr>
<td></td>
<td>Smoker/No. (%)</td>
</tr>
<tr>
<td></td>
<td>Ex-smoker/No. (%)</td>
</tr>
</tbody>
</table>

According to the Binet and Rai classification in Chronic Lymphocytic Leukemia, 15(39.47%) were in stage II/B. Radiological features varied from wide spread pulmonary infiltration, interstitial opacities, lobar consolidation, cavitation or halo sign that were reported in only 15(39.47%; Table 2).

Table 2: Radiological features and disease stages according to Binet and Rai classification

<table>
<thead>
<tr>
<th>Variables</th>
<th>No. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage</td>
<td></td>
</tr>
<tr>
<td>Stage II/ B</td>
<td>15(39.47)</td>
</tr>
<tr>
<td>Stage III/C</td>
<td>11(28.95)</td>
</tr>
<tr>
<td>Stage IV/C</td>
<td>12(31.85)</td>
</tr>
<tr>
<td>Radiological features</td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>23(60.53)</td>
</tr>
<tr>
<td>Positive</td>
<td>15(39.47)</td>
</tr>
</tbody>
</table>
Results of current study (Figure 1) revealed that 18(74.37%) received two previous lines of chemotherapy, while 13(34.21%) of received only single line of chemotherapy. The most frequent regimen was fludarabine, cyclophosphamide, rituximab (FCR) in twenty-two patients (57.89%).

![Figure 1: Frequency of different treatment regimen. FCR: fludarabine, cyclophosphamide and rituximab; BR: bendamustine and rituximab; RLP: rituximab, leukeran and prednisolone; RCHOP: rituximab, cyclophosphamide, Adriamycin, vincristine and prednisolone; EP: cyclophosphamide and prednisolone; FCM: fludarabine, cyclophosphamide and rituximab.](image)

Microbiological characteristics: Conventional microbiological investigations revealed that 16(42%) patients had bacterial infection, while 10(26%) of them had fungal infection. Mixed bacterial and fungal infections were reported in 9 (24%) patients. However, two patients showed no microbial growth (Figure 2).

![Figure 2: Distribution of pathogens among study patients. PJP: pneumocystis jirovecii pneumonia](image)

Direct Gram stain revealed that 13(34.2%) patients had Gram-negative bacteria, while the rest (26.3%) had Gram-positive bacteria. It was found that P. aeruginose and Klebsiella spp. constituted the highest percentages (15.79%, 7.89%), respectively, followed by the Acinetobacter baumanni (5.26%) and then Proteus species and Ewingella Americana at a percentage of (2.63%) for each. Acid-fast bacilli (AFB) staining was positive in five patients (13.16%). Fungal infection was discovered in (26%). The most common isolated fungi being Candida albican (15.79%) followed by Aspergillus (7.8%), Cryptococcus neoformans (5.26%), Rhizopus spp, Candidia glabrata, Chrysosporium zonatum, Candida tropicalis, Candida parasilosis each one (2.63%). Modified Giemsa stain (Diff-Quik stain) detected one case with positive pneumocystis jirovecii pneumonia (PJP). Spectrum of microbial pathogen was shown in Figure (3).
Hematological Parameters: Laboratory data revealed that the maximal level of WBC in this study was $209 \times 10^3/\text{ml}$, while the minimal level was $0.8 \times 10^3/\text{ml}$, with a mean level of $34.6 \times 10^3 \pm 52 \times 10^3/\text{ml}$ (median was $12 \times 10^3/\text{ml}$). There was no statistically significant association between WBC count and development of chest infection ($P = 0.515$; Table 3). The absolute neutrophils count (ANC) ranged from $(0.4-10) \times 10^3/\text{ml}$, with a mean of $6 \times 10^3 \pm 12 \times 10^3/\text{ml}$ (median was $4.1 \times 10^3/\text{ml}$) without statistically significant association, too ($P = 0.44$). Platelets count ranged from $7 \times 10^3$ to $355 \times 10^3/\text{ml}$ and the mean $\pm$ SD was $133 \times 10^3 \pm 88 \times 10^3/\text{ml}$, with statistically significant association ($P = 0.025$; Table 3).

Table 3: Association of hematological parameters with type of infection

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Bacterial</th>
<th>Fungal</th>
<th>Mixed</th>
<th>None</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>WBCs</td>
<td>44370 ± 63320.92</td>
<td>27683 ± 38712.89</td>
<td>9700 ± 11613.78</td>
<td>47500 ± 59679.81</td>
<td>0.515</td>
</tr>
<tr>
<td>ANC</td>
<td>5052.50 ± 8947.89</td>
<td>11562.00 ± 21513.28</td>
<td>1985.00 ± 1859.29</td>
<td>1450.00 ± 1343.50</td>
<td>0.44</td>
</tr>
<tr>
<td>Hb</td>
<td>9.91 ± 4.08</td>
<td>9.40 ± 1.95</td>
<td>10.55 ± 2.25</td>
<td>10.70 ± 2.97</td>
<td>0.906</td>
</tr>
<tr>
<td>Platelets</td>
<td>122400 ± 43192.84</td>
<td>139700 ± 93167.77</td>
<td>100166.67 ± 87446.94</td>
<td>305000 ± 261629.51</td>
<td>0.025</td>
</tr>
</tbody>
</table>

Discussion

In spite of the improvement in supportive care, infection is still a significant cause of mortality and morbidity in CLL patients. Approximately, 80% of patients developed an infectious complication during the course of their disease with the lung being the most common site \(^{(8)}\).

In the current study, bacterial infections were recognized in (42%) of patients, mostly identified as Gram-negative bacilli (34%) which is compatible with \(^{(9)}\) who reported that (37%) of CLL patients were affected by Gram negative bacteria. Similarly, \(^{(10)}\) reported that 35% of CLL patients were exposed to Gram-negative bacterial infection. This can be explained as the most prevalent microorganism in any immuno-compromised patients or those acquiring infection during their hospital stay. In most medical centers, \(P. aeruginosa\), \(Klebsiella\) and \(E. coli\) were responsible for 60 -70 % of Gram-negative infections \(^{(9,10)}\) being the most prevalent infectious pathogen which is in agreement with this study.
Regarding Gram-positive bacteria, *S. pneumoniae* was found to be the most frequent pathogen in this group which represented (15.79%), followed by *S. aureus* (10.53%). This finding was higher than that reported by (11) who identified only 4% of CLL patients with respiratory tract infection in a study done over a period of 18 years. This difference can notify the importance of general hygiene principles in avoiding community acquired infections.

Current study had emphasized on the rate of occurrence of *Mycobacterium Tuberculosis* in CLL which was in this investigation (13%). It was higher than what that recorded in a large retrospective study done over 10 years from 1990-2000 on 917 patients with hematological malignancies where the prevalence of TB was 6.9% (12) in contrast to other older repots (13). This variation report can be explained that TB is considered endemic in our region.

It seemed that results of fungal infection in current study were higher than what was observed by (14) which was a large monocentric retrospective study. All patients had chronic lymphoproliferative disorders admitted between 2006 and 2014, from those 305 CLL patients, four patients (1.3%) only found to have fungal infection, (1%) with candida infection and (0.3%) with aspergillus infection. The risk of fungal infection was reported in many studies such as (15) who found that the incidence of fungal infection in CLL was 7.8%, while (16) reported that the risk of fungal infection was (4%). It was believed that these findings were so worrisome for raising possibility of fungal infection in resistant respiratory tract infection in CLL patients that can be assumed to be secondary to liberal prophylactic antibiotics used by most patients.

It is already known that fludarabine-based treatment had resulted in increasing risk of pneumocystis jirovecii infection which current study reported to be prevalent in (3%) of patients only. This figure was lower than the 33% reported by (17). Those patients were commonly advised to use prophylactic trimethoprim–sulfamethoxazole that may lessen this infection rate.

In current study, no growth of bacteria was detected in (5.26%) of patients which may be due to prophylactic antibiotics use or presence of viral infection or the presence of unculturable bacteria. Generally speaking, it is documented that a good quality sputum could be obtained only in 14.4% of cases (18).

There were no statistical association among any of hematological parameters with risk of infection apart from prolonged thrombocytopenia (P= 0.025) which simply could be attributed to the effect of infection on recovery of some blood parameters.

**Conclusion**

An increasing risk of recurrent and resistant respiratory tract infection in CLL patients is a common heath burden. Bacterial infection is still continued to be the most common pathogen comprising Gram-negative micro-organisms and followed by Gram-positive micro-organisms in addition to Mycobacterium infection. A progressive scale of increasing fungal infection is already reported as a second frequent etiology in respiratory infections.

**Ethical Clearance:** The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding.

**REFERENCES**


5. Alexandrescu DT, Wiernik PH. Serum globulins as marker of immune restoration after treatment


Genotyping of Ataxia-Telangiectasia Mutated (ATM) Polymorphisms in Patients with Breast Cancer

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\textsuperscript{1}College of Science, University of Babylon, Iraq

ABSTRACT

**Background:** The Ataxia-telangiectasia mutated (ATM) gene encodes a protein kinase with PI-3 kinase–related domain that plays a significant role in the activation of cellular responses to DNA double-strand breaks through subsequent phosphorylation of central players in the DNA damage-response pathway. Many studies explained that specific variants in the ATM gene are related with malignant breast tumors risk. The aim of current study was to assess the rates of Ataxia-telangiectasia mutated (ATM) genetic polymorphism in a group of breast cancer and apparently normal breast tissues.

**Method:** One-hundred and fifty 150 frozen fresh breast tissues were enrolled in this study as 100 biopsies were from breast carcinoma and 50 were from apparently normal breast tissues as control group. Detection of ATM (c.IVS10–6T > G) variants was performed by using polymerase chain reaction (PCR)-restriction fragment length polymorphism (RFLP) analysis.

**Results:** Detection of ATM (IVS10–6T > G) mutation in tissues with breast carcinoma was observed in six out of 100, while in apparently normal breast tissues (control group) was one biopsy out of 50. The statistical differences between the rates of ATM (IVS10–6T > G) mutation were non-significant (P≤ 0.05).

**Conclusion:** Our results indicated that the ATM gene c.1066–6T > G (IVS10–6T > G) mutation did not contribute to the development of a subset of breast malignant tumors in Iraqi population.

**Keyword:** ATM genotyping, Breast cancer, PCR-RFLP, polymorphism, protein kinase.

Introduction

Cancer is a group of diseases that cause cells in the body to change and spread out of control. Most types of cancer cells eventually form a lump or mass called a tumor. Breast carcinoma is the most frequent malignancy in women in most populations, constituting about 20% of all female carcinomas \(^{(1)}\). Breast carcinomas are potentially highly malignant tumors. The latter are pathologically and clinically heterogeneous diseases with variable prognosis \(^{(2)}\). It was estimated that heritability explains about 30% of the variation in breast cancer risk, the remaining 70% being attributable to several environmental risk factors. Thus, approximately one-third of the variation in breast cancer risk in a population can be accounted for by inter-individual genetic differences \(^{(3)}\). As the authors highlighted, this estimate includes both cancer-specific genetics and genetic contributions to some cancer risk factors, such as obesity, that have a genetic component \(^{(4)}\). Although genetic factors overall are presumed to play a rather small role in the etiology of breast cancer, mutations in BRCA1 or BRCA2 genes remarkably increase the risk of breast cancer, especially in early-onset disease. One affected first-degree relative doubles the risk and the risk increases further with more affected relatives \(^{(5)}\).

ATM is a serine/threonine protein kinase that is recruited and activated by DNA double-strand breaks located on the long (q) arm of chromosome 1, between positions 22 and 23 (11q22-q23) \(^{(6)}\). It phosphorylates several key proteins that initiate activation of the DNA damage checkpoint, leading to cell cycle arrest, DNA repair or apoptosis. The protein was named for the disorder ataxia-telangiectasia caused by mutations of ATM \(^{(7)}\).
There are two main checkpoints, the G1/S and the G2/M, during the cell cycle, which preserve correct progression. ATM plays a role in cell cycle delay after DNA damage, especially after double-strand breaks (DSBs) (8).

The aim of current study was to study ATM mutation in relation to a set of breast cancers in Iraq population.

**Method**

**Study Population:** A case-control study was conducted between January 2018 and December 2018 in the Biotechnology and Genetic Engineering Laboratory, Department of Biology, College of Science/University of Babylon, Iraq. In addition, biopsy samples were collected from private laboratory. This study was performed using 100 samples. The biopsy samples were collected from patients suffering from malignant breast cancer (100 samples) and 50 samples apparently healthy as a control group.

**DNA isolation and PCR-RFLP amplification:** Genomic DNA was extracted from fresh tissues using DNA extraction kit (zymoresearch). Genomic DNA was dissolved in TE (10mM Tris-HCl and 0.1mM EDTA, pH 8.0), confirmed by agarose gel electrophoresis. Spectrophotometry was used to quantify DNA using the Nanodrope Plus spectrophotometer. Polymerase chain reaction-restriction fragment length polymorphism (PCR-RFLP) analysis was performed to determine the IVS10–6T > G variants of ATM gene.

**ATM IVS10–6T > G polymorphism analysis:** A PCR– RFLP assay was used to detect the ATM IVS10–6T > G variant using Thermal Cycler (Applied Biosystems). A 193bp PCR product was amplified using the following primers: Forward; 5-ACAGCGAAACTCTGGCTCAAA-3, Reverse; 5-TGATCTTTATTACTTCCCAGCTAGT-3 in a final volume of 20μL as described in Table (1). Cycling conditions were 94°C for 4min, followed by 36 cycles of 20s of denaturing at 94°C, 20s at 53°C, and 20s of annealing at 72°C, with a final extension at 72°C for 7min. The PCR products were digested with the Rsal restriction enzyme. Digestion was performed in a total volume of 20mL containing 10mL PCR product, 1X digestion buffer, 0.1mg/mL BSA and 3U of RsalI by overnight incubation at 37°C. The digested products were separated by electrophoresis on a 3% agarose gel staining with ethidium bromide.

**Statistical Analysis:** Statistical analysis was carried out using SPSS version 16, where data were expressed as Means ± Standard Error. One–sample t-test, One–way ANOVA, Chi–Squared test, Pearson’s chi-square (X2) test, Odds ratio were used to identify the danger factors of renal failure with their 95% confidence interval (CI), were used to find the association between the categorical variables, P≤ 0.05) was considered statistically significant.

**Results**

**Genotyping of ATM Polymorphisms:** The results revealed that the presence of a single band (196bp) of the target sequence of ATM gene in the agarose gel electrophoresis (Figure 1).

**Table 1: Recommended volumes and concentrations for applying PCR into AccuPower® PCR tubes**

<table>
<thead>
<tr>
<th>Component</th>
<th>Volume (μl)</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCR master mix</td>
<td>10</td>
<td>2X</td>
</tr>
<tr>
<td>Forward primer</td>
<td>1</td>
<td>10pmol/μl</td>
</tr>
<tr>
<td>Reverse primer</td>
<td>1</td>
<td>10pmol/μl</td>
</tr>
<tr>
<td>Template DNA</td>
<td>2</td>
<td>50ng</td>
</tr>
<tr>
<td>Free water</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Final volume (dH2O)</td>
<td>20</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 1:** Amplified product of the target sequence of ATM gene of breast cancer patients and healthy controls. M: DNA size marker; the amplified products were a single band of 196bp in size. Electrophoresis conditions were 1% agarose concentration, 75V, 20mA for 120min and stained with ethidium bromide.

After that, the amplified products of the ATM target sequences were digested with Rsal (5’ GTAC 3’) restriction enzyme (Figure 2) to detect the IVS10–6T > G SNP in ATM gene shown in Figure (1).
Figure 2: Allele typing patterns of ATM gene; where A: a homozygous allele (GT) had two bands (58 and 135bp) molecular size in breast cancer and B: homozygous allele had single band with 196bp molecular size. M: DNA ladder 100-1100bp. The digested products using Rsal enzyme by PCR-RFLP were migrated into 3% agarose, 75V, 20mA for 120min, 15µl in each well, and stained with ethidium bromide.

ATM- PCR-RFLP: The results of PCR-RFLP showed ATM polymorphism which appeared as two bands (58 and 135pb), while the uncut band (193bp) indicated the wild type allele due to lack of Rsal restriction site. All restricted fragments were observed for homozygous genotype. Statistical analysis showed non-significant differences (Table 2).

Table 2: Genotypic distribution and odd ratio of ATM gene polymorphisms between patients and their healthy controls

<table>
<thead>
<tr>
<th>Genotype ATM</th>
<th>Patients</th>
<th>Controls</th>
<th>Significance</th>
<th>OR (95%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 band ¹</td>
<td>94(94%)</td>
<td>49(98%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 band ¹</td>
<td>6(6%)</td>
<td>1(2%)</td>
<td>0.25</td>
<td>0.32(0.03-2.73)</td>
</tr>
<tr>
<td>Total number</td>
<td>100</td>
<td>50</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Discussion

Breast cancers have been ranked as the top on the commonest ten cancers in Iraqi provinces and districts, accounting for about one third of the registered female cancers. The majority of molecular events in the genesis of breast cancer are unknown. Hereditary, hormonal (estrogenic hormones and derivatives), environmental and life style factors have been attributed to play a role in breast carcinogenesis (¹).

The ATM gene, encoding a large protein kinase, is mutated in ataxia-telangiectasia (AT), an autosomal recessive disease characterized by neurological and immunological symptoms as well as cancer predisposition. Previous studies suggested that heterozygous carriers of ATM mutations have an increased risk of breast cancer compared with non carriers, but the contribution of specific variants was difficult to estimate (⁹).

In the present population-based case-control study, we evaluated for the first time the involvement of ATM mutations IVS10–6T>G. The results of the PCR-RFLP showed non-significance of the (IVS10–6T > G) in Iraqi patients suggesting that the frequency of those variants is extremely low (or not present) in Iraqi population. The ATM gene has long been hypothesized to be a breast cancer susceptibility gene, but the evidence was contradictory. Most mutation analyses of ATM in patients with breast cancer and in control subjects did not find increased frequency of mutations in case of patients that would be expected if these mutations did predispose to breast cancer (⁹,¹⁰). Also, (¹²) found no evidence for a difference in the risk of breast cancer or other cancers according to the type of ATM mutation, while the risk estimate (¹³) was based mainly on truncating mutations. Haplotype analysis could also reveal a role for common variants in the ATM gene in causing breast cancer. Five biallelic haplotype tagging
single nucleotide polymorphisms (SNPs) have been estimated to capture 99% of the haplotype diversity in Caucasian populations. On the other hand, IVS10–6T?G ATM mutation has been detected in the homozygous state in one German patient with full blown A-T (14). This leaky splicing mutation appeared to be the most common pathogenic ATM gene mutation at the population level although it was infrequently compared with other ATM mutations in ataxia-telangiectasia patients (15). Our results thus refute those of who proposed that the ATM IVS10–6T > G mutations are high-risk breast cancer-susceptibility alleles (16).

**Conclusion**

Our results might point for none-existent role for the ATM mutation in the early stage of development of a subset of breast cancers in our Iraqi patients.

**Ethical Clearance:** The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding.

**References**

STR Mutation at D13s317 Locus in 18D-V2.0 Powerplex Kit and 24 Loci Global Filter Kit in Paternity Match cases

Abeer Salman Nasseif, Maarib Naziyah Rasheed2, Hanan Khaleel mahmood1, Ali Waleed Ali3
1Medico-Legal Directorate, Ministry of Health, Iraq; 2Genetic Engineering and Biotechnology Institute, University of Baghdad, Iraq; 3Public Central Health Lab, Ministry of Health, Iraq

ABSTRACT

Background: Mutations that occur in short tandem repeats technique, might lead to alleles mismatched between the child and their parents, which complicate the forensic decisions in Paternity cases. Most of reported microsatellite was confined to single-step mutations. In the present study we reported case of a paternity case processed by 18 loci PowerPlex kit from (Promega) with a mismatch in locus D13S317.

Method: The genotypes of the alleged father, the mother and the child in D13S317 locus were 11/12, 8/12 and 8/13, respectively.

These samples were reprocessed with another forensic kit of a different primer which is 24 loci Global Filer from (Applied Bio System) to ensure the mutant alleles. After interpretation of data was made and statistical analysis was calculated in dependable software (Gene Marker HID).

Results: The results stated that the alleged father is the biological father of the child.

Keywords: Paternity match cases, STR mutation, single-step mutation, multiple-step mutation, forensic decision.

Introduction

Short tandem repeat (STR) technique is an efficient tool used worldwide to ensure the paternity match between children and their parents which follows the traditional Mendelian Inheritance. One problem with it is the STR mutations which cause the allelic mismatches in the child compared to parent, making the forensic interference more complex in paternity testing. Most of the reported microsatellite mutations were confined to single-step mutations [1-5]. Several factors can affect the rate of slippage events, among which the repeat unit which is the most important factor. A negative correlation was suggested between the length of the repeat unit and the rate of slippage [6]. In addition, [7] showed that the rate of slippage was the highest in dinucleotide STRs and the lowest in tetranucleotide STRs. This is consistent with the observation that the longer the repeat unit, the less the total amount of STRs. Probably because longer repeat units would require the strand to slip further before the bases could pair correctly again, and then they become less common in the genomes. Besides the repeat unit, other factors such as the number, location and sequence of repeats are also likely to affect the rate and direction of slippage [8]. For instance, in humans, the rate of slippage events exponentially increases with the increasing repeat number [9]. Multistep-mutations were rarely discovered in STR loci compared to single-step mutation and they only account for a very limited number of STR mutation events. Previous studies reported a single-step mutation at locus D13S317 in paternity testing [10,11].

Materials and Method

Samples: Blood samples were collected from the alleged father, mother and child. Informed permission was obtained from the parents to use their FTA blood samples in DNA profiling and subsequent research.

STR Profiling: Genomic DNA was processed by direct PCR by Punching the FTA with Puncher (Harris). The kit used was the powerplex 18 V2:0 (Promega D13s317 Locus in 18D-V2.0 Powerplex Kit and 24 Loci Global Filter Kit in Paternity Match cases

Abeer Salman Nasseif, Maarib Naziyah Rasheed2, Hanan Khaleel mahmood1, Ali Waleed Ali3
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corporations as per manufacturer’s instructions). The PCR amplifications were performed using Gene AMP PCR system 9700 (Applied Biosystems) as follows:

- 5µl was added primer per mix
- 5µl Master Mix 5X
- 15µl Distalled Water, Amplification grade
- 2µl Control DNA samples for father, mother & Child.
- As a total volume of 12µl for processed samples.

Vortex for the amplicon then loaded into PCR System 9700 for 28 Cycles. (Instruction of use was found in powerPlex 18D system technical manual+Tmd031).

Www.promega.com/Protocols

Post PCR

PCR products were loaded into ABI 3130 XL Genetic analyser using:

<table>
<thead>
<tr>
<th>WEN internal lane stander 500</th>
<th>0.5µl</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formamide</td>
<td>9.5µl</td>
</tr>
<tr>
<td>DNA Samples</td>
<td>2.0µl</td>
</tr>
</tbody>
</table>

Denaturation for samples was done in PCR 9700 for 5min, soaked in ice for 5min.

Then loaded in the plate in Genetic Analyser using polymer 4, buffer and deionized distal water. The analyser was set for the standardization of PowerPlex Criteria (standard Labs).

STR profiling was generated by gene mapper ID V3.2 software (applied Biosystems).

The samples were processed for a second time in different primers to ensure the mutation at locus D13S317 in global filer STR Kit 24 loci from applied bio system. The same procedure was done for the direct PCR loading in 3500 Genetic Analyser (Applied bio System).

Statistical Analysis: The paternity index was calculated in standard using the frequency of alleles from the population genetic data for 20 autosomal STR loci in an Iraqi Arab population: Application to the identification of human remains\(^{[12]}\).

Results and Discussion

Table 1: The genotypes of alleged father, mother and child of PowerPlex 18 STR KIT (Promega) involved one-step mutation was found in D13S317 (in red color)

<table>
<thead>
<tr>
<th>STRs</th>
<th>Alleged father A</th>
<th>Mother B</th>
<th>Child C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amelo</td>
<td>X,Y</td>
<td>X,X</td>
<td>X,Y</td>
</tr>
<tr>
<td>D3S1358</td>
<td>16,18</td>
<td>17,18</td>
<td>16,18</td>
</tr>
<tr>
<td>TH01</td>
<td>9,9.3</td>
<td>6,9.3</td>
<td>6, 9.3</td>
</tr>
<tr>
<td>D21S11</td>
<td>28,30</td>
<td>33,2,33,2</td>
<td>30, 33,2</td>
</tr>
<tr>
<td>D18S51</td>
<td>12,14</td>
<td>12,18</td>
<td>12,18</td>
</tr>
<tr>
<td>Penta E</td>
<td>5,19</td>
<td>11,14</td>
<td>14,19</td>
</tr>
<tr>
<td>D5S818</td>
<td>12,13</td>
<td>12,13</td>
<td>12,13</td>
</tr>
<tr>
<td>D13S317</td>
<td>11,12</td>
<td>8,12</td>
<td>8,13</td>
</tr>
<tr>
<td>D7S820</td>
<td>10,11</td>
<td>10,11</td>
<td>11,11</td>
</tr>
<tr>
<td>D16S539</td>
<td>11,12</td>
<td>12,12</td>
<td>11,12</td>
</tr>
<tr>
<td>CSF1PO</td>
<td>10,11</td>
<td>12,12</td>
<td>10,12</td>
</tr>
<tr>
<td>Penta D</td>
<td>9,11</td>
<td>12,13</td>
<td>11,13</td>
</tr>
<tr>
<td>VWA</td>
<td>17,19</td>
<td>16,18</td>
<td>17,18</td>
</tr>
<tr>
<td>D8S1179</td>
<td>10,14</td>
<td>13,15</td>
<td>14,15</td>
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<tr>
<td>TPOX</td>
<td>9,11</td>
<td>8,8</td>
<td>8, 11</td>
</tr>
<tr>
<td>FGA</td>
<td>23,23</td>
<td>19,22</td>
<td>19,23</td>
</tr>
<tr>
<td>D19S433</td>
<td>12,13</td>
<td>13,13</td>
<td>12,13</td>
</tr>
<tr>
<td>D2S1338</td>
<td>17,23</td>
<td>19,26</td>
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Conted…

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<thead>
<tr>
<th>Positive Control</th>
<th>1µl</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative Control</td>
<td>1µl</td>
</tr>
</tbody>
</table>

Denaturation for samples was done in PCR 9700 for 5min, soaked in ice for 5min.

Then loaded in the plate in Genetic Analyser using polymer 4, buffer and deionized distal water. The analyser was set for the standardization of PowerPlex Criteria (standard Labs).

STR profiling was generated by gene mapper ID V3.2 software (applied Biosystems).

The samples were processed for a second time in different primers to ensure the mutation at locus D13S317 in global filer STR Kit 24 loci from applied bio system. The same procedure was done for the direct PCR loading in 3500 Genetic Analyser (Applied bio System).

Statistical Analysis: The paternity index was calculated in standard using the frequency of alleles from the population genetic data for 20 autosomal STR loci in an Iraqi Arab population: Application to the identification of human remains\(^{[12]}\).
Figure 1: D13S317 genetic marker for the alleged father, mother and child showing the mutant alleles.

Table 2: The genotypes of alleged father, mother and child of 24 loci Global filer kit-Applied Biosystems involved one-step mutation was found in D13S317 (in red colour).

<table>
<thead>
<tr>
<th>STRs</th>
<th>Alleged father A</th>
<th>Child C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amelo</td>
<td>X,Y</td>
<td>X,Y</td>
</tr>
<tr>
<td>D3S1358</td>
<td>16,18</td>
<td>15,17</td>
</tr>
<tr>
<td>VWA</td>
<td>17,19</td>
<td>15,17</td>
</tr>
<tr>
<td>D16S539</td>
<td>11,12</td>
<td>11,12</td>
</tr>
<tr>
<td>CSF1PO</td>
<td>10,11</td>
<td>10,12</td>
</tr>
<tr>
<td>TPOX</td>
<td>9,11</td>
<td>8,11</td>
</tr>
<tr>
<td>D8S1179</td>
<td>10,14</td>
<td>14,15</td>
</tr>
<tr>
<td>D21S111</td>
<td>28,30</td>
<td>29</td>
</tr>
<tr>
<td>D18S51</td>
<td>12,14</td>
<td>14</td>
</tr>
<tr>
<td>DYS391</td>
<td>11</td>
<td>10</td>
</tr>
<tr>
<td>D2S441</td>
<td>10,12</td>
<td>11.3, 14</td>
</tr>
<tr>
<td>D19S433</td>
<td>12,13</td>
<td>12,15</td>
</tr>
<tr>
<td>TH01</td>
<td>9,9.3</td>
<td>6,9</td>
</tr>
<tr>
<td>FGA</td>
<td>23,23</td>
<td>22,23</td>
</tr>
<tr>
<td>D2S1</td>
<td>15,16</td>
<td>15</td>
</tr>
<tr>
<td>D5S817</td>
<td>12,13</td>
<td>11,12</td>
</tr>
<tr>
<td>D13S317</td>
<td>11,12</td>
<td>11,13</td>
</tr>
<tr>
<td>D7S820</td>
<td>10,11</td>
<td>9,10</td>
</tr>
<tr>
<td>SE33</td>
<td>20,23.2</td>
<td>13,20</td>
</tr>
<tr>
<td>D10S1248</td>
<td>13,16</td>
<td>14,17</td>
</tr>
<tr>
<td>D1S1656</td>
<td>16,3, 22</td>
<td>13</td>
</tr>
<tr>
<td>D12S391</td>
<td>22,22</td>
<td>15,23</td>
</tr>
<tr>
<td>D2S1338</td>
<td>17,23</td>
<td>18,23</td>
</tr>
</tbody>
</table>

Figure 3: Locus D13S317 in both alleged father and child showing the mutant alleles which were 12 and 13, respectively.

Figure 3: The family pedigree for the alleged father, mother and the child showing all genetic markers involving the mutant alleles.
The PI was calculated for the same individual, coded C, was the child male sex XY and he had a PI E+21^7. The PI for the alleged father, who coded A, was calculated with the child and the value was E+04^4. In addition, the PI for the mother, who was coded B, with the child was E+07^2.

All results led to conclude that the alleged father was the biological father.

**Discussion**

This study presented a standard paternity test to examine autosomal STR loci using both PowerPlex 18 D STR Kit and 24 loci of global filer STR kits (Applied Bio System) and they got the same results for that all loci were matched accurately by Mendelian Inheritance law, except locus D13S317 was mutant. Most of the abnormal STR inheritances were confined to single-step mutations which were considered a match paternity case.

These results were greed with [13] who explained the paternity index was calculated for each 10 loci and then individual PI value were multiplied together to obtained the combined paternity index (CPI) for the entire set of genetic loci examined.

They generally accepted minimum standard for an inclusion in paternity is a PI of 100 or greater [13]. PI of 100 correlates to the probability that the alleged father has 99 to 1 better chance of being the father than a random man. Also, the results were agreed with [14] who stated that most of the abnormal STR inheritance was confined to a single-step mutation, whereas multiple-step mutations were rarely reported. The higher of mutation steps, the less likely the mutation would happen [14].

This went with [15] who stated that the more genetic systems examined, the greater the chance of random mutation to be observed with STR analysis of the examined battery of a dozen or more loci uncommon to see two inconstancies between a child and the true biological father [15].

**Ethical Clearance:** The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding.

**REFERENCES**


between slippage events and point mutations. Proc Natl Acad Sci 1998; 95: 10774-10778.


Anticancer Drugs as a Model for Destroying and Reducing the Growth of Human Breast MDA-MB231 Cancer Cells

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¹Department of Chemistry, College of Education for Pure Sciences, ²Animal Production, College of Agriculture, University of Basra, Iraq; ³Department of Medical Laboratory, Technology, Alkunooze University College, Iraq

ABSTRACT

Background: Azo dyes are receiving high attention in scientific research and they have great importance in chemical analysis. Cancer is a major public health problem in the world. Chemotherapy is one of the commonly-used strategies in breast cancer treatment. This therapy is usually associated with adverse side effects. The aim of current study was to produce a combination between Paracetamol and L-thyroxin drugs by synthesis of new pharmaceutical azo dye in order to reduce the growth of human breast MDA-MB231 cancer cells in vitro.

Method: The (S)-2-((4-acetamido-2-hydroxyphenyl)diazenyl)-3-(4-(4-hydroxy-3,5-diiodophenoxy)-3,5-diiodophenyl)propanoic acid (1) was synthesised. The synthetic azo dye was derived from two different drugs (paracetamol and L-thyroxine). This azo dye was then characterized using m.p., UV-visible and IR spectrum.

Results: The synthetic azo dye provided non-toxic effects using different concentrations and it didn’t show any haemolytic effect in the cells. Furthermore, the cell viability (cytotoxicity) assay presented the ability of azo dye in destroying and reducing the growth of human breast MDA-MB231 cancer cells.

Conclusion: The synthetic azo dye may be useful as a novel anticancer drug.

Keywords: Azo dye, Cytotoxicity assay, Human breast cancer cells, Cell viability, conformational analysis.

Introduction

Azo dyes are receiving high attention in scientific research [1,2,3,4] and they have great importance in chemical analysis. A strongly coloured compound can be yellow, red, orange, blue or even green depending on the exact structure of the molecule due to make azo dyes extremely important as dyes and also as pigments for a long time [5]. The structural features in organic compounds, that usually produce colour, are C=C, N=O, N=N, aromatic rings, C=O and NO₂. However, the groups that invariably confer colour are the azo (–N=N–) and nitroso (–N=O), while other groups actually do so under certain circumstances [6]. Azo dyes contain one or more azo groups (–N=N–) which are linked to SP₂ hybridized carbon atoms, based on the number of such groups [6]. These compounds contain more than one active group, which is able to formulate chelatic coordinational complexes with metal ions distinguished by their colour and ability to dissolve in different solvents [6]. Further, the azo is reactive compound [5] that was reported for its pharmaceutical importance as antidiabetic [6], antineoplastic [6], antibacterial [5,6] and anticancer agent [6].

Cancer is a major public health problem in the world [6]. Chemotherapy is one of the commonly-used strategies in breast cancer treatment. This therapy is usually associated with adverse side effects [10] ranging from nausea to bone marrow failure [6] and development of multidrug resistance (MDR) [6]. Cytotoxicity has been defined as the cell-killing property of a chemical
compound independent from the mechanism of death [6]. Cytotoxicity assay is an appropriate method for screening new substances within a short time in order to determine their cytotoxicity on cancer cells [6]. Usually in oncology research and clinical practices, in vitro testing is preferred prior to in vivo testing. The in vitro cultures can be refined under controlled environmental conditions (pH, temperature, humidity, oxygen/CO$_2$ balance etc.) resulting in homogenous batches of cells and thus minimizing experimental errors [16]. The aim of current study was to make a combination between the paracetamol and L-thyroxin drugs by synthesis of new pharmaceutical azo dye in order to reduce the growth of human breast MDA-MB231 cancer cells in vitro.

**Method**

The melting point of the azo dye was attended using Buchi B190K. The IR spectrum was carried out on a FT-IR-8400S. Fourier Transform Infrared Spectrophotometer Shimadzu (Japan) by using a KBr disc in the range 500–4000cm$^{-1}$. Absorption spectrum in ethanol with the concentration of (1x10$^{-4}$M) was determined on a spectrophotometer. The IR, UV-Visible spectrophotometer and the melting point were performed in the Chemistry Department/College of Education for pure science/University of Basra, Iraq.

**Synthesis of (S)-2-((4-acetamido-2-hydroxyphenyl)diazenyl)-3-(4-(4-hydroxy-3,5-diiodophenoxy)-3,5-diiodophenyl)propanoic acid:** This azo dye was synthesised by a method similar to that nominated by Fox [17]. It was prepared by dissolving paracetamol (0.006mol; 0.907g) in concentrated HCl (2.1mL) followed by adding 10mL of distilled water with continuous stirring in ice bath to keep the temperature below (-5°C). Also, the NaNO$_2$ was prepared by dissolving 0.468g in 5mL of distilled water and then was added to the first solution drop by drop with keeping the temperature below (-5°C). The resulting solution was then added to the L-thyroxine (0.006mol; 4.661g) in 25% NaOH. The resulting crudes were recrystallized in ethanol and hexane to yield the titled azo dye (3.5g; 63%)mp showed decomposition of azo dye; $v_{max}$: 3327.21, 3302.13, 3207.62, 3041.74, 1662.64 and 1375.25cm$^{-1}$.

**Solution of azo dye in ethanol:** The solution of the azo dye was prepared by dissolving ethanol to give (1x10$^{-4}$M) concentration.

**Cellular toxicity:** The Xian-guo and Ursola method [6] was applied to measure the toxicity of azo using hemolytic red blood cells as follows: A stock solution of 200mg/mL was prepared and followed by preparing a series of diluted (0.2, 0.3 and 0.4mg/mL) solutions. Then 0.8mL of each diluted solution was added to Eppendorf tubes and 0.2mL of red blood cells was also added to each tube. In addition, two Eppendorf tubes were equipped; in the first tube, 0.8mL of Ringer solution was added as a negative control, but the tap water as a positive control was added to second tube. Then 0.2mL of red blood cells was added to each tube. The results were recorded after the incubation of these tubes for 37 minutes in a special incubator and the changes in the solutions were checked.

**Cell culture:** Human breast cancer MDA-MB231 cells were maintained in 10cm plate contained DMEM supplemented with 10% FBS, 100units/ml penicillin and 100μg/ml/ml streptomycin at 37°C and humidified atmosphere with 5% CO$_2$.

**Cytotoxicity:** The MDA-MB231 cells were grown in 96-well plate for 24h and then treated with 100μM of the prepared azo dye for 24h. Cells viability was measure at 570nm in a micro-plate reader (Thermo Scientific) and the experiment was repeated 3 times. The results were measured in Salman Abad University in Pakistan.

**Result and Discussions**

The azo dye, named (S)-2-((4-acetamido-2-hydroxyphenyl)diazenyl)-3-(4-(4-hydroxy-3,5-diiodophenoxy)-3,5-diiodophenyl)propanoic acid, was synthesised [17] (Figure 1).

Figure 1: Synthesis of the synthetic azo dye
This azo dye was derived from two different drugs (paracetamol and L-thyroxine) using a method similar to that designated by Fox [17] with optimizing the stoichiometry and the conditions of the reaction. Thyroxine [6] was the first hormone replacement therapy, first initiated more than a century ago. Its absorption after ingestion is largely in jejunum and ileum. The absorption is affected by many pharmacological agents and herbal remedies. Levothyroxine is a commonly prescribed thyroid medication that is used to treat hypothyroidism and goiter [6]. A previous study mentioned that oxidative stress could be increased using levothyroxine medication, because it leads to the overproduction of reactive oxygen species (ROS) in the body. Due to the hypermetabolic status, increased oxidative stress induces chronic inflammation. However, some studies also confirmed that chronic inflammation is usually connected to some chronic conditions such as cancer, diabetes, and heart disease [19]. As human cell structure and function could be altered owing to overproduction of ROS; hence, imbalance of body function may induce somatic mutations and neoplastic transformation. In addition, oxidative stress has been linked to cancer initiation and progression, because it promotes DNA damage and cell proliferation by increasing DNA mutation. A recent study has shown that activation of phosphoinositol 3-kinase (PI3K) and the mitogen-activated protein kinase (MAPK) due to the effect of thyroid hormone are responsible for breast cancer cell proliferation. Indeed, thyroxine can activate these pathways and promote breast cell proliferation [19]. Though paracetamol/acetaminophen is one of the most popular and most commonly used analgesic and antipyretic drugs around the world, it is available without prescription, both in mono- and multi-component preparations [6]. It is the drug of choice in patients who cannot be treated with non-steroidal anti-inflammatory drugs (NSAID) such as people with bronchial asthma, peptic ulcer disease, haemophilia, salicylate-sensitized people and children under 12 years of age, pregnant or breast-feeding women. It is recommended as a first-line treatment of pain associated with osteoarthritis. The mechanism of action is complex and includes the effects of both peripheral (COX inhibition), and central (COX, serotonergic descending neuronal pathway, L-arginine/NO pathway, cannabinoid system) antinociception processes and redox mechanisms. The current study was focused on combination between the paracetamol and L-thyroxin drugs by synthesis of new pharmaceutical azo dye in order to reduce the growth of human breast MDA-MB231 cancer cells in vitro.

The synthetic azo dye was then characterized using m.p. (which showed that the azo dye was decomposed), UV-visible and IR spectrum. The UV-visible spectrum was documented at the range 250-450nm. The results showed that the maximum wave length of the azo dye was equal to 260nm and 380 and 430nm related to (π-π*) and (n-π*), respectively, as shown in Figure (2).

![Figure 2: The UV-Vis spectrum of the synthetic azo dye](image-url)
The IR spectrum of the synthetic azo dye (Figure 3) was also studied. The results showed that the stretching vibration of the \( \nu \) (OH) group appeared in the region 3327.21 cm\(^{-1}\).

![Figure 3: IR spectrum of the synthetic azo dye](image)

But, the \( \nu \) (N=N) stretching vibration band seemed in the region 1456.26 cm\(^{-1}\)\(^{[2,3]}\). Other bands with this region can be considered as skeletal vibrations. The \( \nu \) (C=C) stretching vibration of the aromatic ring showed a strong band in the region 1510.26 cm\(^{-1}\)\(^{[2,3]}\) and the aromatic CH band appeared in the region 3041.74 cm\(^{-1}\)\(^{[3]}\).

The method of\(^{[13]}\) was then applied to measure the toxicity of the synthesised dye using haemolysis of red blood cells \textit{in vitro}. The results showed that the azo dye provided non-toxic effect and didn’t induce any haemolytic effect despite using different concentrations. The cell viability (cytotoxicity assay) was used for to observe its (azo dye) ability in destroying live cancer cells and reducing living cells growth for human breast MDA-MB231 cancer cells. After 24h treatment with 100\(\mu\)M, the results were presented in Table (1) below.

### Table 1: Values of the cell viability test after 24h of treatment with 100\(\mu\)M of the synthetic azo dye

<table>
<thead>
<tr>
<th>Sample</th>
<th>Viability % 1</th>
<th>Viability % 2</th>
<th>Viability % 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>42.07048</td>
<td>51.80723</td>
<td>62.25403</td>
</tr>
</tbody>
</table>
The results of the cytotoxicity assay revealed high cytotoxic action of the azo dye on the viability of cancer cells in contrast to the control. In addition, the average of this effect was 52.04391, which indicated that the action of the azo dye was around 50% in contrast to the 100% action in the controls.

Theoretical studies were performed on the synthetic azo dye to understand the effect of its structure in its anticancer activity. Conformational analysis of the azo dye in question was also studied theoretically. The results showed that the conformational energy around single bond in each side of azo group was generating eclipsed and staggered conformers. The energy of C(26)-C(27)-N(25)-N(23) and N(25)-N(23)-C(20)-C(19) conformers were presented in Figure (4a and b) below.

![Figure 4: The conformational energy of each C(26)-C(27)-N(25)-N(23) (a) and N(25)-N(23)-C(20)-C(19) (b) conformers in the synthetic azo dye](image_url)

The results showed that each rotation around each side can generate eclipsed and staggered conformers as seen in Figure (4) above. Figure (4a) showed that the eclipsed E for E(-180°), E(0°) and E(135°) were equal to 137.89, 151.19 and 143.54kcal/mole, respectively. However, the staggered conformers for E(-130°), E(6°) and E(180°) were equal to 128.07, 129.26 and 137.89kcal/mole, respectively. On the other hand, Figure (4b) showed that the eclipsed E for E(-150°), E(-20°), E(55°) and E(180°) were equal to 141.48, 147.92, 205.08 and 137.89kcal/mole, respectively. In addition, the staggered conformers for E(-180°), E(-85°), E(30°) and E(135°) were equal to 137.89, 136.17, 136.47 and 134.35kcal/mole, respectively.

Furthermore, the MM2 properties were envisioned for the azo dye of interest, the results revealed that the stretch, cubic stretch, quartic stretch, bend, stretch-bend, torsion, non-1,4 VDW, 1,4 VDW, dipole/dipole and the total energy were equal to 37.0880, -2.0000, 2.3330, 20.2607, -0.3695, 29.3927, -5.2310, 1.3248, 1.6257 and 84.0915kcal/mol, respectively. When comparing these results with those received by anticancer activity, we found that the azo dye gave better ability in destroying living cancer cells. Therefore, the non-toxic azo dye can be used as a novel anti-cancer drug. Further, the MM2 minimization for the azo dye was studied and data from current study showed that the stretch, bend, stretch-bend, torsion, non-1,4 VDW, 1,4 VDW, dipole/dipole and the total energy were equal to 1.9484, 11.0444, 0.1601, -20.4440, -11.5854, 24.0501, -3.4969 and 1.6767kcal/mol, respectively. The MMFF94 total energy, MMFF94 minimization iteration energy and MMFF94 minimization/sampling energy were equal to 131.660, 80.0929 and 79.8793kcal/mol, respectively. All these results showed that the minimization was attended successfully.
Conclusion

The azo dye was cheap to prepare, because the starting materials are available and most of the chemistry is completed at or below room temperature. Also, the synthetic azo dye gained good colour, delivered non-toxic effect and didn’t show any haemolytic effect in the red blood cells. Furthermore, the azo dye had good ability to bind breast cancer MDA-MB231 cells and affect their viability. The molecular mechanics calculated the energy of a molecule and then adjusted the energy through changes in bond lengths and angles to obtain the minimum energy structure. The rotation of atoms about the single bonds is the subject of conformational analysis. This can affect the internal coordination because it affects the binding of molecules and can make this azo dye novel anti-cancer drug.

Ethical Clearance: The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding.

REFERENCES


Role of Some Enzymes in Early Diagnosis of Ovarian Cancer

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ABSTRACT

Background: Ovarian cancer is the most deadly gynecologic malignancy. It’s well-known as the silent killer since in most cases there are no warning symptoms and signs until the spread of cancer to other organs. Therefore, the aim of current study was to measure the levels of enzymes such as α-Amylase, Lactate Dehydrogenase A, 5-Nucleotidase and 17-Beta-Hydroxysteroid Dehydrogenase type 14 were measured in the blood stream of ovarian cancer patients and healthy groups with different age ranges in try to find new biomarker that could be used a potentially assistance in early diagnosis of ovarian cancer.

Method: Blood samples were collected from 80 women at local hospitals in Baghdad. The subjects were divided into 2 groups depending on their age. Group 1 (25 females) aged between (20-40) years with ovarian cancer and 15 healthy women as controls. On the other hand, group 2 aged between (40-60) years and included 25 patients with ovarian cancer and 15 healthy women as controls. Enzymes levels (α-Amylase, Lactate Dehydrogenase A, 5-Nucleotidase and Human17-Beta-Hydroxysteroid Dehydrogenase type 14) were measured for both groups.

Results: Data from current study showed that there was an increase in all measured enzymes concentrations in the serum of patients with ovarian cancer in comparison with their controls for both age groups with (P-Value = 0.0001).

Conclusion: Elevated serum levels of the enzymes α-Amylase, Lactate Dehydrogenase A, 5-Nucleotidase and 17-Beta-Hydroxysteroid Dehydrogenase type 14 level would be employed as potentially new biomarkers that can assist in early diagnosis of ovarian cancer.

Keywords: Ovarian cancer, Oxidative stress, Antioxidant, Enzymes, Biomarkers.

Introduction

Ovarian cancer is an extremely heterogeneous tumor which has been generally described by its diverse histological subtypes and degrees of variation. Type I, are low-grade tumors that exemplify 25% of ovarian cancers and generally show slow development with a variable reluctance to conventional chemotherapy, while type II are high-grade exemplify more than 70% of all ovarian cancers and show aggressive actions since are diagnosed in progressive stage and are described by their high sensitivity to chemotherapy [1,2].

“Oxidative stress” is imbalance between production of reactive oxygen species and absence of antioxidants. Oxidative stress and free radicals play critical roles in carcinogenesis [3]. Antioxidants perform as protection system to avoid damaging effect of reactive oxygen species [4]. Ovarian cancer has no symptoms and warning signs so always detected in advanced stage. New biomarkers will be potential guide for early diagnosis which could enhance patient survival. Therefore, the aim of current study was to measure the levels of enzymes such as α-Amylase, Lactate Dehydrogenase A, 5-Nucleotidase and 17-Beta-Hydroxysteroid Dehydrogenase type 14 were measured in the blood stream of ovarian cancer patients and healthy groups with different age ranges in try to find new biomarker that could be used a potentially assistance in early diagnosis of ovarian cancer.

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Materials and Method

Study group: Fifty Iraqi women with ovarian cancer were selected according to their ages, collected from local Hospital in Baghdad, Iraq. All patients completed the primarily planned treatment and had no history of cancer. The patients were divided into 2 subgroups; group 1 aged between (20-40) years and included (25) females and group 2 between (40-60) years and included (25) females.

Control group: Thirty healthy Iraqi women were chosen as controls; they were from Baghdad and had no history of cancer or other diseases. They were divided into 2 groups; group 1 aged between (20-40) years and included (15) females and group 2 aged between (40-60) years and included (15) females.

Blood samples collection: A 5-ml blood sample was drawn from each patient. The samples were directly transferred to gel tubes and allowed to clot at room temperature for 20min. the tubes were centrifuged at 3000rpm for 10min. Serum for each patient was transferred to clean Eppendorf tube using micropipette and all tubes stored at -20°C until time of analysis.

Analysis of serum enzymes levels: The enzymes (α-Amylase, Lactate Dehydrogenase A, 5-Nucleotidase and Human17-Beta-Hydroxysteroid Dehydrogenase type 14) levels in the serum of patients and controls were measured by ELISA kit on ELISA system (Biotech/USA). The enzymes α-Amylase and Lactate Dehydrogenase A were analyzed by Elabscience ELISA kit, USA (catalog numbers: E-EL-H2235, E-EL-H0556), respectively, while the enzyme 5-Nucleotidase was analyzed by MyBioSource ELISA kit, USA (catalog numbers: MBS760122). However, 17-Beta-Hydroxysteroid Dehydrogenase Type 14 was analyzed by CLOUD-CLONE CORP, ELISA kit, USA (catalog numbers: SEF175Hu). All analyses were done according to the manufacturers’ instructions.

Statistical Analyses: Statistical analyses were performed with Graph Pad Prism (version 6, Graph Pad Software Inc., La Jolla, CA). The results were expressed as mean ± standard deviation. Student t-test was performed to analyze the statistical significance of the both groups. P-value ≤0.05 was considered statistically significant.

Results and Discussion

The results showed that mean(SD) serum amylase levels of patients with ovarian cancer and their controls, aged 20-40 years, were 436.6(74.67)ng/mL and 65.57(12.38)ng/mL, respectively, (Figure 1), whereas the enzyme levels in ovarian cancer patients and their controls, aged 40-60 years, were 391.3(44.97)ng/mL and 63.82(10.44)ng/mL, respectively, (Figure 2). The study demonstrated that in both groups there was significant increase in amylase level in ovarian cancer patients in comparison with their controls (P-value =0.0001). Our results were agreed with another study that documented statistically significant increase in serum amylase level in ovarian cancer patients. This rise may be due to increased production or decreased clearance of the enzyme [5].

Figure 1: Serum α-amylase concentration in ovarian cancer patients and their controls aged (20-40) years

Figure 2: Serum α-amylase concentration in ovarian cancer patients and their controls aged (40-60) years

The mean(SD) serum lactate dehydrogenase levels in ovarian cancer and their controls, aged (20-40) years, were 1.126(0.32)ng/mL and 0.63(0.0936)ng/mL, respectively (Figure 3), while the enzyme levels in ovarian cancer patients and their controls, aged (40-60) years, were 1.857(0.271)ng/mL and 0.783(0.0719)ng/mL, respectively, as shown in Figure (4). The study revealed that in both groups there was significant increase of enzyme.
level in ovarian cancer patients in comparison with their controls (P-value = 0.0001). Our results were agreed with other study that reported significant rise in serum LDHA level in patients with malignant ovarian cancer [6]. This increase may be due to high glycolytic activity.

Our results were agreed with other study that reported significant rise in serum LDHA level in patients with malignant ovarian cancer [6]. This increase may be due to high glycolytic activity.

Moreover, the mean(SD) serum 5′-Nucleotidase (5′NT) levels in ovarian cancer patients and their controls, aged (20-40) years, were 14.92(1.851)ng/mL and 12.86(1.585)ng/mL, respectively, whereas the enzyme levels in ovarian cancer patients and their controls, aged (40-60) years, were 15.1(1.235)ng/mL and 13.14(1.03)ng/mL, respectively (P= 0.001; Figure 5). A previous study showed that 5′NT level was significantly increased in ovarian cancer patients in comparison with healthy subjects [7]. The results demonstrated that the rise in serum enzyme concentration was less than 5%; therefore it may be due to a successful response to treatment.

Furthermore, the mean(SD) serum 17-β-hydroxysteroid dehydrogenase type 14 levels in ovarian cancer patients and their controls, aged (20-40) years, were 102.2(13.83)ng/mL and 56.53(10.28)ng/mL, respectively, whereas enzyme levels in ovarian cancer patients and their controls, aged (40-60) years, were 106(14.63)ng/mL and 63.13(6.15)ng/mL, respectively (P= 0.0001; Figure 6). These results didn’t agree with [8] who suggested that normal breast cells prefer oxidative enzymatic direction, favoring the conversion of Estradiol to Estrone, while tumor progression is related to a shift towards a reductive environment.

Conclusion

Serum levels of the enzymes α-Amylase, Lactate Dehydrogenase A, 5-Nucleotidase and 17-Beta-Hydroxysteroid Dehydrogenase type 14 level was elevated in ovarian cancer patients. Also, results showed
a statistically significant increase with (P-value = 0.0001) between patients and control groups.

**Ethical Clearance:** The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

**Conflict of Interest:** The authors declare that they have no conflict of interest.

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**REFERENCES**


Antibacterial Activity of Zinc Oxide Nanoparticles and Poly (B-hydroxybutyrate)/ZnO Bionanocomposites Against *Escherichia coli*

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ABSTRACT

**Background:** Zinc oxide (ZnO) is an inorganic compound widely used in everyday applications. It is currently listed as a generally recognized safe (GRAS) material by the Food and Drug Administration and is used as food additive. ZnO nanoparticles have been incorporated in polymeric matrices in order to provide antimicrobial activity to the packaging material and improve packaging properties. The aim of current study was to evaluate the antimicrobial activity of ZnO nanoparticles and PHB/ZnO nanobiocomposites against *E. coli*.

**Method:** Biosynthesis of ZnO nanoparticles by *Lactobacillus casei* and studying the characterization of these particles such as structure and morphological measurement including X-Ray diffraction measurements and scanning electron microscope and optical measurements including UV-Vis diffuse reflectance measurements and Fourier Transform Infrared (FTIR) measurements done in other studies.

**Results:** Data from current study revealed that ZnO nanoparticles exerted concentration-dependent inhibition of bacterial growth against *E. coli*. However, ZnO/PHB nanobiocomposites exerted stronger inhibition than ZnO nanoparticles.

**Conclusion:** ZnO nanoparticles enhanced antibacterial effects of the ZnO/PHB nanobiocomposites maybe via mechanical performance, barrier and/or antibacterial properties of polymers.

**Keywords:** antibacterial activity, ZnO, *E. coli*, UV-Vis, ZnO/PHB nanobiocomposites.

Introduction

Lactic acid bacteria (LAB) and the widely accepted probiotics (derived from Greek means pro= for and bio= life) bacteria with beneficial healthy effects are a major factor in dairy technologies. When administered in adequate amounts and good viability, probiotics maintain the balance and composition of the gut microflora increase the resistance to pathogens and protect the host intestine from several disorders (¹).

The synthesis of nanoparticles (NPs) with various methods; chemical physical and biological make changes in sizes and shapes of nanoparticles. Biological methods have advantageous more than other chemical methods as they are low cost and do not use temperatures, toxic chemicals, energy and high pressure (²). The oxidized form of synthesized NPs was more useful, because these NPs have good magnetic, electrical and optical properties (³).

Zinc oxide (ZnO) is an inorganic compound widely used in everyday applications. It is currently listed as a generally recognized safe (GRAS) material by the Food and Drug Administration and is used as food additive. The advent of nanotechnology has led the development of materials with new properties for use as antimicrobial agents. Thus, ZnO in nanoscale has shown antimicrobial properties and potential applications in food preservation (⁴). ZnO nanoparticles have been incorporated in polymeric matrices in order to provide antimicrobial activity to the packaging material and
improve packaging properties. Poly-β-hydroxybutyrate (PHB) is thermoplastic polyester. It is biocompatible and biodegradable, and therefore, of industrial interest in the cell. PHB is an intracellular storage material synthesized during unbalanced growth conditions. All bacteria which are capable of PHB synthesis accumulate PHB during the stationary phase of growth when the cells become limited for an essential nutrient but have an access for carbon sources. Species from more than 50 genera are known to be capable of synthesizing PHB. Despite the fact that PHB was also detected in actinomycetes and yeasts, it is most often accumulated by bacteria of various morphological and physiological groups. Only the monomer was detected in the mycelium of micromycetes. The amount of PHB production by the genera of Lactobacillus, Streptococcus and Pediococcus is not well studied and documented. Plastics are widely used in packaging, building materials and commodities.

### Material and Method

#### Biosynthesis of ZnO Nanoparticles: Lactobacillus casei

Lactobacillus casei was selected as biological model for synthesis of ZnO nanoparticles from several strains including (L. plantarium, L. bifidium, L. Acidophilus and L. fermentium), by screening the ability of all strains to produce ZnO nanoparticles, this strain has ability to synthesis ZnO nanoparticles. This strain was taken from advanced microbiology Lab in Baghdad University. It was isolated naturally from the dairy products. Its nonpathogenic bacteria were diagnosed by microscopic examination using Gram stain to this colony, colony morphology on different media and basic biochemical test.

#### Synthesis of ZnO nanoparticles by Lactobacillus casei

Biosynthesis of ZnO nanoparticles (ZnONPs) by Lactobacillus casei and studying the characterization of ZnONPs such as structure and morphological measurement including X-Ray diffraction measurements and scanning electron microscope (SEM) and optical measurements including UV-Vis diffuse reflectance measurements and fourier transform infrared (FTIR) measurements done in other studies.

#### Extraction and quantification of PHA

A 10-mL sample of culture was centrifuged at 5000rpm for 15min. The supernatant was discarded and pellet was treated with 10mL sodium hypochloride and the mixture was incubated at 30°C for 2h. The mixture was centrifuged at 5000rpm for 15min and then washed with distilled water, acetone and methanol, respectively. The pellet was dissolved in 5ml boiling chloroform and evaporated by pouring the solution on sterile glass tray kept at 4°C and weighed. The relative PHB accumulation by the different isolates was compared to help in identification of the best producer.

**Screening of polyhydroxybutyrate producing bacteria by Nile Red:** The isolates were qualitatively tested for PHB production by culturing the colonies on MM plate supplemented with Nile Red at a concentration of 0.5μg/ml. The agar plates were examined by UV light (235nm) after a suitable period of incubation at 30°C.

**PHB spectrophotometer assay:** A sample containing polymer in chloroform was transferred to a clean test tube. The chloroform was evaporated and 10ml of concentrated H₂SO₄ were added. The tube was capped with a glass marble and heated for 10min at 100°C in a water bath. The solution was cooled and after thorough mixing, a sample was transferred to a silica cuvette and the absorbance at 235nm in a UV spectrophotometer was measured against a sulfuric acid blank. A standard curve was established with PHB (Sigma Aldrich) concentrations according to (6-9).

**Infrared spectroscopy (IR):** IR analysis of PHB-like granules was performed using a commercial customer service, Aarti Industries, Tarapur, India. Briefly, extracted sample and standard PHB from Sigma® were separately made into solid pellet by making an intimate mixture of a powder sample with potassium bromide for IR analysis. The relative intensity of transmitted light was measured against the wavelength of absorption in the region 800 to 4000cm-1 using IR double beam spectrophotometer (Shimandzu®). IR spectra of samples were measured at ambient conditions.

**Qualitative analysis of polyhydroxybutyrate granules**

**Fluorescent Microscope:** The bacterial cells were cultured in MRS broth, heat fixed on a glass slide and flooded by the Nile Blue A solution 1% and incubated at 55°C for 10 minutes, then the slide washed with 8% of acetic acid solution for 1 minute to remove unbound stain. The slide was rinsed with tap water and covered with a glass cover slip and observed under oil immersion using 100x magnification fluorescent microscope fitted with cellSens® Version 1.4 Software.
Antibacterial activity assay of ZnONPs: In order to examine the antibacterial activity of the ZnONPs on these microorganisms, they were suspended in deionized water and constantly in ultrasonic apparatus until a uniform colloidal suspension was formed to yield a powder concentration of 500mg/ml. To assess toxicity range of ZnONPs against seven strains of bacteria including Gram positive, an appropriate volume of test bacteria was inoculated in nutrient broth medium supplemented with serially diluted ZnONPs with two various particle sizes and bulk suspensions, including 5, 2.5, 1.25, 0.625 and 0.313mg/ml. Colony forming units (cfu) were quantified after an overnight incubation at 37°C.

Determination of zone of bacterial growth inhibition: A volume of 0.05ml of various concentrations of different ZnONPs in discs, respectively. After inoculation and cultivation of different target bacteria on top of nutrient agar, discs were placed in selected area on different plates. The zone of inhibition (ZOI) was measured after 24h incubation. The antibacterial activity of different concentrations of ZnO was compared. To gain different nanoparticle sizes, equal amounts of synthesized ZnONPs were dried at 70°C. High temperatures result in bigger particle size.

Preparation of PHB films and PHB-ZnO nanobiocomposite films: The conventional solvent-cast technique was used for PHB films and PHB-ZnO composite films preparation. PHB films were prepared by dissolving (0.025, 0.0125, 0.0625, 0.0313, 0.0156mg/ml of the extracted polymer in 10ml of chloroform in a Schott bottle with stirring magnetically for 30 minutes then poured into a glass Petri dish (5cm in diameter) as the casting surface. The Petri dishes were covered with punctured Aluminium sheets and left in a dark place for 24 hours at room temperature (30°C) for complete evaporation of chloroform. The ZnONPs were used for composite preparation which was prepared in a manner resembling the conventional solvent-casting method in concentrations (0.025, 0.0125, 0.0625, 0.0313, 0.0156mg/ml were dissolved in chloroform to create five concentrations (5, 2.5, 1.25, 0.625, and 0.313 mg/ml.

Results and Discussion

Extraction of polyhydroxybutyrate from lactobacillus casei

Primary screening of polyhydroxybutyrate production: The Nile Red staining of viable colonies was used as a direct and a rapid tool for direct detection of PHB accumulation within bacterial cells (12, 13). Three isolates had positive results, but only one of these isolates was visible and more fluorescent with Nile Red stain isolated from standard isolate. A pink fluorescent under UV illumination was obtained as a result of the binding between stain and polymeric granules (14). The production of pink fluorescent can discriminate the isolate that produced PHB when compared to both the PHB-positive control (lactobacillus casei) and PHB-negative control (Bacillus spp) (Figure 1).

PHB spectrophotometer: UV-Vis scanning of the extracted polymer showed a peak at 235nm reading extract from L. casei (Figure 2). This peak indicated the occurrence of PHB (19).
The anti-bacterial activity of ZnONPs and ZnO/PHB bionanocomposites against *E. coli*: The antibacterial activities of ZnONPs and ZnO/PHB nanobiocomposites were tested by the disc diffusion agar methods (Table 1).

Table 1: Zone of inhibition of ZnONPs and ZnONPs + PHB nanobiocomposite for *E. coli*

<table>
<thead>
<tr>
<th>ZnONPs concentration (mg/ml)</th>
<th>ZnONPs inhibition (mm)</th>
<th>ZnONPs + PHB nanobiocomposite concentration (mg/ml)</th>
<th>ZnONPs + PHB nanobiocomposite (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>13</td>
<td>5</td>
<td>16</td>
</tr>
<tr>
<td>2.5</td>
<td>12</td>
<td>2.5</td>
<td>15</td>
</tr>
<tr>
<td>1.25</td>
<td>12</td>
<td>1.25</td>
<td>14</td>
</tr>
<tr>
<td>0.625</td>
<td>9</td>
<td>0.625</td>
<td>12</td>
</tr>
<tr>
<td>0.312</td>
<td>0</td>
<td>0.312</td>
<td>9</td>
</tr>
</tbody>
</table>

Moreover, Figure (3) showed significant increase (P≥0.05), for both inhibitors, in rate of inhibition diameters for *E. coli*. Data showed that the efficiency of incorporated ZnO/PHB nanobiocomposites as bacterial inhibitor was greater than ZnO nanoparticles, because ZnO nanoparticles have been shown to be very effective in enhancing the mechanical performance, barrier and/or antibacterial properties of polymers such as poly(ether ether ketone) (PEEK) (23).

Figure 3: Effect of bacterial inhibitor type on rate of inhibition diameters for *E. coli* L.S.D 0.05 = 0.341

Also, Figure (4) showed significant increase (P≥0.05) in all nanoparticles concentrations used against *Escherichia coli* revealed that the antibacterial activities increased as the concentration of ZnO nanoparticles increased which were in line with results of (20). On the other hand, Figure (5) showed a comparison of antibacterial activity of ZnO nanoparticles and ZnO/PHB nanobiocomposites but ZnO/PHB were more effective and the inhibition zone increased with increasing inhibitor’s concentration.
These results completely agreed with \cite{24} who reported that ZnO NPs have antibacterial activity against \textit{Escherichia coli} bacteria. Also, the results were in agreement with those obtained by \cite{25}. Improvement of ZnO biological activity was reflected as a consequence of the created free radicals by the way ZnO absorbs UV light \cite{26}.

\begin{figure}[h]
\centering
\includegraphics[width=0.5\textwidth]{Figure4.png}
\caption{Effect of bacterial inhibitor concentration on rate of inhibition diameters for \textit{E. coli}. L.S.D 0.05 = 0.540}
\end{figure}

\begin{figure}[h]
\centering
\includegraphics[width=0.5\textwidth]{Figure5.png}
\caption{Comparison of antibacterial activity of ZnO nanoparticles and ZnO/PHB nanobiocomposite on \textit{E. coli}.}
\end{figure}

**Ethical Clearance:** The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

**Conflict of interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding.

**REFERENCE**


25. Shao FC, Jian PL, Kun Q, Wei PX, Yang L, Wei XH, Shu HY. Large-scale photochemical synthesis of M@TiO2 nanocomposites (M = Ag, Pd, Au, Pt) and their optical properties, co-oxidation performance, and antibacterial effect. J Nano Res 201; 3: 244-255.

The Relationship between Postmenopausal Women and Some Hormonal Changes

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ABSTRACT

Background: Menopause is defined as loss of ability of ovarian follicles to develop. The period of menopause is affected by age and genetic factors. Also, toxic factors can affect ovarian activity such that women who smoke have earlier menopause. The irregular menstrual cycle is the most characteristic of menopause that the ovary never responds to the pituitary gland stimulation. Current study was aimed to estimate blood levels of estradiol, cholesterol, triglyceride, ALT and AST in postmenopausal women.

Method: The present study included 120 postmenopausal women their ages ranged from 46 to 65 years and divided into two groups; 46-55 years and 56-65 years. In addition, 30 before menopausal women were recruited as a control group.

Results: The result showed a significant increase (p<0.05) in estradiol level in all postmenopausal women compared with control group. Also, results showed a significant increase (p<0.05) in cholesterol and triglyceride levels in all postmenopausal women compared with control group. The results of ALT and AST revealed a significant increase (p<0.05) in all postmenopausal women compared with control group.

Conclusion: According to the results of current study, we can conclude that postmenopausal age is associated with a decrease of estradiol hormone, an increase in cholesterol and triglycerides levels, and significant differences in AST and ALT levels.

Keywords: postmenopause, cholesterol, GPT, triglyceride, estradiol.

Introduction

Menopause is defined as loss of ability of ovarian follicles to develop (1,2). The period of menopause is affected by age and genetic factors. Also, toxic factors can affect ovarian activity such that women who smoke have earlier menopause (3). The irregular menstrual cycle is the most characteristic of menopause that the ovary never responds to the pituitary gland stimulation (4).

The physiological characteristic of menopause is regarded as part of female reproductive processes based on decrease of estrogen and progesterone secreted from ovary and that lead to cardiovascular dysfunction (5). During postmenopausal period, levels of ovarian hormones are decreased and that leads to elevation in circulating LH and FSH hormones (6).

The decrease of ovarian activity in postmenopause and the drop of female steroid hormones have greater metabolic and pathological effects accompanied with cardiovascular dysfunction and a rise in blood pressure as well as abnormalities in lipid profile and glucose metabolism (7). Current study was aimed to estimate blood levels of estradiol, cholesterol, triglyceride, ALT and AST in postmenopausal women.

Material and Method

The study was carried out at the Teaching Hospital in Al-Muthanna province, during the period from September 2018 to February 2019. The study included 125 postmenopausal women. Subjects were divided into two age groups; (46-55 years) and (56-65 years). The study also included 30 women aged 30-39 years old as a control group.
Assessment of hormonal parameters: Estradiol was determined by Enzyme-Linked Immune Sorbent Assay (ELISA) technique using a kit provided by Moonblind Inc, USA. The absorbance was read at wavelength (450nm) (8).

Assessment of biochemical parameters

1. Assessment of total cholesterol: According to the method described by (BURTIS and Ashwood, 1999), as shown in the following, cholesterol concentration was determined enzymatically:

\[
\text{Cholesterol esters + H}_2\text{O} \rightarrow \text{Cholesterol + Fatty acids}
\]

\[
\text{Cholesterol + O}_2 \rightarrow \text{Cholesterol 4-one +H}_2\text{O}_2
\]

\[
\text{H}_2\text{O}_2 + \text{phenol + ATP} \rightarrow \text{Quinonimine (pink) + 4H}_2\text{O}
\]

2. Assessment of triglycerides: Triglycerides concentration was determined enzymatically according to the method described by (9) as showing in the following reaction:

\[
\text{Triglycerides + lipase} \rightarrow \text{glycerol + free fatty acid + ATP} \rightarrow \text{glycerol kinase} \rightarrow \text{glycerol-3-phosphate + ADP}
\]

\[
\text{glycerol -3-p + PAP} \rightarrow \text{peroxidase} \rightarrow \text{Quinonimine + 4H}_2\text{O}
\]

The absorption of the colored complex (quinonimine) is proportional to the amount of triglycerides in the specimen.

3. Assessment of alanine aminotransferase (ALT): ALT was determined enzymatically according to the method describe by (10) as shown in the following reaction:

\[
a - \text{Oxoglutarate + L- alanine} \rightarrow \text{GPT} \rightarrow \text{L-glutamate + pyruvate}
\]

\[
a - \text{Oxoglutarate + L- aspartate} \rightarrow \text{GOT} \rightarrow \text{L-glutamate + Oxalocetate}
\]

Statistical Analysis: All values were expressed as a mean ± stander deviation (SD). Data were analyzed by using a computer-based statistical program (SPSS). Student’s t-test was used to explain differences between groups and ANOVA was used to perform multiple comparisons between subgroups. In addition, p<0.05 represented the lowest significant limit (19).

Results

The results (Table 1) showed a significant decrease at (p<0.05) in estradiol levels in all postmenopausal women compared with control group (13.22 ± 42.73, 13.28 ± 32.54 and 37.28 ± 130, respectively). In addition, data from current study revealed that there was significant increase at (p<0.05) in the level of cholesterol in postmenopausal women (5.85 ± 0.30, 6.3 ± 0.25) compared with control group (5.25 ± 0.23). Also the result showed a significant increase at (p<0.05) in triglycerides level in all postmenopausal groups (1.50 ± 0.20, 1.30 ± 0.05) compared with control group (1.06 ± 0.10). Moreover, current study reported significant increase at (p<0.05) in ALT level in postmenopausal women (8.21 ± 10.7, 6.05 ± 20) compared with control group (1.38 ± 4.50). Also, the results shown a significant increase at (p<0.05) in AST level in postmenopausal women (9.92 ± 20.30, 9.02 ± 25.70) compared with control group (8.30 ± 15.22).

Table 1: Level of current study measured variables in postmenopausal women and control group

<table>
<thead>
<tr>
<th>Variables</th>
<th>Groups</th>
<th>Postmenopausal women age groups/yr</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>46-55</td>
<td>56-65</td>
<td></td>
</tr>
<tr>
<td>Estradiol</td>
<td>13.22 ± 42.73#</td>
<td>8.28 ± 32.59#</td>
<td>37.28 ± 130</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>5.85 ± 0.30</td>
<td>6.3 ± 0.25</td>
<td>5.25 ± 0.23</td>
</tr>
<tr>
<td>Triglyceride</td>
<td>1.50 ± 0.20</td>
<td>1.30 ± 0.05</td>
<td>1.06 ± 0.10</td>
</tr>
<tr>
<td>ALT</td>
<td>8.21 ± 10.7</td>
<td>6.05 ± 20</td>
<td>1.38 ± 4.50</td>
</tr>
<tr>
<td>AST</td>
<td>9.92 ± 20.30</td>
<td>9.02 ± 25.70</td>
<td>8.30 ± 15.22</td>
</tr>
</tbody>
</table>

#: Represents a significant difference between postmenopausal subgroups and control group at p<0.05. The result were shown as a Mean ± SD.


**Discussion**

**Estradiol Level:** The major symptoms of postmenopausal period are related primarily to estrogen deficiency and that is due to loss of ovarian follicles \(^{(11)}\).

Our study showed a significant decrease at (p<0.05) of estradiol hormones in all postmenopausal women compared with control group. The risk factors that are related to decrease of estradiol level in postmenopausal women include osteoporosis and changes in biochemical parameter of bone turnover \(^{(12)}\). Therefore, a sex-specific hormonal factor may lead to aneurysm formation and rupture. The collagen wasting commonly noticed in bone and skin in the postmenopausal period due to decreased estrogen levels could be responsible for the formation of aneurysms in the proximal parts of the cerebral arteries as it occurs in various connective tissue diseases \(^{(13,14)}\).

**Cholesterol and triglycerides levels:** The results of current study showed a significant increase in cholesterol and triglycerides at (p<0.05). The changes in lipid profile levels may be due to altered hormonal levels at postmenopausal women. The biological effect of estrogen replacement therapy that alters lipid profile levels is the best mechanism to protect against cardiovascular disease \(^{(17,18)}\).

**Alanine aminotransferase:** The results obtained in this study indicated a significant increase at (p<0.05) in ALT levels in postmenopausal women compared with control group. This finding was in agreement with \(^{(15)}\) who found that the increase of ALT was because of the destroyed hepatic cells. Naturally, women lose approximately 1% of their bone density every year at postmenopausal period. The increase in ALT level can detect women who lose the density of bone per year \(^{(16)}\).

**Aspartate aminotransferase (AST):** The result showed a significant increase at (p<0.05) in AST level in all postmenopausal women and this finding was in agreement with \(^{(17,18)}\). The latter authors explained the increase of AST as due to the destroyed hepatic cells and this enzyme filtrates from the cytoplasm of hepatic cell to the circulation. AST is considered an important enzyme in the production of energy and can increase in the case of heart cells breakdown as in the case of myocardial infarction. However, these finding disagreed with \(^{(11)}\) who found no difference in AST levels in postmenopausal women.

**Conclusions**

According to the results of current study, we can conclude that postmenopausal age is associated with a decrease of estradiol hormone, an increase in lipid profile and significant differences in AST and ALT levels.

**Ethical Clearance:** The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding.

**REFERENCES**


Osteoporosis Knowledge and Osteoprotective Behavior among Female Patients Attending DXA Clinic: A Cross-Sectional Study

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ABSTRACT

Background: Osteoporosis is a serious public health concern. Both males and females are prone to osteoporosis; but it is more common in females, especially after menopause. The most frequent type of osteoporosis is primary osteoporosis. The objectives of current study were to validate an osteoporosis knowledge instrument and to determine female patient’s knowledge about osteoporosis and its prevention.

Method: A cross-sectional study design with convenience sampling method. It was conducted among (202) female patients attending DXA clinic in Mosul city, Iraq from February to November 2018. The assessment was performed using a structured questionnaire including Osteoporosis Knowledge Assessment Tool (OKAT), concern about osteoporosis and osteoporosis health belief scale (OHBS). Bone mineral density (BMD) measurements were carried out by Dual-Energy X-ray Absorptiometry (DXA). Univariate and Logistic regression were used in data analysis.

Results: The reliability value was 0.881 for the nineteen items in OKAT. The mean (SD) age of the participants was 56.18(11.4) years. Around half of the females (49.0%, n =99) had an intermediate score (9 to 13) of knowledge, while 43.6% (n =88) had a low score (<8). Significant correlation between age and osteoporosis knowledge was found. Only 41.6% had a normal BMD, whereas osteopenia and osteoporosis were found in 47.0% and 11.4% of participants, respectively.

Conclusions: The translated OKAT was reliable and valid instruments for assessment of knowledge and health beliefs toward osteoporosis in female patients. The tools were suitable to recognize patients requiring bone health-promoting intervention concerning changes of lifestyle behavior in a clinical setting.

Keywords: Osteoporosis, Knowledge, Osteoprotective behavior, OKAT, DXA.

Introduction

Osteoporosis is a serious public health concern. The World Health Organization’s definition of osteoporosis is a ‘’bone mineral density value more than 2.5 standard deviations below the mean for the normal young white women’’ [2]. Both males and females are prone to osteoporosis; but it is more common in females, especially after menopause. The most frequent type of osteoporosis is primary osteoporosis [4].

Osteoporosis knowledge is documented to be important in reducing the prevalence of the disease [5]. Previous studies revealed that many females of all ages require knowledge concerning osteoporosis [6].

Valid and reliable tools are required to assess females’ knowledge and beliefs about osteoporosis [7]. To the best of our knowledge, there were no previous studies on osteoporosis in Iraq that assessed the incidence and prevalence of osteoporosis related to women’s knowledge about osteoporosis. Therefore, the aims of this study were to validate and test the reliability of an instrument, which is used to measure osteoporosis knowledge among female patients attending DXA clinic, and to determine female patient’s knowledge and attitudes concerning osteoporosis and its prevention.
Methodology

Study design and setting: A cross-sectional study design was employed to measure osteoporosis knowledge among female patients attending DXA clinic. The DXA clinic is located inside Nineveh Physical Rehabilitation Center in Mosul city, Iraq. Data were collected between February and November 2018.

Participants and sample size: The study participants were female patients attending DXA clinic. Patients were collected using convenience sampling method. Inclusion criteria were adult females attending DXA clinic, while the exclusion criteria were pregnant women and female patients less than 18 years old.

The entire number of patients who attended DXA clinic annually is around 1000; this number was employed as the whole population from which the sample size was drawn. Raosoft sample size calculator (http://www.raosoft.com/samplesize.html) was employed for calculating the required sample size. Employing an accepted margin of error of 5% and a 95% confidence interval, the sample size must be 198 participants [8]. In this study; we had a response rate of 100%.

Current study was approved by the Medical Research and Ethics Committee of the College of Pharmacy, University of Mosul. In addition, an approval from the Ethical Committee of the Nineveh Directorate of Health was also obtained. A written informed consent was taken from all the participants. All participants were assured that their personal information are anonymous as well as confidential and their participation in the study is entirely voluntary.

Measurements: BMD measurements was carried out using DXA [Stratos DR dosimetry (February 2009), DMS–393 - France] at the DXA clinic.

The (OKAT), which was developed by [9], consists of 20 questions to measure knowledge. One question was omitted, so it consists of 19 questions. Every item was answered with “yes”, “no” or “don’t know”.

The (OHBS) was employed to evaluate beliefs which were developed based on the Health Belief Model (HBM) theory. OHBS was developed by [10]. This scale consists of questions on perceived susceptibility, perceptions towards barriers to calcium intake, towards benefits of calcium intake, perceived seriousness and health motivation towards osteoporosis [11]. Females were classified as osteoporotic, normal and osteopenic based on DXA T-scores.

Translation and validation: The five parts of the data collection sheet were translated in accordance with international guidelines [12,13], this was achieved as follows:

1. A forward translation of the original questionnaire was carried out via translation from English to the Arabic.
2. A backward translation from Arabic to English was undertaken by another translator.
3. The translated questionnaire was distributed to 25 females (staff from College of Dentistry at Mosul University) who completed the questionnaire. These females were not included in the final study.
4. The last version of the Arabic questionnaire was finished and made available to study validity and reliability. Around 10 minutes were needed to complete the questionnaire.

Statistical analysis: Data from current study were processed and analyzed using computer-based Statistical Package for Social Science (SPSS, version 18; SPSS Inc., Chicago, Ill). A p-value <0.05 was regarded as statistically significant. To test reliability, the internal consistency was evaluated using Cronbach’s alpha and the criterion for accepting Cronbach’s alpha is a score above 0.5 [14,15]. In addition, inferential statistical methods such as t-test, ANOVA and Binary logistic regression was ere also employed.

Results

Validity and Reliability: For the fifteen items in OHBS, Cronbach’s alpha test of internal consistency was 0.788 that is around 0.7 and within the suggested satisfactory result for reliability [16]. For the nineteen items in OKAT, Cronbach’s alpha test was 0.881.

Demographic characteristics: Current study recruited 202 females whose average (SD) age was 56.18 (11.40) years and ranged from 28 to 85 years. The average (BMI) was 31.64 kg/m² (SD = 5.50) and ranged from 15.52 to 47.67.

Osteoporosis knowledge: The mean ± SD score for the test was 9.96 ± 3.40. The OKAT total score ranged from
0 to 19. Three levels of participants’ knowledge (low, medium and high) were developed by classification of knowledge scores. The frequency(%) of low, medium and high knowledge were 88(43.6), 99(49.0) and 15(7.4), respectively.

Non-parametric statistical tests to find differences in OKAT scores between independent groups were employed. There were significant differences in the OKAT scores between the three educational levels.

Shortened osteoporosis health belief scale: Total belief ranged from 5 to 50 with mean(SD) of 34.84(5.96). No significant differences in the belief scores were found between groups of demographic characteristics.

DXA finding: The mean T-score of study participants was -0.78 ± 1.42. According to DXA measurements, 84(41.6%) of participants had normal BMD, whereas osteopenia and osteoporosis were reported in 95(47%) and 23(11.4%) of them, respectively. No significant correlation was found between T-scores and total knowledge scores of the study participants (p=0.5).

Concern about osteoporosis: Table 1 showed that 48.5% of participants were “very concerned” about osteoporosis, 37.1 % of them rated their risk of getting osteoporosis as being lower than similarly-aged females. In addition, 43.1% of participants rated their risk of having a fracture as lower than age-matched females. Only a small proportion of participants recorded a higher self-rating risk for fracture (26.7%) and to osteoporosis (29.2%). Table (1) presented the differences in OKAT scores among concern about osteoporosis variables of the study population. There were significant differences in the OKAT scores with concern of osteoporosis.

Table 1: Differences in knowledge scores of the study population with regard to concern about osteoporosis

<table>
<thead>
<tr>
<th>Concern of bone health</th>
<th>No. (%)</th>
<th>Total knowledge Mean (SD)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concern of osteoporosis (using a 3-point Likert scale)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very concerned</td>
<td>98 (48.5)</td>
<td>9.08 (3.27)</td>
<td>0.0001</td>
</tr>
<tr>
<td>Little concerned</td>
<td>63 (31.2)</td>
<td>10.23 (3.71)</td>
<td></td>
</tr>
<tr>
<td>Unconcern</td>
<td>41 (20.3)</td>
<td>11.63 (2.41)</td>
<td></td>
</tr>
<tr>
<td>Rating risk of osteoporosis</td>
<td></td>
<td></td>
<td>0.07</td>
</tr>
<tr>
<td>Little</td>
<td>75 (37.1)</td>
<td>10.62 (3.39)</td>
<td></td>
</tr>
<tr>
<td>Equivocal</td>
<td>68 (33.7)</td>
<td>9.33 (3.65)</td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>59 (29.2)</td>
<td>9.83 (2.98)</td>
<td></td>
</tr>
<tr>
<td>Rating risk of fracture</td>
<td></td>
<td></td>
<td>0.3</td>
</tr>
<tr>
<td>Little</td>
<td>87 (43.1)</td>
<td>10.20 (3.49)</td>
<td></td>
</tr>
<tr>
<td>Equivocal</td>
<td>61 (30.2)</td>
<td>10.14 (3.62)</td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>54 (26.7)</td>
<td>9.35 (2.94)</td>
<td></td>
</tr>
</tbody>
</table>

Logistic regression analysis of osteoporosis: The dependent variable (outcome) is T-score. It was dichotomized into either normal or pathological bone status. The independent variable (predictors) included age, BMI, education, employment, income, dichotomous smoking, chronic illness and medication, lastly total knowledge and belief scores. Wald test was used to determine the predictor/s that significantly contributes to developing osteoporosis with its odd ratio (Exp B). In summary, 22% of variation in chance of developing osteoporosis is explained by this logistic model. Table (2) showed the results of logistic regression between factors and T score.

Table 2: Multivariate association between factors and T-score

<table>
<thead>
<tr>
<th>Predictors</th>
<th>B</th>
<th>SE</th>
<th>Wald</th>
<th>DF</th>
<th>P</th>
<th>Exp. (B)</th>
<th>95% CI of Exp. (B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>0.054</td>
<td>0.017</td>
<td>10.253</td>
<td>1</td>
<td>0.001*</td>
<td>1.055</td>
<td>1.021-1.091</td>
</tr>
<tr>
<td>BMI</td>
<td>-0.086</td>
<td>0.031</td>
<td>7.576</td>
<td>1</td>
<td>0.006*</td>
<td>0.918</td>
<td>0.864-0.976</td>
</tr>
<tr>
<td>Education</td>
<td>-0.496</td>
<td>0.181</td>
<td>7.508</td>
<td>1</td>
<td>0.006*</td>
<td>0.609</td>
<td>0.427-0.868</td>
</tr>
<tr>
<td>Medication</td>
<td>-0.974</td>
<td>0.462</td>
<td>4.442</td>
<td>1</td>
<td>0.035*</td>
<td>0.378</td>
<td>0.153-0.934</td>
</tr>
</tbody>
</table>

Model Chi-squared test = 11.503, P<0.05. Hosmer and Lemeshow goodness of Fit test: (P= 0.1, n= 202, df= 8). CI= Confidence Interval, *: P<0.05.
Discussion

The aim of current study was to measure osteoporosis knowledge among female patients attending DXA clinic. The OKAT was used by many studies. A number of studies used OHBS [11]. Concern about osteoporosis was used by a study conducted in Australia [3].

The 15-item OHBS was internally reliable with a good overall Cronbach’s alpha (0.788). Additionally, the degree of consistency for OHBS was comparable [10].

The 19-item OKAT was internally reliable with a good overall Cronbach’s alpha (0.881). Moreover, the degree of consistency for OKAT was comparable to [9]. The reliability and validity results revealed effective cultural adaptation of the translated tool from the English version in an Arabic population.

The mean score of knowledge in current study was 9.96. A study among Syrian females revealed similar results as the mean score was 9.4 [7].

The majority of women in this study reported having a “lower or same” risk compared to other aged-matched females who were rating their own risk of getting osteoporosis and future fracture. The same result was found by a study conducted among Australian female participants [9]. The results of this study showed that osteoporosis knowledge was significantly associated with concern of osteoporosis. An unexpected result that appeared in the present study was the inverse relationship between osteoporosis knowledge and concern of osteoporosis. The majority of patients were concerned regarding osteoporosis. Concern was not significantly associated with behavior besides looking for medical advice [3].

Osteoporosis health beliefs were examined in this study. The present study did not find a significant association between the belief scores and demographic characteristics of participants. Significant differences in belief scores were found with history of secondary osteoporosis, however, no significant differences in belief scores were found with concerns about osteoporosis variables. The osteoporosis knowledge was significantly associated with perceived susceptibility. It was a sensible finding that females with low level of knowledge felt more susceptible to develop osteoporosis than others with intermediate or high levels of knowledge. As the latter had more information about the disease and its risk factors which they can avoid, they considered themselves less susceptible to osteoporosis.

The findings of this study revealed a significant association between T-score, Z-score (with history of secondary osteoporosis) and history of using drugs for osteoporosis, as T-score and Z-score decrease in patients with osteoporosis and osteopenia. Similarly, significant differences in T-score and Z-score were found with history of use of corticosteroids in last 3 months. The latter finding could be attributed to the adverse bone-related biochemical effects of oral and inhaled corticosteroids, which had been verified in animal studies to induce bone resorption and cause osteoporosis [18]. There was no significant association between T-score or Z-score and concerns about osteoporosis variables or with the five belief domains.

Conclusion

Current study found that the translated OKAT, OHBS and concern about osteoporosis were valid and reliable instruments to recognize persons who are in real need for educational intervention to provide protection against the disease. Actions to enhance concerns in addition to knowledge are required, particularly for individuals who have other risk factors of developing osteoporosis complications. Determining female’s beliefs, behaviors and knowledge concerning osteoporosis is useful in formulating effective interventions and conducting community health programs to avoid the disease.

Ethical Clearance: The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding.

REFERENCES


Isolation and Identification of Dermatophytes Causing Dermatophytosis in Hilla City, Iraq

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ABSTRACT

Background: Dermatophytes are a group of closely related keratinophilic and keratinolytic filamentous fungi, which are most commonly of the Trichophyton genus and less commonly of the Microsporum or Epidermophyton genera. Cutaneous fungal infection is divided into superficial and deep mycosis. Superficial infection is limited to the stratum corneum affecting the skin (Tinea corporis, Tinea cruris, Tinea pedis), hair (Tinea capitis), beard (Tinea barbae), nails (onychomycosis or Tinea unguium). The purpose of this study was to determine the dermatophyte species causing superficial fungal infections among patients attending dermatology out-patient clinic in Al-Imam Al-Sadiq Teaching Hospital of Hilla city, Babylon Province, Iraq during the period from June 2017 to May 2018.

Method: One hundred and twenty nine samples were examined by 10% KOH and cultured on Sabouraud’s dextrose agar with cyclohexamide and chloramphenicol to identify the dermatophytes species. All skin, hair and nail samples from clinically suspected cases of dermatophytosis were included in the study.

Results: Data from current study showed that 74 females and 55 males were considered as the total number of patients selected. Dermatophytes were isolated from 95 out of the 129 patients included in this study. The isolated Dermatophytes included predominantly Trichophytone species [T. rubrum 19(20%), T. verrucosum 11(11.57%) and T. violaceum 11(11.57%)] followed by Microsporum species [M.gypseum 10(10.52%), M.canis 7(7.36%) and M.nanum 6(6.31%)], all rated from high to low incidence. Tinea unguium was the most common 31(32.63%) clinical type of dermatophytosis encountered in our study, as compared to other types like tinea pedis 23(24.21%), tinea capitis 20(21.05%), tinea mannum 13(13.68%), tinea barbae 5(5.26%)and tinea corporis 3(3.15%). The study also showed that the incidence of Dermatophytosis was higher in females with 61(64.21%) cases as compared to males with 34(35.79%) cases.

Conclusion: Dermatophytosis is a major public health problem in tropical and subtropical countries, like Iraq, yet remains unresolved. Most common fungal species isolated were Trichophyton species.

Keywords: Dermatophytes, Dermatophytosis, Tinea, Trichophyton, 10% KOH.

Introduction

Dermatophytes are a group of closely related keratinophilic and keratinolytic filamentous fungi which are most commonly of the Trichophyton genus and less commonly of the Microsporum or Epidermophyton genera (¹). The anthropophilic dermatophytes (commonly isolated from human infection) are the most common source of human dermatomycosis. These tend to evoke a limited host response and are less likely to be accompanied by severe inflammation or to clear spontaneously.

Dermatophytosis is due to severe inflammatory reaction, particularly true in the case of tinea infections caused by zoophilic species (commonly isolated from animal infection (²). Tinea capitis, tinea pedis and onychomycosis are common dermatologic diseases that may result from such an infection (¹,³,⁴).

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Dermatophyte infections of the skin are variable in clinical presentation which varies according to location of infection and the specific dermatophyte species causing it (7). The inflammatory symptoms are often absent in skin infection, but in other cases they may be very pronounced, in particular when caused by zoophilic Dermatophytes (8). Clinical diagnosis should be supported by laboratory diagnosis. Culture is a necessary adjunct to direct microscopic examination for the identification of etiological agent and the choice of therapy depends upon the specific identification of the fungi causing the Dermatophytosis (4).

Tinea infections can be treated either topically or systemically; the method chosen will depend on type of tinea infection, severity of infection and patient’s preferences (7). Some cases (moderate to severe disease) require systemic anti-fungal therapy for adequate tissue penetration. The purpose of this study was to determine the dermatophyte species causing superficial fungal infections among patients attending dermatology outpatient clinic in Al-Imam Al-Sadiq Teaching Hospital of Hilla city, Babylon Province, Iraq during the period from June 2017 to May 2018.

Materials and Method

The study was conducted at the dermatology outpatient clinic in Al-Imam Al-Sadiq Teaching Hospital in Hilla city, Babylon Province, Iraq, during the period from June 2017 to May 2018. Total number of patients was 129 for skin scraping, hair stubs and nail clipping. Patients were referred to out-patient clinic, department of dermatology in Hilla city, Province of Babylon, Iraq. The study population consisted of 74 females and 55 males. Collected samples were preserved in laboratory test tubes and sent to the laboratory for microorganisms’ isolation and diagnosis. Samples were marked for cases data (name, age, sex, type, site of infection and date of collection). Skin samples were collected using a sterile scalp knife blade and the skin scraping was collected onto prepared Sabouraud’s media in duplicate. One culture media was incubated at 37°C, while the other was incubated at room temperature (25°C). Incubated plates were inspected for fungal growth on a daily basis. Fungal isolates that existed as mixed growth were subcultured each on different plates so as to obtain pure growth. Having obtained pure growth (which took about 3 to 7 days) cultures showing no growth in a period of 4 weeks were discarded. The macroscopic features on the forward as well as the reverse side of the plate were observed under a Biosafety Cabinet Class-II. Thereafter, a drop of lacto phenol cotton blue was put on a clean slide and using a piece of cello tape, the fungi were gently touched and fixed on a slide containing lacto phenol blue. The slides were viewed under low power (10x objective) and then under medium or 40x objective lens. The microscopic appearance was recorded by drawing.

The samples were subjected to 10% KOH and 20% for identification of nail samples. After 30 minutes the specimens were examined for the presence of hyphae or erythro-spores. Clinical samples followed appropriate techniques for handling specimens as per established guidelines. Culture media used were Sabouraud’s Dextrose Agar (SDA), prepared by using 65.0 grams suspended in 1000ml distilled water, heating till boiling to dissolve the medium completely, then sterilized by autoclaving at 15 lbs pressure (121°C) for 15 minutes and cooled down to 45-50°C. Chloramphenicol and Cyclohexamide were added, then mixed well and poured into sterile Petri plates (9).

Results

Current study recruited 129 patients divided into 74 females and 55 males. Dermatophytes were isolated from 95 out of the 129 patients included in the study and identified 18 species related to 6 phenotypes (Table 1). The isolated Dermatophytes included predominantly Trichophyton species [T. rubrum (9), T. verrucosum 11 (11.57%) and T. violaceum 11 (11.57%)] followed by Microsporum species [M. gypseum 10 (10.52%), M. Canis 7 (7.36%) and M. Nanum 6 (6.31%)], all rated from high to low incidence (Table 1 and Figure 1). Tinea unguium was the most common 31 (32.63%) clinical type of dermatophytosis
encountered in our study, as compared to other types like tinea pedis 23 (24.21%), tinea capitis20 (21.05%), tinea mannum 13(13.68%), tinea barbae 5(5.26%)and tinea corporis 3(3.15%). Also, the Yeast speices (Candida) was isolated notably candida parapsilosis 4(4.2%) cases that infect the nail (Tinea unguium) (Table 2, Figure 2).

Table 1: Total numbers of dermatophytes isolated in current study and sex distribution of patients

<table>
<thead>
<tr>
<th>No.</th>
<th>Dermatophytes</th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Aspergillus flavus</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1.05</td>
</tr>
<tr>
<td>2</td>
<td>Aspergillus fumigatus</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1.05</td>
</tr>
<tr>
<td>3</td>
<td>Candida albicans</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>2.10</td>
</tr>
<tr>
<td>4</td>
<td>Candida parapsilosis</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>4.2</td>
</tr>
<tr>
<td>5</td>
<td>Candida tropicalis</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>2.10</td>
</tr>
<tr>
<td>6</td>
<td>Chrysosporium keratinophilum</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>2.10</td>
</tr>
<tr>
<td>7</td>
<td>Chrysosporium tropicum</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1.05</td>
</tr>
<tr>
<td>8</td>
<td>Epidermophyton floccosum</td>
<td>2</td>
<td>5</td>
<td>7</td>
<td>7.36</td>
</tr>
<tr>
<td>9</td>
<td>Microsporum canis</td>
<td>3</td>
<td>4</td>
<td>7</td>
<td>7.36</td>
</tr>
<tr>
<td>10</td>
<td>Microsporum gypseum</td>
<td>4</td>
<td>6</td>
<td>10</td>
<td>10.52</td>
</tr>
<tr>
<td>11</td>
<td>Microsporum nanum</td>
<td>1</td>
<td>5</td>
<td>6</td>
<td>6.31</td>
</tr>
<tr>
<td>12</td>
<td>Microsporum persicolor</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>3.15</td>
</tr>
<tr>
<td>13</td>
<td>Trichophyton kanei</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>2.10</td>
</tr>
<tr>
<td>14</td>
<td>Trichophyton mentagrophytes</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td>3.15</td>
</tr>
<tr>
<td>15</td>
<td>Trichophyton mentagrophytes var. mentagrophytes</td>
<td>0</td>
<td>3</td>
<td>3</td>
<td>3.15</td>
</tr>
<tr>
<td>16</td>
<td>Trichophyton rubrum</td>
<td>8</td>
<td>11</td>
<td>19</td>
<td>20</td>
</tr>
<tr>
<td>17</td>
<td>Trichophyton verrucosum</td>
<td>4</td>
<td>7</td>
<td>11</td>
<td>11.57</td>
</tr>
<tr>
<td>18</td>
<td>Trichophyton violaceum</td>
<td>3</td>
<td>8</td>
<td>11</td>
<td>11.57</td>
</tr>
<tr>
<td>Total number of dermatophytes</td>
<td>34</td>
<td>61</td>
<td>95</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Figure 2: Percentage distribution of clinical types

Table 2: Gender distribution and percentages according to clinical types of dermatophytosis

<table>
<thead>
<tr>
<th>Clinical type</th>
<th>Percentage of cases</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Males</td>
</tr>
<tr>
<td>Tinea pedis</td>
<td>11.57</td>
</tr>
<tr>
<td>Tinea capitis</td>
<td>7.36</td>
</tr>
<tr>
<td>Tinea mannum</td>
<td>5.26</td>
</tr>
<tr>
<td>Tinea Barbae</td>
<td>3.15</td>
</tr>
<tr>
<td>Tinea corporis</td>
<td>3.15</td>
</tr>
<tr>
<td>Total</td>
<td>35.79</td>
</tr>
</tbody>
</table>
The study also showed that the incidence of Dermatophytosis was higher in females with 61(64.21%) cases as compared to males with 34(35.79%) cases and Tinea unguium 20(21.05%) was the most common clinical type caused by 10 dermatophytes species (T.rubrum, T.violaceum, T. verrucosum, M. canis, T.kanei, Epidermophyton floccosum, Candida tropicalis, Candida parapsilosis, Candida albicans, T. mentagrophytes, var. mentagrophytes) followed by Tinea pedis 16(16.84%), Tinea capitis 15(15.78%) and Tinea mannum 10(10.52%) (Table 2).

Discussion

Dermatophytosis is a major public health problem in tropical and subtropical countries like Iraq, yet remains unresolved. The incidence is increasing due to widespread use of corticosteroids and antifungal agents without appropriate microbiological investigations (9). Therefore, it is essential that good laboratory methods are available for the rapid and precise identification of the dermatophytes involved in order to apply appropriate treatment and preventive measures (10). In the present study, 129 clinically suspected cases of tinea infections were examined over a period of 12 months, among which the most common fungal species was Trichophyton species then Microsporum species, and this result was in agreement with (11,12) who found that infection with Trichophyton species was the highest. T. rubrum was the most common isolate, followed by T. verrucosum, T. violaceum then M. gypseum, M. canis and M. nanum, 6(6.31%), 19(20%), 11(11.57%), 10(10.52%), 7(7.36%) and 11(11.57%), respectively. These results were in agreement with (13-19) who found that T. rubrum was the most common isolate, and disagreed with other Iraqi studies (20-22) who found that tinea capitis and tinea corporis were the commonest clinical types. So the reason may return to enzymes lipase and phospholipase produced by this dermatophytes which play a major role in penetrating the tissues of the host. On the other hand, T. verrucosum and T. violaceum were less common isolates which cause different types of tinea, notably tinea unguium, tinea corporis, tinea capitis and tinea barbae that may be attributed to high ability to produce elastase enzyme.

Table 3: Results of various studies shown T. rubrum as the commonest isolate

<table>
<thead>
<tr>
<th>Study</th>
<th>Dermatophytes</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agarwalla et al., 2001</td>
<td>T. rubrum</td>
<td>45.74</td>
</tr>
<tr>
<td>Asticcioli et al., 2008</td>
<td>T. rubrum</td>
<td>42.3</td>
</tr>
<tr>
<td>Bindu V et al., 2002</td>
<td>T. rubrum</td>
<td>66.2</td>
</tr>
<tr>
<td>Sumana MN et al., 2002</td>
<td>T. rubrum</td>
<td>52.7</td>
</tr>
<tr>
<td>Samia A.G.et al., 2006</td>
<td>T. rubrum</td>
<td>15.65</td>
</tr>
<tr>
<td>Seema Bose et al., 2013</td>
<td>T. rubrum</td>
<td>33.3</td>
</tr>
<tr>
<td>A.Anupama et al., 2017</td>
<td>T. rubrum</td>
<td>33</td>
</tr>
<tr>
<td>Present Study</td>
<td>T. rubrum</td>
<td>20</td>
</tr>
</tbody>
</table>

T: Trichophyton.
Tinea unguium was the most clinical type of dermatophytosis with an incidence of 32.36%, caused by 10 dermatophyte species, and the most common was T. rubrum. Onychomycoses in females were more frequent than in males. This is mainly due to the contact with water and detergents in home work and potential fungal nutrient such as sugar as well as trauma produced by manicure and modern life style. Similar results were shown by other studies (22-28).

**Conclusion**

Dermatophytosis is a major public health problem in tropical and subtropical countries, like Iraq, yet remains unresolved. Most common fungal species isolated were *Trichophyton* species.

**Ethical Clearance:** The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding.

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11. Jha BK, Murthy S, Devi NL. Molecular identification of dermatophytosis by polymerase chain reaction (PCR) and detection of source of infection by restricted fragment length polymorphism (RFLP); 2013.


Dental Plaque as a Probable *Helicobacter Pylori* Reservoir

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**ABSTRACT**

**Background:** The natural reservoir and the specific mode of transmission for *Helicobacter Pylori* are unknown. Although the importance of *H. Pylori* culturing resides in the knowledge gained about their growth characteristic. Polymerase chain reaction had demonstrated great sensitivity and specificity than considered as the optimal method for identifying *H. Pylori* DNA in the oral cavity. The goal of this study was to investigate the occurrence of *H. Pylori* in the oral cavity with the biochemical characteristics and molecular identification of its strains by culturing and targeting 16S ribosomal RNA.

**Method:** During the period of study, a total of 95 dental plaque samples from patients in the age group (6-65 years) were collected. Dental plaque sample was discrete separately in 3ml of urea broth with urea supplement to detect the urease activity through change in color after one night and in 3ml of trypticase soy broth with 5% serum for proliferation and activation of microorganisms presenting in the plaques.

**Results:** Urease-positive activity was detected in 53(55.9%) out of the 95 samples. Then, just urease-positive specimens were cultured in chocolate agar under standard conditions for these bacteria. Only 11(11.7%) out of 53 urease-positive samples showed positive results according to biochemical test and morphologic characters. The isolated bacteria were confirmed by one sets of 16S ribosomal RNA primer F (AGAGTTTGATCCTGGCTCAG), R (GGTTACCTTGTTACGACTT) were used for PCR after total DNA extracted from isolated colonies of bacteria by specific methods. Pure DNA for 28(52%) of 53 samples was amplified with universal primer that we chose and yielded 1500bp DNA product when monitored by 1.5% agarose gel and visualized by UV-light instrument. Twenty-five (47.16%) out of 53 samples displayed negative results.

**Conclusion:** We believe that it is necessary to pay close attention to dental plaques as a second reservoir of *H. Pylori* colonization and possible source of infection. In this study we found the presence of *H. Pylori* was more in healthy children dental plaques than in adult patients, perhaps related to their living conditions.

**Keywords:** *Helicobacter pylori*, polymerase chain reaction, dental plaque, Chocolate agar, urease-positive.

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**Introduction**

*Helicobacter pylori* (H. pylori) are gram negative bacteria that cause most prevalent disease in the world. The organism is found in the stomach of half of adults in developed countries and it is almost universal in developing countries (¹). *H. pylori* first isolated by Warren and Marshall in 1983, it is the most common cause of gastritis, gastric ulcer, duodenal ulcer and gastric adenocarcinoma, one of the most common causes of cancer death in the world (²). It is also linked to gastric mucosa-associated lymphoid tissue (MALT) lymphoma (³). Mode of transmission for *Helicobacter Pylori* is unknown yet (⁴). Humans usually acquire bacteria in the first few years of life and persist lifelong unless treated (⁵). *H. pylori* has many virulence factors, some of these are present in all strains of bacteria such as urease and flagella, but not all strains are contracted with clinical symptoms (⁶). Motility and urease production are very important to establish infection and colonization. Urease enzyme neutralizes stomach acidity by hydrolysis of urea into carbon dioxide and ammonia ions, thus allowing *H.
Helicobacter pylori to persist in acidic environment (7). Other most significant virulence factors associated with gastric pathogenesis include production of cytotoxin (cagA protein) and vacuolating cytotoxin (vacA). Helicobacter pylori infection elicits a strong immune response, resulting in high titers of anti-H. pylori antibodies (Abs) and this response is not adequate for elimination of the pathogen unless treated with antibiotics (8). Although several previous studies investigated routes of transmission of H. Pylori infection, the exact mode and type of transmission of H. Pylori infection is not known yet, but it was assumed to be person-to-person by the fecal-oral contamination or by contact with gastric secretions in some other way (9,10). The presence of H. pylori in stomach, saliva, dental plaque and feces shows that the oral and fecal cavities are most likely involved in H. pylori transmission. Consideration of oral cavity as the secondary reservoir for H. pylori remains controversial since the isolation rate of this bacterium in the mouth is very diverse (11). However, there are a number of reports concluded that there is a major relationship between gastric and oral H. pylori infections (12). Recently, diverse studies in different geographical areas had evaluated the prevalence of H. pylori genes in saliva and dental plaque, but it has not been extensively studied in Iraq.

The aim of current study was to evaluate the prevalence of H. pylori in dental plaque by adapting two different approaches, culture method depending on biochemical characteristic with culturing morphologic form of these bacteria and polymerase chain reaction (PCR) method to confirm isolates and to assess the presence of 16S rRNA genotypes in dental plaque of Iraqi people with and without peptic ulcer.

Material and Method

Sample Collection: An informed consent was obtained from patients whereby patients who agreed to take part in a study gave a permission to collect information and patient’s history. In this study, 95 dental plaque samples from patients between (6-65 years) with mean(SD) age of 25.8 (14.8) were recruited from different areas in Babylon Health Directorate (Al-Shonly hospital, The Specialist Dental Center, The health Center in Shomaly) during the period from August to November 2018. Dental plaque was removed from the at least two teeth surfaces (one anterior and one posterior) with a sterile periodontal curette. Both supra- and sub gingival plaques were collected by an upward scrape against the teeth surfaces. Subjects with diabetes, HIV-positive patients, smokers, pregnant women, and patients who had taken antimicrobials within the previous 2 months were excluded from the study.

Isolation of Helicobacter pylori: All dental plaque samples cultivated in trypticase soy broth which was prepared according to manufactured procedures supplemented with 5% human free H. pylori antibody serum and incubated at 37°C overnight for bacterial activation and proliferation. All test tubes having bacterial growth were centrifuged and the supernatant removed. Remaining pellet was transferred to urea broth with phenyl red indicator and incubate at 37°C overnight to detect bacterial urease activity through change in color. Each urease-positive sample was spread onto chocolate agar supplemented with trimethoprim, vancomycin and fluconazole to prevent over growth of gram positive bacteria and fungi and plates were incubated for (4-7) days at 37°C under microaerophilic condition (5% O2, 10% CO2 and 95% humidity) (13). Bacterial isolates were reliable with H. pylori in shape, morphology, enzymatic activity (oxidase, catalase, urease) and Gram-negative status.

Molecular Identification of Helicobacter pylori: Fifty-three isolates of H. Pylori from ninety-five samples by morphological characters and biochemical tests were confirmed by molecular method using (PCR) technique. DNA extraction from isolated colonies with wizard genomic DNA purification kit (promega/USA) according to manufacturer’s procedures then amplified by PCR with specific sequence of 16S rRNA primer (forward [F27] 5’-AGAGTTTGATCCTGGCTCAG-3’ and reverse [R1492] 5’-GGTTACCTTGTACGACTT-3’) (14). These primers bind to universally conserved regions and allow the amplification to occur producing approximately 1500bp fragments. The PCR amplification was carried out by PCR system (cleaver/USA). The amplification conditions were as follows: initial denaturation at 94°C for 10min and 35 cycles of denaturation at 95°C for 30s; annealing at 56°C for 1min; extension at 72°C for 1min; and final extension at 72°C for 10min. The presence of 1500bp specific PCR products (16S rRNA) was visualized by running 1.5% agarose gels.
Results

During the period of study, 95 dental plaque samples were collected and analyzed to detect the prevalence of Helicobacter pylori in oral cavity. Samples from patient were distributed according to age into 6 groups (Figure 1), then we adopted two different methods in this study, and the results of these methods were widely different from each other.

![Figure 1: All 95 dental plaque samples distributed in to the six groups according to patients ages](image)

**Culture part of the study:** After incubating samples with TSB and subculture in chocolate agar for early diagnosis, 53 (55.9%) samples from the total 95 gave urease-positive when incubated with urea broth, while only 11 (11.7%) samples demonstrated *Helicobacter pylori* characters, morphologic form and biochemical activity in chocolate agar (Table 1).

**Table 1:** Results for urease-positive and growth on chocolate agar distributed among six age groups of patients

<table>
<thead>
<tr>
<th>No.</th>
<th>Patients age group/yr</th>
<th>No.(%)</th>
<th>Urease positive No. (%)</th>
<th>Growth in chocolate agar No. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>6-15</td>
<td>20 (21.1)</td>
<td>17 (17.9)</td>
<td>4 (4.2)</td>
</tr>
<tr>
<td>2.</td>
<td>16-25</td>
<td>13 (13.7)</td>
<td>10 (10.5)</td>
<td>3 (3.2)</td>
</tr>
<tr>
<td>3.</td>
<td>26-35</td>
<td>17 (17.9)</td>
<td>9 (9.5)</td>
<td>No growth</td>
</tr>
<tr>
<td>4.</td>
<td>36-45</td>
<td>22 (23.2)</td>
<td>13 (13.7)</td>
<td>2 (2.1)</td>
</tr>
<tr>
<td>5.</td>
<td>46-55</td>
<td>14 (14.7)</td>
<td>3 (3.2)</td>
<td>1 (1.1)</td>
</tr>
<tr>
<td>6.</td>
<td>56-65</td>
<td>9 (9.5)</td>
<td>1 (1.1)</td>
<td>1 (1.1)</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>95 (100)</td>
<td>53 (55.9)</td>
<td>11 (11.7)</td>
</tr>
</tbody>
</table>

**Molecular part of the study:** All 53 urease-positive isolates obtained from urea broth undergone molecular method using PCR to confirmed detection and isolation. Data revealed that 28 (52.8%) samples from all 53 isolates amplified with universally 16S rRNA primers and produced 1500bp PCR product size bands (Table 2).

**Table 2:** Percentage of DNA samples which were amplified with 16S rRNA primer and gave positive results

<table>
<thead>
<tr>
<th>No.</th>
<th>Patients age group/yr</th>
<th>DNA samples from urease-positive groups</th>
<th>DNA samples gave positive result (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>6-15</td>
<td>17</td>
<td>11 (20.7)</td>
</tr>
<tr>
<td>2.</td>
<td>16-25</td>
<td>10</td>
<td>7 (13.2)</td>
</tr>
<tr>
<td>3.</td>
<td>26-35</td>
<td>9</td>
<td>3 (5.7)</td>
</tr>
<tr>
<td>4.</td>
<td>36-45</td>
<td>13</td>
<td>6 (11.3)</td>
</tr>
<tr>
<td>5.</td>
<td>46-55</td>
<td>3</td>
<td>1 (1.9)</td>
</tr>
<tr>
<td>6.</td>
<td>56-65</td>
<td>1</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>53</td>
<td>28 (52.8)</td>
</tr>
</tbody>
</table>
Discussion

H. pylori infection is considered one of the most common bacterial infections in human. The infection is widely accepted as an important cause of gastritis and is strongly associated with peptic ulcer disease and gastric cancer. The human stomach was considered to be the only reservoir for H. pylori until bacteria were discovered in the oral cavity of humans (dental plaque, saliva) (15). There were various reports from different studies about the isolation rate of H. pylori from dental plaques ranged from 0 to 90%. In addition, there was a disagreement among several studies about the relationships between the prevalence of H. pylori in dental plaque and it is pathogenicity for the stomach. Some studies shown that there was no association between H. Pylori of dental plaque and stomach (16) and some researchers suggested that H. pylori should be categorized as normal flora of the oral cavity (17). This controversy among different studies reflected differences in the design as well as target populations of those studies. Our study adopted culturing and PCR methods for detected H. Pylori in dental plaques. The results exhibited wide variation between these methods as shown in (Tables 1 and 2). In Table (1), we shown 53 samples gave urease positive test, while PCR analysis gave only 28 isolates from the entire population of current study (95 samples). On the other hand, Table (2) suggested that urease-positive bacteria recovered from dental plaques perhaps belong to H. Pylori-like organisms, but they were negative on H. Pylori specific PCR examination thus demonstrating the possibility of false identification (18). For this reason, in our study urease test was not used for detection thus we continued and cultivated urease-positive organisms in chocolate agar under specific H. Pylori-cultivating conditions. The results showed few H. Pylori organisms as shown in Table (1). Several previous studies attempted to cultivate oral cavity H. Pylori. Indeed, the reported culture-positive rates were very low from various oral samples including dental plaques (19). Finding of these past studies were approximately similar to our findings. The main difficulties of bacterial cultures from oral cavity specimens were due to the presence of coccoid forms of H. Pylori maybe caused by the increased oxygen environment, the presence of numerous other microorganisms in the oral cavity which competed with H. Pylori then made culturing more difficult and/or there might be a small number of colonies of H. Pylori for culture (20). On the other hand, our PCR results in this study (Table 2) revealed that children harbored more H. Pylori than adults. This finding was in agreement with a previous study that suggested that the infection is most often acquired in childhood (21). Poor oral hygiene and socioeconomic conditions such as living in crowded areas probably responsible for almost incidence of present H. Pylori in children between the age of 6 and 15 years (22). By depending on culture and molecular methods for isolation of H. pylori from patients in different ages, we have shown that the prevalence of these bacteria in the oral cavity of children was higher than that in adult patients (Figure 2).

Conclusion

We believe that it is necessary to pay close attention to dental plaques as a second reservoir of H. Pylori colonization and possible source of infection. In this study we found the presence of H. Pylori was more in healthy children dental plaques than in adult patients, perhaps related to their living conditions. Our final results were discussed above confirmed by PCR technique. Although the culture is considered an important methodology for isolating bacteria, PCR method is considered more reliable especially with dental plaque samples.

![Figure 2: Adopted three methods (urease test, growth on solid media and molecular test) to isolate H. pylori from dental plaques of different six groups of patients.](image-url)
**Ethical Clearance:** The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding.

### REFERENCES


Exploration of Potential Link between Prevalence of Irritable Bowel Syndrome and Seropositivity for *Helicobacter pylori*

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¹Department of Pharmacy, Al-Zahrawi University College, Karbala, Iraq

ABSTRACT

**Background:** Irritable bowel syndrome (IBS) is a chronic gastrointestinal condition mainly manifested by abdominal pain, discomfort and alteration in gut habits. Therapeutic approaches are mainly focused on symptoms mitigation and modification of life style. It was believed that GIT infection, inflammation and changes in mucosal flora may be involved in IBS development. Abnormal modification of gut-nervous system interaction may be also implicated. *Helicobacter pylori* (*H. pylori*) is a well-known cause of peptic ulcer with greater prevalence in developing communities. Some studies have linked this gram negative bacterium with several extra-gastric diseases like pre-eclampsia. It was proposed that infection with *H. pylori* can initiate systemic inflammation leading to IBS development through alterations in gut permeability, normal flora and interaction with nervous system. However, the precise association between IBS prevalence and *H. pylori* infection is still controversial. The aim of current study was to evaluate any possible relationship between irritable bowel syndrome prevalence and *Helicobacter pylori* seropositivity.

**Method:** Lateral flow immunochromatographic assay was employed to screen 30 IBS patients and 30 control (without IBS) volunteers for *H. pylori* IgG antibodies.

**Results and Conclusions:** Our regression analysis didn’t show any significant association between irritable bowel syndrome prevalence and *H. pylori* seropositivity.

**Keywords:** Irritable bowel syndrome, Helicobacter pylori, nervous system, seropositive, flow immunochromatographic assay.

Introduction

Irritable bowel syndrome (IBS) is a functional gastrointestinal disorder with a global incidence ranging between 10% -15% (1). This chronic condition is mainly characterized by changes in bowel habits associated with abdominal discomfort and pain (2). The incidence of IBS is more common among female patients and the onset of IBS symptoms can be observed in early adulthood (3). Therapeutic strategy is mainly focused on modification of life style and symptoms alleviation (2).

The underlying cause of irritable bowel syndrome is not clear, but several hypotheses had been proposed. An alteration in interaction between gastrointestinal tract (GIT) and nervous system seemed to be mainly involved (4). Additionally, GIT mucosal inflammation, changes in gut normal flora and infection are well recognized in IBS patients (5,6). The end result of these proposed mechanisms is a pathological alteration of mucosal permeability and sensitivity of GIT (7).

*Helicobacter pylori* (*H. pylori*) is a well-known microbial cause of peptic ulcer and gastritis, it has been linked to several extra-gastric diseases like asthma and pre-eclampsia (8). Some strains of this gram negative bacteria possess several virulence factors like cytotoxin associated gene A (CagA), this antigen can trigger an inflammatory reaction that may predispose the host to develop IBS (9).
It was believed that systemic inflammation triggered by *H. pylori* infection can enhance mucosal permeability of GIT and change gut flora \(^9,^{10}\). Mucosal infiltration of lymphocytes and mast cells in GIT can elicit the release of inflammatory mediators like substance P leading to modification of gut-brain interaction \(^{(11)}\). Finally, the ongoing inflammation can stimulate hypothalamus-pituitary-adrenal axis (stress axis) \(^{(12)}\).

However, the precise link between *H. pylori* infection and prevalence of IBS is still controversial and a matter of debate in scientific community \(^{(7)}\). The aim of current study was to obtain a better insight into such possible relationship by screening IBS patients and normal volunteers for *H. pylori* IgG antibodies.

**Materials and Method**

**Study Sample:** Our screening study was performed between December 2018 and February 2019. For this case-control research, sixty volunteers were selected randomly from several gastroenterology clinics in Karbala, Babylon and Baghdad provinces. The implemented protocol for this project was in accordance with the guideline of Iraqi board of medical specialities.

Of these volunteers, thirty patients with a confirmed IBS diagnosis were selected as a case group, the diagnosis was in compliance with Rome IV criteria \(^{(2)}\). The other thirty individuals with no IBS diagnosis were included as a control group. A verbal consent was acquired from each volunteer.

Both demographic and clinical characteristics were reported for each participant. A previous history of having *H. pylori* eradication therapy was considered as an exclusion criterion.

**Immunochromatography assay:** The Accutest *H. pylori* cassette test kit from Jant Pharmacal Corporation was used for serological screening of IgG antibodies. Five milliliters of blood were collected from each volunteer in a vacutainer tube. After clotting of blood specimen, the serum was separated and collected by centrifugation.

As specified by the manufacturer, one drop of serum was applied to the cassette well followed by the addition of washing buffer; the final result was then reported after 2-3 minutes. The appearance of the control line only was regarded as a negative reading, while the recognition of both control and test lines was an indication for presence of *H. pylori* IgG antibodies. Failure to develop any line or the appearance of only test line in the cassette was considered invalid reading.

**Statistical analysis:** Our continuous data were described as median and range, both case and control groups were compared by using Mann-Whitney test. On the other hand, categorical data were reported as frequency and percentage. The difference between control and case groups was assessed by using Chi-squared test; Fisher’s exact test was employed in some instances when small sample size is encountered. The above statistical analyses were accomplished by using Graph Pad prism version 5.01.

Logistic regression was utilized to investigate the relationship between IBS prevalence and *H. pylori* seropositivity. The difference in gender was implemented as a covariant to calculate degree of association. IBM SPSS Statistics version 20 was used to evaluate regression. Statistical significance was reported when a two-tailed P value lower than 0.05 was encountered.

**Results**

The demographic and clinical characteristics of both IBS patients and control volunteers were concisely described in Table (1). No significant difference can be noticed between control and IBS groups regarding age, body mass index, smoking habit, concomitant diseases and family history of IBS. However, the only significant difference was reported for gender distribution with P value = 0.007. Our IBS sample did include more female patients (80%) as compared to male counterpart (20%).

| Table 1: Demographic and clinical characteristics of study subjects |
|-----------------|-----------------|-----------------|-----------------|
| Variable        | Control         | Case (IBS)      | *P* value       |
| Age (years)     | Median (range)  | No.(%)          | 0.086 (NS)      |
|                 | 23 (19-55)      | 23 (19-50)      |                 |
| Gender:         |                 |                 |                 |
| Male            | 16 (53.33%)     | 6 (20%)         | 0.007           |
| Female          | 14 (46.67%)     | 24 (80%)        |                 |
| BMI (Kg/m\(^2\)) | 23.89 (19.53-50.15) | 24.31 (19.11-35.94) | 0.739 (NS)      |
Conted…

<table>
<thead>
<tr>
<th>Smokers</th>
<th>12 (40%)</th>
<th>5 (16.67%)</th>
<th>0.084 (NS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concomitant diseases:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypertension</td>
<td>0 (0.00%)</td>
<td>2 (6.67%)</td>
<td>0.491 (NS)</td>
</tr>
<tr>
<td>DM</td>
<td>0 (0.00%)</td>
<td>2 (6.67%)</td>
<td>0.491 (NS)</td>
</tr>
<tr>
<td>Migraine</td>
<td>1 (3.33%)</td>
<td>1 (3.33%)</td>
<td>1.000 (NS)</td>
</tr>
<tr>
<td>Asthma</td>
<td>2 (6.67%)</td>
<td>0 (0.00%)</td>
<td>0.491 (NS)</td>
</tr>
<tr>
<td>Family history</td>
<td>7 (23.33%)</td>
<td>14 (46.67%)</td>
<td>0.058 (NS)</td>
</tr>
</tbody>
</table>

No.: Frequency; IBS: Irritable bowel syndrome; BMI: Body mass index; NS: Not significant; DM: Diabetes mellitus.

Based on Table (2), our regression analysis didn’t detect any significant association between prevalence of irritable bowel syndrome IBS and seropositivity of H. pylori (P value adjusted to gender = 0.103). The distribution of H. pylori IgG antibodies among study individuals was well illustrated in Figure (1).

**Table 2: Helicobacter pylori seropositivity prevalence among IBS and control patients**

<table>
<thead>
<tr>
<th>Prevalence of H. pylori IgG</th>
<th>Control No. (%)</th>
<th>Case (IBS) No. (%)</th>
<th>Total</th>
<th>P value*</th>
<th>Odds ratio (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>12 (40%)</td>
<td>17 (56.67%)</td>
<td>29 (48.33%)</td>
<td>0.103</td>
<td>2.59 (0.82-8.16)</td>
</tr>
<tr>
<td>Negative</td>
<td>18 (60%)</td>
<td>13 (43.33%)</td>
<td>31 (51.67%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>30 (100%)</td>
<td>30 (100%)</td>
<td>60 (100%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

No.: Frequency; IBS: Irritable bowel syndrome; CI: confidence interval. *: P value was adjusted for gender.

**Figure 1: Distribution of Helicobacter pylori seropositivity among study volunteers**

**Discussion**

According to gastroenterologists’ opinions, IBS is a frequently observed GIT disorder that can affect quality of life for many patients (2-13). In the absence of any GIT organic or structural abnormality, the underlying cause of IBS seems to be multifactorial and poorly defined. As a consequence, the currently available therapeutic options are mainly symptoms directed with variable effectiveness (2,4).

Some studies suggested that Helicobacter pylori may play a critical role in irritable bowel syndrome development (9). Systemic inflammation triggered by virulent antigens of H. pylori can increase GIT permeability, modify gut normal flora and also change the interaction between nervous system and GIT (7,10,11).

According to observational studies, the exact relationship between H. pylori infection and IBS development is still questionable (7). As an objective, we
tried to explore this controversial association and satisfy our uncertainty.

To minimize the possibility of having false positive results in immunochromatographic screening, we excluded any individual with a previous history of *H. pylori* eradication therapy, because having this treatment course can eliminate the bacterium but not the corresponding immunoglobulins which can stay in host circulation for long periods (13).

It is worth mentioning that we included gender distribution difference as a covariant during our association analysis. Based on our demographic data, more females were recruited into IBS group (80% females versus 20% males). It is well-known that IBS is more common in females than males with a ratio of 2:1 (8).

Our regression study failed to report a significant association between *H. pylori* seropositivity and prevalence of IBS with adjusted P value = 0.103. This result was in agreement with a previous study carried out in China (7). However, additional screenings with larger samples from different communities are highly recommended to shed more light on this controversial relationship.

**Ethical Clearance:** The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding.

**REFERENCES**


The Anti Inflammatory Effect of Pumpkin Seeds Oil in Treatment of Gingivitis; Clinical Study

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ABSTRACT

Background: Many studies had focused on investigating the anti inflammatory roles of herbal medicines such as oils rich in fatty acids. Pumpkin seeds oil contains omega-3, omega-6 fatty acids and other fatty acids (oleic, linoleic and palmitic acids). Six phenolic acids (protocatechuic, caffeic, syringic, vanillic, p-coumaric and ferulic) were detected. Pumpkin seeds oil is a good source of vitamins, minerals and anti-oxidants. Many people have difficulty in controlling plaque build-up and preventing gingivitis using only conventional teeth cleaning. The objective of this study was to determine the anti inflammatory properties of pumpkin seeds oil for treatment of gingivitis.

Method: In this study 58 healthy male patients were involved their age ranged was (20-30) years. They were diagnosed having gingivitis according to the criteria of Loe and Sillness gingival index. These 85 patients were equally divided into two 29-subject groups as study and control groups. The patients in the study group were instructed to brush their teeth twice daily morning and before the bed time and then apply few drops from the pumpkin seeds oil on the brush and make a gentle massage for one minute to the gingiva. Patients in control group were instructed to do the same protocol but using normal saline (placebo without any active ingredient) instead of the pumpkin seeds oil. All the patients were examined again after one week to evaluate the cases prognosis.

Results: Data from current study showed the index of gingivitis for selected teeth before treatment. The highest score was for the maxillary right first molar (2.7), while the lowest score was for the mandibular right first bicuspid (1.8).

Conclusion: This study proved that pumpkin seeds oil is a potent anti inflammatory agent that can be used topically for treatment of gingivitis without any side effects.

Keywords: Pumpkin seeds oil, gingivitis, anti-inflammatory properties, Omega-3.

Introduction

Pumpkin is a commonly used vegetable all around the world. Its seeds are rich in proteins and fatty acids. Increasing natural drug demand for pharmaceutical uses has encouraged scientists all around the world to investigate medicinal plants recognized as efficient remedies. Nutritional values and health protective characteristics of pumpkin attracted considerable attention of food scientists in recent years. Many studies had focused on investigating the anti inflammatory roles of herbal medicines such as oils rich in fatty acids. Pumpkin seeds oil contains omega-3, omega-6 fatty acids and other fatty acids (oleic, linoleic and palmitic acids). Six phenolic acids (protocatechuic, caffeic, syringic, vanillic, p-coumaric and ferulic) were detected. Pumpkin seeds oil is a good source of vitamins, minerals and anti-oxidants.

Gingivitis is inflammation of the gums and it is a reversible condition as the gingiva become red, swollen...
and can bleed easily (7). Many people have difficulty in controlling plaque build-up and preventing gingivitis using only conventional teeth cleaning (8). In susceptible people, gingivitis may lead to periodontitis which is not reversible. Therefore, people use mouth rinses in addition to conventional teeth cleaning to control gingivitis (9). Conventional mouthwashes have adverse effects like teeth staining, altering taste and sensitivity from chemical ingredients (10). So mouthwashes with active natural constituents are our target to reach in this clinical study. a pumpkin may be considered as a valuable source for new multi-purpose products for industrial, cosmetic and pharmaceutical utilizations (11). The objective of this study was to determine the anti-inflammatory properties of pumpkin seeds oil for treatment of gingivitis.

Materials and Method

Pumpkin seeds oil was purchased from Amazon website: In this study 58 healthy male patients were involved their age ranged was (20-30) years. They were diagnosed having gingivitis according to the criteria of Loe and Silness gingival index. These 85 patients were equally divided into 2 groups; study group, 29 patients, and control group, 29 patients. Gingival tissue around six teeth for each patient were diagnosed (upper right first molar and lateral incisor and left first premolar, for the lower teeth left first molar and lateral incisor and right first premolar). Gingival tissue of selected teeth was divided into four units (facial margins, lingual margins, distofacial and distolingual margins) to determine the degree of gingival inflammation. The patients in the study group were instructed to brush their teeth twice daily morning and before the bed time and then apply few drops from the pumpkin seeds oil on the brush and make a gentle massage for one minute to the gingiva. Patients in control group were instructed to do the same protocol but using normal saline (placebo without any active ingredient) instead of the pumpkin seeds oil. All the patients were examined again after one week to evaluate the cases prognosis.

Results

Gingival index was developed by Loe and Silness in 1963 for assessing the location and severity of gingivitis by examining the qualitative changes of gingival tissue.

- GI 0: Normal, healthy gingiva with sharp non-inflamed margins.
- GI 1: Marginal gingivitis with minimal inflammation and edema at the free gingival margins. No bleeding on probing.
- GI 2: Moderate gingivitis with a wider band of inflammation and bleeding upon probing.
- GI 3: Advanced gingivitis with inflammation clinically reaching the muco-gingival junction usually with ulceration. Periodontitis will usually be present.

Gingival Index (GI) before treatment

<table>
<thead>
<tr>
<th>Tooth (No.)</th>
<th>Index average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maxillary right first molar</td>
<td>2.7</td>
</tr>
<tr>
<td>Maxillary right lateral incisor</td>
<td>2.1</td>
</tr>
<tr>
<td>Maxillary left first bicuspid</td>
<td>2.3</td>
</tr>
<tr>
<td>Mandibular left first molar</td>
<td>2.6</td>
</tr>
<tr>
<td>Mandibular left lateral incisor</td>
<td>2.6</td>
</tr>
<tr>
<td>Mandibular right first bicuspid</td>
<td>1.8</td>
</tr>
</tbody>
</table>

The table showed the index of gingivitis for selected teeth before treatment; the highest score was for the maxillary right first molar (2.7), while the lowest score was for the mandibular right first bicuspid (1.8).

Then,

\[
\text{The index for patients before treatment } = \frac{(2.7+2.1+2.3+2.6+2.6+1.8)}{6} = 2.35
\]

Table 2: Mean (and standard deviation) gingival index after treatment

<table>
<thead>
<tr>
<th>Group</th>
<th>No.</th>
<th>Mean</th>
<th>SD</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study</td>
<td>29</td>
<td>0.5</td>
<td>0.18</td>
<td>0.0001</td>
</tr>
<tr>
<td>Control</td>
<td>29</td>
<td>1.98</td>
<td>0.37</td>
<td>0.001</td>
</tr>
</tbody>
</table>

This table showed the mean, standard deviation and p value for the control and study group after treatment. The mean for the study group was 0.5, the standard deviation was (0.18) and the p value was highly significant.

Discussion

Pumpkin seeds oil is an extraordinarily rich source of nutritional, pharmaceutical, and cosmeceutical
properties that exhibited many pharmacological effects and health benefits \(^{(12)}\). Pumpkin seeds oil served as an antioxidant \(^{(13)}\), antidiabetic \(^{(14)}\) antifungal \(^{(15)}\), antibacterial, antihypercholesterolemic and anti-inflammatory \(^{(16)}\). Anti-microbial activity of pumpkin seeds oil was performed against the pathogenic bacteria S. aureus using disc diffusion method \(^{(17)}\). In addition, in vitro, in vivo and clinical studies showed that pumpkin seeds oil had a wide spectrum of amazing biological activities \(^{(18)}\).

Pumpkin seeds oil with high content of polyunsaturated fatty acids (Linoleic acid, tocopherols and sterols. Several types of unsaturated fatty acids are the dominant components in pumpkin seeds which can play a role in disease prevention and health promotion \(^{(19)}\). High content of these bioactive components were in agreement with an efficient wound healing by the means of an in vivo study. In vivo experiment was conducted by \(^{(20)}\) using the cutaneous wound healing rats and revealed that oil from pumpkin seeds extracted by cold pressure was better in macroscopic, morphometric and histological data of rat skin than the untreated rat. Pumpkin seeds are rich in vitamin E as an emerging free radical scavenger, anti-aging and antioxidant. The pumpkin oil could significantly increase collagen production \(^{(21)}\).

**Conclusion**

This study proved that pumpkin seeds oil is a potent anti-inflammatory agent that can be used topically for treatment of gingivitis without any side effects.

**Ethical Clearance:** The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding.

**REFERENCES**


Relationship between Testosterone and Body Mass Index, Hirsutism, Alopecia, Acne, Type of Menstrual Cycle, and Levels of Interleukin-1β, Interleukin-17, Interleukin-27 and Interleukin-35 for Infertile Women with Polycystic Ovary Syndrome

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ABSTRACT

Background: Polycystic ovary syndrome prevalence among young females is 15%. Sex hormones regulate immunity through hormone receptors on immunocytes. In addition, cytokines, commonly called interleukins, participate in ovarian cycle regulation. Major source of interleukin-17 is T helper 17 cells. Current study was aimed to investigate relationship between testosterone levels with interleukins levels, body mass index and polycystic ovary syndrome symptoms.

Method: Twenty-six infertile polycystic ovary syndrome women were enrolled. Serum testosterone levels and serum levels of interleukin-1β, -17, -27 and -35 were measured on day 2 of the cycle.

Results: There was significant correlation between elevated body mass index and high testosterone levels [p=0.0001]. In addition, recognizable impact of high testosterone concentrations was on incidence of hirsutism, alopecia, acne regularity of menstrual cycle [p=0.0006, p=0.002, p=0.006, p=0.04], respectively. Compared with normal testosterone levels, high testosterone levels caused significant decrease in interleukin-1β levels [p=0.002]; whereas interleukin-17 and interleukin-27 showed comparable results [p=0.36, p=0.09]; and non-significant increase in interleukin-35 in high testosterone levels [p=0.25].

Conclusions: Testosterone levels had significant impact on BMI, PCOS symptoms and serum interleukins levels.

Keywords: Body Mass Index, Polycystic ovary syndrome, alopecia, acne, interleukins, testosterone.

Introduction

Polycystic ovary syndrome (PCOS) prevalence among young females is 15% [1]. Ovarian theca cells synthesize testosterone, major androgen [2,3]. Sex hormones regulate immunity through hormone receptors on immunocytes [4]. On the other hand, body fat quantity is hard to measure directly and is determined indirectly via body mass index (BMI) calculation [5].

Cytokines, commonly called interleukins, participate in ovarian cycle regulation [6]. Major source of interleukin-17 [IL-17] is T helper 17 [Th17] cells [7]. Pro-inflammatory interleukin-1β [IL-1β] and interleukin-17 [IL-17] are produced by macrophages, vascular endothelial cells or adipocytes [8]. Antigen-presenting cells [APCs] produce Interleukin-27 [IL-27] [9]. Interleukin-27 enhances or limits immunity [9]. Inhibitory interleukin-35 [IL-35] is secreted by regulatory T [Treg] cells [10]. Circulating interleukins are altered in polycystic ovary disease [PCOD] [11].
This study was aimed to investigate relationship between testosterone levels and BMI, PCOS symptoms and impact on IL-1β, IL-17, IL-27, and IL-35 concentrations.

Materials and Method

This study was conducted with randomly selected twenty-six infertile PCOS females attended consultant clinic of Higher Institute for Infertility Diagnosis and Assisted Reproductive Technologies at AL-Nahrain University in Baghdad, Iraq from January 2016 to April 2016. Information concerning age, type and duration of infertility, hirsutism, alopecia, acne, and menstrual cycle type whether normal or oligomenorrhea (OM) were obtained from patients’ records.

PCOS was diagnosed according to Rotterdam criteria by specialist physician in consultant clinic. Diagnostic PCOS parameters included suffering from two of three criteria: OM or chronic anovulation, clinical and/or biochemical signs of hyperandrogenism, and polycystic ovaries. Conditions excluded before diagnosis were: thyroid dysfunction, hyperprolactinaemia, androgen-secreting tumors, Cushing’s syndrome and congenital adrenal hyperplasia [12]. Also, women having uterine anomalies, endometritis, sexually transmitted diseases, tubal factor infertility and endometriosis were excluded.

Age of participants ranged from 21 to 35 years. Twenty-two had primary infertility with duration from 1 to 10yr [Mean ± SD= 4.04 ± 0.53yr], and four had secondary infertility with duration from 1 to 14yr [Mean ± SD= 5.00 ± 3.02yr].

Body Mass Index: Calculation of BMI was done as weight in kilograms divided by squared height in meters [Kg/m²]. Classification of BMI involved underweight [<18.5 Kg/m²], normal weight [18.5-24.9 Kg/m²], overweight [25-29.9] Kg/m², and obese [BMI ≥30.0 Kg/m²] [13].

Blood Sampling: Informed and signed consent was obtained from participants. Intravenous blood was obtained on day two of the cycle [CD2]. Blood was centrifuged at 2500rpm for 15 minutes. Serum testosterone concentrations were measured on CD2 using commercially available mini-VIDAS kits [BIOMERIEUX/France]. Normal testosterone levels range is [0.23-0.73ng/ml] according to kit leaflets. Serum levels of IL-1β, IL-17, IL-27 and IL-35 were measured using ELISA kits [CUSABIO/China].

Statistical Analysis: Data from current study were analyzed using Statistical Analysis System (SAS; 2012). Chi-squared test was used to compare between percentages and Least Significant Difference (LSD), while t-test was used to compare between means in this study [14].

Results

Twenty-six infertile PCOS women were enrolled in current study. BMI was measured and 4[15.38%] patients had normal weight [22.98 ± 0.39kg/m²], 10[38.46%] were overweight [28.06 ± 0.50 kg/m²] and 12[46.15%] were obese [37.74 ± 0.77 kg/m²] (Table 10).

In addition, 17[65.38%] patients had normal testosterone levels [0.42 ± 0.03ng/ml] and 9[34.62%] had high testosterone levels [0.78 ± 0.02ng/ml]. Also, mean testosterone concentration, for 2[7.69%] normal weight patients, was [0.30 ± 0.00ng/ml], for 8[30.77%] overweight it was [0.42 ± 0.05ng/ml] and for 7[26.92%] obese it was [0.47 ± 0.06ng/ml]. For 9[34.61%] PCOS women with high testosterone levels, mean testosterone level for 2[7.69%], normal weight women, was [0.74 ± 0.00ng/ml] and for 7[26.69%], overweight, it was [0.85 ± 0.00ng/ml] and for 5[19.23%], obese patients, it was [0.78 ± 0.02ng/ml].

Moreover, 20[76.92%] PCOS women were hirsute, 20[76.92%] were with alopecia and 11[42.31%] had acne (Table 1).

Table 1: Distribution of PCOS women according to body mass index and testosterone levels

<table>
<thead>
<tr>
<th>T Levels</th>
<th>Normal Weight No.(%)</th>
<th>Overweight No.(%)</th>
<th>Obesity No.(%)</th>
<th>Total No.(%)</th>
<th>Chi-squared</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal T Levels</td>
<td>2(7.69)</td>
<td>8(30.77)</td>
<td>7(26.92)</td>
<td>17(65.38)</td>
<td>13.53**</td>
<td>0.0001</td>
</tr>
<tr>
<td>High T Levels</td>
<td>2(7.69)</td>
<td>2(7.69%)</td>
<td>5(19.23)</td>
<td>9(34.61)</td>
<td>10.64**</td>
<td>0.0001</td>
</tr>
<tr>
<td>Total</td>
<td>4(15.38)</td>
<td>10(38.46)</td>
<td>12(46.15)</td>
<td>26(100)</td>
<td>10.02**</td>
<td>0.0001</td>
</tr>
</tbody>
</table>

BMI: body mass index; T: testosterone; [%]: percentage; P: probability; **: P<0.01 was considered significant.

Furthermore, for 17[65.38%] PCOS women with normal testosterone, mean testosterone level were for 11[42.30%] hirsute was [0.45 ± 0.04ng/ml] and for 6[23.08%] not hirsute, it was [0.38 ± 0.05ng/ml]. For 9[34.61%]
PCOS women with high testosterone, all of them were hirsute with mean testosterone level of \([0.78 \pm 0.02\text{ng/ml}]\) (Table 2).

Table 2: Distribution of PCOS women according to testosterone levels and presence of hirsutism

<table>
<thead>
<tr>
<th>Hirsutism</th>
<th>T Levels</th>
<th>Normal T Levels No. (%)</th>
<th>High T Levels No. (%)</th>
<th>Total No. (%)</th>
<th>Chi-squared</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>With Hirsutism</td>
<td>11(42.30)</td>
<td>9(34.61)</td>
<td>20(76.92)</td>
<td>9.57**</td>
<td>0.0006</td>
<td></td>
</tr>
<tr>
<td>Without Hirsutism</td>
<td>6(23.08)</td>
<td>0</td>
<td>6(23.08)</td>
<td>8.41**</td>
<td>0.002</td>
<td></td>
</tr>
<tr>
<td>Total Number &amp; [%]</td>
<td>17(65.38)</td>
<td>9(34.61)</td>
<td>26(100)</td>
<td>9.75**</td>
<td>0.0004</td>
<td></td>
</tr>
<tr>
<td>Chi-squared</td>
<td>11.38**</td>
<td>9.93**</td>
<td>11.62**</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>P-value</td>
<td>0.0001</td>
<td>0.0001</td>
<td>0.0001</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

T: testosterone; [%]: percentage; P: probability; **: P<0.01 considered significant.

For 17[65.38%] PCOS women with normal testosterone, mean testosterone level for 14[53.84%] with alopecia was \([0.44 \pm 0.04\text{ng/ml}]\), and for 3[11.54%] without alopecia, it was \([0.37 \pm 0.11\text{ng/ml}]\). For 9[34.61%] PCOS women with high testosterone, mean testosterone levels for 6[23.08%] with alopecia was \([0.77 \pm 0.02\text{ng/ml}]\), and for 3[11.54%] without alopecia, it was \([0.81 \pm 0.03\text{ng/ml}]\) (Table 3).

Table 3: Distribution of PCOS women according to testosterone levels and presence of alopecia

<table>
<thead>
<tr>
<th>Alopecia</th>
<th>T Levels</th>
<th>Normal No. (%)</th>
<th>High No. (%)</th>
<th>Total No. (%)</th>
<th>Chi-squared</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>With Alopecia</td>
<td>14(53.84)</td>
<td>6(23.08)</td>
<td>20(76.92)</td>
<td>8.96**</td>
<td>0.002</td>
<td></td>
</tr>
<tr>
<td>No Alopecia</td>
<td>3(11.54)</td>
<td>3(11.54)</td>
<td>6(23.08)</td>
<td>4.73*</td>
<td>0.03</td>
<td></td>
</tr>
<tr>
<td>Total Number &amp; [%]</td>
<td>17(65.38)</td>
<td>9(34.62)</td>
<td>100(100)</td>
<td>9.14**</td>
<td>0.0008</td>
<td></td>
</tr>
<tr>
<td>Chi-squared</td>
<td>10.67**</td>
<td>4.74*</td>
<td>12.69**</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>P-value</td>
<td>0.0001</td>
<td>0.04</td>
<td>0.0001</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

T: testosterone; [%]: percentage; P: probability; **: P<0.01; *: P<0.05 considered significant.

For 17[65.38%] PCOS women with normal testosterone, mean testosterone level for 9[34.61%] with acne was \([0.47 \pm 0.04\text{ng/ml}]\), and for 8[30.77%] without acne, it was \([0.37 \pm 0.05\text{ng/ml}]\). For 9[34.61%] PCOS women with high testosterone, mean testosterone level for 2[7.69%] with acne, it was \([0.85 \pm 0.00\text{ng/ml}]\) and for 7[26.92%] without acne, it was \([0.77 \pm 0.02\text{ng/ml}]\) (Table 4).

Table 4: Distribution of PCOS women according to testosterone levels and presence of acne

<table>
<thead>
<tr>
<th>Acne</th>
<th>T Levels</th>
<th>Normal No. (%)</th>
<th>High No. (%)</th>
<th>Total No. (%)</th>
<th>Chi-squared</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acne</td>
<td>9(34.61)</td>
<td>2(7.69)</td>
<td>11(42.30)</td>
<td>8.82**</td>
<td>0.006</td>
<td></td>
</tr>
<tr>
<td>No Acne</td>
<td>8(30.77)</td>
<td>7(26.92)</td>
<td>15(57.69)</td>
<td>1.05 NS</td>
<td>0.13</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>17(65.38)</td>
<td>9(34.61)</td>
<td>26(100)</td>
<td>0.0004</td>
<td>9.75**</td>
<td></td>
</tr>
<tr>
<td>Chi-squared</td>
<td>0.97NS</td>
<td>7.36**</td>
<td>6.41**</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>P-value</td>
<td>0.24</td>
<td>0.008</td>
<td>0.009</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

T: testosterone; [%]: percentage; P: probability; **: P<0.01 considered significant; NS: non-significant.

For 21[80.77%] PCOS women with OM, mean testosterone level for 12[46.15%] of them was normal \([0.40 \pm 0.04\text{ng/ml}]\), and for 9[34.62%] of them was high \([0.78 \pm 0.02\text{ng/ml}]\). On the other hand, for 5[19.23%] PCOS women with regular menstrual cycle (RMC), testosterone level was normal \([0.47 \pm 0.07\text{ng/ml}]\) (Table 5).
Table 5: Distribution of PCOS women according to testosterone levels and type of menstrual cycle

<table>
<thead>
<tr>
<th>Menstrual Cycle</th>
<th>T Level</th>
<th>Normal No. (%)</th>
<th>High No. (%)</th>
<th>Total No. (%)</th>
<th>Chi-squared</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OM</td>
<td>12(46.15)</td>
<td>9(34.62)</td>
<td>21(80.77)</td>
<td>4.63*</td>
<td>0.04</td>
</tr>
<tr>
<td></td>
<td>R MC</td>
<td>5(19.23)</td>
<td>0</td>
<td>5(19.23)</td>
<td>7.24**</td>
<td>0.008</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>17(65.38)</td>
<td>9(34.62)</td>
<td>26(100)</td>
<td>9.75**</td>
<td>0.0004</td>
</tr>
<tr>
<td></td>
<td>Chi-squared</td>
<td>8.46**</td>
<td>8.94**</td>
<td>13.58**</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>P-value</td>
<td>0.009</td>
<td>0.008</td>
<td>0.0001</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

T: testosterone; [%]: percentage; OM: oligomenorrhea; RMC: regular menstrual cycle; P: probability; **: P<0.01 considered significant; NS: non-significant.

Table 6: Distribution of PCOS women according to testosterone and interleukins levels

<table>
<thead>
<tr>
<th>ILs</th>
<th>T Level</th>
<th>Normal [Mean ± SE]</th>
<th>High [Mean ± SE]</th>
<th>t-test</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IL-1β</td>
<td></td>
<td>90.44 ± 7.15</td>
<td>56.78 ± 5.69</td>
<td>14.63**</td>
<td>0.002</td>
</tr>
<tr>
<td>IL-17</td>
<td></td>
<td>15.08 ± 4.50</td>
<td>14.87 ± 4.75</td>
<td>5.07NS</td>
<td>0.36</td>
</tr>
<tr>
<td>IL-27</td>
<td></td>
<td>9.62 ± 1.70</td>
<td>7.42 ± 0.95</td>
<td>3.28NS</td>
<td>0.09</td>
</tr>
<tr>
<td>IL-35</td>
<td></td>
<td>44.11 ± 8.21</td>
<td>47.14 ± 12.21</td>
<td>12.96NS</td>
<td>0.25</td>
</tr>
</tbody>
</table>

T: testosterone; SE: standard error; ILs: interleukins; IL-1β: interleukin-1β; IL-17: interleukin-17; IL-27: interleukin-27; IL-35: interleukin-35; P: probability; **: P<0.01 considered significant; NS: non-significant.

Discussion

Around 30% of PCOS females have clinical and/or biochemical increase of androgens [15]. Notable condition of PCOS is insulin resistance (IR). Hyperinsulinemia is promoter of hyperandrogenism and chronic oligo-ovulation [16]. The important step in testosterone synthesis is regulation of P450c17 enzyme [17]. Activation of this enzyme in ovary is regulated by insulin and insulin-like growth factors [IGFs], and luteinizing hormone [LH]. Hyperactivity of P450c17 enzyme causes ovarian hyperandrogenism [17]. Luteinizing hormone stimulates androgen production by theca cells [6]. Chronic LH stimulation in PCOS stimulates theca cells hyper production of androgens [17]. Aromatase activity was lessened in PCOD follicles, and androgen increase (caused by this decreased activity) contributes to abnormal development of follicle [18].

Considerable relationship between PCOS and BMI and prevalence of obesity was high [19]. Moreover, abdominal adiposity is prevalent across all weight classes in PCOD [16]. Visceral adiposity is about 30% of normal weight PCOD [10].

In normal weight, severity of hyperandrogenism and IR exhibited strongest relationship in PCOD [20]. Study observed that testosterone levels were significantly elevated in obese and non-obese PCOS groups compared with control healthy subjects. Some PCOS women with normal BMI showed clinical/biochemical hyperandrogenism [15]. Androgen stimulates differentiation of pre-adipocytes to adipocytes, especially in abdominal area, facilitating progress of visceral-type obesity [21]. Insulin working through insulin-like growth factor 1 [IGF1] enhances LH-mediated steroidogenesis in theca cells and increases ovarian androgens [22]. Excessive insulin in obese acts similarly to co-gonadotrophin on theca cells stimulating androgen synthesis and reducing steroid-hormone binding globulin (SHBG) elevating free testosterone concentrations and causing hyperandrogenemia [20].

Adiposity lowers testosterone concentrations [2]. Lower level correlates with higher BMI [2]. A previous study reported significant increase in serum testosterone levels in obese PCOS group compared to non-obese PCOS group [23]. Insulin working through IGF1 enhances LH mediated steroidogenesis in theca cells and increases ovarian androgens [22].

Abdominal adiposity is frequently present even in non-obese PCOD women is IR feature [8]. For elevated weight females, PCOD is associated with IR...
and hyperandrogenic [20]. In obesity, excessive insulin acting on theca cells stimulating androgen secretion and reducing SHBG, elevating free testosterone levels and causing hyperandrogenemia [20].

Hyperandrogenism manifestations are hirsutism, alopecia, virilization, acne and seborrhea [15]. Study of 716 PCOS patients showed that the prevalence of hyperandrogenemia, hirsutism, and acne was 75.3%, 72.2%, and 14.5%, respectively. In most cases, hirsutism was caused by combination of increased androgen synthesis compared with non-hirsute females and high skin sensitivity to androgens. Sensitivity of hair follicles to androgen is governed by 5α-reductase activity in skin [15]. For about 20-40% of hirsute PCOs females, analysis of serum androgens failed to reveal elevated concentrations of androgens [24]; maybe, current measurement procedures were not sufficiently reliable, or absence of clear boundaries of normal values in circulation of females. Normal circulating androgens in presence of other clinical signs, does not exclude PCOD diagnosis [24].

Acne prevalence in PCOD was 10%-34% [25]. A study mentioned expression of ARs in keratinocytes within pilosebaceous ducts and documented androgen directly impacted keratinization in acne process [26]. Acne is chronic inflammatory disorder of pilosebaceous unit caused by elevated sebum secretion stimulated by androgen, altered keratinization, bacterial colonization of hair follicles on face, neck, chest, and back, and inflammation [15].

In PCOS, among hyperandrogenism symptoms is alopecia [27].

Females with OM and PCOS have high free testosterone and lower SHBG compared with RMC control women [20]. Insulin resistance and hyperandrogenemia are correlated with having an IMC [20]. Menstrual cycle disorders were present in 90.7% of PCOD [24]. Oligomenorrhoea was reported by 69.2%, while 9.3% had normal menses in PCOD [24].

Aberrant regulation of immune system leads to pathological states. Sex hormones regulation of immunity is attribute to hormone receptors present on immunocytes where interaction influences secretion of interleukins which impact proliferation, differentiation and maturation of different kinds of immune cells and consequently outcome of inflammatory disorders. Testosterone is a regulator of immunity [4]. There was an observation that androgen deprivation therapy correlated with elevated concentrations of pro-inflammatory agents and lessened anti-inflammatory interleukins concentrations, while researches indicated that testosterone supplementation reduced inflammatory factors in hypogonadal men [28].

Studies recorded that inflammatory markers were positively combined with androgen concentrations in PCOD [29]. Normal and high testosterone levels decreased IL-1β expression [4]. Interleukin-27 and IL-35 suppress IL-17 release [9,30-31].

Conclusions

Testosterone levels were recognizably increased in high and normal BMI cases. Also, high testosterone levels impacted PCOS symptoms and recognizably affected interleukins concentrations.

Ethical Clearance: The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding.

REFERENCES


Assessment of TNF-a, IL-17, IL-33, TGF-b, and Dopamine in Iraq Depressed Women with Chronic Toxoplasmosis Infection

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ABSTRACT

Background: In Iraq, a high prevalence rate of Toxoplasma gondii infection was reported and data about correlation between this infection and major depressive disorders were documented. Therefore, the aim of current study was to evaluate the association between levels of parameters related to chronic toxoplasmosis infection and depression in Iraq women.

Method: In this study, 260 serum samples were collected from Iraqi women and divided into four groups as follow: G1 depressed women infected with toxoplasmosis, G2 women infected with toxoplasmosis but did not have depression, G3 depressed women without toxoplasmosis infection with toxoplasmosis, G4 apparently healthy persons. The following parameters were assessed TNF-a, IL-17, IL-33, TGF-b and dopamine. Statistical analysis was performed by using statistical analysis system.

Results: Data from current study revealed elevated levels of proinflammatory cytokines TNF-a, IL-33, IL-17, as well as there was an increase in concentration of dopamine in G1. The mean ± SE levels for the three cytokines were (2444.69 ± 98.82, 3629.50 ± 61.10 and 1008.88 ± 36.35 pg/ml), respectively and the mean ± SE for dopamine was (387.33 ± 8.09 pg/ml), while TGF-b didn’t show any elevation in its level in this group.

Conclusion: Elevated levels of both proinflammatory cytokines and dopamine in depressed women who had chronic infection of toxoplasmosis may reflect the effect of chronic infection that may alter the expression of dopamine which skew the immune response towered Th17 that affect the expression level of proinflammatory cytokines and neutrophils response.

Keywords: TNF-a, IL-17, IL-33, TGF-b, dopamine, toxoplasma infection, depression.

Introduction

In Iraq, a high prevalence rate of Toxoplasma gondii (T. gondii) infection was reported (¹). Data about correlation between T. gondii and major depressive disorder were documented by (²). Chronic T. gondii infection is characterized by increased levels of host immune activity and neuroinflammation (³). Evidence about correlation between anti-toxo IgG antibodies and depression considered conflicting. Some researchers found a correlation between titer of IgG in pregnant infected women and depression in the USA (⁴). T. gondii infection considered risk factor for schizophrenia, depression and personality disorders in humans. In dopaminergic cells, the parasite increases the level of K+ ion, causing 3 times increase in dopamine release. The level of dopamine was also found to be high in the brain tissue with T. gondii cyst (⁵). TNF-α is known to be associated with mood disorders. The IL-33/ST2 axis protects mice from Th1-induced damages in the brain during toxoplasmosis. Cytokines and chemokines are regulated with a delicate balance between a necessary Th1 response for the control of parasite proliferation and a Th2-regulated response to limit the pathology due to an exacerbated deleterious Th1 response (⁶). It was reported that the level of TGF-b was higher in depressed patients as compared with control group.
Moreover, previous data showed that level of anti-inflammatory cytokine TGF-b also showed a significant decrease in patients with major depressive disorder \(^{(7)}\). Moreover, it was observed that the level of TGF-b was significantly different in young depressed patients, while there were negative correlations between TGF-b and IL-17, it was observed that the level of TGF-b wasn’t affected by level of dopamine in contrast to level of inflammatory cytokines which was associated with a mood disturbance in toxoplasmosis-infected individuals. Also, IL-17 showed a significant increase. Dopamine was affected in infected rodents. In addition, T. gondii infection may be thought to cause behavioral alteration due to tryptophan metabolism and the effect on the hypothalamic-pituitary adrenal flow \(^{(8)}\). There are very few studies supporting toxoplasma infection IgM seropositivity or the development of schizophrenia after the maternal fetal period infection. Toxoplasma induces neuroinflammation and cytokines leading to imbalance in the neurotransmitter metabolism, tryptophan metabolism, host immunity functions and systemic hormone levels. In rodent studies, chronic T. gondii infection increases dopamine concentration through tyrosine hydroxylase encoded in the parasite genome of the brain and nitric oxide-mediated dopamine release occurs in the host \(^{(9)}\).

Aim of the study: For many years, the nervous system and the immune system have been seen as two separate systems. In recent years, this situation has begun to be constantly discussed and the point reached in this regard was that: “The fact that the central nervous system, which is supposed to be devoid of the immune system, now harbors the immune system” These interactions, expressed as neuroimmunity, can be described in two ways; Classical nervous system molecules such as dopamine can act on the immune cells.

Therefore, the aim of current study was to evaluate the association between levels of parameters related to chronic toxoplasmosis infection and depression in Iraq women.

**Material and Method**

Serum samples were collected from 260 Iraqi women who were selected according to special criteria and the state of depression was diagnosed by special psychologist. Subjects were divided into four groups as follows: G1 depressed women infected with toxoplasmosis, G2 women infected with toxoplasmosis but did not have depression, G3 depressed women without toxoplasma infection, G4 apparently healthy individuals. The following parameters were evaluated TGF-b, TNF-a, IL-33, IL-17 and dopamine by using ELISA technique. Statistical analysis was performed by using statistical analysis system (SAS; 2010) and excel to find means and correlations.

**Result**

Table (1) showed that there were increasing levels for proinflammatory cytokines included TNF-a, IL-33, IL-17, as well as there was increasing in concentration of dopamine in G1. The mean ± SE was (2444.69 ± 98.82, 3629.50 ± 61.10, 1008.88 ± 36.35 pg/ml) for the three cytokines respectively, and the mean ± SE for dopamine was (387.33 ± 8.09 pg/ml), while TGF-b didn’t show any rise in this group.

**Table 1: Serum levels of cytokines and dopamine through studied group**

<table>
<thead>
<tr>
<th>Groups</th>
<th>TGF-b (pg/ml) (Mean ± SE)</th>
<th>TNF-a (pg/ml) (Mean ± SE)</th>
<th>IL-33 (pg/ml) (Mean ± SE)</th>
<th>IL-17 (pg/ml) (Mean ± SE)</th>
<th>Dopamine (pg/ml) (Mean ± SE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1</td>
<td>1654.74 ± 129.12b</td>
<td>2444.69 ± 98.82 a</td>
<td>3629.50 ± 61.10a</td>
<td>1008.88 ± 36.35a</td>
<td>387.33 ± 8.09a</td>
</tr>
<tr>
<td>G2</td>
<td>1628.53 ± 192.64b</td>
<td>1643.67 ± 52.51 b</td>
<td>3367.00 ± 45.91b</td>
<td>737.32 ± 22.24b</td>
<td>398.91 ± 9.15a</td>
</tr>
<tr>
<td>G3</td>
<td>1659.03 ± 183.31b</td>
<td>1665.39 ± 59.63 b</td>
<td>3386.88 ± 49.50b</td>
<td>614.03 ± 25.98C</td>
<td>345.63 ± 6.78b</td>
</tr>
<tr>
<td>G4</td>
<td>1721.02 ± 136.20a</td>
<td>1378.85 ± 56.79 c</td>
<td>3318.38 ± 51.94c</td>
<td>606.79 ± 24.44C</td>
<td>383.9 ± 8.52a</td>
</tr>
<tr>
<td>LSD Value</td>
<td>53.26 **</td>
<td>193.49 **</td>
<td>146.0 **</td>
<td>77.401 **</td>
<td>22.80 **</td>
</tr>
</tbody>
</table>

**Discussion**

Many studies referred to the increased levels of inflammatory cytokines through chronic infection of toxoplasmosis TNF \(^{(3)}\), IL-17 \(^{(10)}\), and IL-33 \(^{(11)}\) and also showed increased level of TNF throughout depression state \(^{(12)}\). At the same time IL-33 also showed an association with state of depression. Moreover, \(^{(13)}\)}
showed an increase in Th17 cells, but lack of association between IL-17 level in blood and severity of disease suggested that IL-17 might be promote depression state but not entirely dependent on IL-17 and might promote neurons inflammation and activation of Th17 and other cells might stimulate depressive-like behavior in mice as a result of accumulation of Th17 in brain of mice exhibiting depressive-like behavior. High levels of pro-inflammatory cytokines during course of infection are important to control infection and prevent prevalence of parasite via different mechanisms for example TNF-a has anti-parasitic effect. On the other hand, (3) showed that mice infected with cyst release a high level of TNF and TNF-a produced by different cells during toxoplasmosis infection such as macrophage, microglia and dendritic cells promoting anti-parasitic mechanisms by macrophage. IL-17 also participates in anti-parasitic effect and, during infection, IL-17 is involved in development of neutrophils which were important in eliminating the parasites in addition to contributing in inflammation during parasitic infection (14). IL-33 might regulate information among different types of immune cells during inflammatory response toxoplasmosis, and might regulate immunopathology of ocular toxoplasmosis with its receptors ST2 (14). There were increasing levels of pro-inflammatory cytokines verses decreased levels of anti-inflammatory cytokine TGF-b in three group of our study. However, (15) showed that level of TGF-b was not different among mice infected with toxoplasmosis and also didn’t differ during period of infection.

About dopamine neurotransmitter, current study recorded a low level in (G3) (depressed patients) and this was considered natural result, because of low level of dopamine associated with state of depression and this consisted with previous study. However, its level was high in (G1); might be due to the ability of T. gondii in synthesis of DOPA decarboxylase which is important to convert L-DOPA to dopamine in the dopaminergic cell and this was shown in cyst-containing cells in the brain (16). So in spite of decreasing level of dopamine in (G3) but infection with T. gondii could have modified its level causing increased level in groups (G1 and G2). Toxoplasmosis infection did not increase level of dopamine only, but also might have increased its release. Furthermore, (5) showed that T. gondii infection caused behavioral changes in intermediate host rodents and was considered a risk factor in schizophrenia, depression and personality disorders in humans. In dopaminergic cells, the parasite increases the level of K+ ion, causing dopamine release 3 times more than the normal level. In addition, it was found that dopamine has elevated level in brain tissue with T. gondii cyst. For many years, the nervous system and the immune system have been seen as two separate systems. In recent years, this situation has begun to be constantly discussed, and the point reached in this regard was that: “The fact that the central nervous system, which is supposed to be devoid of the immune system, now harbors the immune system” These interactions, expressed as neuroimmunity, can be described in two ways; Classical nervous system molecules such as dopamine can act on the immune cells. For example, T cells express a few dopamine receptors (DARs). The stimulation of specific DARs on dendritic cells and T cells has been shown to affect the CD4 + T cell differentiation in Th4 or Th17 inflammatory cells. Dopamine receptors are expressed in T cells, dendritic cells (DCs), B cells, NK cells, neutrophils, eosinophils, and monocytes. The best example of these interactions is the cytokine called IL-6. Although its mechanism has not been clearly defined, IL-6 acts in this process as a neuropoietin (stimulator of neuronal growth), TNF-a provides protection during chronic stage of infection (17), this protection is mediated by neutralization of cytokines involved in increasing the susceptibility and higher parasite burdens (18). TNF-a also mediated production of NO. Mice treated with TNF antibody (Ab) showed decreasing NO levels. It was also suggested that the connection between testosterone and dopamine is mediated by nitric oxide as testosterone enhances production of NO by up-regulation of nitric oxide synthase in the medial pre-optic area of the brain (MPOA); subsequently, NO promotes dopamine release in the MPOA and facilitates male sexual behavior (19). NO, TNF-a and other cytokines mediated increased dopamine release (20). Increased level of IL-17 was associated with increased level of dopamine and this appeared in levels of both IL-17 and dopamine in studied groups or through significant positive correlation that was recorded previously. Nonetheless, association between dopamine and IL-17 during human Rheumatoid Arthritis was examined by (20), they showed that cytokine secretion including IL-17 from CD4+ naive T cells, which were stimulated by anti-CD3/CD28 Abs and simultaneously added dopamine. Dopamine markedly increased IL-17 secretion in a dose-dependent manner via IL-6 dependent IL-17 production via D1-like receptors. In addition, D2-
like receptor antagonists induce accumulation of IL-17 T cells and IL-6 T cells, indicating dopamine as an important factor for Th17 differentiation. It was showed that level of TGF-b wasn’t affected by level of dopamine in contrast to level of inflammatory cytokine IL-6 which was associated with mood disturbance associated with toxoplasmosis infection, and IL17 also showed significant increase. Mast cells are adjacent to the neurons and glial cells in thalamus, hypothalamus and leptomeninges and activate them by cell-to-cell contacts as well as by releasing inflammatory and neurotoxic mediators (21). Mast cells located at the brain side (more than 95%) of the BBB protect the brain from invading pathogens and toxic substances from peripheral organs (22). Mast cells play a major role in neuroinflammatory conditions including neurodegenerative diseases, by increasing the BBB permeability and activating the brain-resident immune cells microglia and T-cells (23). Stress conditions activate mast cells through CRH, which is activated through activation of HPA axis, and other neuropeptides to release several neuroinflammatory mediators including cytokines such as TNF-α, IL-33 and other inflammatory mediator.

Conclusion

Elevated levels of both proinflammatory cytokines and dopamine in depressed women who had chronic infection of toxoplasmosis may reflect the effect of chronic infection that may alter the expression of dopamine which skew the immune response towered Th17 that affect the expression level of proinflammatory cytokines and neutrophils response.

Ethical Clearance: The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

Conflict of Interest: The authors declare that they have no conflict of interest.

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Down-Regulation of Circulating MicroRNA-205 as a Potential Biomarker for Distinguishing Prostate Carcinoma from Benign Prostatic Hyperplasia

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ABSTRACT

Background: MicroRNAs are a sequence of short (~22nt), single-stranded RNA molecules that act as post-transcriptional controllers of gene expression. Circulating microRNAs as the potential minimally-invasive biomarkers for early detection and progression of prostate carcinoma. Therefore, the aim of the study was to find out the potential application of using circulating microRNA-205 to detect prostate cancer among patients with benign prostatic hyperplasia and find its correlation with age and stage of tumors. Methods: Real-Time PCR was done to demonstrate the gene expression of microRNA-205 in serum sample of patients with prostate cancer, benign prostatic hyperplasia and control groups. The expression levels of microRNA-205 were calculated relative to messenger RNA of Glyceraldehyde 3-phosphate dehydrogenase and determined using the livak method.

Results: microRNA-205 expression level in tissue samples was significantly down-regulated in prostate carcinoma in comparison to normal adjacent tissues and also the serum level was significantly down-regulated in prostate cancer cases in comparison to apparently healthy controls and benign prostatic hyperplasia.

Conclusion: Serum- microRNA-205 gene expression can serve as minimally-invasive biomarkers and standard screening tool for early detection of prostate cancer and for detection of higher stage from early stage of the tumor.

Keywords: MicroRNA-205, RT-PCR, Livak method, Prostate cancer, Benign Prostatic Hyperplasia
responsible for PCa mortality. Thus, proof of identity of predictive diagnostic markers capable to distinguish indolent tumors from aggressive ones would be helpful in dropping the risk of missed diagnosis. Thus, sensitive diagnostic markers are essential to reduce missed diagnosis, overtreatment and biopsy side effects\(^3\).

MicroRNAs (miRs) are short RNA molecules, on average 22 nucleotides long. They function as post-transcriptional regulators of target complementary RNA (mRNA) usually in the 3’ UTR, which results in mRNA degradation resulting in reduced levels of encoded protein \(^4\). miRNAs play the major regulatory part in different cellular processes comprising cell cycle, proliferation, differentiation and apoptosis \(^5\). Recent revisions had associated various miRNAs in the emergence and progression of many human cancers and also as a potential marker for cancer diagnosis and prognosis \(^6,7\).

**Materials and Method**

The study was conducted during the period from April 2012 to March 2018. This is a prospective study involved a total of 100 cases; whereby 60 of them were with newly diagnosed PCa, 30 were with Benign Prostatic Hyperplasia (BPH) and 10 were apparently healthy controls. Patients were recruited at the Surgical Department/AL-Diwaniyah Teaching Hospital in Diwaniyah City. Digital rectal examination (DRE) and Ultrasound-guided punch biopsy were performed as a part of the standard diagnostic protocol for patients with prostatic disease in Pathology Department/AL-Diwaniyah Teaching Hospital in Diwaniyah City.

The serum sample was collected from the patients with prostatic disease (n=90) before an operation and apparently healthy controls (n=10) were diagnosed without any tumor or physical illness. After excision of the prostate samples, further tested with the established criterion able to classify as benign or malignant on the basis of miR-205 expression values. Take 90 pairs of fresh tissues from some cases of prostate lesion and normal adjacent tissues (NATs) which is considered as internal control and preserved in Diethylpyrocarbonate (DEPC) water for total RNA extraction and for RT-PCR. Another 90 pairs of specimens from the prostate lesion and normal adjacent tissues for histopathological examination. Pathological sorting was done based on WHO classification and tumor staging was carried out according to AJCC.

**MiRNA isolation from serum and tissue:** Serum samples were collected between 8:00 and 9:00 a.m. Following centrifugation for 30min at 2,650g, serum samples were stored at 80°C. Tissue samples were homogenized in a denaturing lysis solution and dissolved RNA was stored at -20°C before use. Isolation of total RNA (RNA was extracted from serum and fresh tissues using the Trizol reagent; Bioneer, Korea) was done according to the manufacture’s instructions. RNA quality was assessed with a NanoDrop 1000 spectrophotometer.

**Real-time RT-PCR for miR-205 quantification:** miR-205 was evaluated according to “TaqMan miR RT-kit procedure (Applied Biosystems, Foster City, CA, USA)” which involve using miR-specific primer (according to miR- database to design the primers) \(^19\) in addition to essential Taq-Man probes. Reverse transcriptase reactions was prepared to make cDNAs in a volume of 15ml using 10ng total RNA for each sample, 50nM stem–loop RT primer, 1RT bufer, 1mM each of dNTPs, 3.33U/ml and 0.25 U/ml RNase inhibitor. Real-Time PCR was done in triplicate. The volume of 20ml of each sample included; TaqMan Universal PCR Master Mix, 1ml specific miR Assay Mix, and 1.34ml RT product. The reactions were incubated at 50°C for 2min and 95°C for 10min, followed by 40 cycles of 95°C for 15s and 60°C for 1min. All miR-205 quantification data were normalized to house-keeping gene. The messenger RNA(mRNA) of GAPDH gene primers and probe were designed by using NCBI- Gene Bank data base and Primer 3 plus design online. The cDNAs primer of GAPDH design as Random Hexamer primer and the primer used in qPCR was: forward, 5-UCCUUCAUUCACCAGAGUCUG-3 and reverse 5-GACUCGGGUGGAAUGAAGAAU-3. Taq-Man probe for mGAPDH was: FAM-CCAGCCGAGCCACATCGCTC-TAMRA. The data results of RT-qPCR for miR-205 and GAPDH were analyzed by the relative quantification gene expression levels (fold change) were based on the Ct values by using the Livak method (Fold change = 2^-ΔΔCT) that described by \(^8\).

**Statistical Analysis:** SPSS version 16 and Microsoft Office Excel 2007 were implemented in data analysis. Chi-squared test and Fisher exact test were done to find out the correlations between any two nominal variables. P≤0.05 was considered significant.
Results

Clinicopathological characteristics of patients: Table (1) shown a total of 100 patients, of whom 60 cases (66.7%) with PCa, 30(33.3%) cases with BPH, and the apparently healthy controls were 10 cases.

Table 1: Clinicopathological characteristics of patients

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>PCa (n = 60)</th>
<th>BPH (n = 30)</th>
<th>Healthy controls (n = 10)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤65 years</td>
<td>10</td>
<td>16.7</td>
<td>10</td>
</tr>
<tr>
<td>&gt;65 years</td>
<td>50</td>
<td>83.3</td>
<td>20</td>
</tr>
<tr>
<td>LN</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>30</td>
<td>50</td>
<td>---</td>
</tr>
<tr>
<td>Negative</td>
<td>30</td>
<td>50</td>
<td>---</td>
</tr>
<tr>
<td>Stage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>15</td>
<td>25</td>
<td>---</td>
</tr>
<tr>
<td>B</td>
<td>15</td>
<td>25</td>
<td>---</td>
</tr>
<tr>
<td>C</td>
<td>15</td>
<td>25</td>
<td>---</td>
</tr>
<tr>
<td>D</td>
<td>15</td>
<td>25</td>
<td>---</td>
</tr>
</tbody>
</table>

Comparison of tissue microRNA-205 gene expression of prostate carcinoma and benign prostatic hyperplasia with normal adjacent tissues: Mean cancer tissue of miR-205 was statistically significantly lower than that of NATs (-120 ± 1.5 vs. 1 ± 0.21, respectively, P<0.001; Table 2). Mean fold change of miR-205 in the tissue sample of BPH did not change in comparison with that of NATs and was not statistically significantly different from that of NATs (P>0.05; Table 2). Mean cancer tissue of miR-205 was statistically significantly lower than BPH tissues (P<0.001; Table 2).

Table 2: Comparison of tissue level of microRNA-205 gene expression between prostate carcinoma, benign prostatic hyperplasia patients and NATs

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>P1</th>
<th>P2</th>
<th>P3</th>
</tr>
</thead>
<tbody>
<tr>
<td>NATs</td>
<td>90</td>
<td>1</td>
<td>± 0.21</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PCa</td>
<td>60</td>
<td>-120</td>
<td>± 1.5</td>
<td>&lt;0.001</td>
<td>&gt;0.05</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>BPH</td>
<td>30</td>
<td>1.1</td>
<td>± 0.20</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Comparison of serum microRNA-205 of prostate carcinoma and benign prostatic hyperplasia with apparently healthy controls: The mean serum miR-205 level of cancer patients was statistically significantly lower than that of apparently healthy controls -80 ± 2.5 vs. 1 ± 0.41, respectively, P<0.001. Mean fold change of miR-205 in the serum of BPH did not change in comparison to those apparently healthy controls and was not statistically significantly different from those apparently healthy controls (P>0.05). Mean fold change of miR-205 in serum of cancer patients was statistically significantly lower than BPH tissues (P<0.001).

The correlation of microRNA-205 gene expression fold change between prostate carcinoma tissues and paired serums: The results showed a statistically significant correlation of miR-205 gene expression in the PCa tissues with those in the paired serums, with r = 0.41 (P<0.001; Figure 1).

Figure 1: The correlation of microRNA-205 gene expression fold change between prostate carcinoma tissues and paired serums

Also, the results showed a statistically significant correlation of miR-205 gene expression fold change of the BPH tissues with those in the paired serum, with r = 0.31 (P<0.001).

Correlation between serum fold change of microRNA-205 gene expressions with age: Present study presented that there was no significant association between serum fold change miR-205 of PCa, BPH and age of patients in those≤65 years and >65 years (P>0.005).
Association between serum fold change of microRNA-205 and stage of the tumor: The mean fold change of miR-205 serum levels in PCa patients showed significant statistical difference among stages of a tumor (A, B, C, D) (Table 3).

Table 3: MiR-205 fold change can predict stage of tumor

<table>
<thead>
<tr>
<th>Stage</th>
<th>Mean fold change</th>
<th>Minimum</th>
<th>Maximum</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (n = 15)</td>
<td>(-55±5)</td>
<td>-50</td>
<td>-60</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>B (n = 15)</td>
<td>(-65±5)</td>
<td>-60</td>
<td>-70</td>
<td></td>
</tr>
<tr>
<td>C (n = 15)</td>
<td>(-75±5)</td>
<td>-70</td>
<td>-80</td>
<td></td>
</tr>
<tr>
<td>D (n = 15)</td>
<td>(-90±5)</td>
<td>-80</td>
<td>-100</td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>0.001</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Predictive value of microRNA-205 in the serum of patients: To evaluate the diagnostic value of serum miR-205 for PCa by using the RT-qPCR technique, a Receiver Operator Characteristic (ROC) curve analysis was done.

A. Comparison of the PCa group and the healthy control group: The best cut-off value for serum miR-205 in PCa in comparison to those apparently healthy control groups was (-50 fold change) with a specificity of 100%, a sensitivity of 87.30% and an excellent accuracy (AUC) (Figure 2).

Figure 2: Receiver Operator Characteristic curve analyses of serum microRNA-205 in those with prostate carcinoma and healthy control groups

B. Validity of microRNA-205 folds change as a prognostic marker: To check the cut-off value of fold change for miR-205 expression level, that could assume PCa patient with positive LN and TNM stages C and D (higher stage PCa from patients with earlier stages of PCa (A, B), an ROC curve analysis was done.

Accordingly, we initiated that miR-205 fold change could guess positive LN and higher stage (C, D). While ROC results established that the AUC values were 100% (excellent) and 96.5% (excellent), when the cut-off value was set to the optimal points (≥-70 and ≥-80), specificity values were 97.2% and 97.1%; sensitivity values were 100% and 100%, respectively (Table 4).

Table 4: Receiver Operator Characteristic curve analyses of serum microRNA-205 of those with prostate carcinoma and higher stage

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Cutoff value</th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>Accuracy (AUC)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serum miR-205 in stage A</td>
<td>≥-50 fold change</td>
<td>87.30%</td>
<td>100%</td>
<td>0.982%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Serum miR-205 in stage B</td>
<td>≥-60 fold change</td>
<td>100%</td>
<td>98.1%</td>
<td>excellent</td>
<td></td>
</tr>
<tr>
<td>Serum miR-205 in stage C</td>
<td>≥-70 fold change</td>
<td>100%</td>
<td>97.2%</td>
<td>excellent</td>
<td></td>
</tr>
<tr>
<td>Serum miR-205 in stage D</td>
<td>≥-80 fold change</td>
<td>100%</td>
<td>97.1%</td>
<td>96.55% excellent</td>
<td></td>
</tr>
</tbody>
</table>
Discussion

The present study focused on tissue and serum levels of miR-205 of same prostate cancer patient samples. The mean cancer tissue fold change of miR-205 was statistically significantly lower than that of NATs. These results were in agreement with results of many studies (9-14). The serum level of miR-205 gene expression was statistically significantly lower from those apparently healthy controls and BPH. Also, the best cut-off value for gene aberration was (-50 fold change) with a specificity of 100%, sensitivity of 87.30% and an excellent accuracy (AUC) from which can detect normal gene expression from gene aberration and also can detect normal and BPH cases from malignant ones. However, it could be helpful for early detection of prostate carcinoma in those cases of highly suggestive and with grey-zone of PSA. These results were in agreement with results of previous studies (9-14).

Early diagnosis has been the key to effective management of many life-threatening illnesses, including prostate carcinoma. Early detection causes the establishment of better treatment of prostate carcinoma at its early stage before it is disseminated and affects other healthy tissues of the body. The expression array of miR-205 could act as a powerful tool for diagnosis of early stage prostate carcinoma (9).

The serum levels of miR-205 gene expression in advanced stages (C, D) and LN metastasis in the present study were statistically significantly lower than those of early stages (A, B) and LN negative, respectively. Moreover, the best cut-off value for gene aberration for stages C and D were (-70) and (-80) fold changes, respectively. Therefore, we can detect gene aberration in advanced stages (C,D) with LN involvement from gene aberration of early stages (A, B). This suggested the possibility of down-regulated miR-205 levels as a prognostic biomarker. These results were in agreement with results of other studies (14-22). In the presented study, there was no statistically significant difference between the age of patients and fold change of miR-205 gene aberration. These findings agreed with those from other studies (9,15).

Conclusion

MiR-205 could be a useful biomarker for early detection of prostate carcinoma, detect the advanced stage of prostate carcinoma. In addition, to the screening of asymptomatic populations and assessment of disease progression in prostate carcinoma.

Ethical Clearance: Ethical approval was obtained from the Research Ethics Committee at AL-Diwaniyah Teaching Hospital, Iraq.

Source of Funding: self-funded.

Conflict of Interest: None to declare.

REFERENCES


Investigation of the MEP4 Gene of the Fungalysins Gene Family (MEP 1-5) in Isolated Skin Fungus from Primary School Students

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ABSTRACT

Background: Fungalysin MEP 1-5 is a group of genes that encode protease enzymes in skin fungi. Since proteins make up a large part of the weight of mammals represented by collagen, elastin and keratin, accounting for 25% of the weight of mammals. In addition, there are other proteins on the skin are the pillars of the work of protease enzymes; Endoprotease and Exoprotease, which are working to break down protein which is the source of carbon and nitrogen necessary for the growth of these fungi. The aim of current study was to confirm the presence of MEP4 of the Fungalysin gene family in isolates of skin fungal infections.

Method: The study was conducted on isolated samples of primary school students under the age of 16 and included collection of samples from different areas of head palpitations, flexion of the body, hip flexor, mandrel, fingernail and foot band. The fungal infections were distinguished from other conditions such as eczema and hypersensitivity. Several samples were prepared to detect the presence of one MEP1-5 gene (fungalysins) using a known sequence of the 2000bp molecular weight MEP4 gene. After obtaining a primer, a real-time PCR scan was conducted to investigate the differences between the different isolates and their relationship to the virulence of species. The SDA and cycloheximide were used to prevent the growth of fungal fungi and chloramphenicol to prevent the growth of bacteria. The isolates were isolated and phenotypic isolates were included. Trichophyton ssp, Microsporium sp, Epdermophytoni sp analyzed data statistically, and analyzed real-time PCR melting curve.

Results: The real-time analysis indicated that 59.25% of isolates did not show the gene expression of this gene, while 40.74% showed expression of MEP 4 gene.

Keywords: Skin fungal infection, Fungalysin gene family, MEP4, PCR, Phenotypic.

Introduction

Fungalysin MEP 1-5 is a group of genes that encode protease enzymes in skin fungi [1]. Since proteins make up a large part of the weight of mammals represented by collagen, elastin and keratin, accounting for 25% of the weight of mammals [2]. In addition, there are other proteins on the skin are the pillars of the work of protease enzymes; Endoprotease and Exoprotease, which are working to break down protein which is the source of carbon and nitrogen necessary for the growth of these fungi. So, it was necessary to find studies on the mechanism of entry of fungus into the skin where the link and the formation of bacterial tube by mechanical forces (contact and friction) and secretion of exoenzymes for lipid analysis and necessary for penetration. A group of these enzymes were identified in fungi by [1]in M. canis and T. rubrum fungi to be a family of five genes known as MEP1, MEP2, MEP3, MEP4, MEP5 and all of the endometalloprotease type in experiments on guinea pigs [1,3,4]. Five specialized genes belonging to the metalloproteases family (MEP), MEP1-5, were identified by the world and [1]’s described three genes belonging to this family: MEP1, MEP2, MEP3 in M. canis, encoded for three endometalloproteases and MEP2, MEP3 protease in infections of laboratory animals in guinea pigs. The MEP3 gene showed activity with

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Keratinolytic, Elastinolytic and Collagenolytic proteins. Two additional genes, MEP4 and MEP5, were then recorded to become a family of five genes in M. canis. Both genes were controlled by endometalloproteases. MEP4, MEP5 in T. rubrum [5].

The authors [1] reported that MEP3 had a molecular weight of 43.5 kilo Dalton and that the gene with MEP2 was produced during the fungus invasion of host cells.

Other researchers [6] found high levels of MEP 3 and MEP4 when developing T. rubrum, while soybeans were high in MEP 2 and MEP5 in T. violaceum [6]. Also, [7] confirmed that MEP4 levels were high in the fungal infection of the host.

The MEP4 gene ensures the following sequences for ATCGTGATTCCTTTAGCACC
[8] And Rev TCGCCCATGGTATAGTCAG

In another study [9], in Egypt, showed that 10% of the isolates contained MEP1-4, while the MEP5 gene had a 20% appearance in T. Verrucosum.

The experiments carried out by [10] using the Agrobacterium tumefaciens-mediated transformation (ATMT) system demonstrated that mutant isolates of MEP4, MEP5 were less virulent than non-mutant isolates, believing that these genes had a significant role in pathogenesis of isolates they contain. The aim of current study was to confirm the presence of MEP4 of the Fungalysin gene family in isolates of skin fungal infections.

**Materials and Method**

The study samples were collected from people with dermatological diseases and were diagnosed clinically by specialized dermatologists from April 2016 to March 2017. Primary school students in Babylon and Diwaniyah governorates were included through consultation clinics in governmental hospitals or through private clinics for dermatologists. The study included 38 samples of skin flakes, 12 infected hair follicles and 10 samples of infected nails. The patient’s specific information was recorded according to an already prepared form. The samples were transferred by sterile siphon bags prepared for this purpose to the laboratory. Of which 10% were used in direct examination using 10% KOH.

Samples from school children infected with SDACCG were incubated at 28-30°C and observed after day 5. As fungi began to appear in the form of growing colonies, colonies were monitored and changes during the incubation period were recorded.

Insects are passed from time to time to keep them from dying or fungal contamination and subsequent tests [11].

**Direct Microscopy:** A small sample of the sample was placed on the clean glass slide. A drop of 10% KOH solution was added and cut for 15-30 minutes to allow keratin to dissolve by KOH. Then the test was performed to see the fungal yarn and reproductive spores. If the sample was nail, it was left for a longer period of up to an hour to allow the keratin to dissolve and then examine the samples [12].

**Growth of Samples:** Samples from infected school children with SDACCG were incubated at 28-30°C and observed after day five as fungi began to appear in the form of growing colonies. Growth of colonies and recording of changes during incubation period are observed. Insects are passed from time to time to keep them from dying or fungal contamination and subsequent tests [11].

**Examination and diagnosis of fungal colonies:** Phenotypic examination of colonies: The fungal colonies were examined at the first appearance, as they varied in the number of days needed for growth. The shape of the colony and its edges were also recorded regularly or irregularly. The external appearance was described as granular (cottony) or wooly (wooly). In addition, the color of the dyes produced by each type is recorded on the opposite side and the degree of change of these pigments by the growth progress and the type of medium on which it grows.

**Microbiology of colonies:** The specific characteristics of each isolated fungal species were investigated using the adhesive tape method. A drop of blue lactiphenol was placed on a clean glass slide. Place the adhesive tape on the surface of the fungal colony and gently press to allow adhesion of the fungus and spores and then lift the tape and place it on the lachinoin drop. The fungal structures are under 10x-20x-40-100x, and parts of the fungal colonies may be taken with fine forceps and placed on the glass slide, then a drop of dye is placed after the lid had been placed and the isolates examined [2,13,14].
Physical tests

1. Hair hole test hair perforation test: This test was used to distinguish between species capable of puncturing hair or not, by taking a strand of blond hair and cut into parts of one centimeter length, sterilized with the catheter and placed in sterile test tubes. Each tube was added to 10-15ml distilled water. The fungus cultivars developed well, with the colony not less than two weeks old. The tubes were incubated at a temperature of 25°C for 1-4 weeks in a dark incubator. The hair was examined a week later by placing the hair on a glass slide and a drop of lactiphenol, Trichophyton spp is repeated every two days of penetration, the results recorded and used to distinguish different types\(^{[15,16]}\).

2. DNA extraction of skin fungi: DNA had been extracted as reported by manufacturer FAVORYGN BIOTECH CORR. The program was applied to real-time PCR inspection.

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Step</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>95</td>
<td>Initial Denaturation</td>
<td>5 minutes</td>
</tr>
<tr>
<td>95</td>
<td>Denaturation</td>
<td>30 seconds</td>
</tr>
<tr>
<td>Temperature</td>
<td>Time</td>
<td>Anneal</td>
</tr>
<tr>
<td>60</td>
<td>60 seconds</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td></td>
<td>Number of cycles</td>
</tr>
<tr>
<td>115 minutes</td>
<td></td>
<td>Total time</td>
</tr>
</tbody>
</table>

Results and Discussion

Direct examination showed 43 positive cases from 51 cases (84%), while results of the transplant showed positive 27% by 52%.

Figure 1: Direct examination of fungal dermatophontia using KOH10%

The isolates showed a variable rate of infection with *Trichophyton mentagrophyte* 37.04%, while the second type was *T. soudanense* (14.82%), the *T. rubrum* (14.2%), *M. audouinii* (11.11%) and for *Epidermophyton floccosum & M. canis*, was 7.41% each. Both *M. ferrgineum* and *T. verrcosum* had the lowest infection rate of 3.70% each (Figure 2).
The results showed that there were significant differences between urban and rural populations. Urban injuries were 44.44%, while rural injuries were 55.56% (P= 0.0395). The percentage of male injuries was 62.96%, while females accounted for 37.04%. In terms of age, we found that ages of more than 10 years accounted for 70.38%, while ages less than 10 years accounted for 29.62% (P= 0.0001).
Figure 4: Relationship between age and injury

Amplification chart

Figure 5: PCR real-time analysis and disintegration curve of MEP4 gene.
The real-time analysis indicated that 59.25% of isolates did not show the gene expression of this gene, while 40.74% showed the gene expression as shown in the real-time PCR scan and the MEP 4 disintegration curve.

**Ethical Clearance:** Ethical approval was obtained from the Research Ethics Committee at the Directorates of Education and Health in Babylon and Diwaniyah Governorates, Iraq.

**Source of Funding:** Self-funded.

**Conflict of Interest:** None to declare.

**REFERENCES**


Laboratory Administration of Clinical Trachoma Cases Caused and Ruled by *Musa domestica* in Mesopotamia

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ABSTRACT

**Background:** Trachoma is an infectious disease carried by bacterium *Chlamydia trachomatis* that roll out by both straight and secondary contact with an infected person’s nose or eye. The aim of current study was to diagnose the main cause of trachoma transferred by houseflies and proves this role through modern analytical techniques used in this study.

**Method:** The current project addressed 12 cases. Clinical treating submitted several modern lab methods incorporated NAAT, culture, antigen detection, genetic probes; and microscopy.

**Results:** Significant difference (P<0.05) seemed to be obvious in most of the tested variables.

**Conclusion:** Our study provided an explanation of the spread of new cases of trachoma in Mesopotamia and the modern ways for diagnosis applied in biology lab to prove those cases.

**Keywords:** Trachoma, Iraq, Musa domestica, NAA test, demographic map.

Introduction

Trachoma is an infectious disease carried by bacterium *Chlamydia trachomatis* that roll out by both straight and secondary contact with an infected person’s nose or eye. This disease causes a jagging of the eyelid’s inner surfaces leading to pain in this organ, collapse of the cornea or the outer surface and at long-last losing vision(1). Universally, more than 80 million persons have an active trachoma. Infections in some states perhaps current in as many as 60–90% of youngsters. Amid grown-up, women more by ordinary influenced than men – likely because their adjacent connection with youngsters. This disease causes declined vision in more than 3 million patients, of whom more than million are formerly blind. It mostly occurs in 53 states of Asia, Africa, and South and Central America, with about more than 200 million persons as at danger cases(2).

Houseflies insects do not perform duties for as a coming after host or act as a container of any germ of medical or veterinary importance, but they do play as mechanical vectors to over 200 microbes, such as Chlamydia. It can travel for several miles from their reproducing places, bearing this microorganism on their body parts; mouthparts, hairs, vomitus, and contaminated feces(4).

Sudden upset of trachoma in Middle East demanded many governmental and private efforts on the research levels to combat, quarantine and eradicate this problem. So many diagnostic techniques were improved and introduced in that manner; i.e. PCR, serological tests, NAD, and others (5).

**The aim of current study was to** diagnose the main cause of trachoma transferred by houseflies and proves this role through modern analytical techniques used in this study.

Materials and Method

Models and tests were analyzed in Mesopotamia, particularly in southern regions, Central educational hospitals, while investigations in Baghdad city include serological investigation. NAA applied in LabCorp, headquartered in Burlington, North Carolina.
About 10 cases aged 10 to 24 years who had clinical trachoma diagnosed during the period from July to October 2018.

Diagnostic methods involved applying Direct cytological examination, isolation in cell culture, antigen detection, NAA, Serology.

Demographic map is a mapping technology used to view data on population infected with trachoma in Iraq during 2018.

Statistical analysis of collected and calculated data for clinical variables was scheduled and solved according to (6).

### Results

Diagnostic tests proved that there are mature inclusions appeared as dark purple masses in the cytoplasm of epithelial cells. Culture tests explained a Chlamydial elementary and reticulate bodies can be purified from tissue culture harvests by use of differential renografin density gradients and cushions. Additional antigen diagnostic tests detected elementary bodies in smears. On the same ways NAA assays positive out coming results. The last evidence for trachoma in our study was the positive serological test with IgG: <1:64 and IgM: <1:10 (Table 1).

### Table 1: Results of clinical diagnostic tests for trachoma cases

<table>
<thead>
<tr>
<th>Test</th>
<th>Result</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct cytological examination</td>
<td>+</td>
<td>Mature inclusions appear</td>
</tr>
<tr>
<td>Isolation in cell culture</td>
<td>+</td>
<td>Chlamydia elementary &amp; reticulate bodies</td>
</tr>
<tr>
<td>Antigen detection</td>
<td>+</td>
<td>Detected elementary bodies in smears</td>
</tr>
<tr>
<td>NAA†</td>
<td>+</td>
<td>Positive out coming results</td>
</tr>
<tr>
<td>Serology†</td>
<td>+</td>
<td>IgG: &lt;1:64 and IgM: &lt;1:10</td>
</tr>
</tbody>
</table>

†Relative to the other assays, NAA and Serological tests are the most sensitive and specific.

Statistical correlation indicated strong and directional relationship between basic research variables (mostly flies) and the trachoma test’s outcomes (Figure 1).

![Figure 1: Statistical bubble diagram explains strong correlation among factors of our research](image)

Demographic survey showed progressive spread of trachoma at the south of state and then it appeared up in Babylon and its neighbor villages of other governorates.

### Discussion

Cytological examining to detect inclusions is particularly beneficial in detecting acute inclusion conjunctivitis of the newborn; the sensitivity of this method exceeds 90%. Cytological testing is relatively insensitive when diagnosing adult conjunctival and genital tract infections. Culture is the only methods that confirms the presence of viable or living organisms (7). Antigens, nucleic acids or antibodies can present in the absence of viable infectious particles. Nucleic acid amplification is a valuable molecular tool not only in basic research but also in application of oriented fields such as clinical medicine development, infectious diseases diagnosis, gene cloning and industrial quality control. Serologic tests support NAAT findings of very
low to zero prevalence of ocular *Chlamydia trachomatis* in this community and have potential to provide objective measures of transmission and useful surveillance tools for trachoma elimination programs (8,9).

Demographic maps data and spatial information technologies have three main advantages here. First: it can be a means of recording and storing information by the governments, the private sector, development agencies and civil society. Second: they can be used to identify and study spatial patterns. Maps draw attention to spatial associations. Third: they are helpful in presenting information and communicating findings. Maps permit us to convey information and conclusion that are difficult to express in words, or to condense messages that would be lengthier to describe in words (10,11).

**Conclusion**

Conclusion of our study states that incidence of chlamydia infection in the populations and communities being served should be monitored. Any unexpected variation from this expected rate should initiate investigation into any variation in laboratory practice, specimen collection and transport procedures, or changes in the population served. Each of the alternate isothermal methods has their own limitations and their mechanisms are relatively complex, they are simple to perform and offer better sensitivity. Incorporation of real-time detection methods such as ECL, molecular beacon made them more competent to be used widely. In the future, some of these methods will be as acceptable and applicable as PCR.

**Ethical Clearance:** Ethical approval was obtained from the Research Ethics Committee at the Directorate of Health in Iraqi Governorate, Iraq.

**Source of Funding:** Self-funded.

**Conflict of Interest:** None to declare.

**REFERENCES**


Evaluation of Neutrophils Activity and Function in Type II Diabetes Mellitus Patients’ Blood Samples

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ABSTRACT

Background: Patients with T2DM are considered as immunosuppressed hence they are at risk of infections. Neutrophils are one of the most important phagocytic cells and have important roles in innate immunity. This study was aimed to detect the type of suppression in circulating Neutrophils function in T2DM blood; either resultant from endogenous or exogenous factor.

Method: A total of 60 blood samples were collected from T2DM adult outpatients, and 30 controls or healthy people were involved. Evaluation of neutrophils activity was accomplished for both patients and controls by testing the abilities of circulating neutrophils in blood samples to engulf and reduce NBT dye. Also, IL-8 ELISA test was used to estimate this cytokine levels in patients and controls.

Results: Data from current study showed significant decrease in phagocytic activity and IL-8 levels in T2DM.

Conclusion: T2DM are negatively affected on peripheral Neutrophils via diminishing phagocytic activity and that was due to endogenous and exogenous factors. However, still need more investigations about other related cytokines because it leads to suppression in innate immunity in T2DM patients which predispose them to various infections.

Keywords: diabetes mellitus, NBT, IL-8, innate immunity, Cytokine, Phagocytosis, neutrophils.

Introduction

Type II diabetes mellitus (T2DM) is a heterogeneous group of disorders characterized by variable degrees of insulin resistance, impaired insulin secretion and increased glucose production. Patients with T2DM are considered immunosuppressed hence they are at risk of infections [1]. Neutrophils are one of the most important phagocytic cell types. Neutrophils follow chemotactic cues to locate sites of inflammation, migrating to infection sites in response to signals such as chemo-attractants mainly the cytokine IL-8. Phagocytosis is defined as the ingestion of particles by cells and this process involves the binding of particles to the surface of phagocytic cells followed by internalization and destruction of these particles. The coating of a microorganism with molecules that trigger its destruction by phagocytes is known as opsonization. The reduction of nitroblue tetrazolium (NBT) by monocytes and neutrophils can be used as an indirect marker of the phagocytic activity of these cells.

NBT is a dye with low reduction potential that produces an intensely stained product called Formazan Crystals when reduced inside the mitochondria [2].

In patients with T2DM, abnormalities are usually associated with polymorphonuclear neutrophils (PMNs) and monocytes chemotaxis, opsonization, ingestion of bacteria, oxidative burst and intracellular killing. Hyperglycemia or the presence of advanced glycation end products is believed by many researchers to lead to a state of low activation in PMNs [3]. Interlukine-8 is a cytokine produced by macrophages and epithelial cells and acts as powerful chemo-attractant for neutrophils. The effects of IL-8 on neutrophils include chemotaxis, degranulation, trans-endothelial migration and respiratory burst activation and regulation [4]. Hence, this study was aimed to detect the type of suppression in circulating Neutrophils function in T2DM blood; either resultant from endogenous or exogenous factors.
Material and Method

Subjects and Samples: A total of 60 blood samples were collected from T2DM adult outpatients at the Diabetic and Endocrine center in Al-Hussein hospital in Al- Muthanna Governorate, Iraq during the period from November 2017 to March 2018. The patients were clinically diagnosed by physicians. Blood samples were collected into two tubes; heparin tubes for NBT test and ordinary tubes to isolate serum. Samples were treated as recommended by [5].

Controls and Samples: The controls were 30 healthy volunteers; 25 males and 6 females. They were adults and healthy with no history of recent infections nor DM. Blood samples were collected similarly from all subjects to compare the results with patients’ results.

Ethical Approval: All ethical approvals concerning DM patients and controls were obtained before starting work.

Phagocytic Activity Evaluation: Evaluation of neutrophils activity was accomplished for both patients and controls by testing the abilities of circulating neutrophils in blood samples to engulf and reduce NBT dye (provided by Segma/USA) and forming formazan particles. This test usually detects the oxidative burst inside neutrophils. Heparinized blood was used and slides were stained by Fleishman’s stain (provided by Segma/USA). Preparation and examination of blood smears were done according to [6].

Interlukin-8 estimation: This cytokine was estimated in serum samples of patients and controls. IL-8 ELISA kit was used for this purpose (provided by R &D/USA), and work was done according to kit leaflet.

Statistical Analysis: Statistical analysis of data was performed using SAS (Statistical Analysis System - version 9.1). Independent t test was used to assess the differences between means.

Results and Discussion

Results are presented in Tables 1 and 2. Parameters used in this study decreased significantly as compared with controls’ results statistically. Concerning NBT test outcomes, there were an obvious suppression in neutrophils activity detected in patients’ neutrophils when compared with controls. Results of current study showed that T2DM has caused a significant decrease (at P<0.05) in neutrophils activity in generating proper phagocytosis. Normal values for this test were also in account and are (55-75%) as recommended by [5].

Table 1: Nitro blue-Tetrazolium Test (phagocytic activity)

<table>
<thead>
<tr>
<th>Status</th>
<th>No.</th>
<th>Mean ± SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient</td>
<td>60</td>
<td>15.03±0.81*</td>
</tr>
<tr>
<td>Control</td>
<td>30</td>
<td>49.18±3.26</td>
</tr>
</tbody>
</table>

* Refers to significant differences at P<0.05.

Mean: represents the number of positive cells out of 100 counted.

SE: Slandered error.

Regarding IL-8 levels, results indicated low levels in a significant manner in T2DM patients’ serum samples when compared with controls’ (Table 2).

Table 2: Interlukin-8 levels in serum from diabetic and control subjects

<table>
<thead>
<tr>
<th>Status</th>
<th>No.</th>
<th>Mean ± SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient</td>
<td>60</td>
<td>558.44±78.65*</td>
</tr>
<tr>
<td>Control</td>
<td>30</td>
<td>866.14±151.81</td>
</tr>
</tbody>
</table>

* Refers to significant differences at P<0.05. Mean: ng/mL. SE: Slandered error.

The obtained results indicated that T2DM patients involved in this study suffered from suppression in phagocytic cells represented by neutrophils in their blood. In addition, the cytokine that is responsible for their activation was in regression of its levels which means less activation and lower function of Neutrophils.

Metabolic disorder and starving cell disease are the description of DM including both type I and type II, because cells don’t get enough energy (glucose) for daily activities. Many authors stated about the effects of T2DM on neutrophils at the cellular level. Decreased bactericidal activity, impairment of phagocytosis and decreased release of lysosomal enzymes and reduced production of reactive oxygen species by neutrophils of diabetic patients have been described by other scientists [7-9].

Other researchers [10] searched about the effects of endogenous and exogenous pro-oxidants trigger of leukocytes activation in DM patients and stated that these mechanisms interact in a cycle responsible for
the control of oxidative/antioxidant homeostasis which were significantly affected in patients with diabetics as in current study.

Other researchers [11] described the causes of diminished phagocytic activity in DM patients from a physiological view and showed for the first time that the chemotactic activity of neutrophils from diabetic patients is significantly lower than in cells from healthy controls and there was an impairment of their functions. Decreased bactericidal activity, impairment of phagocytosis and decreased release of lysosomal enzymes, reduced production of reactive oxygen species by neutrophils of diabetic patients, reduction in leukocyte phagocytosis and bactericidal activity showed a significant correlation with increased blood glucose levels in patients. They explained that due to diabetes mellitus effects on the metabolism of neutrophils, it impaired metabolism of glucose and glutamine and increased fatty acid oxidation then compensate for the reduction in glucose and glutamine utilization to maintain the ATP supply for these cells. That can explain current study result, since NBT test needs the oxidative burst inside phagocytic cells to be efficient in order to reduce NBT dye and form the black formazan particles that deposit and give the positive result. Mitochondrial dysfunction caused impairment of phagocytosis in neutrophils of T2DM, this fact was revealed by [12] and they explained that by less energy supply in diabetic cells including neutrophils.

The present study outcomes were confirmed by suppression of IL-8 levels in T2DM patients, which was reflected on the activity of neutrophils in turn. Since this cytokine plays an important role in activity function of neutrophils as stated by [13], they proved that this cytokine can be used as an indicator for abnormalities of renal innate immunity which leads to renal failure in diabetic patients. Another study [14] supported the fact that recurrent infections in DM patients can be attributed to impaired innate immune response, the first line of defense represented by neutrophils, and that can explain the difficulty in treating infections in DM patients. Moreover, the authors [15] estimated many cytokines in T2DM patients peripheral blood and they concluded that, in general, many cytokines secretion was affected and reflected on their levels and duties in regulation of overall immune system status in patients. Also, they found that IL-8 levels were decreased in a significant manner.

Conclusion

T2DM patients are negatively affected on peripheral Neutrophils via diminishing phagocytic activity and that was due to endogenous and exogenous factors. However, still need more investigations about other related cytokines because it leads to suppression in innate immunity in T2DM patients which predisposes them to various infections.

Ethical Clearance: Ethical approval was obtained from the Research Ethics Committee at the Directorate of Health in Iraqi Governorate, Iraq.

Source of Funding: Self-funded.

Conflict of Interest: None to declare.

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The Effect of the Use of the Self-Programming Method in Cognitive Achievement and Learning the Handling Skills of Football Students

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ABSTRACT

The aim of the research was to identify the effect of the self-programming method in cognitive achievement and learn the handling skills of students. This research was conducted on a sample of students of the first stage in the Faculty of Physical Education and Sports Sciences/ University of Kufa for the academic year 2018-2019. They were divided into two equal groups. The experimental worked in a self-programming and control method. The method was followed by the teacher of the material after performing the homogeneity and equivalence processes, such as the selection of appropriate tests for the research variables affecting the cognitive achievement and learning the handling skills of the football students identified by the researcher (10) students from outside the basic research sample, using the tools and aids in the research. The tribal tests were carried out on the two groups and then the research method was applied within the educational units (8) units within four weeks. (90) Minutes, after which the remote tests were carried out, and then the results of the research were processed using the appropriate statistical methods. The researchers produced several needs, the most important of which is that the self-programming method has a positive effect on learning the skill of handling football and the cognitive achievement associated with this skill, As well as the possibility of using this method in the educational process of football material, and in light of these conclusions recommend that the researchers recommend the use of self-programmatic cognitive achievement and learning the skill of handling for football students.

Keywords: self-programming, cognitive achievement and learning.

Introduction

The teaching methods are an important means of organizing the relations between the learner and the teacher and the educational material during the stages of the educational unit for the purpose of achieving the teaching method that achieves the desired goal. The duties of the teacher are all related to the teaching of the students. All the experiences and attitudes that help to learn the skills of the motor are in the methods teaching and methods(1).

The method that attracts the senses of the learner and develop his mental abilities in the process of obtaining information, which gives him focus throughout the duration of the educational unit, is a good method, as the modern educational process depends on the investment of all the senses of the learner using different methods and teaching methods that address more than a sense of more than Learner achievement in certain situations to receive information about the learning process, and cognitive achievement is an important factor to reach the learner to the learning outcomes of the motor(2).

Football is a group of games that are practiced at the level of schools, clubs and universities, and contain several basic skills that require learning when teaching methods to achieve the educational purpose, such skills is the handling of football, which is one of the basic skills of football, which requires to style The importance

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of research in the use of the method of self-programming and its application in the educational situations associated with attracting the learners' attention and focus towards the process of learning this important skill.

The method of self-programming is one of the technological methods in the field of teaching and learning, motor and psychology, which provides the effort and time for the teacher to explain the educational material, and depends on this method to determine the general objectives of the self-programmatic style, which contains behavioral goals (same kinetic, cognitive, emotional) Age and individual differences among learners, as well as the adoption of the organization of educational material, which includes instructions and guidance and provide expressions that are exciting and suspense and the distribution of the framework of the article (preface, linking, frames of re-review, distinction) and serial drawings to illustrate the technical performance of the kinetic energy to be learned.

Research Methodology and Field Procedures:

Research Methodology: The researchers used the experimental approach to design the two groups with pre-test and post-test as appropriate to the nature of the research problem.

The research sample: The sample of the research was selected from the original research society of the students of the first stage in the Faculty of Physical Education and Sports Sciences - University of Kufa for the academic year (2018-2019), the number of (71) students, randomly and a number of (30) students, were divided into two equal groups and (15) Is a student for each group. Thus, the percentage of the research sample is (42.25%), which is appropriate to represent the research community as a real and honest representation, as shown in Table (1).

<table>
<thead>
<tr>
<th>Group</th>
<th>Number of students per group</th>
<th>The teaching method followed for each group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>15</td>
<td>Learning in a self-programming style</td>
</tr>
<tr>
<td>Control</td>
<td>15</td>
<td>Learning in the manner followed by the coach</td>
</tr>
<tr>
<td>Total number of sample</td>
<td>30</td>
<td></td>
</tr>
</tbody>
</table>

Homogeneity of the sample and the equivalence of the two research groups: To verify the homogeneity of the research sample in the variables of age, height and weight, the researchers measured these variables and extracted the arithmetic mean, the standard deviation, the mean and the spline coefficient, as shown in Table (2).

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>SD</th>
<th>Mode</th>
<th>Skewness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Year)</td>
<td>19.89</td>
<td>0.92</td>
<td>20</td>
<td>-0.12</td>
</tr>
<tr>
<td>Length (cm)</td>
<td>174.27</td>
<td>1.22</td>
<td>172</td>
<td>1.86</td>
</tr>
<tr>
<td>Mass (kg)</td>
<td>69.45</td>
<td>1.51</td>
<td>68</td>
<td>0.96</td>
</tr>
</tbody>
</table>

The researchers also found the equivalence of the two experimental research groups with the variables affecting the learning of the handling skills of the football and cognitive acquisition in order to start with one line of project, as shown in Table (3).

<table>
<thead>
<tr>
<th>Variables</th>
<th>Self-programming style</th>
<th>The style followed by the coach</th>
<th>(t) calculated</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive Achievement (Degree)</td>
<td>3.54</td>
<td>3.22</td>
<td>1.25</td>
<td>Non sig.</td>
</tr>
<tr>
<td>Technical performance of handling skill (Degree)</td>
<td>2.98</td>
<td>3.05</td>
<td>0.24</td>
<td>Non sig.</td>
</tr>
</tbody>
</table>

Table (3) shows that the values of (t) calculated are less than the tabular value of (2.04) at the level of significance (0.05) and the degree of freedom (28) which means that there are no significant differences between the two research groups in the search variables affecting learning handling skills And cognitive achievement of
football, in which shows the equivalence of the two groups in the tests under consideration.

**Means, tools and devices used in research:**
- Arab and foreign sources and references.
- Observation
- Personal interviews
- The exams
- Football field and legal football balls (10).
- Metal measuring tape for measuring length and medical balance for weight measurement.
- Hand Scientific Calculator and Pencils.
- Evaluation form for technical performance tests for handling skills.
- Evaluation form for tests of variables of research affecting the learning of handling skills.

**Selection of tests:** The researchers selected the tests in question * by looking at the scientific sources of tests, measurement and football, and the tests were selected machines:

1. Test the skill of technical performance and accuracy of handling football.

2. The cognitive achievement test in line with the research objectives the researchers used the cognitive achievement scale of the research sample as well as the comparison between the two research groups in the extent of mastery of the cognitive achievement of the skills of football. It is a tool to measure the learning outcomes of the first stage students in the Faculty of Physical Education and Sports Sciences. For this purpose, the researchers prepared and formulated the cognitive test score and developed it in a format that covers the basic aspects of some of the basic skills of football taught to students through the self-programming method.

**Pilot study:** The pilot study was conducted on 15/1/2019 on the sample of the exploratory survey consisting of (20) students and outside the basic research sample. The aim of this experiment is to know the following:
- Time taken to perform tests.
- Method of using tools, instruments and tests.
- Organize the test sequence to facilitate the transition from one player to another to save time and effort.
- Finding scientific tests.

**Conducting the main experiment:** The experimental tests were conducted on 9/2/2019, after the implementation of the first two teaching units, in which the handling skills were explained after using the ideal living model in the skill presentation. The research sample applied this skill during the two educational units. At the end of the second unit, The tests were conducted on the tribal variables of research affecting the learning of the skills of handling and achievement of knowledge of football, and took the educational curriculum (4) weeks, two units per week, and the total units of the skill handling (8) Hydrating 90 minutes, as the researchers apply the vocabulary of the educational curriculum according self-style programmatic style, and after the completion of the college educational units, posttests of the first and second of the two groups on 13/4/2019 and the circumstances of the same as they were tribal tests for this skill was conducted.

**Results**

Table 4: Shows the statistical results of the value (t) calculated between the tribal and remote tests in the booklet style programmed in learning the skill of handling football and cognitive achievement

<table>
<thead>
<tr>
<th>Variables</th>
<th>Pretest</th>
<th>Posttest</th>
<th>(t) calculated</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Cognitive Achievement (Degree)</td>
<td>3.54</td>
<td>0.76</td>
<td>5.94</td>
<td>0.96</td>
</tr>
<tr>
<td>Technical performance of handling skill (Degree)</td>
<td>2.98</td>
<td>0.82</td>
<td>6.98</td>
<td>1.02</td>
</tr>
</tbody>
</table>

The researchers attributed the reason for these differences in the learning of handling skills and the development of cognitive achievement among the learners of this group to the ability of the material teacher to control and invest the time of the unit in the implementation of teaching tasks and duties using
the explanatory method that helped to understand and understand the learner and his understanding of the parts of the skill, in its three parts (preparatory, president, final). The use of illustrations, which have been included in the curriculum, with the help of the presentation of the living model of skill, has enabled the learner to understand and understand the nature of the movement.  

Table 5: Shows the statistical results of the value of \( t \) calculated in the tests and the distance between the two groups of the first research (manual programmed) in learning the technical performance of the skill of handling cognitive achievement

<table>
<thead>
<tr>
<th>Variables</th>
<th>Self-programming style</th>
<th>The style followed by the coach</th>
<th>( (t) ) calculated</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive Achievement (Degree)</td>
<td>Mean 5.94 SD 0.96</td>
<td>Mean 3.98 SD 0.72</td>
<td>6.32</td>
<td>Sig.</td>
</tr>
<tr>
<td>Technical performance of handling skill (Degree)</td>
<td>Mean 6.98 SD 1.02</td>
<td>Mean 5.15 SD 0.95</td>
<td>5.09</td>
<td>Sig.</td>
</tr>
</tbody>
</table>

Table (5) shows that the calculated values \( t \) were greater than the tabular value of \( (2.04) \) at the level of significance \( (0.05) \) and below the degree of freedom \( (28) \) indicating that there are significant differences between the two sets of the programmed manual and the demonstration in cognitive achievement tests and performance. The researchers attribute the cause of the differences between the two methods and the superiority of the programmatic method that the use of technological development in the process of learning may achieve the objectives required in the teaching process and attract the learner and develop his attention throughout the duration of the unit and this is confirmed study, which indicated that the self-programmatic approach strengthens motivation and stimulates the learner and increases his attention and concentration in comparison with traditional methods.

The use of the method of self-programming has helped to effectively learn this skill because it is a modern scientific methods in which the learner is the focus of the educational process, which increases the motivation for the learning process, as well as it provided sufficient time to apply and provide information and correct errors, a greater opportunity for skill training. As well as the development of cognitive achievement related to the skill of dealing with football in the research, which resulted in this method is the sources of interest and motivation and suspend to the process of learning and attention and automatic work and active as the behavior of the learner in this method independent behavior as an individual and a member of his group and provide him with sufficient instructions to ensure it on the experience of value and ensure that the trends in the use of his abilities to identify the principles and detailed parts of the skill and focus on it and represents an educational method that allows the learner to develop his knowledge through practical experience directly.

**Conclusion**

1. The method of self-programming have a positive impact in learning the skill of handling and development of cognitive achievement for football students.
2. Learning in a self-programming way. In learning the skill of handling and developing the cognitive achievement of football students.
3. The possibility of using this method in the educational process of football for students.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding

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The Level of Ambition and its Relation to the Cognitive Achievement of Students in Volleyball

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1,2,3The College of Physical Education and Sports Sciences, University of Kerbala, Iraq

ABSTRACT

The research consisted of two axes, namely the identification of the level of ambition and cognitive achievement and comparison among students in the fourth stage/Kerbala University, Faculty of Education and Sports Sciences, where the standards of the level of ambition and cognitive achievement were prepared and the descriptive method used in the comparison method to suit the nature of the research. The research sample included (90) students, and the extraction of associative relations using statistical means.

Keywords: Ambition and cognitive achievement.

Introduction

As a result of this development, the countries of the world began the programmed and precise planning of the educational process, which called for the discovery of many modern scientific theories which led to the interpretation of many phenomena and helped to find the best solutions to many of the problems and topics that aim to improve the level of technical and digital performance and various sports competitions.

Believing in the effective and influential role that can be played by the psychological side, which did not take the appropriate share of it, considering that the psychological factor complemented the aspects of the general numbers of the individual and is an important axis of the integrated development of the athlete and also confirmed scientific studies in the field of physical education importance, During the study of personality theories and analysis and identify the drivers of the behavior of sports and the diagnosis of important social and psychological phenomena affect the cognitive and mental aspects and the extent of the individual’s possession of the cognitive and informational aspects of skill or effective practice and this is called the side Cognitive or cognitive achievement, which is the result of previous experiences and knowledge, and the extent of their understanding and interpretation within the mental abilities related to the inherent fact and the act of locomotion and its relevance to the skill aspect of volleyball. The extent to which the individual has a knowledge of the various skills of volleyball and knowledge of offensive formations is necessary to reverse the optimal performance And the extent of success achieved as the extent of the student’s abilities and possibilities qualify him to perform his duties towards the game of volleyball and to improve the level of student in the game of volleyball and its relevance to the level of ambition required and built On the basis of his real abilities is necessary and this explains the extent of success and athletic excellence of it, and hence must be studied their behavior during the performance in the fulfillment of their ambitions in the practice of various volleyball skills and all formations offensive and the accompanying acts of conduct during the behavior of students when playing volleyball, And this is all related to the cognitive aspect of the student and the extent of his awareness of the skill and offensive formations and the level of ambition desired, and hence the drawbacks of the importance of research lies in the identification of the correlation between the variables of the study and the (level of ambition, cognitive achievement) Of the volleyball.

Methodology

Field research procedures: The researchers used the descriptive method of surveying methods and comparative
studies because of its suitability and the nature of the research. The researchers chose the research society from the students of the fourth stage - Faculty of Physical Education and Sports Sciences - Kerbala University for the academic year (2018 - 2019) and 90 students.

**Scale Level of ambition:** The researchers built the scale of the level of ambition according to the scientific steps followed in building the measurements. A total of (36) paragraphs of the scale were distributed in (5) areas. As shown in table (1).

Table 1: The fields and the number of paragraphs and their sequence of the measurement of communication skills

<table>
<thead>
<tr>
<th>S.</th>
<th>Field name</th>
<th>Paragraph numbers</th>
<th>Number of paragraphs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Going towards the future</td>
<td>1_2_3_4_5_6_7_8</td>
<td>8</td>
</tr>
<tr>
<td>2.</td>
<td>Going towards excellence</td>
<td>9-10-11-12-13-14-15</td>
<td>7</td>
</tr>
<tr>
<td>3.</td>
<td>Towards specialization</td>
<td>16-17-18-19-20-21-22</td>
<td>7</td>
</tr>
<tr>
<td>5.</td>
<td>optimism</td>
<td>30-31-32-33-34-35-36</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>36</td>
</tr>
</tbody>
</table>

The substitutions were used to answer the paragraphs of the scale and reached three alternatives for each paragraph (always 3 degrees), sometimes (2 degrees), never (1 degree).

**Coherence coefficient:** Pearson correlation coefficient was used in this and for all of the measures of the scale (35). The results showed that all the paragraphs have a statistical function in a sample of (90) students below the level of significance (0.05) of (0.205) and freedom degree (88). Table (2) the correlation between the degree of the paragraph and the sum.

Table 2: The correlation coefficient between the degree of the paragraph and the total score of the total sum of the level of ambition

<table>
<thead>
<tr>
<th>S.</th>
<th>Correlation coefficient</th>
<th>Statistical significance</th>
<th>S</th>
<th>Correlation coefficient</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>0.227*</td>
<td>Sig.</td>
<td>19</td>
<td>0.529**</td>
<td>Sig.</td>
</tr>
<tr>
<td>2.</td>
<td>0.647**</td>
<td>Sig.</td>
<td>20</td>
<td>0.549**</td>
<td>Sig.</td>
</tr>
<tr>
<td>3.</td>
<td>0.207*</td>
<td>Sig.</td>
<td>21</td>
<td>0.464**</td>
<td>Sig.</td>
</tr>
<tr>
<td>4.</td>
<td>0.431**</td>
<td>Sig.</td>
<td>22</td>
<td>0.649**</td>
<td>Sig.</td>
</tr>
<tr>
<td>5.</td>
<td>0.539**</td>
<td>Sig.</td>
<td>23</td>
<td>0.260*</td>
<td>Sig.</td>
</tr>
<tr>
<td>6.</td>
<td>0.401**</td>
<td>Sig.</td>
<td>24</td>
<td>0.431**</td>
<td>Sig.</td>
</tr>
<tr>
<td>7.</td>
<td>0.266*</td>
<td>Sig.</td>
<td>25</td>
<td>0.712**</td>
<td>Sig.</td>
</tr>
<tr>
<td>8.</td>
<td>0.549**</td>
<td>Sig.</td>
<td>26</td>
<td>0.349**</td>
<td>Sig.</td>
</tr>
<tr>
<td>9.</td>
<td>0.268**</td>
<td>Sig.</td>
<td>27</td>
<td>0.304**</td>
<td>Sig.</td>
</tr>
<tr>
<td>10.</td>
<td>0.456**</td>
<td>Sig.</td>
<td>58</td>
<td>Fell through (t) discriminatory</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>0.354**</td>
<td>Sig.</td>
<td>29</td>
<td>0.344**</td>
<td>Sig.</td>
</tr>
<tr>
<td>12.</td>
<td>0.288**</td>
<td>Sig.</td>
<td>30</td>
<td>0.400**</td>
<td>Sig.</td>
</tr>
<tr>
<td>13.</td>
<td>0.555**</td>
<td>Sig.</td>
<td>31</td>
<td>0.462**</td>
<td>Sig.</td>
</tr>
<tr>
<td>14.</td>
<td>0.337**</td>
<td>Sig.</td>
<td>32</td>
<td>0.234*</td>
<td>Sig.</td>
</tr>
<tr>
<td>15.</td>
<td>0.489**</td>
<td>Sig.</td>
<td>33</td>
<td>0.428**</td>
<td>Sig.</td>
</tr>
<tr>
<td>16.</td>
<td>0.712**</td>
<td>Sig.</td>
<td>34</td>
<td>0.427**</td>
<td>Sig.</td>
</tr>
<tr>
<td>17.</td>
<td>0.307**</td>
<td>Sig.</td>
<td>35</td>
<td>0.456**</td>
<td>Sig.</td>
</tr>
<tr>
<td>18.</td>
<td>0.385**</td>
<td>Sig.</td>
<td>36</td>
<td>0.307**</td>
<td>Sig.</td>
</tr>
</tbody>
</table>

**Volleyball Cognitive Achievement Scale:** The researchers constructed the cognitive achievement scale for volleyball for the fourth stage, and 40 knowledge questions were distributed in the scientific fields of the offensive plan without the crushing beating, the offensive plan (4-2), the offensive plan (3-3) 4), offensive plan (1-5), rules of play, each question (4) one choices are the correct choice.
Correction of cognitive achievement test: The questions of cognitive achievement are of (40) question, where the researcher assigned one (one) to the question his answer is correct and (zero) for the question his answer is incorrect and all of them included multiple choice.

Statistical analysis of cognitive achievement test questions:

First: coefficient of ease and difficulty paragraphs: After the statistical analysis of the cognitive test subjects in the fourth stage students of the Faculty of Physical Education and Sports Sciences - University of Kerbala, the researchers found that there are questions of an appropriate level and the difficulty and ease of each question was found to be between 67% - 33% This shows.

<table>
<thead>
<tr>
<th>Questions</th>
<th>Ease factor</th>
<th>Difficulty Factor</th>
<th>Evaluation of paragraph</th>
<th>Questions</th>
<th>Ease factor</th>
<th>Difficulty Factor</th>
<th>Evaluation of paragraph</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.56</td>
<td>0.44</td>
<td>Valid</td>
<td>21</td>
<td>0.44</td>
<td>0.56</td>
<td>Valid</td>
</tr>
<tr>
<td>2</td>
<td>0.46</td>
<td>0.54</td>
<td>Valid</td>
<td>22</td>
<td>0.40</td>
<td>0.60</td>
<td>Valid</td>
</tr>
<tr>
<td>3</td>
<td>0.46</td>
<td>0.54</td>
<td>Valid</td>
<td>23</td>
<td>0.54</td>
<td>0.46</td>
<td>Valid</td>
</tr>
<tr>
<td>4</td>
<td>0.48</td>
<td>0.52</td>
<td>Valid</td>
<td>24</td>
<td>0.50</td>
<td>0.50</td>
<td>Valid</td>
</tr>
<tr>
<td>5</td>
<td>0.50</td>
<td>0.50</td>
<td>Valid</td>
<td>25</td>
<td>0.40</td>
<td>0.60</td>
<td>Valid</td>
</tr>
<tr>
<td>6</td>
<td>0.56</td>
<td>0.44</td>
<td>Valid</td>
<td>26</td>
<td>0.56</td>
<td>0.44</td>
<td>Valid</td>
</tr>
<tr>
<td>7</td>
<td>0.52</td>
<td>0.48</td>
<td>Valid</td>
<td>27</td>
<td>0.58</td>
<td>0.42</td>
<td>Valid</td>
</tr>
<tr>
<td>8</td>
<td>0.58</td>
<td>0.42</td>
<td>Valid</td>
<td>28</td>
<td>0.54</td>
<td>0.46</td>
<td>Valid</td>
</tr>
<tr>
<td>9</td>
<td>0.42</td>
<td>0.58</td>
<td>Valid</td>
<td>29</td>
<td>0.58</td>
<td>0.42</td>
<td>Valid</td>
</tr>
<tr>
<td>10</td>
<td>0.60</td>
<td>0.40</td>
<td>Valid</td>
<td>30</td>
<td>0.44</td>
<td>0.56</td>
<td>Valid</td>
</tr>
<tr>
<td>11</td>
<td>0.48</td>
<td>0.52</td>
<td>Valid</td>
<td>31</td>
<td>0.50</td>
<td>0.50</td>
<td>Valid</td>
</tr>
<tr>
<td>12</td>
<td>0.40</td>
<td>0.60</td>
<td>Valid</td>
<td>32</td>
<td>0.50</td>
<td>0.50</td>
<td>Valid</td>
</tr>
<tr>
<td>13</td>
<td>0.42</td>
<td>0.58</td>
<td>Valid</td>
<td>33</td>
<td>0.46</td>
<td>0.54</td>
<td>Valid</td>
</tr>
<tr>
<td>14</td>
<td>0.52</td>
<td>0.58</td>
<td>Valid</td>
<td>34</td>
<td>0.52</td>
<td>0.48</td>
<td>Valid</td>
</tr>
<tr>
<td>15</td>
<td>0.46</td>
<td>0.54</td>
<td>Valid</td>
<td>35</td>
<td>0.63</td>
<td>0.38</td>
<td>Valid</td>
</tr>
<tr>
<td>16</td>
<td>0.58</td>
<td>0.42</td>
<td>Valid</td>
<td>36</td>
<td>0.60</td>
<td>0.40</td>
<td>Valid</td>
</tr>
<tr>
<td>17</td>
<td>0.46</td>
<td>0.54</td>
<td>Valid</td>
<td>37</td>
<td>0.54</td>
<td>0.46</td>
<td>Valid</td>
</tr>
<tr>
<td>18</td>
<td>0.63</td>
<td>0.38</td>
<td>Valid</td>
<td>38</td>
<td>0.60</td>
<td>0.40</td>
<td>Valid</td>
</tr>
<tr>
<td>19</td>
<td>0.67</td>
<td>0.33</td>
<td>Valid</td>
<td>39</td>
<td>0.52</td>
<td>0.48</td>
<td>Valid</td>
</tr>
<tr>
<td>20</td>
<td>0.54</td>
<td>0.46</td>
<td>Valid</td>
<td>40</td>
<td>0.58</td>
<td>0.42</td>
<td>Valid</td>
</tr>
</tbody>
</table>

Parameter discrimination coefficient: The results showed that all the paragraphs were distinct and were limited between (0 - 0 - 63.0). The researcher adopted the questions that had a discrimination index (40.0) and higher according to the Ebel standards. (40) Question that it has a very good discrimination index and is able to distinguish between tested individuals.

Relationship of the paragraph to the overall degree of the test (internal consistency): The researchers used the Pearson correlation coefficient between the scores of the sample on each question and their total score on the test to extract the correlation and then rely on the sample of the building sample. It ranged from (219.0 - 768.0) to the statistical correlation coefficient with the values of the correlation coefficient (205.0) In the light of this criterion, all the paragraphs were function with a degree of freedom equal to (N -2), equal to (88) and a significant level (0.05).

Results

After the process of measurement of variables through the application of the measurement measures and access to data and to achieve the objectives of the study, which includes recognition of the reality of the
level of ambition and cognitive achievement of students, and then sought to extract the values of the computational and standard deviations of the sample of the sample of the basic experiment of the search of (90) And then the mean value of the investigated variables was calculated as shown in Table (4).

### Table 4: Shows the descriptive statistical values of the investigated variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>Standard error</th>
<th>Median</th>
<th>Mode</th>
<th>SD</th>
<th>Skewness</th>
<th>Extent</th>
<th>Lowest value</th>
<th>The biggest value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of ambition</td>
<td>87.44</td>
<td>0.71</td>
<td>88.00</td>
<td>88.0</td>
<td>6.78</td>
<td>0.03</td>
<td>29.0</td>
<td>72.0</td>
<td>101.0</td>
</tr>
<tr>
<td>Cognitive Achievement</td>
<td>23.71</td>
<td>37.50</td>
<td>24.00</td>
<td>24.00</td>
<td>3.55</td>
<td>0.42</td>
<td>18.0</td>
<td>16.0</td>
<td>34.0</td>
</tr>
</tbody>
</table>

**Present the reality of the level of ambition among students:**

### Table 5: Shows the significance of the differences between the realized arithmetic mean and the mean of the aspiration scale

<table>
<thead>
<tr>
<th>The sample</th>
<th>Mean</th>
<th>SD</th>
<th>The mean medium</th>
<th>df</th>
<th>(t) value Calculated</th>
<th>Tabulated</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>90</td>
<td>87.444</td>
<td>6.78914</td>
<td>70</td>
<td>89</td>
<td>7.71</td>
<td>2</td>
<td>Sig.</td>
</tr>
</tbody>
</table>

Table (5) shows that the difference in favor of the arithmetical mean achieved, and this indicates that the reality of the level of ambition for students of the fourth stage volleyball is above the middle level and this indicates their high level of ambition and have the ability to achieve their goals. The student is always seeking to obtain a job that is appreciated and respected social status, although the motivation for this job is not related to the economic needs, the student seeks respect and needs to be appreciated, proud of his qualifications and achieving his professional ambition and satisfaction of this need is achieved for the student mental health and the ability to face pressure this confirms their positive attitude toward volleyball. The researchers attribute this to their high confidence in themselves and have the ability and ability to excel in performance and in line with the development of sport because the student received knowledge and learning of the skills of sports and its various laws and methods of playing and teaching various and how to manage competitions and competitions gave him a scientific background and formed a culture of sports highlights its role in the service of the community and the specialization of sports education as a stand-alone science no less than the other educational disciplines because it contains many sciences and knowledge and at the same time have a common knowledge with the Other educational and scientific disciplines. The researchers believe that the students of the faculties of physical education and sports sciences must have a cognitive and academic aspect that makes them a glorious teacher in the success of the educational process, especially the levels of knowledge and culture. This in itself shows that there are levels of knowledge and culture that vary from teacher to teacher. The professional, educational and educational attitudes that require high interpretation and analysis require knowledge capabilities that are characterized by rapid response without hesitation, as well as the extent of experience and excellence that reflect teacher intelligence, because knowledge is “a variety of preparations and strengths The mind, the mind, the mind, the mind, the mind, the mental aspect of the human personality”.

The researchers believe that the control of mental and psychological behaviour and relaxation associated with the performance of the study sample members plays an important role in their attitudes and responses, as (relaxation and psychological calm of the player and the stimulation of the nervous system within the environment works to make positive behaviour and develop processes of perception and improvement of memory and imagination).

Collective achievement is positive and affects the psychological variables as it is an indicator of positive thinking and behaviour that the player in a particular position, whether that educational and training situation and linked to the positive and direct behaviour or performance, which occurs during the movement through the rapid translation of the thinking plan to Different movements, responses and behaviours.
On the other hand, «how to think and types, and the replacement of negative ideas to positive ideas and good behavior of the priorities of the performance of the volleyball team by having the correct thinking and adjustment to the path of positive behavior, so that the athlete can solve the tactical duties and to be skilled performance at the level of high level of development must work on the development of various aspects of thinking has such as the correct cashability and speed of thought and flexibility and thinking ability and the ability to visualize and the speed of reaction and perception and development of the thinking of the player must take its place prominent and influential by mastering technical skills and that are preparing the basic conditions for the development and raise the level of tactical thinking of the player and this is shown by the positive behavior of the player and the achievement of its objectives.8

View and analyze the relation between the level of ambition and cognitive achievement in the research sample: The researchers used the method of studying correlational relationships in the investigated variables and in order to achieve the objectives of the study (the nature of the relationship between the level of ambition and cognitive achievement).

Table 6: Shows the level of ambition and its relation to the cognitive achievement of students in the fourth stage

<table>
<thead>
<tr>
<th>Variables</th>
<th>Calculate the values of (t) of the significance of the correlation coefficient</th>
<th>Moral significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cognitive Achievement</td>
<td>Level of ambition</td>
</tr>
<tr>
<td>Cognitive Achievement</td>
<td>1</td>
<td>0.477</td>
</tr>
</tbody>
</table>

Table (6) shows that the value of the correlation coefficients of cognitive achievement in calculating the value of (T) calculated as an indication of the significance of the correlation coefficients reached (1) either at the correlation coefficient between the cognitive achievement variables, at the degree of freedom (2) and below the level of significance (0.05). The researchers see that physical education and sports science is one of the areas that affect the human being as an important element in the building of the individual, and prepared in an integrated manner on scientific grounds, the ability of the individual to exert effort depends on many of the variables which come in the forefront variables level of ambition and cognitive achievement.9

Some studies believe that the true success of the sports educator is to emphasize the combination of practice with activity and knowledge. It is essential that every sports educator learns the knowledge and knowledge of the sport and the psychological and social skills that enable him to transfer his knowledge and culture to others. It is not reasonable for an individual to exercise activity and trust without a repertoire of knowledge to help him.10

Conclusion

Develop a scientific research tool to measure the level of ambition among students in the fourth stage Faculty of Physical Education and Sports Sciences Kerbala University; The development of a scientific research tool on the cognitive achievement test of students in the fourth stage Faculty of Physical Education and Sports Sciences Kerbala University.; results showed that there are differences in the level of ambition among students in the fourth stage Faculty of Physical Education and Sports Sciences Kerbala University., and results showed that there are differences in the cognitive achievement test among the students of the fourth stage, Faculty of Physical Education and Sports Sciences, Kerbala University.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

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6. Al-Mashhad RAA. The Impact of the Plan and PDEODE Strategies in Developing Awareness of Cognitive Processes and Reducing Psychological Pollution Among Students of the Faculty of Physical Education and Sports Sciences. 2018;928–35.


The Effect of Stopping Training in Some Physical and Functional Variables and Sending Table Tennis

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¹,²,³The College of Physical Education and Sport Sciences, University of Anbar, Iraq

ABSTRACT
The aim of the study is to track the changes due to the cessation of training for a period of one week, two weeks and three weeks on the strengths of the muscles, the functional variables and the skill of transmission in the face and back of the tennis racket. While the hypothesis confirmed there are differences of statistical significance in the strengths of muscle and functional variables and skill of transmission in the face and the back of the racket as a result of the cessation of training between the level and after the cessation of the period (one week and two weeks and three weeks).

The researchers used the descriptive approach in a sequential manner to suitability and nature of research. The results of the study included (6) players representing the Anbar University table tennis team for the academic year 2018-2019. The researchers concluded that there were negative effects in the reduction of all functional variables, but diastolic pressure maintained its level for the duration of the period of cessation of training either the technical and physical variables recorded a significant decrease Stop training altogether. The researchers recommended that periodic tests of the fitness, functional and skill level of tennis players be consistently confirmed.

Keywords: stopping training, physical and functional variables.

Introduction
The continuation of the training process is one of the most important basic principles that reach the athlete to the highest levels and must be scientifically determined according to the age and level of the athlete and the effectiveness exercised by both the individual or the individual as the scientific basis of the training process is one of the most important factors to ensure the correct orientation of the athlete Maintain its level and climb to the top. Therefore, the cessation of the training process is considered a negative indicator affects the level of performance of the athlete, whether in physical, functional or skill, although the cessation of a short period or long.¹

The sudden interruption of training can lead to disruption of the athlete’s health condition, and difficulties arise when the training is resumed. Therefore, it is necessary to know what changes occur to the athlete when the physical training is stopped for a period of time, whether due to injury or the end of the sports season, resulting in a decline in the level of performance sports for most sports events.²

Among these activities is the game of ping pong, which has reached a level of performance and play. All the games that require its practitioners to prepare well physically, skillfully, strategically and psychologically. This preparation must be based on scientific bases, with the necessity of continuing the training without interruption through the above The importance of research in the knowledge of the scientific facts resulting from the impact of the cessation of training in some physical and functional variables and the skill of transmission in the game of table tennis in order to provide the stakeholders (trainers, players, teachers and researchers) in this sport scientific information and indications of the impact of the stop N training to be
helpful to them when training curricula or research on the players drop-volitional training or forcibly for their access to the physical and skill level required action.  

**Research Methodology**

The researchers used the descriptive approach in a sequential manner to suitability and nature of research.

**The research sample:** The study sample consisted of (6) players representing the Anbar University team in table tennis for the academic year 2018-2019. The players were excluded for the pilot experiment and the sample number reached (4) players.

Standards and tests used in the search:

**Functional Benchmarks:**
- Blood pressure measurement: Blood pressure is measured by a ready-made blood pressure measurement type.
- Pulse measurement: Pulse is measured by an electric type device.

**Tests used in research:**

**Muscle strength tests:**

**Explosive power test for the muscles of the arms:**

**Purpose of the test:** Measure the explosive force of the arms.

**Measuring instruments:** measuring tape, medical ball weighing (3) kg, throwing circle space area.

**Description of performance:** The laboratory takes the position of standing in front of the position of throwing, and holds the ball in the hands together and then bend the knees and swing the hands with a medical ball and throwing forward as far as possible.

**Registration:** Calculates the distance to the nearest name from the rim of the circle throwing to the nearest trace of the ball from the edge of the circle.

**Test the strength of the muscles of the legs:** Jump to the maximum height bend and extend the two men from the knee joint and to the maximum number of repetitions until the exhaustion of the effort.

**Test the strength characteristic of the speed of the muscles of the arms:** Test the propulsion in front position for 10 seconds.

**Purpose of the test:** Measure the speed characteristic of the muscles of the arms and shoulders.

**Serve test:** Testing the difficulty scores for the high and low transmission reception areas of the side and back of the hand.

Areas were divided into five regions as follows:

- The area (1) located at the right of the table surface is 112 cm x 15 cm wide.
- Area (2) located in the right corner of the table at a distance of 25 cm.
- Area (3) located in the left corner of the table with a distance of 25 cm.
- The area (4) to the left of the tabletop is 112 cm x 15 cm wide.
- Area (5) confined to the lines of the former regions.

**Machines and tools used in research:**

- An electrical device to measure blood pressure and heartbeat type (beurer).
- Stopwatch type (any time).
- Line pen for dividing and numbering table areas.
- (5) Table balls.
- Table tennis rackets (4).
- Legal toys table with accessories number (1).

**Field research procedures:**

**Pilot study:** The researcher conducted the pilot study on Sunday, 24/2/2019, on players from the total research community, through which it was recognized the efficiency of the sample in the tests and the occurrence of some errors that were avoided in the main experiment.

**Main experience:** The researchers conducted the test for the first week on the research sample on Thursday, 28/2/2019 at the student activities hall of Anbar University and included several tests that included the research variables. After the second week, researchers conducted the second test on Thursday 7/3/2019. The third test was conducted three weeks after the discontinuation of the training respectively on 14/3/2019 and 21/3/2019 for all the variables of the research. The researchers took into account the sequence, date and place of the tests.
Results

Table 1: Shows the arithmetic, standard deviations, class differences, deviations, calculated values, error rate and significance of the variables under study

<table>
<thead>
<tr>
<th>Variables</th>
<th>Test</th>
<th>Mean</th>
<th>SD</th>
<th>Mean diff.</th>
<th>SD diff.</th>
<th>(t) Calculated</th>
<th>Error Ratio</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explosive power</td>
<td>placement</td>
<td>5.83</td>
<td>0.75</td>
<td>0.33</td>
<td>0.21</td>
<td>1.58</td>
<td>0.17</td>
<td>Non sig.</td>
</tr>
<tr>
<td></td>
<td>First week</td>
<td>5.50</td>
<td>1.05</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Endurance force</td>
<td>placement</td>
<td>74.33</td>
<td>5.24</td>
<td>3.00</td>
<td>0.97</td>
<td>3.11</td>
<td>0.03</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>First week</td>
<td>71.33</td>
<td>4.97</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distinctive power</td>
<td>placement</td>
<td>23.50</td>
<td>4.23</td>
<td>3.67</td>
<td>1.73</td>
<td>2.12</td>
<td>0.09</td>
<td>Non sig.</td>
</tr>
<tr>
<td></td>
<td>First week</td>
<td>19.83</td>
<td>2.32</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pulse</td>
<td>placement</td>
<td>64.83</td>
<td>3.37</td>
<td>-2.50</td>
<td>0.76</td>
<td>-3.27</td>
<td>0.02</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>First week</td>
<td>67.33</td>
<td>2.42</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diastolic</td>
<td>placement</td>
<td>75.00</td>
<td>5.48</td>
<td>-1.67</td>
<td>1.67</td>
<td>-1.00</td>
<td>0.36</td>
<td>Non sig.</td>
</tr>
<tr>
<td></td>
<td>First week</td>
<td>76.67</td>
<td>5.16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Systolic</td>
<td>placement</td>
<td>127.00</td>
<td>8.37</td>
<td>-4.17</td>
<td>1.90</td>
<td>-2.19</td>
<td>0.08</td>
<td>Non sig.</td>
</tr>
<tr>
<td></td>
<td>First week</td>
<td>131.17</td>
<td>4.67</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The serve is facing the racket</td>
<td>placement</td>
<td>10.67</td>
<td>1.75</td>
<td>1.17</td>
<td>0.79</td>
<td>1.47</td>
<td>0.20</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>First week</td>
<td>9.50</td>
<td>1.22</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The serve with the back of the racket</td>
<td>placement</td>
<td>10.00</td>
<td>1.10</td>
<td>1.17</td>
<td>0.48</td>
<td>2.44</td>
<td>0.06</td>
<td>Non sig.</td>
</tr>
<tr>
<td></td>
<td>First week</td>
<td>8.83</td>
<td>0.75</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table (1) shows the significance of some of the variables studied because the value of the error ratio is less than the significance level of 0.05, while some of the variables achieved the lack of moral and maintain the athlete at the level because the level of significance less than the proportion of error.

Table 2: Shows the computational and standard deviations, the differences and their deviations, the calculated values, the error rate and the significance of the variables under study

<table>
<thead>
<tr>
<th>Variables</th>
<th>Test</th>
<th>Mean</th>
<th>SD</th>
<th>Mean diff.</th>
<th>SD diff.</th>
<th>(t) Calculated</th>
<th>Error Ratio</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explosive power</td>
<td>placement</td>
<td>5.83</td>
<td>0.753</td>
<td>0.500</td>
<td>0.224</td>
<td>2.236</td>
<td>0.076</td>
<td>Non sig.</td>
</tr>
<tr>
<td></td>
<td>Second week</td>
<td>5.33</td>
<td>0.516</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Endurance force</td>
<td>placement</td>
<td>74.33</td>
<td>5.241</td>
<td>6.167</td>
<td>1.600</td>
<td>3.853</td>
<td>0.012</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Second week</td>
<td>68.17</td>
<td>3.061</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distinctive power</td>
<td>placement</td>
<td>23.50</td>
<td>4.231</td>
<td>4.833</td>
<td>1.579</td>
<td>3.060</td>
<td>0.028</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Second week</td>
<td>18.67</td>
<td>1.366</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pulse</td>
<td>placement</td>
<td>64.83</td>
<td>3.371</td>
<td>-3.833</td>
<td>1.014</td>
<td>-3.781</td>
<td>0.013</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Second week</td>
<td>68.67</td>
<td>1.033</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diastolic</td>
<td>placement</td>
<td>75.00</td>
<td>5.477</td>
<td>-5.000</td>
<td>2.236</td>
<td>-2.236</td>
<td>0.076</td>
<td>Non sig.</td>
</tr>
<tr>
<td></td>
<td>Second week</td>
<td>80.00</td>
<td>6.325</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Systolic</td>
<td>placement</td>
<td>127.00</td>
<td>8.367</td>
<td>-5.500</td>
<td>2.062</td>
<td>-2.668</td>
<td>0.044</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Second week</td>
<td>132.50</td>
<td>4.183</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The serve is facing the racket</td>
<td>placement</td>
<td>10.67</td>
<td>1.751</td>
<td>2.167</td>
<td>0.703</td>
<td>3.081</td>
<td>0.027</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Second week</td>
<td>8.50</td>
<td>0.837</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The serve with the back of the racket</td>
<td>placement</td>
<td>10.00</td>
<td>1.095</td>
<td>2.000</td>
<td>0.577</td>
<td>3.464</td>
<td>0.018</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Second week</td>
<td>8.00</td>
<td>0.632</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table (2) shows the significance of all the studied variables because the value of the error ratio is less than the significance level of 0.05, while the lack of morality in the variables to maintain the athlete at the level and this is shown by the level of significance for being less than the error rate.

Table 3: Shows the computational environment, standard deviations, differences, deviations, calculated values, error rate and significance of the variables under study

<table>
<thead>
<tr>
<th>Variables</th>
<th>Test</th>
<th>Mean</th>
<th>SD</th>
<th>Mean diff.</th>
<th>SD diff.</th>
<th>(t) Calculated</th>
<th>Error Ratio</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explosive power</td>
<td>placement</td>
<td>5.83</td>
<td>0.75</td>
<td>0.75</td>
<td>0.17</td>
<td>4.392</td>
<td>0.007</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Third week</td>
<td>5.08</td>
<td>0.49</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Endurance force</td>
<td>placement</td>
<td>74.33</td>
<td>5.24</td>
<td>11.00</td>
<td>2.59</td>
<td>4.239</td>
<td>0.008</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Third week</td>
<td>63.33</td>
<td>3.98</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distinctive power</td>
<td>placement</td>
<td>23.50</td>
<td>4.23</td>
<td>7.33</td>
<td>1.26</td>
<td>5.838</td>
<td>0.002</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Third week</td>
<td>16.17</td>
<td>2.14</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pulse</td>
<td>placement</td>
<td>64.83</td>
<td>3.37</td>
<td>-6.33</td>
<td>1.31</td>
<td>-4.842</td>
<td>0.005</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Third week</td>
<td>71.17</td>
<td>1.33</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diastolic</td>
<td>placement</td>
<td>75.00</td>
<td>5.48</td>
<td>18.83</td>
<td>16.73</td>
<td>1.126</td>
<td>0.311</td>
<td>Non sig.</td>
</tr>
<tr>
<td></td>
<td>Third week</td>
<td>56.17</td>
<td>37.46</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Systolic</td>
<td>placement</td>
<td>127.00</td>
<td>8.37</td>
<td>-7.17</td>
<td>2.24</td>
<td>-3.196</td>
<td>0.024</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Third week</td>
<td>134.17</td>
<td>3.76</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The serve is facing the racket</td>
<td>placement</td>
<td>10.67</td>
<td>1.75</td>
<td>2.50</td>
<td>0.62</td>
<td>4.038</td>
<td>0.010</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Third week</td>
<td>8.17</td>
<td>0.75</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The serve with the back of the racket</td>
<td>placement</td>
<td>10.00</td>
<td>1.10</td>
<td>2.33</td>
<td>0.49</td>
<td>4.719</td>
<td>0.005</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Third week</td>
<td>7.67</td>
<td>0.82</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table (3) shows the significance of all the studied variables because the value of the error ratio is less than the significance level of 0.05, while the lack of morality in the variables to maintain the athlete at the level and this is shown by the level of significance for being less than the error rate.

**Discussion**

It is evident from the tables (3.2.1) that there are statistically significant differences for some variables between the test of determining the level and the first week and in favor of the test of the level. This is evidence that there is a decrease in the level of strength and pulse due to leaving the training in the period after the cessation of training. Which is confirmed by several studies, especially with regard to functional performance where it can begin to appear with indicators attributed to the low level in the absence of touching any activity, especially the pulse rate and this is confirmed by Fleck (Fleck1994) that the dropout of training leads to change the physiological and physical adaptations of the body Lack of physical achievement and, The improvement in the level of the individual resulting from physical activity and skill is an improvement can be increased and decreased in the case of the fallout of training, the ability of the individual decline and the degree of development previously acquired functionally and physically and skillfully, and this experience has shown that many Of physical and skill traits decrease in the event of discontinuation of training. “While there are no differences between some of the physical, functional and skill capabilities of the players and these variables can be retained by the player even in the absence of activity, but this retention is for a limited period."

Table (2) shows that there are differences for all variables between the test of the level and the second week and for the test of the level determination because of the lack of practice of the players training level gradually decreased in all functional variables, physical and skill, except the variable diastolic pressure was maintained below the level of low and normal for the players, and stresses that the sudden interruption of
training can lead to disruption of the health condition of the athlete and create difficulties in the resumption of training. While athletes at the level maintained the level of diastolic pressure and explosive power, both of which can be maintained in that period.9

Table (3) shows that there are differences between the test of the level and the third week and for the test of determining the level in all variables except the variable diastolic variable where the level was maintained below and under normal condition of the players. The researcher attributed this decline to the lack of physical activity and skill in the post-competitive period and this is because of the low level of performance of the players, which confirms that the discontinuation of training, whether complete or partial, it leads to the loss of anatomical and physiological and achievement related. The greater the period of discontinuation of training, the greater the quality and quantity of physiological and physical adaptations lost.10 While the athletes maintained the level of pressure in the period, although the effect may be induced if the period exceeded one and a half to two months due to lack of exercise. This is confirmed that diastolic pressure is not affected by the absence of physical or physical activity, but that for a specified period may last from two to three months.11

**Conclusion**

1. There is a negative effect on the low heart rate and the pace of force between the first two weeks

2. There is a positive effect of some physical, functional and skill variables for the period between the first two weeks and the second in the case of non-exercise training.

3. There is a negative effect of all the variables studied between the results of leaving the training for three weeks except the diastolic pressure variable maintained its level during that period.

4. There is a negative impact of all the variables studied between the results of leaving the training for four weeks except the diastolic pressure variable maintained its level during that period.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding

**References**


7. Al-Mashhad RAA. The Impact of the Plan and PDEODE Strategies in Developing Awareness of Cognitive Processes and Reducing Psychological Pollution Among Students of the Faculty of Physical Education and Sports Sciences. 2018;928–35.


Study of Variables in the Ratio of Creatine in the Blood of Short, Medium and Long Distance for Runners

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ABSTRACT

The study of the effect of training on jogging on serum creatine levels is important to identify the level of developmental and functional development, as well as understanding the process of developing appropriate training programs for short, medium and long term effectiveness.

Creatine is an important indicator in the human body by calculating the blood quantities in the day following the race or training in order to know the work of the kidneys or any damage in them, and to establish a sound path and right to our coaches and our players relying on the analysis that helps them in the development of their achievement.

The aim of the study was to study the variables in the ratio of creatine in the blood of short, medium and long distances of 10 players.

The researchers concluded:

1. The presence of effects of significant significance for the athletes in the various energy systems in the ratio of creatine in the blood of the players and according to the high intensity and effort in the functional work of the two kidneys.
2. Short-range athletes were more susceptible to high blood creatinine, as they needed higher voltage than medium and short hips.

Keywords: Creatine, blood and distance.

Introduction

The study of the effect of training on different types of jogging on the blood creatine ratio is important and necessary to know the level of development and functional as well as the understanding of the development of training programs suitable for the events of short, medium and long, which has received great attention by researchers and trainers in the world, where the largest number of The medals in the games because the awards are characterized by individuality in addition to attracting large numbers of athletes and the public because of the skill, excitement and suspense(1,2). Laboratory analysis has been used to determine changes in creatine levels of short-, medium- and long-term athletes due to the effect of exercise with different training doses on them. It is therefore necessary to identify the physiological and chemical laws on which functional changes occur during sporting events and which help to improve the body’s response when controlling and working on them(1).

In view of the specificity of jogging by regulating the production of different energy and the development of the physical and functional capabilities of the players in order to achieve advanced achievements, the importance of research in the study of the impact of jogging the various energy production systems in the proportion of creatine in the blood according to modern scientific

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bases in order to raise the level of players to reach them achievements to reach the level of players in developed countries in this important and vital(3).

Creatine is an important indicator of the metabolism of proteins in the human body. This is done by calculating its quantity and its value in the blood because it is one of the energy-rich chemical compounds to measure the metabolic remains that indicate tiredness and recovery. However, some trainers did not give enough importance to this vital and influential aspect The development of training curricula that are affected by the type of effort given to the short, medium and long distance runners who need proper nutrition, especially the quality of the meat and the quantity of power generation according to the type of intensity and training load of each and the impact of this on the proportion of creatine ratio in the blood in order to develop a sound track and true in front of our coaches and players by relying on sound scientific results that are useful in the development of their achievement(3,4).

Research aims:
1. Knowledge of the effects of energy systems at different levels of creatine blood in the players.
2. Knowledge of the differences in the ratio of creatine blood runners according to the energy systems used in each of the variables investigated.

Research hypotheses:
1. The short, medium and long circuits of different energy systems have a real effect on the blood creatine ratio of the players.
2. There are differences in the proportion of creatine blood between the groups of the research sample in the variables investigated.

Research methodology and procedures:

Research Methodology: The experimental method is used as an equal group due to its relevance to this research. Experimental approaches examine the problems and phenomena based on the experimental method or the scientific research method based on observations, hypotheses and precise experiments to verify hypotheses (Mahmoud Al-Rubaie et al. 2018, p. 30).

The research sample: The research sample consisted of 10 (10) advanced runners in the field and the field were chosen by random method and those who practice activities ran (100 m and 3-1500m and the number of (4 – 5000 m and the number 3) distributed to three groups and depending on the type of game.

In order to identify the characteristics of the sample members and the extent of their representation in the research community, the researcher found some variables as shown in Table (1).

Table 1: Represents the computational circles, standard deviations and percentages of the distribution of the members of the research sample according to the type of effectiveness in some variables

<table>
<thead>
<tr>
<th>Activity</th>
<th>Number of Players</th>
<th>Percentage</th>
<th>Variables</th>
<th>Units</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 meter</td>
<td>3</td>
<td>%30</td>
<td>Age</td>
<td>Year</td>
<td>26.58</td>
<td>3.34</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Training age</td>
<td>Year</td>
<td>5</td>
<td>2.47</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Weight</td>
<td>Kg</td>
<td>70.25</td>
<td>6.66</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Length</td>
<td>cm</td>
<td>170.75</td>
<td>4.9</td>
</tr>
<tr>
<td>1500 meter</td>
<td>4</td>
<td>%40</td>
<td>Age</td>
<td>Year</td>
<td>25.13</td>
<td>3.54</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Training age</td>
<td>Year</td>
<td>4</td>
<td>2.51</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Weight</td>
<td>Kg</td>
<td>67.80</td>
<td>4.51</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Length</td>
<td>cm</td>
<td>170.90</td>
<td>4.01</td>
</tr>
<tr>
<td>5000 meter</td>
<td>3</td>
<td>%30</td>
<td>Age</td>
<td>Year</td>
<td>23.73</td>
<td>3.24</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Training age</td>
<td>Year</td>
<td>5</td>
<td>2.31</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Weight</td>
<td>Kg</td>
<td>61.67</td>
<td>5.22</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Length</td>
<td>cm</td>
<td>172.67</td>
<td>5.11</td>
</tr>
</tbody>
</table>

Pilot study: For the purpose of adjusting variables for the main experiment, the researcher conducted a reconnaissance experiment on 15/2/2018, the purpose of which was to:
1. Ensure that the task force can apply duties.
2. Identify the time of the experiment to benefit from the main experiment.
3. Identify the requirements of conducting the main experiment in terms of materials used and others.

Field research procedures

Measurements and tests:

1. Anthropometric measurements (length, weight, age, training age)
2. Measurement of some biochemical variables (measuring the concentration of urea in the blood)

Method of testing: The assistant team drew blood samples from the eye in order to conduct tests on them and to identify some biochemical variables (serum creatin concentration). The blood was withdrawn after the athlete had been out of food for at least six hours. The laboratory temperature (37 degrees).

The main experience: The assistant team drew blood samples from the resting position, six minutes before the race and for all the sample of the research during the first day of the official championship period corresponding to 18/2/2018. On 20/2/2018, another sample was drawn from the blood of runners running 100 m. After the official race for them, and draw the blood for the contestants 1500 m, 5000 m on 21/2/2018 also after the completion of the race immediately after the transfer of a special portfolio to the laboratory where the measurements there until 3/3/2018 were processed statistically, as stated in the door the fourth.

Results

<table>
<thead>
<tr>
<th>Groups</th>
<th>Pretest</th>
<th>Posttest</th>
<th>(t) value</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td>Calculated</td>
</tr>
<tr>
<td>100 meter (short)</td>
<td>125.33</td>
<td>45.74</td>
<td>136</td>
<td>45.177</td>
</tr>
<tr>
<td>1500 meter (Medium)</td>
<td>98.650</td>
<td>17.05</td>
<td>109.175</td>
<td>18.821</td>
</tr>
<tr>
<td>5000 meters (long)</td>
<td>92.766</td>
<td>18.917</td>
<td>94.000</td>
<td>20.952</td>
</tr>
</tbody>
</table>

The first group (ran 100 m) shows that \(^{(2)}\) for the creatinine test, Phosphokinase, the mean (125.333) and the standard deviation (45.742) in the pretest, the mean (136) and the standard deviation (45.177), \(^{(2)}\) which indicates that the difference is significant between the pre and post tests and for the benefit of the post-test.

The mean of the calculation of creatine phosphokinase was (98.650) with a standard deviation (17.051) in the pretest. In the post-test, the mean (109.175) and the standard deviation (18.821), the calculated value (t) is (3.985), which is the largest of the value of the table (2) is (3.182) by line (0.05) and the degree of freedom (2), indicating that the difference is significant between the pre-test and the post-test and for the post-test.

That (5000) meter as in Table (2) shows that the computation of the test creatine phosphokinase (92.766) and the standard deviation (20.952) in the post-test. The calculated value (t) is 0.196, which is smaller than the total value of (4.352) and a score of error (0.05) and degree of freedom (2), which indicates that the difference is not significant between the tests pre and post.

Knowledge and the difference between the groups in the post tests the researcher sought to test the analysis of variance as in the following table (3).

Table 3: Shows the results of variance of the three groups in the post-test creatine test

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Total squares deviations</th>
<th>df</th>
<th>Average square deviations</th>
<th>(f) value calculated</th>
<th>(f) value Tabulated</th>
<th>Indication of difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>2727.433</td>
<td>2</td>
<td>1363.717</td>
<td>1.585</td>
<td>4.74</td>
<td>Non sig.</td>
</tr>
<tr>
<td>Within groups</td>
<td>26022.768</td>
<td>7</td>
<td>860.395</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>8750.201</td>
<td>9</td>
<td>2224.112</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table (3) shows that the calculated value of \( f \) is (1.585), which is smaller than the \( f \) tabular value of (4.74) and by mistake (0.05) and freedom degree (7.2). This indicates that the differences between the averages Groups are not significant.

**Discussion of Results**

Creatine is an important indicator of the metabolism of proteins in the human body. This is done by calculating the quantity and value of blood in the day following the race or training to measure the residual metabolism following the race or training, which indicates tiredness, recovery and removal of metabolic residues.

In the three groups (short-, medium- and long-term), the ratio of creatine in the blood was normal, where it was limited to (1-2-6), as shown in Table 2. Although the ratio increases during short- may lead to a relative increase even though they are within the normal range. In our observation of Table (2) we find that after the effort there is an increase in the ratio of creatine in the blood for the spindles (100) m, which can be explained by the high effort in this sport and reliance on the phosphate creatinine stored muscle in burning energy\(^{5,6}\), which leads to increase the proportion of blood availability and delay The rate of removal by the kidneys due to the relative discontinuation of kidney function, as is the case in runners (1500 and 5000), since the dependence on phospogentic storage is not the burning of energy (Divix-1988- p. 59)

Table (2) shows that the results are significant for the three groups in the post tests in the pre. The researcher attributed this to the fact that the rider of these events controlled the rate of effort through the appropriate speed, which makes the creatine phosphate and the metabolism is not exhausted before the time, indicating that it allows the most efficient use of phosphate metabolism and creatine during the full competition\(^{6-9}\).

On this basis, we did not see any significant differences between the three tests of the three groups as shown in Table (3). The reason is that the metabolic process is responsible for the energy used during these activities, but it is emptied less quickly than the phosphate creatine during these activities and during the physical effort, Because the metabolic process is done by other devices, so the impact of the exercise of sporting events will be delivered on all the organs of the body, which shows us that the body and its functional mechanism works as a unit\(^{10-12}\).

**Conclusions**

1. The long range (5000 m) group was less affected by the high blood creatinine ratio because it required more long-term training than short and medium training.
2. Effect of kidney function towards elimination of excess creatinine due to delay in removal rate by kidneys in running (100 m)
3. There is an increase in creatine in the blood for spasticity (100 m) due to high stress and dependence on muscle creatine phosphate in the muscle to burn energy
4. Do not rely on the reservoirs in the burning energy (1500 m) and (5000 m), which leads to removal by the kidneys
5. Control the runners in the rate of effort through the appropriate speed makes phosphate creatine and the metabolism is not exhausted before the ozone
6. No significant differences of the three groups because the metabolism is responsible for the energy used during the pharmacology, to be discharged less quickly than phosphate creatine.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding

**References**


6. Al-Mashhad RAA. The Impact of the Plan and PDEODE Strategies in Developing Awareness of Cognitive Processes and Reducing Psychological Pollution Among Students of the Faculty of Physical Education and Sports Sciences. 2018;928–35.


Molecular Investigation of Aminoglycoside Modifying Enzyme among Aminoglycoside-Resistant Uropathogenic Escherichia Coli Isolates from Najaf Hospitals, Iraq

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ABSTRACT

Background: E coli is the most common uropathogen for uncomplicated UTIs (75-95%). Plasmid-mediated AMEs were reported to be the widespread among Gram-negative isolates resistant to aminoglycosides. The purpose of this study is to investigate the occurrence of genes encoding AMEs in aminoglycosides resistance UPEC isolates.

Method: A cross sectional study of the participate patients their approval for direction usage their specimen. The susceptibility test by disk diffusion for UPEC were isolated from urine and thirteen plasmid–mediated AMEs aac(3′)-I, aac(3′)-II, aac(3)-III, aac(3')-IV, ant(2′′)-I, ant(3″)-1, ant(4′)-IIa, acc(6′)-Ib, acc(6′)-IIb, aph(3′)-I, aph(3′)-IIa, aph(3′)-Ib, and aph(3′)-VI were screened by mono- and tri-plex PCR.

Results: 298 was significant bacteruria, there were 132 clinical isolates of uropathogenic E. coli, among these 60 (45.5 %) co resistant to at least two aminoglycoside antibiotics were selected varied from (100%) kanamycin to (53.3% (amikacin. It was found that 98.3%, 95.0%, 90.0%,86.7%, 51.7%, 36.7%, and 10 % of isolates were harbored aac(6′)-Ib, aph(3′)-I, aph(3′)-IIa, aph(3′)-Ib, ant(3″)-I, (aac(3)-II, and aac(3)-IV, respectively.

Conclusion: AME genes were present in all of the UPEC isolates and the first aph(3′)-I, aph(3′)-Ib, aph(3′)-IIa and ant(3″)-I determinants in Iraq.

Keyword: Plasmid-mediated AMEs, uropathogenic E. coli, aac(6′)-Ib, aph(3′)-I, aph(3′)-IIa, aph(3′)-Ib, ant(3″)-I, (aac(3)-II, and aac(3)-IV.

Introduction

Urinary tract infection is the most prevalent infectious diseases, and very problematic worldwide(1). UPEC is the most frequently causes of UTIs in humans(2). Three methods to aminoglycosides resistance in human bacterial pathogens (i) reduced uptake(3), drug trapping(4), active efflux(5) (ii) aminoglycoside-modifying enzymes (AMEs)(6) and (iii) changed ribosomal binding positions by mutation(7). AMEs are a most family of enzymes containing of three sub-class classified based on the type of chemical alteration.(AACs)-N-acetyltransferase, which using acetyl-coenayme A for acetylate an amino set, (ANTS)-O-nucleotidyltransferases, which transmission an adenyl set from ATP to a hydroxyl set of the antibiotic; and (APHS)-O-phosphotransferases, that phosphorylate a hydroxyl set as well used ATP(8).

Nowadays no epidemiological assessments have described the prevalence of AMEs genes in E. coli clinical isolates in Iraq. The aim of this study is to investigate the occurrence of genes encoding important AMEs in aminoglycosides resistance UPEC isolates from Najaf hospitals.

Method

Collection of specimens: This a cross sectional study of the participate patients their approval for direction usage their specimen was conducted in in two main hospitals in Najaf and during the period of six months from March to
September 2018 in patients clinically suspected to have UTI. The inclusion criteria for the volunteer patients were attended or admitted in the two hospitals.

Isolation and Identification of *E. coli* isolates: Identification of bacterial pathogens was made based on Gram reactions, culture characters, routine standard biochemical tests, culture on EMB agar plates to confirm that there is no mixed and using commercially API 20 E kit.

**Antibiotic Susceptibility Test:** Susceptibility to antimicrobial was accompanied by Kirby–Bauer method based to the guideline suggested by the Clinical and Laboratory Standards Institute.(9)

**Screening Test for Aminoglycosides resistance:** The disk diffusion test was made to identify aminoglycosides resistance by using gentamicin (10μg), tobramycin(10μg), Kanamycin (30 μg), netilmicin (30 μg) and amikacin (30 μg) disk.

**Screening Test for AMEs genes:** The reaction carried out by multiplex PCR for aac(3′)-II, ant(3′)-I and aac(6′)-Ib and monplex PCR for aac(3′)-I, aac(3′)-III, aac(3′)-IV, aph(3′)-I, aph(3′)-IIa, aph(3′)-Ib, aph(3′)-VI, ant(2″)-I, ant(4′)-Ia, and aac(6′)-II in aminoglycosides resistance using T3000 thermocycler and Go Tag Green Master mix [Promega (USA)]. The sequence of primers targeting AMEs genes were published in another place.(10,11,12,13,14,15,16).

**Results**

A total of 1072 urine samples were randomly collected from clinically suspected to have UTI. Overall results revealed that 298 of urine specimens were significantly positive for uropathogens. The mixed bacterial infections were not found. 132 (44.3%) isolates were recognized as *E. coli* followed by other Gram-negative and Gram-positive bacteria as shown (Figure 1).

**Screening test for Aminoglycosides Resistance:** Overall, 45.5% (60/132) of the UPEC were no susceptible to at least two of the aminoglycosides tests varied among the isolates at the 100%, 98.3%, 80.0%, 65.0%,and 53.3% for kanamycin, tobramycin, gentamicin, netilmicin and amikacin, respectively. Furthermore, the 22 (16.7%), bacteria were resistance to all aminoglycosides agents.

**Screening Test to AMEs genes:** AMEs determinants were found in 60 isolates (100%). ACCs were the most prevalent type of AME was detected in 98.3% of the isolates. The most frequently was aac(6′)-Ib (59 isolates; 98.3%), followed by aac(3′)-II (22; 36.7%), and aac(3′)-IV (6; 10.0%). The second types was APHs genes, aph(3′)-I (57; 95.0%), aph(3′)-Ib (52; 86.7%) and aph(3′)-IIa (54; 90.0%). ANTs genes was also investigated, ant(3″)-I (31; 51.7%). While aac(3′)-I, aac(3′)-III and aac(6′)-II, aph(3′)-VI, ant(2″)-I and ant(4′)-Ia were not identified. All the 60 UPEC harbored several AMEs genes for at least three genes, and a total of 20 different combinations. One isolates (1.7%) harbored seven aminoglycoside resistance genes.

**Discussion**

**Frequency of *E. coli*:** UPEC isolates (44.3%) were the major causative agent of significant bacteriuria in Najaf. The more frequency of the *E. coli* could be attributed to the enteric flora and the way of transmission is by fecal contamination because of poor hygiene and the anatomical nearness to the genito–urinary tract in females(17).The rate of UPEC isolated is agreement with study done in Iraq(18), documented that rate of *E. coli* was 38.9% in urine specimens from patients suffering from UTIs. Many authors have the same findings, which *E. coli* was accounting for more than 40% of UTI(19,20). The variations of the rate of UPEC isolation may be due to the geographical variation, method of collection of urine samples, passage of time, various personal, genders, educational, and general socioeconomic status and availability of medicinal services.

**Resistance to the Aminoglycosides:** All isolates exhibited resistance to older aminoglycosides, kanamycin as compared with resistance to tobramycin (98.3%), gentamicin (80.0%), netilmicin (65.0%), and amikacin (53.3%). Amikacin could still be considered the gold standard in treating the extra resistant UPEC isolates. In Iraq, proportions of resistance of UPEC to kanamycin and gentamicin were perfectly high and

**Figure 1:** Prevalence of bacterial uropathogens identified of patients with significant bacteriuria
t

*(n = 298)*
resistance proportions to netilmicin and amikacin were perfectly low\textsuperscript{(21)}. Low resistance was reported against amikacin antibiotic in other studies\textsuperscript{(22,23)}. The low resistance of amikacin may be attributed to the presence of the aminohydroxybutyryl group, that often stops the enzymatic alteration of amikacin at multiple sites without interfering with the A position of RmA\textsuperscript{(29)}. Other study have identified higher occurrence of resistance to amikacin in Turkey (49.7\%)\textsuperscript{(25)}. Resistance to gentamicin diverse in different countries with rats (94.5\%) described in Turkey\textsuperscript{(25)}. In Iran, South Africa, Latin America, and Europe revealed perfectly high frequencies of amikacin resistance (14\%-92\%) and very high netilmicin resistance (25\%-90\%)\textsuperscript{(26,27,28)}. The different resistance profile in diverse geographical areas may be connected to variances in consumption regimens. E. coli resistance to aminoglycosides is increasing over time, depending on situation of antibiotics consumption in the society.

Dissemination of genes encoding AMEs: AME genes were present in all of the UPEC isolates. In other studies, the AME positive rates were 85.0\% in Baghdad\textsuperscript{(21)}, 95.2\% in China\textsuperscript{(28)} and 79.5\% in Poland\textsuperscript{(28)}. ACC [aac(6\')-Ib, aac(3)-II, aac(3)-IV] genes were the most prevalent AME genes in isolates. aac(6\')-Ib gene was found in 98.3\% of the isolates. This result is in accordance with Spain\textsuperscript{(30)}, Poland\textsuperscript{(28)}, where presented aac(6\')-Ib as the one of the most frequently detected gene encoding ACC in E. coli. aac(3)-II gene (36.7\%),which associated with highly resistant to gentamicin but may only exhibit low-level resistance to tobramycin, and netilmicin\textsuperscript{(31)}. The prevalence of aac(3)-II gene is lower than those previously reported in China (40.0\%), Iran (40.0\%), and Egypt (47.88\%)\textsuperscript{(29,27,32)}. Other reports in Iran and Poland\textsuperscript{(33,28)} showed low rates of aac(3)-II in UPEC isolates. However, aac(3)-II gene present on mobile molecular elements can facilitate the spread and transfer of resistant genes among bacteria\textsuperscript{(34)}. AAC(3)-VI enzyme produces resistance to gentamicin, tobramycin, apramycin and netilmicin and has been identified rarely among clinical isolates of E. coli and Enterobacteriaceae\textsuperscript{(35)}. The rate of the aac(3)-IV gene was low (10.0\%). The low rate (14.3\%) of aac(3)-IV gene was obtained in Ethiopia\textsuperscript{(36)}. In Iran, aac(3)-IV gene were not detected in aminoglycoside resistance E. coli isolate\textsuperscript{(33)}.

APHs genes were present in all of these isolates. aph(3\')-I was the most common with rate 95.0\% that accordance with data from Spain and Iran\textsuperscript{(30,33)} where presented aph(3\')-I as the one of the most frequently detected genes encoding APHs in clinical isolates of E. coli. aph(3\')-I is composed of four variants [aph(3\')-Ia, b, c, d] that are widely distributed mainly among Gram-negative isolates and located within plasmids and transposons\textsuperscript{(37)}. aph(3\')-Ib gene with rate 86.6\%. This gene is part of the wide host range conjugative RP4 plasmid and originally named aphA\textsuperscript{(38)}. According to literature resistance against kanamycin and neomycin is coded by aph(3\')-Ia gene\textsuperscript{(39)}. aph(3\')-Ia was the most commonly (90.0\%). There are only a few studies available on the prevalence of aph(3\')-Ia that found 2.5\% of all isolates resistant to kanamycin as carriers of aph(3\')-Ia\textsuperscript{(39)}. Other report suggested a low abundance of this gene and only rarely identified in bacterial isolates of human\textsuperscript{(40)}. 51.7\% of the ant(3\')-Ia gene is associated with resistance to kanamycin, streptomycin, and spectinomycin. This gene most common found in Gram-negative clinical isolates in Egypt, 44.0\%\textsuperscript{(41)}, China, 13.6\%\textsuperscript{(42)}. The aph(3\')-I, aph(3\')-Ib, aph(3\')-Ia and ant(3\')-Ia genes were not reported in bacteria of clinical isolates from Iraq, this is the first description of its genes in UPEC isolates in Iraq. Present study revealed that all isolates harbored simultaneous genes encoding AMEs at least three genes. The presence of more than one AMEs genes in a single isolate is being increasingly detected\textsuperscript{(29,28)}. Those enzymes are frequently plasmid encoded and may be co-associated in some isolates\textsuperscript{(34)}.

However, the coexistence of aminoglycoside resistance genes and perhaps ability to co-transfer these genes to a recipient isolates may be contribute to the rapid increase in the prevalence of multidrug resistance among bacterial isolates in Iraq.

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**Source of Funding:** Self-funding

**REFERENCE**

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Simulation of the Warfarin Drug-Binding Nano-Metal Induction for Serum Albumin

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ABSTRACT

Metallic bio-conjugated nanoparticles are known to be a common example for these characteristics, out of which gold NPs (AuNPs) in particular are heavily exploited due to their inert nature and high electron density. Coating the AuNPs with albumin proteins is useful due to their biocompatibility and their ability to bind many drug molecules. Among carrier proteins, human serum albumin (HSA) is considered one of the major transporter proteins in the blood plasma. It constitutes approximately half of the protein found in human blood. Curve fitting method allow you to create, access, and modify curve fitting objects. It also allows, through method like plot and integrate, to perform operations that uniformly process the entirety of information encapsulated in a curve fitting object. The results are appeared that describe the variation of the NPs concentration with time, the fluoresce spectrum with nanoparticles. The analytical data are corresponding with experimental information.

Keywords: drug-binding ; Simulation; serum albumin

Introduction

In recent days nanotechnology has induced great scientific advancement in the field of research and technology with developing interest for its various applications ranging from information technologies to medicinal applications. The applications of nanotechnology to biomedicine, especially in cancer diagnosis and treatment, promises to have a profound impact on healthcare [1]. The exploitation of the unique properties of nano-sized particles for cancer therapeutics is most popularly known as nano-medicine.

The unusual properties of nanoparticles (AuNps) are on the basis of their great expansion due to their potential applications in different areas (energy, food, health, clothing, cars, etc.). This situation has led to an increase in the release of different nanomaterials into the environment and their potential effects on the ecosystem and human health are becoming a major concern [2,3]. As a consequence, there is a pressing need to fully characterize the toxicological effects that Nps could have when they are released into the environment or come into contact with the human body.

The high surface-area to volume ratio of the NPs is advantageous for uploading drugs and enhancing their concentration. Metallic bio-conjugated nanoparticles are known to be a common example for these characteristics, out of which gold NPs (NPs) in particular are heavily exploited due to their inert nature and high electron density. This, along with the non-toxic nature of gold, makes NPs a useful system that can be utilized in transporting and delivering a wide range of endogenous and exogenous substances in the biological medium [4,8].

The importance of protein-conjugated NPs as drug carriers is inherent due to their target septicity and biocompatibility which are believed to reduce drug resistance in cells. These unique properties have led to promising applications of NPs in clinical treatments and disease diagnoses through high contrast NPs imaging, tracking and sensing. Extending the applications to include NPs as precursors to maintain and monitor the binding properties of protein–ligand systems would be useful. In this regard, any modification in the binding properties is important to examine. A direct effect on the kinetics of drug release is encountered if binding is too

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strong. On the contrary, it may contribute to inefficient drug transportation and distribution if binding is too weak. This can be achieved by studying the behavior of the protein with ligands/drugs under biologically relevant conditions when this protein is free in solution, compared to when the protein is adsorbed on the surface of NPs\cite{9-14}.

Scientific Study: Many drugs are bound to proteins within the body. There is marked variability in the extent to which the drugs bind to the proteins. The degree of drug-protein binding might affect a drug’s efficiency. Drugs can be bound to plasma proteins as well as tissue proteins. Plasma protein binding can have multiple effects on the pharmacokinetics (PK) of a drug. The binding of drug to plasma proteins is a major determinant of drug disposition. When a drug is bound to the plasma proteins, it is not actively distributed to the site of action to interact with the target tissues. Moreover, the bound drug is kept in the blood, while the unbound (free) fraction may be metabolized or excreted. The binding has a very important effect also on drug pharmacodynamics (PD). Only the free drug interacts with receptors, therefore only the free drug can produce therapeutic effect. Common blood proteins that bind drugs are human serum albumins, lipoproteins, glycoproteins, and globulins. Albumin is the most abundant protein in the blood plasma. Many medications extensively bind to the albumins. Protein binding interactions are displacement reactions, which have been implicated as the causative mechanisms in many drug-drug interactions. Competitive displacement interactions are predominant ones among protein binding reactions. The competitive protein binding drug-drug interactions result in increased the free plasma concentrations of the displaced medications. Clinically displacement reactions acquire importance when the displaced drug is highly bound to plasma proteins. In this case the displacer drug produces a very rapid and significant increase in the plasma concentrations of the displaced medication. The result of this interaction can be dramatic if the second drug is a drug with narrow therapeutic index. Such type of interactions can lead to enhanced pharmacological effects and, possibly, toxicity of the displaced medication. A simple, generalized guideline for the evaluation of the clinical significance of protein binding interactions frequently cannot be applied. Instead, a careful analysis of protein binding effects must be made on a drug-by-drug basis. Free, unbound concentrations should always be measured rather than estimated, and used as the primary input for PK/PD correlations, as well as for statements on the safety and efficacy of drugs\cite{1}.

Method

Comparison between the experimental data and theoretical analysis, also mathematical analysis is known as progression analysis, is used to find the “top appropriate” line or curve for a chain of statistics points. Most of the time, the curve adequate will yield a calculation that can be used to bargain points anywhere lengthways the curve. In approximately cases, you may not be disturbed about result an equation. Instead, you may just want to use a curve acceptable to smooth the data and develop the appearance of your scheme.

Results and Discussions

Fluorescence change of HSA as a function of the concentration of AuNPs, extracted from the data with simulation curve matching. The equation which describe the effect of increasing for Au NPs with time as shown in figure (1) where it gives femtosecond dynamics of Au NPs. Figure (2): The effect of NPs increasing on spectrum curve under simulation of data. Fluorescence of sample concentration of AuNPs (Wavelength = 330nm). The effect in figure (3) is estimated by using the relation:

\[
F (a. u) = 2.1 \times 10^{-22} \lambda^4 - 1.7 \times 10^5 \lambda^3 + 0.011* \lambda^2 - 1.7* \lambda + 30
\]
Figure 2: The effect of NPs increasing on spectrum curve under simulation of data.

Figure 3: Fluorescence of sample concentration of AuNPs (Wavelength max= 330nm).

\[ F(\text{a} . \text{u}) = 2.1 \times 10^{-22} \lambda^4 - 1.7 \times 10^{-5} \lambda^3 + 0.011^\ast \lambda^2 - 1.7^\ast \lambda + 30 \]

**Conclusion**

We examined the spectroscopy of HSA-bioconjugated AuNPs as a model drug carrier in order to illuminate the effect of the protein on the properties of the NPs and the constancy of the protein arrangement on the metallic surface. From the results we catch that the behavior of system variables can be founded by speculating the relations which are designated the deviation of euler implementation by improved the TNPs concentration is changed with time. The fluorescent marker is affected by the increasing on NPs concentration. Thus, the simulation process leads to link between the variables of system.
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REFERENCES

The Creative Leadership of the Heads of Sports Clubs in the Middle Euphrates from the Point of View of its Members

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ABSTRACT

The sports clubs are witnessing a clear and growing interest in developing their managerial abilities in various fields. Perhaps their first step is to take care of the creative leadership and develop it to increase the efficiency of these sports clubs, which is an exceptional importance in our Iraqi society as the main framework through which the movement activates sport and improves its position in the society that suffers from various crises affecting various aspects of life, and the success of these clubs will be a direct and vital contribution to the progress of the sports movement.

The objective of the current research is to identify the reality of the creative leadership of the heads of the sports clubs in the Middle Euphrates from the point of view of the members. The research society also determines the heads of the 58 sports clubs and the members of the governing body in the sports clubs, numbering (429) of the research community (487). The sample of the application was randomly selected, consisting of (100) members of the administrative bodies of the sports clubs in the Middle Euphrates. After the completion of the process of building the measure of creative leadership by following the scientific procedures, and to achieve the goal of the research collected data on the scale, and for the purpose of facilitating the procedures presented in the form of tables and forms and then interpreted, the most important conclusions that provide for the reality of the creative leadership of the heads of sports clubs was reflecting a perception and a satisfactory perception of the administrative bodies of sports clubs clearly and accurately expressed through their answers on the scale of creative leadership.

Keywords: Creative leadership and sports clubs.

Introduction

Sports clubs are currently striving to adapt to the complex and interrelated global and local variables in order to achieve sustainable competitive advantage. In order to achieve this, we must rely on human resources and employees cannot participate constructively in achieving the objectives of sports clubs efficiently and effectively without prior planning. They even exchange it for their confidence by doing their best to achieve their goals.1

Which leads to creativity and excellence in the administrative aspect, as creative leadership plays a role and an impact in building the confidence of working individuals and their reflection in their commitment to their clubs and the commitment of sports clubs to individuals did not mean the study and analysis and remained underpinning, especially as their importance increases to deepen the ability of sports clubs to meet the challenges In order to achieve and instill a culture of individuals’ commitment to their clubs, contemporary sports clubs should consider human resources as the most valuable resources and assets to be able to achieve survival, growth and sustainability. Therefore, creative leadership is one of the most important pillars of the progress of countries and their development in various fields: economic, social, educational and sports. Studies have shown that creative leadership leads to improving the general climate of decision making, breaking down barriers and stimulating new and useful ideas. Solutions and get rid of normal thinking, and produce the largest number of ideas in the least time and effort because they are produced from special mental processes.2
Hence the importance of research in the attempt of the researchers to identify the creative leadership of the heads of sports clubs in the Middle Euphrates from the point of view of its members, in order to improve the level of sports clubs through the study of the reality of this variable and the impact of clubs in the development of the game through the tournaments that they hold between clubs inside and outside the country and its impact on providing Iraqi sports with outstanding players to reach the highest levels. The sports clubs are witnessing a clear and growing interest in developing their managerial abilities in various fields. Perhaps their first step is to take care of the creative leadership and develop it to increase the efficiency of these sports clubs, which is an exceptional importance in our Iraqi society as the main framework through which the movement activates sport and improves its position in the society that suffers from And the success of these clubs will be a direct and vital contribution to the progress of the sports movement, and can summarize the problem of research through the following question:

Is there a creative leadership of the heads of sports clubs?

The aim of this research is to identify the reality of the creative leadership of the heads of sports clubs in the Middle Euphrates from the point of view of the members.

Research methodology and field procedures:

Research Methodology: The researchers used the descriptive approach in the survey method and the correlation and comparison relationships, due to its relevance and the nature of the current study.

Community and sample search: The research community determines the heads of the sports clubs (58) members and members of the governing body in the sports clubs (429), thus the total number of the research community (487). The sample of the application was randomly selected, consisting of (100) members of the administrative bodies of the sports clubs in the Middle Euphrates.

Search Tool: After reviewing the scientific sources and research related to the scale of creative leadership and its fields, the innovative driving scale was adopted, consisting of (50) paragraphs divided into (5) fields, as follows: The first field (gravity and influence) consists of (11) paragraph and the second area The problem consists of (11) paragraphs and the third area (fluency - flexibility - originality) consists of (10) paragraph and the fourth area (encouragement and adoption of creativity) consists of (10) paragraph and the fifth area (initiative) consists of (8) items.

Alternatives to the answer for each paragraph include five alternatives to the answer given that the alternative is very large (5), large (4), medium (3), low (2) and very low (1) degree.

To indicate the validity of the paragraphs were presented to the experts and specialists in educational and psychological sciences and sports psychology and sports management, as well as if you need to delete or modify or merge some similar paragraphs.

Table 1: Shows the results of the overall score of the creative driving scale

<table>
<thead>
<tr>
<th>Scale</th>
<th>Number of sample</th>
<th>Number of Phrases</th>
<th>Total score of the scale</th>
<th>Mean</th>
<th>Median</th>
<th>SD</th>
<th>Skewness</th>
<th>Mean medium</th>
<th>(t) Calculated</th>
<th>(t) Tabulated</th>
<th>df</th>
<th>Level of significance</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creative Leadership</td>
<td>100</td>
<td>50</td>
<td>250</td>
<td>158.80</td>
<td>170</td>
<td>30.81</td>
<td>0.70-</td>
<td>150</td>
<td>2.857</td>
<td>2</td>
<td>99</td>
<td>0.05</td>
<td>Sig.</td>
</tr>
</tbody>
</table>
Table (1) shows that the mathematical mean of the leadership of the sports club leaders in the Middle Euphrates was (148.80), the median (170), the standard deviation (30.81), the torsion coefficient (-0.70) of the scale shows that the arithmetic mean is higher than the mean. Also, when comparing the calculated (t) value of (2.857), which is higher than the (t) table value of (2), the result is statistically significant, indicating that the sample has good creative leadership.

Table 2: Shows the statistical parameters of the fields of the creative leadership scale

<table>
<thead>
<tr>
<th>Fields of scale</th>
<th>Number of Phrases</th>
<th>Total degree of field</th>
<th>Mean</th>
<th>Mean median</th>
<th>SD</th>
<th>Skewness (t) value</th>
<th>Relative weight</th>
<th>Order field results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gravity and influence</td>
<td>11</td>
<td>55</td>
<td>46.21</td>
<td>33</td>
<td>5.95</td>
<td>0.431</td>
<td>84.02</td>
<td>The second</td>
</tr>
<tr>
<td>Ability to solve problems</td>
<td>11</td>
<td>55</td>
<td>46.84</td>
<td>33</td>
<td>5.68</td>
<td>0.282</td>
<td>85.16</td>
<td>The first</td>
</tr>
<tr>
<td>Fluency - Flexibility - Originality</td>
<td>10</td>
<td>50</td>
<td>39.89</td>
<td>30</td>
<td>5.07</td>
<td>0.049</td>
<td>79.78</td>
<td>The fourth</td>
</tr>
<tr>
<td>Encourage and embrace creativity</td>
<td>10</td>
<td>50</td>
<td>39.61</td>
<td>30</td>
<td>4.51</td>
<td>0.161</td>
<td>79.22</td>
<td>The Fifth</td>
</tr>
<tr>
<td>The initiative</td>
<td>8</td>
<td>40</td>
<td>32.66</td>
<td>24</td>
<td>2.72</td>
<td>0.017</td>
<td>81.65</td>
<td>The third</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>250</td>
<td>205.2</td>
<td>150</td>
<td>23.9</td>
<td>0.889</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table (2) shows that the computational mean of the application sample in the results of the problem solving area was (46.84), the standard deviation (5.68), and the torsion coefficient (0.282), indicating the absence of extreme values in their results. The mean medium of the adult field (33) indicates that the value of the arithmetic mean is greater than the value of the mean medium and the field order in their responses (I) with the relative weight of (85.16).5

The ability to solve problems as the basis of creative work, and we mean the diagnosis of many problems within the same situation, by identifying the dimensions and aspects and shortcomings in them to reach creative solutions in respect of them, and that is what the importance of this area is increased in administrative work because it is the means by which the way to solve problems and overcome obstacles and work for the future and the decisions become more difficult as we climb to the top of the administrative pyramid.6

The mean of the results of the field of encouragement and adoption of creativity was (39.61), the standard deviation (4.51),7 and the torsion coefficient (-0.161) indicating the absence of extreme values in their results. Comparing the arithmetic mean with the mean medium of the adult fields (30), where the most important factors that stand in the way of creativity can be summarized as follows:8 Personal obstacles, obstacles from childhood, constraints by the leader may paralyze creativity,9 organizational constraints, social constraints may be due to a defect in the promotion of excellence and creativity and to overcome obstacles and distractions between the president of the club and the members of the administrative bodies of sports clubs in a manner that ensures the maximum possible degree of efficiency to achieve the goals.10

Conclusions

In light of the researcher’s findings from the current research findings, the following can be inferred:

1. The field of ability to solve problems ranked first, which is the highest area of encouragement and adoption of creativity ranked fifth, the lowest in the measure of creative leadership.
2. The club leaders have a good level of creative leadership in most sports clubs.
3. The reality of the creative leadership of the heads of sports clubs was reflecting a perception and a satisfactory perception of the administrative bodies of sports clubs clearly and accurately expressed through their answers on the scale of creative leadership.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding
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Inter-Pregnancy Interval and its Association with Autistic Children

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ABSTRACT

Background: Autism is a life-long developmental disorder that causes considerable amount of health loss during the life of affected people. Despite the role of environmental factors in its development, but a single factor is not sufficient to cause it, and a combination of several factors is more likely to be responsible.

Aim of the Study: To determine the risk of autism with short, adequate and long inter-pregnancy intervals.

Methodology: This study is a cross sectional study conducted in centers for autistic children in three governorates (Karbala, Babil, and Wasit) in addition to the psychiatry unit in Al-Zahraa Teaching Hospital in Wasit. The data collection was performed from January 2019 to April 2019.

Results: Mean age of autistic children was (6.12 ± 2.25) ranging from (3-15) years old, most of them being males (73.7%) who were born term (70.0%). Almost two-thirds of them were born via cesarean section. Three-quarters of children were either second birth order or third (33.2% and 43.7%) respectively. One-third of mother did not have regular antenatal care, and 17.0% of them had bleeding in pregnancy, mostly in first trimester. There was significant association between inter-pregnancy interval and the gestational age at birth (p-value=0.034). Also, there was significant association between inter-pregnancy interval and both of maternal age at child birth and antenatal care, p-value=0.008 and 0.001, respectively.

Conclusion: Certain maternal and child factors are associated with inter-pregnancy interval, including gestational age, maternal age, and antenatal care. Some of these are known risk factors for autism. Almost half of the patients had inter-pregnancy interval of less than 2 years.

Keywords: autism; inter-pregnancy interval; neurobehavioral disorder.

Introduction

Autism is a life-long neuro-developmental disorder that typically has three aspects: communication impairment, impairment in social relationships, and stereotyped patterns of behaviors[1]. The term autism spectrum disorders (ASD) refers to 3 disorders: autistic disorder, Asperger’s disorder, and pervasive developmental disorder (PDD)[2]. This term describes a category of brain disorders that occur in childhood and leads to severe functional impairment and associated problems affecting learning ability and language[3].

ASD are responsible for significant health loss during life[4], and it affects 15 per 1000 persons in developed countries, giving a prevalence of 1.5%[5]. ASD is higher in males than females, with approximately 4 males affected for each female. This was explained by several theories; one of them suggests that sex chromosome genes play a key role in molecular mechanisms involved in autism occurrence[6], another theory is the role of testosterone in the occurrence of ASD[7].

A single factor is not sufficient to cause ASD, and a combination of several factors is more likely to affect disease occurrence[8]. Risk factors are classified into prenatal, perinatal, and postnatal[9]. Both paternal age and maternal age were suggested as risk factors for
autism\textsuperscript{[10,11,12]}. Physical and mental health of the mother are also possible risk factors for ASD\textsuperscript{[9,13]}, as well as prenatal medication use by the mother\textsuperscript{[11]}.

It has been suggested that both short and long inter-pregnancy interval (IPI) are associated with higher risk of developing autism spectrum disorder\textsuperscript{[14]}. This has a significant importance in clinical and public health settings, since it affects families from both developed and developing countries, while being a possibly modifiable risk factor\textsuperscript{[15]}.

The number of women who delay their first pregnancy is rising globally. And to overcome the negative effects of having children at older ages; those women tend to have their second child after a short duration from the birth of

the first one, or within a short inter-pregnancy period\textsuperscript{[15]}. This shorter period may increase the chance that the second child develop autism\textsuperscript{[9]}.

In Iraq, a study in Baghdad in 2011 had shown that autism patients constituted more than 15.0% of psychiatric patients\textsuperscript{[16]}. Another study in 2016 targeted the identification of risk factors for autism in Iraqi autistic children in Baghdad city. The most important of the risk factors identified was unhappy emotional state of the mother during pregnancy, abnormal gestational age, neonatal jaundice, as well as bottle-feeding, which is a highly modifiable risk factor that was not described in many other studies worldwide\textsuperscript{[17]}.

This study aims to determine the risk of developing autism in children born after short, adequate and long inter-pregnancy intervals.

**Aim of the Study**

To determine the risk of autism with short, adequate and long inter-pregnancy intervals.

**Patients and Method**

This is a cross-sectional study conducted in centers for autistic children in governorates (Karbara, Babil, and Wasit) in addition to the psychiatry unit in Al- Zahraa Teaching Hospital/Wasit. Data collection was performed from January 2019 to April 2019.

Children younger than 18 years who were diagnosed with autism spectrum disorder who were not the first born child in their families were included in the study, while children who were the first born for their families were excluded. Data was collected by interviewing families of children using specially designed form, and statistical analysis was performed using SPSS\textsuperscript{®} 24.

**Results**

**Distribution of child’s socio-demographic factors:** Table 1 shows that the mean age of autistic children was (6.12 ± 2.25) years old. The mean birth weight was (2.79 ± 0.64)Kg ranging from (1000-5000)gm.

Most of the children with autism included in the study were male (73.7%) and they were born term (70.0%). Those autistic children who were born preterm had a history of either extreme prematurity (42.6%), or moderate prematurity (48.9%).

**Table1: Distribution of child’s socio-demographic factors**

<table>
<thead>
<tr>
<th>Variable</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>6.12 ± 2.25 (3-15)</td>
</tr>
<tr>
<td>Birth weight (gm)</td>
<td>2.79 ± 0.64 (1000-5000)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gender</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>182</td>
</tr>
<tr>
<td>Female</td>
<td>65</td>
</tr>
<tr>
<td>Total</td>
<td>247</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gestational age</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Term</td>
<td>173</td>
</tr>
<tr>
<td>Preterm</td>
<td>47</td>
</tr>
<tr>
<td>Post term</td>
<td>27</td>
</tr>
<tr>
<td>Total</td>
<td>247</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>If preterm (n = 47)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Extremely prematurity</td>
<td>20</td>
</tr>
<tr>
<td>Moderate prematurity</td>
<td>23</td>
</tr>
<tr>
<td>Late prematurity</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>47</td>
</tr>
</tbody>
</table>

**Distribution of variables related to delivery:** Table 2 shows that up to two-thirds of children with autism included in the study were born via normal vaginal delivery (60.7%) and (48.0%) of vaginal deliveries were induced.

Three-quarters of children were either second in birth order or third (33.2% and 43.7%) respectively. Likewise; three-quarters of autistic children had a cephalic presentation during delivery.
Table 2: Distribution of variables related to delivery

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of delivery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal vaginal delivery</td>
<td>150</td>
<td>60.7%</td>
</tr>
<tr>
<td>Elective cesarean section</td>
<td>51</td>
<td>20.7%</td>
</tr>
<tr>
<td>Emergency cesarean section</td>
<td>46</td>
<td>18.6%</td>
</tr>
<tr>
<td>Total</td>
<td>247</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Induced</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prolonged</td>
<td>72</td>
<td>48.0%</td>
</tr>
<tr>
<td>Using anesthesia</td>
<td>54</td>
<td>36.0%</td>
</tr>
<tr>
<td>Forceps or ventouse</td>
<td>24</td>
<td>16.0%</td>
</tr>
<tr>
<td>Total</td>
<td>150</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth order</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Second</td>
<td>82</td>
<td>33.2%</td>
</tr>
<tr>
<td>Third</td>
<td>108</td>
<td>43.7%</td>
</tr>
<tr>
<td>More than third</td>
<td>57</td>
<td>23.1%</td>
</tr>
<tr>
<td>Total</td>
<td>247</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of baby</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single birth</td>
<td>216</td>
<td>87.4%</td>
</tr>
<tr>
<td>Multiple birth</td>
<td>31</td>
<td>12.6%</td>
</tr>
<tr>
<td>Total</td>
<td>247</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presentation of baby</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cephalic</td>
<td>192</td>
<td>77.7%</td>
</tr>
<tr>
<td>Breech</td>
<td>29</td>
<td>11.8%</td>
</tr>
<tr>
<td>Transverse lie</td>
<td>26</td>
<td>10.5%</td>
</tr>
<tr>
<td>Total</td>
<td>247</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Distribution of maternal obstetrical history:
Regarding obstetrical history, Table 3 shows that about one-third of mothers have either irregular or a total lack of antenatal care (26.7% and 7.3%) respectively. Seventeen percent gave a history of bleeding in pregnancy and over half of those mothers who bled during pregnancy, this event occurred in the first trimester. An absolute majority (78.9%) did not use contraception prior to the current pregnancy.

Table 3: Distribution of maternal obstetrical history

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antenatal care</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regular</td>
<td>163</td>
<td>66.0%</td>
</tr>
<tr>
<td>Irregular</td>
<td>66</td>
<td>26.7%</td>
</tr>
</tbody>
</table>

Table 2: Distribution of variables related to delivery (Conted...)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>History of bleeding in pregnancy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>42</td>
<td>17.0%</td>
</tr>
<tr>
<td>No</td>
<td>205</td>
<td>83.0%</td>
</tr>
<tr>
<td>Total</td>
<td>247</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>If yes (n = 42)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>First trimester</td>
<td>23</td>
<td>54.8%</td>
</tr>
<tr>
<td>Second trimester</td>
<td>18</td>
<td>42.9%</td>
</tr>
<tr>
<td>Third trimester</td>
<td>1</td>
<td>2.3%</td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contraception use prior to current pregnancy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>52</td>
<td>21.1%</td>
</tr>
<tr>
<td>No</td>
<td>195</td>
<td>78.9%</td>
</tr>
<tr>
<td>Total</td>
<td>247</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal previous fetal loss</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>67</td>
<td>27.1%</td>
</tr>
<tr>
<td>No</td>
<td>180</td>
<td>72.9%</td>
</tr>
<tr>
<td>Total</td>
<td>247</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Distribution of inter-pregnancy interval: Figure 1 shows that inter-pregnancy interval which was less than 2 years represented (45.4%), while those whose interval was (2-4 years) or (equal or more than 5 years) represented (27.5% and 27.1%) respectively.

Figure 1: Distribution of inter-pregnancy interval
Distribution of autistic children by history of birth asphyxia:

Figure (2) shows that autistic children who had a history of birth asphyxia was 25.1% of the cases.

![Figure 2: Distribution of autistic children by history of birth asphyxia](image)

Association between inter-pregnancy interval and child’s variables: Table 4 shows that chi square test was conducted to show an association between inter-pregnancy interval which were (less than 2 years, 2-4 years and equal or more than 5 years) and child’s variables which were (type of delivery, gestational age and history of autism in an earlier born sibling). There was significant association between inter-pregnancy interval and gestational age (p-value=0.034).

<table>
<thead>
<tr>
<th>Study variables</th>
<th>Inter-pregnancy interval</th>
<th>$\chi^2$</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Less than 2 years</td>
<td>2-4 years</td>
<td>Equal or more than 5</td>
</tr>
<tr>
<td><strong>Type of delivery</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal vaginal delivery</td>
<td>69(61.6%)</td>
<td>46(67.6%)</td>
<td>35(52.2%)</td>
</tr>
<tr>
<td>Elective cesarean section</td>
<td>24(21.4%)</td>
<td>12(17.7%)</td>
<td>15(22.4%)</td>
</tr>
<tr>
<td>Emergency C/S</td>
<td>19(17.0%)</td>
<td>10(14.7%)</td>
<td>17(25.4%)</td>
</tr>
<tr>
<td>Total</td>
<td>112(100.0%)</td>
<td>68(100.0%)</td>
<td>67(100.0%)</td>
</tr>
<tr>
<td><strong>Gestational age</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Term</td>
<td>79(70.5%)</td>
<td>52(76.5%)</td>
<td>42(62.7%)</td>
</tr>
<tr>
<td>Preterm</td>
<td>25(22.3%)</td>
<td>11(16.2%)</td>
<td>11(16.4%)</td>
</tr>
<tr>
<td>Post term</td>
<td>8(7.2%)</td>
<td>5(7.3%)</td>
<td>14(20.9%)</td>
</tr>
<tr>
<td>Total</td>
<td>112(100.0%)</td>
<td>68(100.0%)</td>
<td>67(100.0%)</td>
</tr>
<tr>
<td><strong>History of autism in an earlier born sibling</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Present</td>
<td>25(22.3%)</td>
<td>10(14.7%)</td>
<td>21(31.3%)</td>
</tr>
<tr>
<td>Absent</td>
<td>87(77.7%)</td>
<td>58(85.3%)</td>
<td>46(68.7%)</td>
</tr>
<tr>
<td>Total</td>
<td>112(100.0%)</td>
<td>68(100.0%)</td>
<td>67(100.0%)</td>
</tr>
</tbody>
</table>

*P-value ≤ 0.05 was significant
Discussion

Mean age of children of autism was (6.12) years, which is approximately (1.3) years younger than the findings in the US National Survey of Children’s Health (NSCH) in 2013 described by Sheldrick et al. in which the mean age at disease identification was (7.4) years[18].

Low birth weight is an important perinatal risk factors for ASD[19]. Mean birth weight for autistic children was (2.79) kg, which was lower than the birth weight of (3.197) Kg reported by Darcy-Mahoney et al. in their study conducted at the Pediatric Neurodevelopmental Clinic (PNC) in 2010[20].

Male children constituted almost three-quarters of children with autism in the present study, giving a male-to-female ratio of (2.8:1). This ratio is close to the ratio of (3:1) reported by Loomes et al.[21]. Autistic children born preterm constituted (19.1%) of the total autistic children. This is close to the finding by Schende et al. in their study who described a proportion of (14.6%) of their study population[22].

Regarding antenatal care of mothers of autistic children, two-thirds (66.0%) had regular antenatal care while the remaining had no regular antenatal care. This is lower than the proportion of Iraqi women with regular antenatal care of (72.7%) reported by Hussein et al. in Al-Hilla city during 2014-2015[23]. This suggest a protective role for antenatal care regularity against ASD development. Bleeding during pregnancy was found in (17.0%) of cases, more than half of them being in the first trimester. This is consistent with the meta-analysis by Gardener et al. who described a significant elevation in risk of autism, reaching up to 81.0%, in pregnant women who are exposed to bleeding during their pregnancies[11].

Inter-pregnancy interval of less than 2 years was observed in almost half of the cases (45.4%), a possible link between short inter-pregnancy period was suggested by Zerbo et al. in 2015[24].

Birth asphyxia was present in more than (25.0%) of study cases, this proportion was substantially higher than what was described by Fezer et al. in their study conducted during 2008-2015, which found proportion of (8.0%) of patients suffered birth asphyxia, and could demonstrate MRI abnormalities in them, concluding that birth asphyxia is one of the modifiable risk factors for autism[25].

Gestational age was found to be significantly associated with inter-pregnancy interval. Darcy-Mahoney et al. demonstrated a 2-fold higher risk of ASD among children with less than 33-weeks of gestation[20], which suggests that this is one of the mechanisms through which inter-pregnancy interval affects the risk of ASD. Two maternal factors were also found to be significantly associated with inter-pregnancy interval, these are maternal age at child birth, and regularity of antenatal care. This may further clarify the role of inter-pregnancy interval in development of ASD.

Conclusion

The study concludes that certain maternal and child factors are associated with duration of inter-pregnancy interval, including gestational age, maternal age, and antenatal care. Some of these factors are well established risk factors for development of ASD. It also concludes that almost half of the patients had inter-pregnancy interval of less than 2 years.

Conflict of Interest: Authors have no conflict of interest.

Source of Funding: This study did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Ethical Clearance: Appropriate approvals and permissions were obtained from responsible authorities before data collection. Informed consent was obtained from all parents of participating children after explaining study objectives. Information were treated with confidentiality during data collection, analysis, and presentation.

REFERENCES


The Role IL-16 rs11556218 T/G Gene Polymorphism with the Risk of Osteoporosis in a sample of Iraqi Postmenopausal Women

Mohammad Shakir Atiya1, Da’ad Ali Hussain1

1Institute of Genetic Engineering and Biotechnology, University of Baghdad, Iraq

ABSTRACT

Background: Interleukins (ILs), a multifunctional cytokines. It’s play a fundamental role in inflammatory diseases, as well as in the development of osteoporosis and there are data about the role of IL-16 polymorphism in development of postmenopausal osteoporosis.

Patients and Method: In this study, we investigated about the IL-16 rs11556218 T/G polymorphisms and the risk of osteoporosis among 50 patients with osteoporosis and 40 healthy controls. Serum IL-16 level and its correlation with the IL-16 rs11556218 T/G genotypes were analyzed.

Results: Significant differences of genotype distribution were observed between osteoporosis patients and controls at the IL-16 rs11556218 T/G genotypes. Compared with the IL-16 rs11556218 T/G homozygote TT, the heterozygous TG genotype was associated with significantly increased risk for osteoporosis ($X^2=13.25$, OR $= 5.52$, $p = 0.00048$); the GG genotype was not significantly different from controls, this may be due to the number of samples collection or samples ethics. But the odds ratio appear a high risk factor (O.R.) of osteoporosis among people who having GG genotype ($X^2= 1.35$, OR $= 2.59$, $P = 0.292$). In addition allele frequency for G allele associated with significantly increased risk for osteoporosis ($x^2=16.78$, OR$=3.94$, $p<0.0001$). TG and GG combined variants were associated with increased risk for osteoporosis compared with the TT genotype ($X^2=10.98$, OR $=4.33$, $P = 0.0013$). Moreover, in patients with osteoporosis, there was a correlation between the serum IL-16 and rs11556218 T/G genotype.

Conclusion: our study provided the evidence of association the polymorphisms of IL-16 rs11556218 T/G genotype and the risk of osteoporosis and found the IL-16 rs11556218 T/G genotype was associated with increased risk for development of osteoporosis in Iraqi postmenopausal women.

Keywords: IL-16, Osteoporosis, Single-nucleotide polymorphism Susceptibility.

Introduction

Osteoporosis in Postmenopausal women is a common disorder characterized by decreased bone mineral density (BMD), changes in bone microarchitecture and thus causing increased fracture risk. Osteoporosis is a disease occurs by the interaction of genetic and environmental factors. The environmental factors can roles play in control gene expression and therefore occur the process of the disease [1]. The risk factors among women include lower height, race, low-calcium diet, body mass index, use of corticosteroids for over six months and menopausal status. Earlier, studies showed that environmental effects and genetic control affected bone turnover [2]. Pro-inflammatory cytokines are among the important factors involved in bone turnover, they are the stimulants of bone resorption by acting directly on osteoclasts and osteoclast precursors. Recent studies propose that osteoclasts and immune cells share a number of regulatory molecules, including cytokines, signaling pathways, receptors, growth factors, and transcription factors [3]. Therefore, cytokines that are produced by immune cells and regulate adaptive responses may also influence osteoclast function through common receptors, signaling pathways, and transcription factors. This hypothesis is propped by

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Email: missanyiraqy30@gmail.com
evidence gathered from experimental animal models and human observations with autoimmune diseases [4,5]. Recent studies have investigated Interleukin-16 gene polymorphisms in relationship to risk of osteoporosis [6] and other disease such as colorectal cancer and gastric cancer [7], prostate cancer [8], glioma [9], and osteosarcoma [10]. Interleukine-16 (IL-16) is produced by activated CD8-positive (CD8+) T cells and activates CD4+ T cells, macrophages, monocytes, and dendritic cells by binding to the CD4 molecular. In addition to the activation of CD4+ T cells, IL-16 can stimulate the secretion of inflammatory cytokines such as interleukin-1β, tumour necrosis factor (TNF), and interleukin-6 (IL-6) [11]. So IL-16 share in the inflammatory disorder through the activation of T lymphocytes and the secretion of inflammatory cytokines [11,12,13] that increases osteoclast formation by promoting bone marrow stromal cell production of M-CSF and RANKL, and by enhance the responsiveness of osteoclast precursors to RANKL [14].

Material & Method

Study population: This study was conducted with 50 osteoporosis patients with postmenopausal Iraqi women who attended Baghdad Teaching hospital in Baghdad/Iraq between December 2018 and March 2019. Osteoporosis was defined according to the conventional World Health Organization (WHO) definition. Subjects with a history of bone disease, metabolic or endocrine disorders such as diabetes mellitus, hyperthyroidism, hyperparathyroidism, renal disease, liver disease, medications known to affect bone metabolism (e.g. anticonvulsants, corticosteroids, heparin sodium) were excluded. The control group comprised 40 healthy volunteers for the general health checkup in our hospital during the same period. After obtaining written informed consent, 5 mL of peripheral blood was collected for DNA extraction and ELISA test. Each participant was interviewed using a standard questionnaire by a trained nurse, to collect demographic characteristics and medical histories. All the specimens we recruited were of Arabic/Iraq ethnicity and were filtered based on their clinical characteristics. Before the assay, we obtained a written informed consent from each participant in our study.

Bone mineral density measurements: Area BMD (g/cm2) was measured by dual energy X-ray absorptiometry (DEXA). Densitometers were calibrated daily. Left hip and posterior–anterior lumbar spine (L2–L3–L4) scans were performed with the patient lying supine on the imaging table using the protocols recommended by the manufacturer.

DNA extraction and genotyping: Genomic DNA was isolated from EDTA anticoagulated peripheral blood with a commercially available extraction kit (Zymo, USA) according to the manufacturer’s instructions. Genotype determination for one SNP in the IL-16 gene (rs11556218T/G) was performed by real-time polymerase chain reaction (RT-PCR). The polymorphisms within IL16 rs11556218 T/G were genotyped with TaqMan genotyping assays using the Roto-Gene Q apparatus Real-Time (Roto-Gene Q, Germany). probes and primers designed for RT-PCR shown in Table 1.

Table 1: Details of RT-PCR primer and probe sequences and conditions in our study

<table>
<thead>
<tr>
<th>Polymorphism</th>
<th>Primer sequence</th>
<th>Product</th>
<th>RT-PCR conditions</th>
</tr>
</thead>
</table>
| rs11556218 T/G   | F: 5'-CTG ACT TCC TTT GGT TTG-3'  
R: 5'-TTG CCC TTC TGA ATA GTC-3' | 18 mer  | 40 cycles: 95°C for 15s, 60°C for 15s, 72°C for 15s. |
| Probe sequence   |                 |         |                   |
| P/T: 5'TGG TTC CAA ATG GGC TGG CCT C-3'  
P/G: 5'TGG TTC CAA AGG GGC TGG CCT C-3' | 22 mer  |                   |

Serum level measurement of IL-16: The interleukin-16 (IL-16) level were determined by enzyme-linked immunosorbent assay (ELISA) using a commercially available ELISA quantitative kit (R&D systems, USA) according to manufacturer’s instructions.

Statistical Analysis: Genetic analysis was performed by using Chi-square (χ2) test. P <0.05 was considered significant. Statistical analysis was performed by using Graphpad Prism6 (Graphpad Software Inc., La Jolla, CA). Data were expressed as (mean ± SD). The normality of the distribution of all variables was assessed by the student’s ANOVA test and Pearson correlation analyses that have been used to determine the significant difference between the groups.
Result

This study included 50 osteoporosis patients and 40 healthy controls, the mean ages of osteoporosis patients and healthy controls were 59.46 ± 7.217 and 53.55 ± 5.007 years, respectively. The genotype and allele frequencies of the IL-16 rs11556218 T/G polymorphisms for all the studied variations are shown in Table 2. All genotype frequencies of the control group conformed to the Hardy–Weinberg equilibrium.

<table>
<thead>
<tr>
<th>Genotypes</th>
<th>Hardy-Weinberg frequency</th>
<th>X²</th>
<th>OR</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control (n = 40)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Patients (n = 50)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TT</td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>TT</td>
<td>30</td>
<td>75</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>TG</td>
<td>8</td>
<td>20</td>
<td>29</td>
<td>58</td>
</tr>
<tr>
<td>GG</td>
<td>2</td>
<td>5</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>100</td>
<td>50</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Allele frequency</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>0.85</td>
<td>0.59</td>
<td></td>
<td></td>
<td>1.00 (Reference)</td>
</tr>
<tr>
<td>G</td>
<td>0.15</td>
<td>0.41</td>
<td></td>
<td></td>
<td>16.78</td>
</tr>
</tbody>
</table>

Table 2: Genotype of IL-16 rs11556218 T/G gene polymorphism with Allele frequency

There were significant differences in the genotype and allele frequencies of IL-16 rs11556218 T/G genotypes between osteoporosis cases and controls. Compared with the IL-16 rs11556218 homozygote TT, the heterozygous TG genotype was associated with significantly increased risk for osteoporosis (X²=13.25, OR = 5.52, P = 0.00048); the GG genotype was not significantly different from controls, this may be due to the number of samples collection or samples ethics. But the odds ratio appear a high risk factor (O.R.) of osteoporosis among people who having GG genotype (X²=1.35, OR = 2.59, P = 0.292). In addition allele frequency for G allele associated with significantly increased risk for osteoporosis (x²=16.78, OR=3.94, p=<0.0001). TG and GG combined variants were associated with increased risk for osteoporosis compared with the TT genotype (X²=10.98, OR =4.33, P = 0.0013).

Serum IL-16 level and its correlation with the IL-16 rs11556218 T/G genotypes. Given the observed notable association between the IL-16 rs11556218 T/G genotypes and osteoporosis risk, we further investigated the serum IL-16 levels in controls and patients with osteoporosis as well as the potential regulatory effects of the IL-16 rs11556218 T/G genotype on serum IL-16. We examined the serum IL-16 levels by ELISA in 50 osteoporosis patients and 40 healthy controls. The serum IL-16 of patients with osteoporosis significantly increased compared to controls (P =<0.0001). Moreover, in patients with osteoporosis, there was a correlation between the serum IL-16 and rs11556218 T/G genotype (P = 0.0001). The rs11556218 G allele-carrying patients had a higher serum IL-16 than the non-carriers (P =< 0.0001, Table 2).

Table 3: Serum IL-16 level and its correlation with the IL-16 rs11556218 T/G genotypes

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Polymorphism</th>
<th>TT</th>
<th>TG</th>
<th>GG</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean IL-16</td>
<td>Control</td>
<td>112.2356</td>
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<td>139.6634</td>
<td>277.1679</td>
</tr>
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<td></td>
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<td>SD</td>
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<td>15.58608</td>
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<td>15.58608</td>
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<tr>
<td></td>
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<td>15.58608</td>
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<td>15.58608</td>
<td>15.58608</td>
</tr>
<tr>
<td>SE</td>
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<td>2.720038</td>
<td>4.024308</td>
<td>1.53626</td>
<td>2.667954</td>
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<tr>
<td>P-value</td>
<td></td>
<td>&lt; 0.0001**</td>
<td>&lt; 0.0001**</td>
<td>&lt; 0.0001**</td>
<td>&lt; 0.0001**</td>
</tr>
</tbody>
</table>

SD: standard Diviation, SE: Standard error, P: Fischer exact probability, **The difference is highly significant at (<0.001).
**Discussion**

In the present study, we selected, one SNP IL-16 rs11556218 T/G to evaluate their association in patients with Iraqi postmenopausal women with osteoporosis and healthy controls. The SNPs rs11556218 T/G, are located in an exon region, and their single-nucleotide changes would result in an amino acid substitution.

Genetic variation in the DNA sequence of the IL-16 gene may lead to altered cytokine production and/or activity variation may modulate an individual’s susceptibility to osteoporosis [7]. The present results revealed that the IL-16 rs11556218 T/G polymorphism, representing an asparagine (Asn) to lysine (Lys) substitution in exon 6 of the IL-16 gene, has a significant effect on the risk of postmenopausal osteoporosis.

Inflammatory processes and cytokines play fundamental roles in the pathogenesis of women osteoporosis [15,16,17]. Variations in cytokine levels, among individuals are a plausible explanation for differences in disease susceptibility and severity, and are principally attributable to single nucleotide polymorphisms (SNPs) in cytokine-encoding genes [18].

Interleukine-16 as a proinflammatory cytokine whose functions include: chemo-attraction and modulation of T cell activation [19], and it’s important mediator in inflammatory and autoimmune diseases [20,21]. The IL-16 gene is located on chromosome 15q26.3 [22], and is initially translated into a precursor protein consisting of 631 amino acids, which is cleaved by caspase-3 to form the active C-terminal domain containing 121 amino acids [23,6]. IL-16 is a CD4-specific ligand required for the initiation of CD4 bioactivity. Through binding to the CD4 molecule, IL-16 can selectively activate CD4+ T cells, monocytes, eosinophils, macrophages, and dendritic cells [24,25]. In addition, IL-16 can increase the stimulate and produce of inflammatory cytokines, such as TNF-α, IL-1β, IL-6, and IL-15, leading to inflammatory response [26,27]. Thus, it is biologically reasonable to hypothesize a potential relationship between IL-16 gene polymorphisms and osteoporosis risk.

**Conclusion**

Our study provided the evidence of association the polymorphisms of IL-16 rs11556218 T/G genotype, G allele, and the risk of osteoporosis, and found the IL-16 rs11556218 T/G genotype and G allele, was associated with increased risk for development of osteoporosis in Iraqi postmenopausal women.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding

**REFERENCES**


The Impact of the Educational Program on the Woods Model in Learning the Skills of Serve and Receiving Volleyball Students

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ABSTRACT
The problem of research is that there is a weakness in the performance of some basic skills in volleyball (transmission and reception) in the educated and not reach the desired level that we aspire to. This may be due to the lack of use of some modern educational strategies and models that make the learner a key focus which could negatively affect performance skill. The aim of the research was to identify the effect of the Woods model in learning the skills of transmitting and receiving volleyball students.

The experimental method was used and the research was conducted on a sample of second grade students in the middle school of Yarmouk for girls. The number of female students was 31 divided into two experimental groups. The number of female students was 16 and the number of female students was 15. The tool was used to measure, the most important results of the research indicate that the Woods model does not play an important role in learning the skills of transmitting and receiving volleyball transmissions in the research sample. The group that learned the two skills studied by using the Woods model is better than the group that learned the same skills using the technique of the lesson. One of the most important recommendations is that the Woods model should be used to learn volleyball skills, especially the skills of serve and receiving in schools, under consideration.

Keywords: Educational program, Woods model and skills of serve and receiving.

Introduction
One of the bright signs that play a role in life is the issue of learning and education. It is a goal and goal for every educational institution, whether sports or non-sports, to bring out learners capable of being role models for their peers at all levels.

Because of the importance of the intermediate stage in building the personality of the learner in general, and the development of his abilities, especially the mental ones in particular, and to be meaningful learning, it was necessary to use models and strategies, such models Woods model, which stems from the theory of construction, which confirms three consecutive mental processes in the educational process, Prediction - observation), prediction is the first stages of the Woods model through which the learners predict the skill to be learned to know what happens in the future based on previous information and the second stage is the learners note the skill to be learned and applied and access the results are through the experiment and the learner begins to receive new information that was not previously available to him. The third stage is the explanation in which the learners reach the correct interpretation of the questions and ideas presented during the educational unit.1

The volleyball game is characterized by its popularity and ease of use by different age groups as well as the technical and planning development of its various skills including (skill of serve and receiving the serve). It is also necessary to pay attention to this class of middle stage as they face different pressures that require effort to face them.

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Through the experience of female researchers in education and their observation of female students' performance, I found that there are weaknesses in the performance of some basic skills in volleyball, especially the skill of transmitting and receiving the students. This may be due to the lack of use of some modern educational strategies and models which make the learner a key focus, which may adversely affect the performance of skills. As the adoption of the learner on a strong basis based on the attitudes of education need to address, thinking and some mental processes that contribute to improving performance.2

All of this called on the researchers to use an educational model that may play a role in making the learner predict, observe and interpret the two skills under study, so that his role is not the recipient of the information but rather strives to achieve the objectives of the educational process, studying.

Research aim: Identify the effect of the Woods model in learning the skills of serve and receiver of volleyball for female students.

Research Hypothesis: The Woods model does not have the effect of learning the skills of serve and receiver of volleyball for female students.

Research Methodology and Field Procedures

Research Methodology: The experimental approach was used to design the two groups (control and experimentation) with pre-test and post-random selection to suit the problem and subject matter of the research.

Research community and design: The research community is represented by the second grade students in the Yarmouk Middle School for Girls, which belong to Al-Rusafa School for the academic year 2017-2018. The number of students is divided into (4) people, and the selection of the sample must be representative of the original society, the researchers randomly selected the two groups (A - C) randomly and in a lottery manner to represent the sample of the main experiment (40) female students. The students were dismissed, who had health problems and absenteeism. The number of female students reached (9)) And a percentage (38.75%) of the total community of origin divided into two groups, one of them (16) students who learn the two skills under study using the Woods model and a control group (A) of 15 students who learn the two skills under study using the teacher style.

Means, tools and devices borrowed:

- Arab and foreign sources.
- Registration and unloading forms.
- International Informatics Net.
- Volleyball court Legal.
- Legal plane balls (15) Micasa type.
- Colored adhesive tape No. 2.
- Metal measuring tape - Flex.
- Camera (2) Type Sharp.
- Discs (CD).
- No-Beat Type Calculator (DELL).

Measurement tools:

Serve test:3 Purpose of the test: Measuring the skill of the serve of the volleyball player in a position similar to the match.

Instruments: legal volleyball court, legal volleyball.

Performance specification: The player stands in the middle of the end of the pitch (the half facing the half of the planned plot 9 meters from the net), from this place and the player holding the ball is serve to cross the ball network to half of the planned stadium.

Registration: Each time you send the correct number of the area in which the ball falls in the half of the planned pitch, and since the player has ten attempts on this test, and because grades are distributed on the regions of (1) to (4) degrees, the great degree of this test is (40) degrees. Note that in the case of the fall of the ball on the line separating the two areas calculated for the player the top zone.

Receiver reception test:4 Purpose of the test: measuring the skill of the player in receiving the serve.

Tools:

1. Draw two circles (A - B) in the corners of the stadium, so that the distance between the center of the circle and the side line (1.5) m, while the distance between the center and the end line (3 meters).
2. A sign (x) shall be placed in the opposite half of the stadium and at a distance of (3 meters) from the finish line, (4.5) meters from the side line.

3. Divide the area (3 meters) into three equal areas.

**Performance specifications:** The laboratory stands within the circle (A) and is facing the network, and the teacher to send the ball to him in this place to receive them to be directed into the area (1), and so on in the following five balls to go to the area (2) As well as with the five balls of the third so that he went to the area (3) repeat the same work with the same number of attempts of the circle (B).

**Registration:** The laboratory records the total points obtained from the 30 attempts granted to it (15 attempts from each department) according to the following method:

- Falling ball within the specified area gives the laboratory (3) degrees.
- Falling ball outside the specified area and within the vicinity of the laboratory gives two degrees.
- The ball falls outside the specified area and inside the stadium the laboratory gets one score.
- Except for the above, the laboratory receives zero.

**Table 1:** Shows the equivalence of the two groups of research in the variables investigated

<table>
<thead>
<tr>
<th>Tests</th>
<th>Experimental group</th>
<th>Control group</th>
<th>(t) calculated</th>
<th>Error level</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td></td>
</tr>
<tr>
<td>Serve</td>
<td>8.1</td>
<td>2.80</td>
<td>7.4</td>
<td>3.86</td>
<td>0.62</td>
</tr>
<tr>
<td>Receiver Serve</td>
<td>18.9</td>
<td>1.96</td>
<td>16.2</td>
<td>0.93</td>
<td>0.21</td>
</tr>
</tbody>
</table>

At the level of error < or = (0.05)

**Main experience:**

- **Pre Tests:** The researchers gave two introductory units on the two skills under study after which the pretests of the two skills were conducted on 27/2/2018 in the external arena of the Yarmouk Middle School for Girls. The researchers also carried out the equivalence of the two groups of research in the pretests of the volleyball and volleyball skills, as shown in Table (1).

**Preparing and implementing the Woods model program:** In order to achieve the research objectives, the researchers prepared the educational program (Woods model) for the purpose of implementation on the members of the experimental group, as follows:

1. The duration of implementation of the method Woods model is (10) weeks.
2. The number of educational units per week and two educational units.
3. The total number of educational units is (20) units.
4. The unit time is 45 minutes.
5. The educational program was implemented on 29/2/2018 until 2/5/2018
6. The experimental group learned the skill of serve and receiving volleyball transmissions using the Woods model. The control group learned the skill using the technique.
7. The Woods model was implemented during the educational unit agencies:
A. The students were divided into groups of 4 groups. Some questions were asked by the school of the subject to the learners and they were allowed to

**Two pilot studies:** The researchers carried out two pilot studies on a group of female students from outside the sample and within the society of origin, the number of (7) female students from Division D were randomly selected in the drawing method and each of the educational units in the Woods model. Several objectives include:

1. Know the suitability of the tests and model for the sample of the research.
2. Knowing the time spent for each section of the unit and the duration of each exercise in the unit.
3. Know the time it took to perform the tests and implement them.
4. Know the difficulties that may face the course of work and develop the most appropriate solutions to them.
think and predict the correct answer. Then, a student from each group was randomly selected to answer the question after consultation with her group.

B. Apply the exercises for the skill under study with a Flex presentation that is close to the place of performance as a feedback feed to correct the performance, and that the application is within the totals themselves to cooperate among themselves to correct the mistakes to achieve the correct performance.

C. Give a game of relaxation or relaxation exercises in the closing section as well as the school to explain the correct questions raised in the educational aspect.

Posttests: The researchers conducted post tests for the technical tests on 3/5/2018 in the external arena of Yarmouk medium for girls.

Results

Table 2: Shows the results of the pre and posttests of the research variables and the two groups

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean diff.</th>
<th>SD diff.</th>
<th>(t) calculated</th>
<th>Error level</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serve</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental</td>
<td>10.55</td>
<td>1.50</td>
<td>4.85</td>
<td>0.02</td>
<td>Sig.</td>
</tr>
<tr>
<td>Control</td>
<td>6.77</td>
<td>1.56</td>
<td>6.94</td>
<td>0.000</td>
<td>Sig.</td>
</tr>
<tr>
<td>Receiver</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental</td>
<td>26.42</td>
<td>10.32</td>
<td>12.66</td>
<td>0.000</td>
<td>Sig.</td>
</tr>
<tr>
<td>Control</td>
<td>15.9</td>
<td>9.24</td>
<td>8.22</td>
<td>0.000</td>
<td>Sig.</td>
</tr>
</tbody>
</table>

At the level of error <or = (0.05)

Table (2) shows that there are significant differences between the pre and posttests of the technical tests (serve - receiving serve) and the experimental and control groups and for the tests of the dimension.

The researchers attributed this to the fact that the Woods model and the style followed by the teacher played an important role in learning the two skills under study. This indicates that the Woods model was appropriate for the sample level as well as that they were prepared according to the correct scientific basis. Do not forget the role of the teacher in planning and implementation, which played an important role in learning the two skills under study. That the natural phenomena of the learning process is to have a development in learning as long as the teacher follows the steps of sound foundations of learning and education, which is the correct performance of the explanation and presentation and then focus on it until the consolidation of performance. The educational process should also be a training organization for beginners to learn motor skills, whether one skill or two skills, to facilitate the learning process.

Table 3: Shows the results of the post tests of the research variables and the two groups

<table>
<thead>
<tr>
<th>Variables</th>
<th>Experimental group</th>
<th>Control group</th>
<th>(t) calculated</th>
<th>Error level</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td></td>
</tr>
<tr>
<td>Serve</td>
<td>18.65</td>
<td>4.30</td>
<td>14.17</td>
<td>5.42</td>
<td>5.62</td>
</tr>
<tr>
<td>Receiver Serve</td>
<td>45.32</td>
<td>8.36</td>
<td>32.1</td>
<td>9.15</td>
<td>10.21</td>
</tr>
</tbody>
</table>

At the level of error <or = (0.05)

Table (3) shows significant differences between the experimental and control groups in the post tests of the two skills under study and for the benefit of the experimental group.

The researchers attributed this to the fact that the Woods model was better at learning the two skills under study than the teacher’s approach. This is because the Woods model makes the learner predict, observe and explain. This in turn makes the learner think and invest his mental processes during the lesson. The study must be provided on the basis of careful observation and practical experimentation and self-activity based on desire and attention to what the student studies. It also requires
during the unit to raise a question related to the subject to predict which raises the interest of learners and challenge their mental abilities to find the appropriate answer.7

And that the opposition of opinions between learners requires the help of the teacher in giving the correct interpretation and scientific and this in turn helps learners to reach the correct solutions and interpretations, and the prediction of learners of what can happen in the future and the expectation of things requires mental perception and this also contributes to learning the skill better. Previous experiences affect the speed and ease of learning and mastering the new skill.8

And the existence of cooperation among members of the same group easy to acquire the information and skills required, and indicates (Ismail) «that the learner who is the process of teaching his colleague and provide him with explanations and advises him mistakes directly in any educational situation helps to acquire and develop advanced skills of the learner.9

The researchers also attribute this to the role of feedback through a flex presentation that represents images of motor performance as well as explanation of skill details, which contributes to correcting the wrong performance of learners. This is expressed, the use of feedback is one of the factors determining the effectiveness learning of motor skills and the development of motor performance. Most research has shown that feedback increases performance improvement in the first stages of learning. This will lead to the use of more than one sense in the performance of the skill and this in turn leads to better learning as a general principle, the more possible use of the senses during mental perception the better.10

**Conclusions**

1. The WDS model has an important role in learning the skills of transmitting and receiving volleyball transmissions in the research sample.

2. The method adopted by the teacher has a positive effect on learning the two skills under study.

3. The group that learned the two skills under study was able to use the Woods model on the group that learned the same skills using the technique of the lesson.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding

**REFERENCES**


Capability of Diffusion-Weighted Magnetic Resonance Imaging in Differentiating between Atypical Hemangioma and Malignant Lesions

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¹College of Medicine, University of Babylon, Ministry of Higher Education and Scientific Research

ABSTRACT

Background: Despite its high sensitivity in detecting spinal intramedullary changes; conventional MRI has limited specificity for distinguishing between benign and malignant lesions. Diffusion-weighted MRI is a promising method that can assist in the identification of atypical hemangiomas and differentiating them from malignant lesions of the spine by assessing the molecular function of the body and its micro-architecture.

Aim of the Study: To evaluate the value of diffusion-weighted magnetic resonance imaging in the diagnosis of and differentiation between atypical hemangioma and malignant lesions of the spine.

Methodology: This study is a comparative analytical study conducted from May 2018 through May 2019 and included patients from Al-Hilla teaching hospital who underwent both diffusion-weighted magnetic resonance imaging (DW-MRI) and computerized tomography (CT) scan for the spine in order to identify and diagnose atypical hemangioma and malignant lesions.

Results: Mean age of study participants was (58.4 ± 15.5) years with a mean body mass index of (24.09 ± 3.76) Kg/m². Males comprised (66.7%) of study population. Magnetic resonance imaging of cases with atypical hemangioma of spine had shown hypointense T1-weighted image, hyperintense T2-weighted image, and no restriction of diffusion, with mean ADC value of (1.24×10⁻³ mm²/s), while in cases of metastatic bony lesions of spine there was hypointense T1, hyperintense T2, and restriction of diffusion with mean ADC value of (0.81×10⁻³ mm²/s).

Conclusions: diffusion weight magnetic resonance imaging is an effective diagnostic tool for differentiation between atypical hemangioma of spine and malignant bony lesion of spine.

Keywords: diffusion-weighted MRI; spine; hemangioma; malignancy

Introduction

High sensitivity of magnetic resonance imaging (MRI) in the detection of intramedullary changes in the spine had led to consider it the technique of choice regarding spinal cord imaging[1]. However, conventional MRI has limited specificity for certain abnormalities especially distinguishing between benign and malignant lesions[2].

Malignant tumors of the spine pose a challenge for clinicians both in diagnosis and in treatment. The majority them are metastatic tumors, forming more than 90% of spinal tumors[3]. In fact, the most common site for bone metastasis in the body is the spine[4]. Spinal metastatic tumors may arise from breast, renal, lung, thyroid, and colorectal cancer[5], with increasing incidence every year[6].

Several diagnostic modalities are employed for the diagnosis of spinal tumors, including plain X-ray, computerized tomography (CT) scans, and MRI[3]. MRI is considered one of the most successful diagnostic techniques in diagnosing the malignancies of spine[7]. Its ability to visualize both bone involvement and
neural compression allowed the clinicians to gain more information about the diagnosis, including the detection of the extent of involvement and the assessment of any compressions of the spinal cord[8].

However, some benign spinal lesions may falsely be diagnosed as malignant, which will expose the patient to unnecessary intervention[9]. Hemangioma is one of the benign lesions of the spine that typically appears hyperintense in T1-weight images and T2-weighted images of the MRI, with intense enhancement in post-contrast T1-weighted images with fat suppression[10].

However, some hemangiomas have atypical features, and may appear hypointense on T1-weighted images while keeping the same appearance on both T2-weighted images and fat suppressed images. This may mimic malignant lesions in conventional MRI, especially when the hemangioma extend indistinctly over the entire vertebral body[10]. This necessitate utilization of certain techniques to differentiate between benign and malignant lesions.

Diffusion-weighted magnetic resonance imaging (DW-MRI) is a promising method that can significantly impact the ability of identifying atypical hemangiomas and differentiating them from malignant lesions of the spine[9, 11]. It can assess the molecular function of the body as well as its micro-architecture, thereby help identify malignant lesions and distinguishing them from benign ones[12].

Diffusion of water molecules occurs in a pattern influenced by tissue components and properties. This pattern is sometimes modified due to certain pathological conditions, and this modification can appear as changes in diffusion pattern[13]. Restriction in water diffusion reflects the cellularity of the tissue and the integrity of the membranes, since water molecules are more restricted when there the tissue is highly cellular with several cell membranes of good integrity (such as the tissue of a tumor), while less restriction is seen when cell membranes are broken or when the environment is less cellular[14].

In solid tumors, diffusion is typically restricted, and diffusion-weighted images can effectively limit the false positive findings acquired by conventional imaging techniques, by showing hyperintense signal for certain tumor regions. This has rationalized the utilization of DW-MRI in oncology as a major diagnostic approach, combined with conventional MRI sequence for the diagnosis of malignancies within various tissues[13].

**Aim of the Study**

To evaluate the value of diffusion-weighted magnetic resonance imaging in the diagnosis of and differentiation between atypical hemangioma and malignant lesions of the spine.

**Patients and Method**

This study is a prospective analytical study conducted from May 2018 through May 2019 and included 300 patients from Al-Hilla teaching hospital who underwent both diffusion-weighted magnetic resonance imaging (DW- MRI) and computerized tomography (CT) scan for the spine in order to identify and diagnose atypical hemangioma and metastatic lesions. Those patients were included for further analysis regarding the efficacy of diffusion-weighted MRI in diagnosing their atypical hemangioma or metastatic bony lesions, while patients who have contraindications to CT scan or MRI were excluded from the study. Statistical analysis was performed using SPSS® version 23 (For Linux operating system). P-value of less than 0.05 was considered statistically significant.

**Results**

The study included 300 patients categorized into 3 groups: Group (A) included 18 patients with atypical hemangioma, Group (B) included 42 patients with metastatic bony lesions, and Group (C) included 240 patients with typical hemangioma. Groups (A) and (B) were included for further statistical analysis.

Age of patients ranged from (30-86) years, with a mean of \( (58.4 \pm 15.5) \) years. Significant difference in age was observed between group (A) with atypical hemangioma \( (41.5 \pm 8.6) \) years and group (B) with metastatic bone lesion \( (65.6 \pm 11.6) \) years, \( t\)-test=7.92, \( P\)-value<0.001. Figure(1) illustrates the age groups of study participants by study group. Two thirds (66.7%) of study participants were males while one-third (33.3%) were females.
Patients had their diseases for a median duration of (3) years, with a range reaching up to (5) years. The most prominent symptom was backache radiated to the lower limbs, which was present in (71.7%) of the cases. Parasthesia and numbness were present in (25%) of cases. Symptoms of malignancy such as osteopenia and compression fractures were present only in metastatic bone lesions group and affected (59.5%) of them.

Atypical hemangioma in group (A) had hypo-intense T1-weighted image in (81.25%) of the cases, and hyper-intense T2-weighted image in all of the cases. Figure(2) shows the MRI of a 54 years old female with hemangioma.

Figure 1: Distribution of age groups among study population

![Figure 1: Distribution of age groups among study population](image)

Figure 2: MRI imaging of a 54 years old female with hemangioma, (A) T1- weighted image (B) DW-weighted image

![Figure 2: MRI imaging of a 54 years old female with hemangioma](image)
No restriction of diffusion was observed in any of the cases with atypical hemangioma (diffusion is free). The DW-MRI imaging of a 69 years old female with spinal hemangioma is shown in Figure(3).

Figure 3: DW-MRI imaging of a 69 years old female patient with spinal hemangioma

Metastatic cases in group (B) similarly had hypo-intense T1-weighted image and hyper-intense T2-weighted image in all of the cases. However, all cases with metastatic lesions shown a restriction of diffusion. Figure(4) shows the MRI of a male aged 49 years with bone metastasis to the spine.

Figure 4: MRI imaging of a 49 years old male with bony metastasis to the spine

Mean ADC value for atypical hemangioma was \((1.24 \times 10^{-3}\text{mm}^2/\text{s})\) with a standard deviation of \((0.32 \times 10^{-3}\text{mm}^2/\text{s})\) and a 95% confidence interval of \((1.08 \times 10^{-3}–1.40 \times 10^{-3})\), while in metastatic bone lesions the mean ADC value was \((0.81 \times 10^{-3}\text{mm}^2/\text{s})\) with a standard deviation of \((0.91 \times 10^{-3}\text{mm}^2/\text{s})\) and 95% confidence interval of \((0.53 \times 10^{-3}–1.09 \times 10^{-3})\) as in Table(1). Figure(5) shows the ADC map of a 30 years old patient of hemangioma of the spine.
### Table 1: ADC values of study groups

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>ADC×10³ mm²/s SD</th>
<th>95% C.I.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group (A)</td>
<td>1.24</td>
<td>0.32</td>
<td>1.08 – 0.40</td>
</tr>
<tr>
<td>Group (B)</td>
<td>0.81</td>
<td>0.91</td>
<td>0.53 – 1.09</td>
</tr>
</tbody>
</table>

#### Discussion

Typical hemangiomas can be differentiated from metastasis to the spine with relative ease utilizing conventional MRI. Those typical hemangiomas appear on MRI as hyper-intense lesions on T1-weighted images and T2-weighted images, which is distinctive from the surrounding vertebral bone marrow that appears normal. While in bone metastasis the lesion appears as hypo-intense on T1-weighted image and either hyper-intense or hypo-intense on T2-weighted image\(^{[10]}\). In contrast, certain atypical hemangioma lesions may show different appearance on conventional MRI, with a hypo-intense appearance on T1-weighted image, giving a radiological finding similar to that of bone metastasis\(^{[15]}\).

Mean age of the cases with atypical hemangioma enrolled in the present study was (41.5) years, which was lower than the mean age of (60.6) for the patients with hemangioma reported by Shi et al. in their study conducted from 2013 to 2015 in China\(^{[15]}\), while the mean age of metastatic lesions in the present study was (65.5) years which was higher than the age of (54.33) years among metastasis patients reported by Shi et al.\(^{[15]}\). This may reflect a variation among the two populations regarding the age of incidence of each condition.

Two thirds of the patients included in the present study were males. However, patients with atypical hemangioma showed a female predominance, which is consistent with the typical demographic characteristics of the hemangiomas\(^{[16]}\). While metastatic bone lesions in the present study had shown a male predominance, which is consistent with some types of tumors, but other types generally have equal gender prevalence\(^{[16]}\).

Back pain was the commonest symptoms among both groups of patients in the present study, with radiation to the lower limbs. This finding is endorsed by the study by Aich et al. who reported in their study that the most common symptom reported by patients with vertebral hemangioma was back pain\(^{[17]}\). Lawrie I. had
also described that back pain is a frequent symptom in spinal bone metastasis\cite{18}.

Although compression fractures and osteopenia were present only in metastatic bone lesions group, and could be considered as distinctive features for this condition in comparison to hemangiomas; but the late presentation and high morbidity of both compression fractures and osteopenia impose considering them as complications rather than symptoms, rendering them useless for the diagnostic distinction between metastatic bone lesions and atypical hemangiomas.

Regarding the radiological findings of the study groups, the majority of patients with atypical hemangioma had shown hypo-intense lesions on T1- weighted image, while all of them had shown a hyper-intense lesion on T2-weighted image. This finding is supported by the finding by Matrawy et al. in their study, who observed a hypo-intense lesion on T1-weighted image and hyper-intense lesion on T2-weighted image in all patients with atypical hemangioma of the spine\cite{9}.

Interestingly, patients with metastatic bone lesions in the present study had also shown similar radiological findings, with hypo-intense lesions on T1- weighted image while being hyper-intense lesion on T2-weighted images, which was similar to the radiological findings described by Matrawy et al. in their study\cite{9}. This similarity in the presentation of T1-weighted and T2-weighted images of malignant metastatic lesions of the spine and benign atypical hemangiomas of the spine reflect the diagnostic difficult between those two lesions of the spine experienced with conventional MRI.

However, on DW-MRI, all the cases of atypical hemangioma were observed to have free diffusion, while all cases of metastatic bone lesions were observed to have restriction of diffusion; giving a high sensitivity and specificity in distinguishing between them. A similar observation was reported by Matrawy et al.\cite{9}

The value of apparent diffusion coefficient (ADC) value was found to be higher among cases with atypical hemangioma compared to cases with metastatic bone lesions, with means of (1.24×10⁻³ mm²/s) and (0.81×10⁻³ mm²/s), respectively. These values are closely similar to the ADC values described by Taskin et al. who observed an ADC mean value of (1.80×10⁻³ mm²/s) for atypical hemangioma and (0.94×10⁻³ mm²/s) for metastatic bone lesions\cite{19}.

Another result that support this findings was observed by Leeds et al. who observed a higher value of ADC in patients with benign spinal lesions than the value of ADC observed in patients with malignant spinal lesions\cite{10}. Combination of DWI technique with ADC mapping can provide a better differentiation between benign and malignant lesions of the spine.

This is similar to what was demonstrated by Herneth et al. in their study that demonstrated a significantly different levels of ADC between cases of vertebral metastases, with a mean of (0.69×10⁻³ mm²/sec) and cases of benign lesions, with a mean of (1.62×10⁻³ mm²/sec), suggesting an increase in the specificity when using ADC values in magnetic resonance imaging\cite{20}.

Conclusions

The present study concludes that diffusion weight magnetic resonance imaging (DW-MRI) can be utilized as an effective diagnostic approach in the identification of cases with spinal hemangiomas (whether typical or atypical) and cases of metastatic bony lesions of the spine, and the differentiation between them when conventional MRI shows a similar findings.’

Conflict of Interest: Authors have no conflict of interest.

Source of Funding: This study did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Ethical Clearance: All required approvals and permissions were obtained from responsible authorities before conducting the study. Informed consent was obtained from all patients included in the study after describing to them the study objectives. Data was kept private during collection, analysis, and presentation.

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Association of the 3’UTR188CT Polymorphism of Lectin-Like Oxidized Low Density Lipoprotein Receptor-1 (LOX-1) Gene with Risk for Acute Coronary Syndromes in a Group of Iraqi Population

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ABSTRACT

Background: Many study had tried to investigated the gene that associated with coronary heart disease and its complication, the danger of atherosclerosis and complication may increase as result of oxidization of low density lipoprotein by lectin-like oxidized low density lipoprotein receptor-1 (LOX-1) which found as cell surface endocytosis searcher receptor, the aim is to explore whether or not the LOX-1 gene and it’s 3’UTR C188T (rs1050283) polymorphisms were a genetic risks of ACS in sample of Iraqi population.

Method: A case control study in which 3’- UTR188 C/T single nucleotide polymorphism (SNP) of LOX-1 were studied in 100 Iraqi subjects: 35 with ACS, 30 have chronic stable angina, and 35 control subjects without CAD. DNA amplification refractory mutant system polymerase chain reaction method was performed the genotyping.

Results: significantly not associated between 3’-UTR188 C/T SNP and the prevalence of ACS among the study groups.

Conclusion: 3’- UTR188 C/T SNP polymorphism in the clinical practice not useful to evaluate the risk for ACS.

Keywords: acute coronary syndromes, Lectin-like oxidized low-density lipoprotein receptor-1 polymorphism, soluble LOX-1, 3’-UTR188 C/T (rs1050283) polymorphism.

Introduction

Coronary artery disease (CAD) is the major cause of morbidity and disability in the world ¹. It is almost always due to atherosclerosis the pathogenesis of which is complex. Several risk factors have been identified: age, male sex, smoking, hypertension, diabetes mellitus, dyslipidemia, obesity, sedentary life and heavy alcohol intake ²myocardial infarction, stroke. Modification of these traditional risk factors has consistently shown a 30% to 40% reduction in mortality and morbidity.

3. Epidemiological studies have shown that genetic predisposition accounts for 40% to 60% of the risk for CAD ³. genetic background of CAD and ACS provide knowledge about the pathogenesis of the illness and the groundwork to build up therapeutic approaches and prevention. Modification of native LDL, particularly its oxidation, is essential for cholesterol accumulation in macrophages and foam cell formation ⁴. LOX-1 receptor is involved in endothelial dysfunction ⁵also known as OLR-1, monocyte union ⁶ox-LDL-mediated upregulation of MCP-1 and monocyte adhesion to HCAECs both were suppressed (P<0.01, the migration, proliferation, and apoptosis of fibroblast/smooth muscle cells ⁷oxidatively (ox-, platelet stimulation ⁸, as well as plaque unsteadiness ⁹, all of above are significant in the pathogenesis of atherosclerosis and its complications. Study done in USA was firstly documented the oxidized LDL-receptor

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1. LOX-1 is a 50-kDa type II membrane glycoprotein belongs to the C-type lectin family. The lectin-like oxidized LDL receptor gene encoding for LOX-1 receptor is mapped on chromosome 12p13.2-p12.3 and consists of 6 exons interrupted by 5 introns designated lectin-like oxidized LDL receptor-1 (LOX-1). The 3’ UTR is an untranslated region found on the 3’ side of the coding sequence on mRNA strand immediately following the translation stop codon and plays a critical role in translation stability, termination, as well as post-transcriptional gene expression. It is the non-coding regions of the genome that are responsible for regulation, facilitating complex temporal and spatial gene expression through the combinatorial effect of numerous mechanisms and interactions working together to fine-tune gene expression. The major regions involved in regulation of a particular gene are the 50 and 30 untranslated regions and introns. In addition, pervasive transcription of complex genomes produces a variety of non-coding transcripts that interact with these regions and contribute to regulation. This review discusses recent insights into the regulatory roles of the untranslated gene regions and non-coding RNAs in the control of complex gene expression, as well as the implications of this in terms of organism complexity and evolution. © 2012 The Author(s). Numerous polymorphisms most certainly been documented inside the LOX-1 gene, including a C-to-T substitution inside the 3’ untranslated region (3’ UTR-C/T; rs1050283) located 188 base pair downstream of the stop codon. This site appointed the binding of ox LDL. The binding of an allele-specific manner with nuclear proteins may be affected by this polymorphism 18-20% to 49% stenosis (24.9%). Human being relationship research of various populations have not significant association between gene polymorphisms and CAD and/or its complications. Regarding whether polymorphisms within this gene were connected with CAD and/or its complications. Therefore the purpose of study is: evaluation of the prevalence of the single nuclear polymorphism (SNP) of the LOX-1 gene: the 3’UTR C188T in a group of Iraqi population and investigate whether variation in the 3’UTR188 CT (1050283rs), genetic cause of Acute coronary syndrome was LOX-1 gene.

**Patient and Method**

**Study design:** This is a case control study conducted at Al-Imamain Al-kadhimain medical city and involved 100 participants (63 male and 37 female). Diagnosis of the clinical syndromes of CAD was ascertained by the attending cardiologist on the basis of history, ECG, hs - Troponin according to American College of Cardiology (ACC) clinical data standard 19.

**Study Subjects:**

1. Group I: included 35 patients with ACS (20 male, 15 female, mean age 58.77 ± 12.66) admitted to the CCU.

2. Group II: The non-ACS group consists of 30 patients with chronic stable angina pectoris (CSA: 19 male, 11 female, mean age 62.07 ± 10.6) controlled by medical treatment or planning for elective revascularization (25 of them did coronary angiography).

3. Group III: Control group consist of 35 non-ischemic individuals (24 male, 11 male, mean age 46.51 ± 12.54) i.e. those without symptomatic CAD or any significant luminal narrowing on coronary angiography (20 of them).

Detailed personal information (age, gender, body mass index, smoking status, family history, hypertension and diabetes) of all patients collected using a structured questionnaire.

All participants were eligible to give consent and being above 18 years of age. A written consent was taken by all participants.

**Exclusion criteria included patients with:** peripheral vascular diseases, and stroke.

**SNP genotyping:** genomic DNA was isolated from fresh blood by using ReliaPrep™ Blood gDNA Miniprep System kit (promega USA). The Polymerase chain reaction (PCR) - amplification refractory mutant system (ARMS) method was used to genotype the 3’UTR188CT (rs1050283) by using two outer primers for amplification and two inner primers for detection of the SNP depending on their melting temperature.; forward inner 5’-TATGTCAACATTTTTTGATTCTAGCGAC-3’, reverse inner primer 5’-ACAAGCTAGGTGAAATAATACCGA-3’, forward outer 5’-TGGAAGAAAGAAAAAGTCTTTTGAGTT-3’, reverse outer 5’-ATGAGGTTAAGAGAAGACTGAGTTCAGAGG-3’. Melting curve detection for each genotype is done by computerized software according to melting
temperature. The melting range for each genotype is: 82 ± 1°C for CC, 85 ± 1°C for TT, and 82°C ± 1, and 85°C ± 1 for CT. equilibrium was done at the SNP locus in the entire example. Used chi-square to evaluate allele and genotype frequencies. \( P < 0.05 \) reflected statistically significant. Statistical analysis done by SPSS 23.

## Results

**Clinical characteristics of the study subjects:** The demographic parameters of the study groups were not significantly different except for age and total cholesterol (table 1)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Control N = 35</th>
<th>ACS N = 35</th>
<th>CSA N = 30</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (yr)</td>
<td>46.51 ± 12.5</td>
<td>58.77 ± 12.6</td>
<td>62.07 ± 10.8</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>29.74 ± 5.06</td>
<td>27.66 ± 6.09</td>
<td>29.72 ± 5.15</td>
<td>0.200</td>
</tr>
<tr>
<td>Gender</td>
<td>Male 24 (68.6%)</td>
<td>20 (57.1%)</td>
<td>19 (63.3%)</td>
<td>0.612</td>
</tr>
<tr>
<td>Medical history</td>
<td>Female 11 (31.4%)</td>
<td>15 (42.9%)</td>
<td>11 (36.7%)</td>
<td></td>
</tr>
<tr>
<td>Smoking</td>
<td>Yes 13 (37.1%)</td>
<td>13 (37.1%)</td>
<td>14 (46.7%)</td>
<td>0.672</td>
</tr>
<tr>
<td>No</td>
<td>22 (62.9%)</td>
<td>22 (62.9%)</td>
<td>16 (53.3%)</td>
<td></td>
</tr>
<tr>
<td>Total -C (mg/dl)</td>
<td>167.3 ± 40.2</td>
<td>151.4 ± 31.3</td>
<td>138.2 ± 40.6</td>
<td>0.009</td>
</tr>
<tr>
<td>TG (mg/dl)</td>
<td>133.1 ± 73.9</td>
<td>128.4 ± 44.3</td>
<td>113.7 ± 47.3</td>
<td>0.374</td>
</tr>
<tr>
<td>HDL-C (mg/dl)</td>
<td>43.8 ± 11.11</td>
<td>41.1 ± 12.27</td>
<td>38.4 ± 12.76</td>
<td>0.197</td>
</tr>
<tr>
<td>VLDL-C (mg/dl)</td>
<td>26.3 ± 14.78</td>
<td>26.28 ± 9.07</td>
<td>22.3 ± 9.46</td>
<td>0.294</td>
</tr>
<tr>
<td>LDL-C (mg/dl)</td>
<td>94.4 ± 31.36</td>
<td>87.5 ± 37.07</td>
<td>75.7 ± 36.86</td>
<td>0.106</td>
</tr>
</tbody>
</table>


The average age of incidence of ACS and CSA was significantly higher than that of control subject but did not differ significantly between each other. Total - C was significantly lower in CSA vs control subjects (table 2)

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Group</th>
<th>Group</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (yr)</td>
<td>Control</td>
<td>ACS</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>CSA</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>ACS</td>
<td>CSA</td>
<td>0.520</td>
</tr>
<tr>
<td>Total cholesterol (mg/dl)</td>
<td>Control</td>
<td>ACS</td>
<td>0.182</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>CSA</td>
<td>0.007</td>
</tr>
<tr>
<td></td>
<td>ACS</td>
<td>CSA</td>
<td>0.340</td>
</tr>
</tbody>
</table>

Genotype distribution and allele frequencies of 3’UTR188CT polymorphism were within equilibrium of Hardy-Weinberg (\( p > 0.05 \)).
Relation of genotype polymorphism with ACS in comparison with other study groups: There were no significant differences in LOX-1 genotype between the study groups, neither in dominant nor recessive model. It seems that the effect of polymorphism is more probably through recessive model (P value 0.09). The frequency of wild type (allele C) and mutant type (allele T) did not differ significantly.

### Table 3: Genotype distribution by Yates’ chi square

<table>
<thead>
<tr>
<th>Genotype</th>
<th>Control No (%)</th>
<th>ACS No (%)</th>
<th>CSA No (%)</th>
<th>Total</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CC</td>
<td>12 (30.0)</td>
<td>19 (47.5)</td>
<td>9 (22.5)</td>
<td>40</td>
<td>0.458</td>
</tr>
<tr>
<td>CT</td>
<td>16 (35.6)</td>
<td>13 (28.9)</td>
<td>16 (35.6)</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>TT</td>
<td>7 (46.7)</td>
<td>3 (20.0)</td>
<td>5 (33.3)</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>35</td>
<td>35</td>
<td>30</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

### Table 4: The distribution of different genotype and alleles of 3’UTR188C/T (rs1050283) in patients with CAD (ACS+CSA) vs. control

<table>
<thead>
<tr>
<th>3’UTR188C/T</th>
<th>Control</th>
<th>CAD (ACS+CSA)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Genotypes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CC</td>
<td>12 (34.28%)</td>
<td>28 (43.1%)</td>
<td>0.39</td>
</tr>
<tr>
<td>CT</td>
<td>16 (45.71%)</td>
<td>29 (44.6%)</td>
<td>0.9</td>
</tr>
<tr>
<td>TT</td>
<td>7 (20%)</td>
<td>8 (12.3%)</td>
<td>0.3</td>
</tr>
<tr>
<td>HWE</td>
<td>0.69</td>
<td>0.9</td>
<td></td>
</tr>
</tbody>
</table>

#### Dominant model

<table>
<thead>
<tr>
<th>Genotypes</th>
<th>Control</th>
<th>CAD (ACS+CSA)</th>
<th>P value</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>CC+CT</td>
<td>28 (80%)</td>
<td>57 (87.7%)</td>
<td>0.3</td>
<td>1.7</td>
<td>0.5 - 5.4</td>
</tr>
<tr>
<td>TT</td>
<td>7 (20%)</td>
<td>8 (12.3%)</td>
<td>0.3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Recessive model

<table>
<thead>
<tr>
<th>Genotypes</th>
<th>Control</th>
<th>CAD (ACS+CSA)</th>
<th>P value</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>CC</td>
<td>12 (34.28%)</td>
<td>28 (43.08%)</td>
<td>0.39</td>
<td>0.68</td>
<td>0.29- 1.6</td>
</tr>
<tr>
<td>TT +CT</td>
<td>23 (56.72%)</td>
<td>37 (56.92%)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Alleles

<table>
<thead>
<tr>
<th>Alleles</th>
<th>Control</th>
<th>CAD (ACS+CSA)</th>
<th>P value</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>28 (54.9%)</td>
<td>57 (60.64%)</td>
<td>0.5</td>
<td>0.79</td>
<td>0.39-1.5</td>
</tr>
<tr>
<td>T</td>
<td>23 (45.1%)</td>
<td>37 (39.36%)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

HWE: Hardy – Weinberg equilibrium

### Table 5 : The distribution of different genotype and alleles of 3’UTR188C/T in patients with ACS vs. control

<table>
<thead>
<tr>
<th>3’UTR188C/T (rs 1050283)</th>
<th>Control</th>
<th>ACS</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Genotypes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CC</td>
<td>12 (34.28%)</td>
<td>19 (54.28)</td>
<td>0.09</td>
</tr>
<tr>
<td>CT</td>
<td>16 (45.71%)</td>
<td>13 (37.14%)</td>
<td>0.46</td>
</tr>
<tr>
<td>TT</td>
<td>7 (20%)</td>
<td>3 (8.58%)</td>
<td>0.17</td>
</tr>
<tr>
<td>HWE</td>
<td>0.69</td>
<td>0.7</td>
<td></td>
</tr>
</tbody>
</table>

#### Dominant model

<table>
<thead>
<tr>
<th>Genotypes</th>
<th>Control</th>
<th>ACS</th>
<th>P value</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>CC+CT</td>
<td>28 (80%)</td>
<td>32 (91.42%)</td>
<td>0.17</td>
<td>0.37</td>
<td>0.08 – 1.5</td>
</tr>
<tr>
<td>TT</td>
<td>7 (20%)</td>
<td>3 (8.58%)</td>
<td>0.17</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Recessive model

<table>
<thead>
<tr>
<th>Genotypes</th>
<th>Control</th>
<th>ACS</th>
<th>P value</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>CC</td>
<td>12 (34.28%)</td>
<td>19 (54.28%)</td>
<td>0.09</td>
<td>0.4</td>
<td>0.16- 1.15</td>
</tr>
<tr>
<td>TT +CT</td>
<td>23 (56.72%)</td>
<td>16 (45.72%)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Alleles

<table>
<thead>
<tr>
<th>Alleles</th>
<th>Control</th>
<th>ACS</th>
<th>P value</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>28 (54.9%)</td>
<td>32 (66.66%)</td>
<td>0.23</td>
<td>1.64</td>
<td>0.72 –3.71</td>
</tr>
<tr>
<td>T</td>
<td>23 (45.1%)</td>
<td>16 (33.34%)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

HWE: Hardy – Weinberg equilibrium
Discussion

Many studies have tested the relations between LOX-1 (1050283rs) polymorphisms and CAD or ACS, this study is the original study in Iraq to report the relationship of with CAD and with ACS in particularly and LOX-1 gene polymorphism. Comparison of genotypes (CC, CT, TT), dominant and recessive model and allele frequencies all show no significant association neither for CAD nor for ACS. Logistic regression of T carrier to CAD and to ACS in whole population (not shown in results), there was significant correlation to ACS only (P value=0.016), but the OR and 95% confidence interval for T carrier was 0.0548 and (0.0051,0.5826) respectively in which the null value (OR=1) is not contained within 95% confidence i.e. the probability that the null hypothesis (rejection of the presence of disease) is more than 5%. However, this can tell that T allele is one of the markers that need to be investigated by a large size study to look for its possible role in clinical practice in connection with ACS risk assessment. This result was in agreement with Sentinelli et al 2006 20 who found no association with CAD in Italian patients (351 patients with CAD and in 215 person as control), Kurnaz et al 2012 21, in a group of Turkish patients (83 CAD patient vs. 99 healthy control), Wang et al 2010 22, and Trabetti et al 2006 (a total of 677 Italian subjects, 327 CAD-free, 350 CAD, of which 190 with AMI and 160 AMI-free) 23. In contrary Mango et al 2003 24 and Chen Q et al 2003 25 26 27 found a 20% to 49% stenosis (24.9% founded an association of the SNP with the threat of MI. samples in Mango research was comparatively small like in our study (150 MI cases and 103 control cases), restricting the research that detect LOX-1 and effects on coronary artery disease and myocardial infarction. while the later research study included 589 white and 122 black women used coronary angiography for diagnosed ischemia. These differences occur due to control group had absent of stenosis after angiography, as in this study (20 out of 35) and sentinelli study (54 out of 215). Thus, undiscovered CAD might be present in the control group. In the study by Mango et al, angiography used to diagnosed controls group (103), and the disease properly evaluated. as a result, chance in a study and small numbers of control cases lead to this no association. another possible explanation for the result divergence is that the different populations and different geographic distribution on which these studies are done, so that ethnic diversity of polymorphisms and environmental factors may play a role.

Conclusion

In this study, relation of the 3'-UTR188 C/T SNP polymorphism with the occurrence of ACS in patients of CAD is still doubtful and need more study on large size population in multi -centers using standardized unbiased methods, enrolling precisely defined CAD patients and well-matched controls to make benefit of the results in the clinical practice to evaluate the risk for atherosclerosis and its related disorders.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

REFERENCES


20. Sentinelli, F. *et al.* The 3′-UTR C>T polymorphism of the oxidized LDL-receptor 1 (OLR1) gene does not associate with coronary artery disease in Italian CAD patients or with the severity of coronary disease. *Nutrition, Metabolism and Cardiovascular Diseases* (2006); 16, 345–352.


Depression is a global problem across the world with high morbidity. Abnormalities in the neuroendocrine, neurohypophyseal system and immune systems have been reported in depression. The possible connection of Oxytocin in psychiatric disorder might predict the risk of depression.

**Aim of the Study:** Estimation of Oxytocin level in individual could be at risk of depression according to their life style as a resident in nursing home and age compared with currently depressed patients and control volunteers and identify the correlation of Oxytocin concentration with the severity of depression.

**Patients and Method:** Thirty three patients diagnosed with depression (21 male and 9 female). Thirty five normal control subjects (19 male and 11 female) and seventy volunteers who reside at nursing home (45 male and 25 female). ELISA technique used to measure the Oxytocin levels.

**Results:** The study found that the Oxytocin value is reduced in patients with depressive disorder compared with control group and similarly values of the third group included in this study to depressive patients levels in which reduction of Oxytocin level. There is a significant association of decreased oxytocin with the severity of depression.

**Conclusion:** Low concentration of Oxytocin in both patients of depression and tested subjects as group at depression risk compared to normal control reveals that estimation of Oxytocin can be used for prediction of early onset of depression particularly in population with increased other risk factors of development of depressive disorders.

**Keywords:** depression risk ; elderly Iraqi population ; Oxytocin level.

---

**Introduction**

Oxytocin (OXT) is a neuropeptide produced by the hypothalamus, involved in a broad range of physiological and behavioral processes (1). Recent biological studies are confirming that OXT has also extra-hypothalamic cerebral sites of production and could be involved in many other central processes related to psychiatric conditions such as depression, autism, anxiety or schizophrenia(2). Depression is associated with substantial deficits in quality of life, it is considered the leading cause of disability globally due to nearly about 350 million people worldwide is affected(3,4). It is well known that the diagnosis of depression is based exclusively on clinical criteria, particularly there is no currently biological diagnostic marker for assessment and management of this disorder(5,6). There is a rising number of studies related to the OXT to psychiatric processes and particularly to mood disorders (7). Also many human studies revealed that plasma OXT levels are reduced in patients suffering from major depression. (8). Among risk factors of depression is the life style and the quality of relationships among families and individuals and the stressful life events, thus the study aimed to evaluate the oxytocin level as a prediction procedure of development of depression in population at risk of this life threatening disorder and may provide the ability of induction the preventable strategies of therapy or improvement of life quality.
Patients and Method

Thirty three participant with depressive disorder diagnosed as mild, moderate and sever depression according to the criteria of ICD−10 (International Statistical Classification of Diseases and Related Health Problems 10th Revision), the samples are collected from Ibn–rushed training hospital for psychiatry, Baghdad, Iraq, from February 2019 to June 2019. The written consent obtained from all the patients and the approval and ethics consideration approved by Ethics Committee of Ibn–rushed training hospital. The exclusion criteria were bipolar disorder, hormonal therapy, pregnancy and lactation for females or using hormonal contraceptives, the patients were 21 male and 9 female mean age 62.71 ± 8.18. The control group were thirty five, 19 male and 11 female mean age 58.42 ± 7.75. Seventy residents in nursing home, 45 male and 25 female mean age 63.67 ± 9.07 with sadness mode and loss of appetite, the information taken by interviews with the volunteers included in this study and reported in the questionnaire. Morning blood samples were collected and centrifuged at 3000rpm, the resultant serum of centrifugation is stored at −40 C°. Serum concentration measured by competitive Enzyme Linked Immuno Sorbent Assay (ELISA) technique. The laboratory measured data are presented as mean ± standard deviation for mean (SDM) to compare the means between the different three groups by using ANOVA.

Receiver Operator Characteristic (ROC) curves used to plot sensitivity and specificity and determine the cut off value. All analyses data were statistically analyzed using Statistical Package for Social Sciences (SPSS), software program version 17.0. A P value less than 0.05 considered statistically significant.

Results

Concentration of OXT in both depressive patient and in subjects at depressive risk group lower than controls, there was a significant difference (P=0.001) as shown in table 1.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Depressive patients (n = 33) mean ± SD</th>
<th>At depressive risk (n = 70) mean ± SD</th>
<th>Controls (n = 35) mean ± SD</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>62.7143 ± 8.18741</td>
<td>63.6714 ± 9.07253</td>
<td>58.4286 ± 7.75085</td>
<td>0.06</td>
</tr>
<tr>
<td>Oxytocin concentration (pg/ml)</td>
<td>613.0050 ± 245.36257</td>
<td>209.95865 ± 768.1158</td>
<td>381.36245 ± 1029.8004</td>
<td>0.001</td>
</tr>
</tbody>
</table>

By the ROC curves for the two groups of depressive patients and controls, the sensitivity was 82.9 and specificity was 66.5 with cutoff value 695.97. Area under the ROC curves (AUC) was 0.838 as noticed in table 2.
Table 2: ROC curve between depressive patient and healthy control groups

<table>
<thead>
<tr>
<th>Cut-off value</th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>AUC</th>
</tr>
</thead>
<tbody>
<tr>
<td>695.97pg/ml</td>
<td>82.9</td>
<td>66.5</td>
<td>0.838</td>
</tr>
</tbody>
</table>

![ROC Curve]

Figure 2: Receiver Operator Characteristic curves of low serum OXT level as indicator of depression

The ROC curves discriminated of serum OXT in population at risk of depression from controls with 71.4 sensitivity and 60.6 specificity, the cut off value was 805.002, AUC was 0.722. as clarified in table 3

Table 3: ROC curve between at depressive risk subjects and healthy control groups

<table>
<thead>
<tr>
<th>Cut-off value</th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>AUC</th>
</tr>
</thead>
<tbody>
<tr>
<td>805.002pg/ml</td>
<td>71.4</td>
<td>60.6</td>
<td>0.722</td>
</tr>
</tbody>
</table>

The effect of depression severity on OXT level described in table (4). Significant correlation was found of decreased OXT concentration with the severity of depression \(P =0.001\).

Table 4: The correlation of OXT levels with the severity of depression

<table>
<thead>
<tr>
<th></th>
<th>Mild depressive patients (n = 4) mean ± SD</th>
<th>Moderate depressive patients (n = 9) mean ± SD</th>
<th>Sever depressive patients (n = 20) mean ± SD</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxytocin concentration (pg/ml)</td>
<td>1029.8881 ± 93.55361</td>
<td>109.43269 ± 748.2589</td>
<td>173.26726 ± 469.1921</td>
<td>0.001</td>
</tr>
</tbody>
</table>

Discussion

Understanding the role of OXT level alteration in development of depressive disorders may be useful in correction the reduced levels by different procedures targeting the enhancement of normal OXT. A significant correlation was found in this study of the low level of OXT in patients in comparison with healthy controls \(P\- value= 0.001\) this was similar to that found by Yuen et al. study\(^9\) and Ozsoy et al. study\(^10\). A similar study identified the role of OXT receptor variability in stress resilience for people with AA OXT receptor genotype which found that low level of peripheral OXT is positively correlated with dopamine transporter availability\(^11\). These results suggest that the involvement of OXT in the
organism reacts to stressful conditions may be explained by the correlations between OXT and the dopaminergic system\(^{(12)}\). These studies confirm that the variability in OXT receptor may increase the risk for depression, by favoring a specific biological pattern of increased sensitivity and reactivity to stress \((5,6)\). The cut off value was found 695.97 in which below show probability for depression with 82.9 and 66.5 for sensitivity and specificity respectively, these results near to a results demonstrated by Abd ElNasr M. Omar et al.\(^{(13)}\) which found 81.82 for sensitivity and 85.7 for specificity. When compared the control group with inhabitants of nursing home the cut off value was 805.002 in which below may indicate increase the risk for depression particularly in population with a number of other risk factors related to their age, attachment and life style, these finding could classify this group as at risk of depressive disorder. The association of OXT level with the severity of depression was statistically significant \((p =0.001)\). Yet no studies evaluate the correlation of serum Oxytocin and severity of depression.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding

**REFERENCES**


Study the Activity of 14-3-3 Eta Protein among Ankylosing Spondylitis Patients

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1Department of Medical Laboratories Techniques, Technical Medical Institute of Mansur, Middle Technical University, Iraq

ABSTRACT

Background: Ankylosing spondylitis (AS) is an immune disorder that influence on spine and may affect on other joints. Ankylosing spondylitis occurs in patients under the age of 45 years, and result in disability and reduce the activity of patient if not treated sufficiently.

Objective: Measuring serum level of 14-3-3 eta protein among ankylosing spondylitis patients and evaluate its effectiveness in the diagnosis of disease.

Materials and Method: The study conducted in Al-Yarmouk teaching hospital and involved 40 patients with AS, 40 patients suffer from rheumatoid arthritis (RA) and 20 healthy control. Mean ages were 38 ± 2, 43 ± 2 and 37 ± 2 for healthy control, rheumatoid patients and ankylosing patients respectively. We used ELISA test to estimate 14-3-3 eta protein levels and anti-citrullinate antibodies (ACP) in serum of ankylosing patients in addition to rheumatoid patients and control.

Results: Among 40 ankylosing patients, there were 18 females and 22 males, while rheumatoid patients there were 20 females and 20 males and control there were 10 females and 10 males. There was no significant in age and gender among studied groups, but there was highly significant in both ACP among rheumatoid patients higher than both ankylosing and control.

Conclusion: There is a relationship between 14-3-3 eta protein and both ankylosing spondylitis and rheumatoid arthritis, but with (RA) more than (AS), also there is relationship between ACP and (AS) and (RA), but also with (RA) more than (AS).

Keywords: Ankylosing spondylitis, 14-3-3 eta protein, ACP, Rheumatoid arthritis

Introduction

Ankylosing spondylitis, an inflammatory condition that can cause grouping of bones of joints. Causes of AS is unknown but ecological and hereditary elements may be played a crucial role in this disease which is considered an autoimmune disease (1). It is the main cause of continuing back pain (2)(3). The medical indicators of (RA) and (AS) are different. AS is beginning in the youth phase compared with RA over the age 40 years, and with a male more than female compared with the female prevalence in RA. HLA-B27 antigen plays important role in AS diagnosis while HLA DR4 or DR 1 positives for RA, with 60%. The type and localization of arthritis is the spine and sacroiliac joints with an oligo arthritis of the larger joints such as hips, knees and shoulders in AS, while peripheral polyarthritis in RA, especially hands and feet (4).

Human 14–3-3 eta protein is an abundant intracellular protein that plays a role in regulation of cellular practices such as protein production, cellular indicating and the whole biochemical process that occur within a living organism(5).

This study discusses recent advances in 14-3-3 eta protein and its autoantibodies among AS patients and compare with rheumatoid arthritis patients.

DOI Number: 10.5958/0976-5506.2019.03208.X
Materials and Method

Patients and Samples: We conducted this study in Al-Yarmouk teaching hospital and involved 40 patients with ankylosing spondylitis, 40 patients suffer from rheumatoid arthritis and 20 healthy control. Mean ages were 38 ± 2, 43 ± 2 and 37 ± 2 for healthy control, rheumatoid patients and ankylosing patients respectively.

Diagnosis: ELISA test was used to estimate 14-3-3 eta protein levels and anti-citrullinate antibodies (ACP) in the serum of ankylosing patients in addition to rheumatoid patients and control.

Statistical Analysis: Statistical analyses were performed using Least significant difference –LSD test (Analysis of Variation-ANOVA) to significant compare between means of difference groups in study parameters. P-values less than 0.05 were statistically significant (6).

Results

Among 40 ankylosing patients, there were 18 females and 22 males, while rheumatoid patients there were 20 females and 20 males and control there were 10 females and 10 males as shown in table 1.

Table 1: Distribution of studied groups according to ages and gender

<table>
<thead>
<tr>
<th>Groups</th>
<th>No.</th>
<th>Mean ± of Age</th>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy</td>
<td>20</td>
<td>38 ± 2</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Rheumatoid arthritis</td>
<td>40</td>
<td>43.5 ± 2</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Ankylosing spondylitis</td>
<td>40</td>
<td>37.8 ± 2</td>
<td>18</td>
<td>22</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>38 ± 2</td>
<td>48</td>
<td>52</td>
</tr>
</tbody>
</table>

Among studied groups, there was high mean of 14-3-3 eta protein among Rheumatoid patients (352.78 ± 299.48) and in the second stage among Ankylosing patients (237.56 ± 60.90) and finally healthy control (223.53 ± 58.45) and there was highly significant difference among Rheumatoid as shown in table 2.

Table 2: Comparison between studied groups in 14-3-3 eta protein

<table>
<thead>
<tr>
<th>Group</th>
<th>No.</th>
<th>Mean ± SE of protein ( )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy</td>
<td>20</td>
<td>223.53 ± 58.45 b</td>
</tr>
<tr>
<td>Rheumatoid p.</td>
<td>20</td>
<td>352.78 ± 299.48 a</td>
</tr>
</tbody>
</table>

Conted…

| Ankylosing p. | 40   | 237.56 ± 60.90 b         |
| LSD value     | ---  | 90.622 **                |
| P-value       | ---  | 0.0105                   |

** (P<0.01).

Means having with the different letters in column differed significantly

Among studied groups, there was high mean of ACP among Rheumatoid patients more than Ankylosing patients (88.98 ± 28.29), (16.39 ± 23.06) respectively and there was highly significant difference in ACP among RP. as shown in table.3.

Table 3: Comparison between studied groups in ACP.

<table>
<thead>
<tr>
<th>Group</th>
<th>No.</th>
<th>Mean ± SE of ACCP ( )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy</td>
<td>20</td>
<td>4.455 ± 3.11 b</td>
</tr>
<tr>
<td>Rheumatoid P.</td>
<td>20</td>
<td>88.98 ± 28.29 a</td>
</tr>
<tr>
<td>Ankylosing P.</td>
<td>40</td>
<td>16.39 ± 23.06 b</td>
</tr>
<tr>
<td>LSD value</td>
<td>---</td>
<td>12.456 **</td>
</tr>
<tr>
<td>P-value</td>
<td>---</td>
<td>0.0001 **</td>
</tr>
</tbody>
</table>

** (P<0.01).

Means having with the different letters in column differed significantly

Discussion

The result of this study showed that levels of 14-3-3 eta protein in the serum of RA patients were high and highly specific RA more than AS patients and this result agreement with (6) who explain the presence of this protein in the joints of patients with rheumatoid arthritis (RA) (7). Said that serum levels of 14-3-3η is high in RA patients, but not in another disorder. Also there are few studies about using 14-3-3 eta protein with AS such as (8) who clarified in his study that 14-3-3 eta protein was higher than control also these could be a novel biomarkers associated with inflammation in AS.

ACP (anti-citrullinated protein) is raised with high specificity in rheumatoid arthritis (RA), this result agreement with many studies as (9) and (10) who demonstrated that ACPA occurrence has a high analytical exactness for RA And associated with bone loss. In spite of ACP is used especially with RA, but in our study we observed elevated level of this protein in the serum of AS patients and there was any study which explain this result.
Conclusion

From this study we concluded that 14-3-3 eta protein is important for RA more than AS and we recommended other studies to evaluate the activity of ACP and 14-3-3 for AS.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

REFERENCES


Prevalence of Endodontically Treated Teeth in Baghdad Sub Population

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¹Department of Conservative Dentistry, Dental College, Mustansiriya University, Baghdad, Iraq

ABSTRACT

Aim: To determine the pattern of demand for endodontic treatment among patients attending Aleulawih dental speciality center in Baghdad, Iraq.

Method: A retrospective review of the patients’ dental records who attended the Conservative Dental Clinic of Aleulawih dental speciality center in Baghdad, Iraq from January 2018 to October 2018 for root canal therapy (RCT) was done. The demographic and clinical data were retrieved from the patients’ records and analyzed using the SPSS version 20. The data were categorized as follows: 1- The total number of maxillary and mandibular teeth. 2- The number of each individual tooth group treated. 3- The number of teeth treated in age groups (10-19, 20-29, 30-39, 40-49,50-59,60-69,70 and above) years. 4- The total number of treatments performed in males and females patients.

Results and Conclusion: The maxillary teeth showed higher percentage (56.3 %) of root canal treatment than mandibular teeth (43.7 %), while mandibular 1st molars show higher percentage (56.2 %) in the treated cases than other teeth. The highest incidence of root canal treatment was found in the age group twenty to twenty-nine (29.2 %). The male patients were more frequent (50.3 %) than female patients.

Keywords: Endodontic epidemiology, Patient demands, Retrospective study, Root canal therapy.

Introduction

Bacteria and their by-products can spread into periapical tissues after ingressian dental pulp by dental caries and trauma (¹). Tooth preservation is the ultimate goal of modern dental care and endodontic treatment is one of the most technically demanding procedures and a very specialized aspect in restorative dentistry requiring high level of technical skills (²,³)

It is important to acknowledge that diseases, apical periodontitis included, are in addition influenced by more distant causes such as dentists’ skills and attitudes, behavior and priorities among people and characteristics of their social environment. These factors form causal patterns by interacting in complicated ways and they may be even more important causes of disease than more directly related cause the pathogens (⁴). Epidemiological studies are the only scientific approach to enlighten such interactions and thereby broaden our concept of health and disease.

Different epidemiological studies have been done on prevalence and conditions of the periapical periodontal tissues of root-filled teeth in population. Some studies assessed the total number of endodontically treated teeth, while others concentrating on the number of persons with endodontic treatment in the population and finally presence and absence of periapical periodontitis in endodontically treated teeth (⁵-⁸).

The rate of dentate individuals has increased over the last decades and the prevalence of root-filled teeth has also increased with age. This change in frequency of dentate individuals in the population may be due to the new and better restorative materials and methods also a declining tendency amongst dentists to extract teeth (⁹).

There are limited epidemiologic studies relating to the pattern of demand of Root Canal Therapy in

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Iraq. Information on pattern of demand for treatment is necessary for understanding disease pattern also for devising optimal preventive and management strategies\(^{(10)}\).

Considering the importance of epidemiological investigations, the aim of this study was to determine the prevalence of endodontically treated teeth in relation to age and gender in Baghdad sub population.

It is important to identify the most frequently involved tooth and pattern of tooth surfaces involvement in caries, to identify the location of the tooth and to reinforce oral hygiene measures from the time of eruption of the tooth. These measures might prevent pulpal exposure and the need for endodontic therapy in the future \(^{(11)}\).

**Aim of the study:** To determine pattern of demand for endodontic treatment among patients attending Aleulawih dental specialty center in Baghdad, Iraq.

**Material and Method**

A retrospective review of the patients’ dental records who attended the Conservative Dental Clinic of Aleulawih dental speciality center in Baghdad, Iraq from January 2018 to October 2018 for root canal therapy (RCT) was done. The demographic and clinical data were retrieved from the patients’ records and analyzed using the SPSS version 20.

The data were categorized as follows: 1- The total number of maxillary and mandibular teeth. 2- The number of each individual tooth group treated. 3- The number of teeth treated in age groups (10-19, 20-29, 30-39, 40-49,50-59,60-69,70 and above) years. 4- The total number of treatments performed in males and females patients.

**Results**

There were 1594 patients comprising 801(50.3%) males and 793(49.7%) females. A total number of 1594 teeth were treated.

The age range of patients was 10-70 years old while median age was 40 years. The highest incidence of root canal treatment 29.2% was found in the 20-29 years age group, this was followed by 30-39 years age group which constituted 26.4%. The 70 years and above had the least number of patients as shown in table (1).

Maxillary teeth underwent higher percentage of root canal treatment (56.3%) as against mandibular teeth were treatment was done in (43.7%) as shown in table (1).

**Table 1: Incidence of Endodontic treatment related to Gender, Age, Tooth type and Arch**

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>801</td>
<td>50.3%</td>
</tr>
<tr>
<td>Female</td>
<td>793</td>
<td>49.7%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 - 19 Years</td>
<td>338</td>
<td>21.2%</td>
</tr>
<tr>
<td>20 - 29 Years</td>
<td>465</td>
<td>29.2%</td>
</tr>
<tr>
<td>30 - 39 Years</td>
<td>421</td>
<td>26.4%</td>
</tr>
<tr>
<td>40 - 49 Years</td>
<td>233</td>
<td>14.6%</td>
</tr>
<tr>
<td>50 - 59 Years</td>
<td>108</td>
<td>6.8%</td>
</tr>
<tr>
<td>60 - 69 Years</td>
<td>24</td>
<td>1.5%</td>
</tr>
<tr>
<td>70 Years &amp; above</td>
<td>5</td>
<td>0.3%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tooth Type</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central</td>
<td>92</td>
<td>5.8%</td>
</tr>
<tr>
<td>Lateral</td>
<td>48</td>
<td>3.0%</td>
</tr>
<tr>
<td>Canine</td>
<td>57</td>
<td>3.6%</td>
</tr>
<tr>
<td>First Premolar</td>
<td>239</td>
<td>15.0%</td>
</tr>
<tr>
<td>Second Premolar</td>
<td>323</td>
<td>20.3%</td>
</tr>
<tr>
<td>First Molar</td>
<td>564</td>
<td>35.4%</td>
</tr>
<tr>
<td>Second Molar</td>
<td>271</td>
<td>17.0%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Arch</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maxillary</td>
<td>898</td>
<td>56.3%</td>
</tr>
<tr>
<td>Mandibular</td>
<td>696</td>
<td>43.7%</td>
</tr>
</tbody>
</table>

When upper and lower teeth are considered together, the molars 835 (52.4%) were the most endodontically treated teeth, followed by premolars teeth 562 (35.3%) as shown in table (2).

**Table 2: Incidence of Endodontic treatment related to the individual tooth group**

<table>
<thead>
<tr>
<th>Tooth type</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anterior</td>
<td>197</td>
<td>12.3</td>
</tr>
<tr>
<td>Premolar</td>
<td>562</td>
<td>35.3</td>
</tr>
<tr>
<td>Molar</td>
<td>835</td>
<td>52.4</td>
</tr>
<tr>
<td>Total</td>
<td>1594</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Mandibular 1st molar has the higher incidence of root canal treatment as shown in table (3).
Table 3: Incidence of Endodontic treatment related to the Tooth type and Arch

<table>
<thead>
<tr>
<th>Tooth Type</th>
<th>Maxillary Count</th>
<th>Maxillary Row N %</th>
<th>Mandibular Count</th>
<th>Mandibular Row N %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central</td>
<td>80</td>
<td>87.0%</td>
<td>12</td>
<td>13.0%</td>
</tr>
<tr>
<td>Lateral</td>
<td>40</td>
<td>83.3%</td>
<td>8</td>
<td>16.7%</td>
</tr>
<tr>
<td>Canine</td>
<td>47</td>
<td>82.5%</td>
<td>10</td>
<td>17.5%</td>
</tr>
<tr>
<td>First Premolar</td>
<td>175</td>
<td>73.2%</td>
<td>64</td>
<td>26.8%</td>
</tr>
<tr>
<td>Second Premolar</td>
<td>203</td>
<td>62.8%</td>
<td>120</td>
<td>37.2%</td>
</tr>
<tr>
<td>First Molar</td>
<td>247</td>
<td>43.8%</td>
<td>317</td>
<td>56.2%</td>
</tr>
<tr>
<td>Second Molar</td>
<td>106</td>
<td>39.1%</td>
<td>165</td>
<td>60.9%</td>
</tr>
</tbody>
</table>

**Discussion**

The results of our study reported a higher incidence of root canal treatment were in males, this is in agreement with studies of Osama et al (12), Oginni (13) and studies done by Kamberi et al (1) and Tareen et al (14), they reported that the prevalence of endodontically treated teeth was significantly higher in males than the females. One explanation for our results may be related to socio-psychological aspects of females and they are more passionate and interested about their oral health, though they attend dental clinics for various treatments more frequently than males (15).

Most of the patients that presented were found in the 20-29 years age group. This can be partly attributed to the location of dental specialty center and high prevalence of dental caries often reported among young adults (16). Our results are in agreement with that of Farrel & Burke (17) which reported a higher incidence between twenty one & thirty years age group.

In this study molars, then premolars required significantly more frequent endodontic treatment than anterior teeth and this is in agreement with studies (11,18) and in agreement with study of Oglah et al (3), The most probable reason was that molars are more susceptible to food stagnation than the anterior teeth.

The percentage of endodontic treatment was higher in premolars than incisors in both arches. This could be related to the anterior position of the incisors in the oral cavity; hence the caries can be easily detected by the patient in the early stage (3).

Our study reported that there was a higher incidence of root canal treatment in the mandibular first molar, this could be related to that it is the first tooth to erupt in the oral cavity; hence it was more prone to caries (3,19).

In our study the maxillary teeth were the most frequent treated than mandibular teeth. This could be related to the aesthetic reason, as the upper teeth appear more prominent than the lower teeth during smile, making the patient more interested to preserve the upper teeth (3). This pattern was in agreement with that of Scavo et al (18) and Al-Negrish (20) who reported that 55.69% and 77.7% of their RCTs were performed in maxillary teeth.

Information about frequency and distribution of endodontically treated teeth may help predict future needs for dental treatment in the growing dental population (11).

**Conclusion**

Maxillary teeth showed higher percentage of endodontic treatment than mandibular teeth with higher incidence in lower molars than other teeth groups. The age between twenty to twenty-nine years have higher percent of root canal treatment than other ages with higher frequency in male than female patients.

**Acknowledgements**

The authors acknowledge the support of the study site, and would like to thank Dr. Ahmed Moussa the manager of Al eulawih dental specialty center in Baghdad, Iraq and Dr. Baan Saeed the supervisor in endodontic department respectively for their encouragement, guidance and support in conducting the study.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.
Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

REFERENCES


Study the Inflammatory Biomarkers of Acute Coronary Syndrome Patients in Wasit Province

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ABSTRACT

This prospective study was performed in the coronary care unit at AL-Zahraa teaching hospital in Wasit Governorate during the period from January 2018 to June 2018. This study explained the role of inflammatory biomarkers in proper diagnosis, risk stratification and prognostic evaluation of patients with acute coronary syndrome (ACS). A total of 100 patients with ACS, 77 men aged 25-90 years and 23 women aged 45-85 years. They were divided into three age groups. The first group was <45 years old, the second group was 45-60 years old and the third group was >60 years. The risk factors for ACS include gender, age, HT, diabetes, smoking, and dyslipidemia through a questionnaire. Our study revealed that male to female ratio was 3:1 and demonstrate that male gender and HT were most prevalent risk factor for ACS. Regarding white blood cells and the rate of Erythrocyte sedimentation rate, the results showed a significant increase in white blood cells, neutrophils and the rate of red blood cell deposition at P≤0.05. The results of our study showed a significant increase in the markers of the acute phase protein, which showed a significant increase in the value of fibrinogen and C-reactive protein (CRP) at P≤0.05. Regarding biomarker of myocardial ischemia, there was a significant increase in troponin and creatinine kinase at P≤0.05. There was high 30 day mortality among patients with high level of inflammatory biomarker (fibrinogen and CRP), biomarkers of myocardial ischemia (troponin and CK-MB) and those with markedly elevated WBC count.

Keywords: ACS, Inflammatory, Biomarker

Introduction

Coronary heart disease (CHD) is the leading cause of death in developed countries¹. CHD can affect individuals at any age, but becomes significantly more common with progressive age. Males are affected more often than females. Atherogenesis refers to the development of atheromatous plaques, which is characterized by arterial remodeling and fatty accumulation in subendothelia. As atherosclerosis develops, myocardial ischemia leads to myocardial hypoxia and myocardial death². ACS includes unstable angina (UA), non-ST elevation myocardial infarction (NSTEMI), and ST elevation myocardial infarction (STEMI). Diagnosis of ACS based on history, ECG finding, Echocardiography and inflammatory biomarker³.

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Inflammation is essential to the initiation, development, and progression of atherosclerosis⁴. Acute-phase response proteins markers include serum C-reactive protein (CRP), pentraxin 3 (PTX3), amyloid A, homocysteine, and fibrinogen⁴,⁵. CRP is an inflammatory biomarker directly participates in atherogenesis and useful in short-term prognosis and long-term risk assessment for cardiovascular disease patients⁶. Fibrinogen (factor I) is a glycoprotein during tissue and vascular injury, it is converted enzymatically by thrombin to fibrin and subsequently to a fibrin-based blood clot⁷. Troponin, is a complex of three regulatory proteins (troponin C, troponin I, and troponin T) that is integral to muscle contraction in skeletal muscle and cardiac muscle, but not smooth muscle and troponin often useful as a diagnostic and prognostic marker. Its highly specific marker for myocardial infarction⁸. Creatine kinase (CK) is an enzyme assayed in blood tests as a marker of damage of CK-rich tissue⁹. So the aims of the study was to determine the Role of inflammatory biomarkers in proper diagnosis, risk stratification and prognostic evaluation of patients with ACS.
Material and Method

Study design: A total of 100 patients in the coronary care unit at AL-Zahraa teaching hospital from "January 2018 - June 2018", with age ranged between (24 to 90 Year). Patients presented with chest pain, ECG and Echo findings of myocardial ischemia. Risk factor for IHD were evaluated. Biomarker of myocardial ischemia (Troponin and CK-MB) and acute phase proteins (CRP and Fibrinogen) were tested for all patients

Blood sample: 8 ml of venous blood were withdrawn and 2 ml was placed in a tube containing Ethylene diamine tetra acetate for checking the complete blood count and ESR. 1.8 ml was placed in a tube containing sodium citrate to obtain the plasma for measurement of the first coagulation factor level (fibrinogen), and 4.2 ml in a tube containing gel and clot activator for check the level of troponin, CK-MB and CRP. White blood cell differential and ESR testing was done using a complete blood measurement Device Cell-DYN Ruby. Hemostat Fibrinogen testing is based on the most commonly used method first described by Clauss. The CRP-latex is a slide agglutination test for the qualitative and semi quantitative detection of CRP. High sensitive troponin I (TNHS) was evaluated by a one-step enzyme immunoassay sandwich method with a final fluorescent detection (ELFA). CK enzyme was assessed by Immunological UV assay.

Statistical Analysis: The descriptive statistics analyzed by using one-way analysis of variance (ANOVA) were performed using means and standard deviations (SDs) with LSD test for continuous variables (p ≤ 0.05) was considered to be significant, and independent–sample T Test for woman group (P-value ≤0.01) was considered to be significant. All analyses were performed with computerized SPSS program (statistical program for social sciences).

Results

A total of 100 patients with ACS were included in this study, Male to Female ratio was 3:1. The most predominant age group in Male patients was 45-60 years (second age group) 39:77 (50.65%) and in women was >60 years (Third age group) 17:23 (73.91%).

There was no clear significance in p-value (p≤0.05) of WBC count between age group in men. On other hand there were significant p-value (p≤0.05) of WBC, Neutrophil, Monocyte and ESR in women age group.

Table (1) and (2) show the acute phase proteins in both gender. There were no clear significant of Fibrinogen in men regarding age group while there were significant P-value (p≤ 0.05) in women. On other side results showed that there were high number of positive CRP in the second age group in men while the highest number was found in the third age group of women.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Age group</th>
<th>No.</th>
<th>FIB mg/dl</th>
<th>CRP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;45</td>
<td>9</td>
<td>670.888 ± 385.712 A</td>
<td>Positive 4  Negative 5</td>
</tr>
<tr>
<td></td>
<td>45-60</td>
<td>39</td>
<td>940.789 ± 509.340 A</td>
<td>23            16</td>
</tr>
<tr>
<td></td>
<td>&gt;60</td>
<td>29</td>
<td>1020.786 ± 615.517 A</td>
<td>19            10</td>
</tr>
<tr>
<td></td>
<td>LSD</td>
<td>-</td>
<td>46</td>
<td>31</td>
</tr>
</tbody>
</table>

* Mean ± SD : Standard deviation. * LSD : Least significant difference.
* Different letters indicated significant differences between groups at level p≤ 0.05.

<table>
<thead>
<tr>
<th>Age group parameter</th>
<th>45-60 NO. = 6</th>
<th>&gt;60 NO. = 17</th>
<th>T value</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIB mg/dl</td>
<td>1003.333 ± 341.619 A</td>
<td>767.250 ± 369.110 B</td>
<td>0.189</td>
<td>≤0.05</td>
</tr>
<tr>
<td>CRP</td>
<td>3</td>
<td>15</td>
<td>Positive</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>2</td>
<td>Negative</td>
<td>5</td>
</tr>
</tbody>
</table>
Table (3) and (4) revealed the myocardial biomarker of ACS in both gender. We found that there were no significance in CK-MB and troponin ($p \leq 0.05$) in term of age groups of men while There were significant different with women where the highest concentration was found in the third age group ($p \leq 0.05$).

Table 3: Myocardial biomarker of Acute Coronary Syndrome in Male patients

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Age group</th>
<th>NO.</th>
<th>TROPONIN ng/dl</th>
<th>CK-MB U/L</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;45</td>
<td>9</td>
<td>12.043 ± 7.531 A</td>
<td>50.412 ± 35.117 A</td>
</tr>
<tr>
<td></td>
<td>45-60</td>
<td>39</td>
<td>10.508 ± 9.936 A</td>
<td>64.751 ± 49.847 A</td>
</tr>
<tr>
<td></td>
<td>&gt;60</td>
<td>29</td>
<td>7.144 ± 6.651 A</td>
<td>48.210 ± 39.393 A</td>
</tr>
<tr>
<td>LSD</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

*Mean ± SD : Standard deviation. * LSD : Least significant difference.
* Different letters indicated significant differences between groups at level $p \leq 0.05$.
Normal value : Troponin:0.12-0.6 ng/ml Creatinine-kinase : ≤20 U/L

Table 4: Myocardial biomarker of Acute Coronary Syndrome in Female patient

<table>
<thead>
<tr>
<th>Age group parameter</th>
<th>45-60</th>
<th>&gt;60</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NO. = 6</td>
<td>NO. = 17</td>
</tr>
<tr>
<td>TROPONIN</td>
<td>6.946 ± 8.801 B</td>
<td>12.985 ± 8.628 A</td>
</tr>
<tr>
<td>CK-MB</td>
<td>14.783 ± 5.796 B</td>
<td>82.782 ± 83.231 A</td>
</tr>
<tr>
<td>T value</td>
<td>0.182</td>
<td>≤0.05</td>
</tr>
<tr>
<td>P value</td>
<td>0.062</td>
<td>≤0.05</td>
</tr>
</tbody>
</table>

Table (5) show the 30 days mortality post ACS. 6 of 100 patients died during 30 days post ACS and all of them had elevated level of myocardial biomarker, elevated acute phase protein and elevated WBC count in both gender and in all age group. The mortality rate was higher in those >60 years of age.

Table 5: 30 days mortality related to inflammatory biomarker post-acute coronary syndrome in both gender

<table>
<thead>
<tr>
<th>Parameter</th>
<th>45-60</th>
<th>&gt;60</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NO. = 1</td>
<td>NO. = 5</td>
</tr>
<tr>
<td>White blood cell</td>
<td>17.500</td>
<td>13.588</td>
</tr>
<tr>
<td>Fibrinogen</td>
<td>865.000</td>
<td>1039.800</td>
</tr>
<tr>
<td>Troponin</td>
<td>39.000</td>
<td>19.354</td>
</tr>
<tr>
<td>Creatine kinase MB</td>
<td>580.500</td>
<td>197.840</td>
</tr>
<tr>
<td>CRP</td>
<td>POSITIV</td>
<td>POSITIVE</td>
</tr>
</tbody>
</table>

Discussion

This study focused on clinical study of patients with ACS intermingled with role of inflammatory biomarker for risk stratification. In this study, it was founded that males to females distribution was (77%: 23%) respectively and these results was similar to result of Jordanian study (78.3%: 21.7%)$^9$, but not similar to Qazvin population (50.2%: 49.8%)$^{10}$and Tehran studies (41%: 59%)$^{11}$. The mean age of male patients was (56.23 ± 12.89 year) similar to that in Tehran study (54 ± 12 year) and the mean age of female patients was (65.65 ± 10.16 year) that is near to Arab and Jewish women study (68 ± 9 and 63 ± 9 year)$^{12}$. Advancing age is the most powerful independent risk factor for cardiovascular disease among both gender$^{13}$. Our study revealed that CAD was more common in postmenopausal women because endogenous estrogens delays the manifestation of atherosclerotic disease in women by its regulating effect on lipids, inflammatory markers and the coagulant system and direct vasodilatory effect$^{14}$.

Regarding WBC count, leukocytosis was observed in 41% of patients. Neutrophil count was increase in 52%of patients. Monocyte count was increased in 26% of patients and ESR was increased in 55% of patients. Our results agreed with Yayan J et al$^{15}$. Correlation of the leukocyte count with CAD was consistent with current concept that atherosclerosis is an inflammatory disease and the utility of the leukocyte count as a risk factor and prognostic indicator$^{16}$.Monocyte-derived macrophages produce oxidants that can induce endothelial cell injury and subsequent thrombus formation$^{17}$. 


Regarding the acute phase proteins, 91 patients (91%) had elevated fibrinogen level, 70 patients (76.92%) was male and 21 patients (23.07%) was female. The result agreed with Ajeed A. M.18 90 %. The fibrinogen form individual fibrin strands that cross-linked by blood factor XIIIa to form a mature fibrin clot3.

The results of CRP revealed that 64 patients (64%) had positive CRP, 46 patients (59.74%) was male and 18 patients (78.26%) was female. These are consistent with the findings of the researchers Li. H et al 19. The CRP increased in the condition of injury, infection, and other inflammatory stimuli. There were agreement with the previous study by Zebras et al20 who showed that CRP levels are higher after AMI and unstable angina. They also showed that CRP was strongly predictive of long-term death from MI for patients presenting with ACS20. We found no correlation between inflammatory marker CRP and CK-MB cardiac enzyme in these patients. These are in agreement with that of Auer et al 21, this may be explained by the fact that CRP levels peaked around 50 hours after the onset of pain, a time when CK-MB which peaked after about 15 hours, had already returned to normal.

Through our survey 71 patients (71%) had positive troponin, 54 patients (76%) was male and 17 patients (24%) was female. Our result of troponin percentage agreed with Melanson et al22 64% and Nicholas et al 23 that show troponin positive in 68% of the patients. The increase in troponin results from the erosion and rupture of a fibrous cap containing a lipid-rich atherosclerotic plaque23. Troponin are released during myocyte damage and necrosis, and represent the cornerstone of the diagnosis of ACS 1. CK-MB enzyme is elevated in patients with myocardial infarction, as a result of damage to myocardial cells23. The result of CKMB revealed that 56 patients (56%) had positive CKMB, 48 patients (85.71%) was male and 8 patients (14.28%) was female and these agreed with Patel S et al26 that show Troponin I and CK-MB levels in STEMI patients were statistically highly significant with ‘p’ value of <0.0001. This is consistent with the studies conducted by previous researchers Joarder et al. reported that Serum cTnI is better and more characteristic biomarker than CK-MB for risk prediction and prognosis in AMI patients. Cardiac troponin-I has high specificity for cardiac injury because it is not found in skeletal muscle27. Previous studies have supported the prognostic value of the WBC as a predictor of heart failure and death in both short term and long term following ACS28. In our study the CRP and fibrinogen were separately associated with increased risk of 30 days mortality independent of conventional cardiovascular risk factors. Steinberg et al found that elevated troponin-I levels greater than 1 ng/ml in patients with acute MI to be positively correlated with death within 30 days and correlation between elevated troponin-I and death was independent of CK-MB levels29. MISSION Trial and GUSTO Ila trial showed that peak troponin T levels are a good estimate of infarct size, left ventricular function and was significantly predictive of 30-day mortality in patients with acute MI.30

**Conclusion**

CAD was more common in male patients of all age group, male to female ratio was 3:1. One or more risk factors patient had more CAD developed. Acute phase protein, biomarker of myocardial ischemia and leukocyte count are important parameter for proper diagnosis and risk stratification of patients with ACS.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding

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20. Zebrack, JS.; Anderson, JL.; Maycock, CA.; Horne, BD.; Bair, TL. and Muhlestein, JB. Usefulness of high-sensitivity C-reactive protein in predicting long-term risk of death or acute myocardial infarction in patients with unstable or stable angina pectoris or acute myocardial infarction. Am J Cardiol. 2002;89(2):145-9.


The Impact of Nd-YAG Laser on Salivary Streptococcus Mutans and Lactobacilli in Vitro

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ABSTRACT

Background: Laser has an antibacterial action on dentine and enamel through the vaporization of cariogenic bacteria (Streptococcus mutans and Lactobacilli). Many investigations related to the application of Neodymium doped yttrium–aluminium–garnet (Nd:YAG) laser in preventive dentistry have been proposed as caries prevention therapies.

Aim of the Study: The aim of the study was to investigate the antibacterial effect of Nd-YAG laser on the viable counts of salivary mutans streptococci and lactobacilli.

Materials and Method: Standardized suspensions of bacterial growth of Streptococcus Mutans and Lactobacilli that each one were inoculated in seven sterile screw capped bottles, one of them was control and the other six were the study bottles (study groups) exposed to Nd-YAG laser beam at different powers and different exposure times.

Results: The results of Streptococcus mutans and Lactobacilli, which exposed to Nd-YAG laser, showed a heavy bacterial growth in the control group, but after radiation, there was a reduction in the mean values of CFU/ml for Streptococcus Mutans, while heavy reduction in the mean values of CFU/ml for Lactobacilli, with the maximum reduction was in the group that was exposed to (80mj for 30s) for two bacteria.

Conclusion: The Nd-YAG laser was represented antibacterial effect on Lactobacilli with minimal exposure time and energy, while less effect on Streptococcus mutans with maximum energy and exposure time.

Keywords: Nd:YAG laser, Streptococcus mutans, Lactobacilli.

Introduction

Dental caries is a localized chemical dissolution of dental hard tissues that is caused by acidic by-products of the metabolic processes of the biofilm (dental plaque) covering an affected tooth surface. When fermentable foods are eaten frequently, the low pH in the plaque is sustained and a net loss of mineral from the tooth occurs. This low pH selects for aciduric organisms, such as S. mutans and lactobacilli. Mutans streptococci and lactobacilli are strong acid producers and hence cause an acidic environment creating the risk for cavities. Lactobacilli are considered secondary invaders rather than initiators of the caries process. The presence of these micro-organisms is also dependent on the size of the cavity: they are more numerous in medium and large cavities. Many studies showed a positive association between Streptococcus mutans and initiation of a carious lesion, such studies demonstrated that these bacteria can be isolated from dental plaque adjacent to a carious tooth surface.

LASER is the acronym of the words ‘Light Amplification by Stimulated Emission of Radiation’. The Nd: YAG laser is classified as solid-state laser because it contains a solid lasing medium (Neodymium-doped yttrium aluminum garnet) Nd: YAG laser (1064 nm) is one of the laser systems that have many applications in the dental field. Irradiation with Nd: YAG laser is absorbed by protein (high affinity to melanin) and mineral structures, such as phosphates and carbonate hydroxyapatite, as well as water (low affinity). Utilizing thermal stresses created inside the tissue, Nd:
YAG disorganizes the skeleton of bacterial cells. In this process, protein denaturation takes place and the bacterial cells die (9).

Materials and Method

In this study, Nd-YAG laser radiation effect was tested at different times and powers on the viable counts of Streptococcus Mutans and Lactobacilli. Fresh clinical isolates of Streptococcus Mutans and Lactobacilli were retrieved from saliva samples of patients with dental caries using: Mitis Salivarius Agar Base and LBS Agar (Lactobacillus Selection Agar). Pure isolates of the bacteria were preserved in nutrient agar in the refrigerator until required for the study. Streptococcus Mutans and Lactobacilli isolates were inoculated in 10 ml of the nutrient broth (pH 7.0), then incubated anaerobically in anaerobic jars containing a range of atmospheric concentrations of CO₂ of about 5%. at 37°C for (18-24) hrs for activation before the conduction of the experiment in the study (10). Standardized suspensions of bacterial growth that contained 10⁸ (McFarland Standard 0.5) were inoculated in seven sterile screw capped bottles near the burner in aseptic conditions, one of them without irradiation of Nd-YAG laser (as a control group) and the other six were the study bottles (study groups) exposed to Nd-YAG laser beam. The beam of Nd-YAG laser was directed perpendicularly to a mirror that reflects the beam directly to the opening of the bottle, in a pulse mode (11). Samples were subjected to laser irradiation at different energies (40mj, 80mj) and different exposure times (5sec., 15sec., 30sec.) (12). After exposure to laser radiation, 0.1ml of the irradiated suspension was spread over the surface of brain heart infusion agar plates for each isolate. Then plates incubated aerobically at 37 °C for 24 hrs according to the nature growth of bacteria until the growth was visible (7). The irradiation experiments were done in sterilized hood. The microbiological assay was carried out by counting the CFU for all tubes (13). Using the following formula, the CFU/ml can be calculated: CFU/ml = No. of colonies x 1/dilution factor x 10 (14).

Results

Many tubes of the broth of Streptococcus Mutans and Lactobacilli exposed to Nd-YAG laser at different energies and exposure times. Results showed a heavy bacterial growth in control group, but after radiation, there was a reduction in the mean values of CFU/ml for Streptococcus Mutans, while heavy reduction in the mean values of CFU/ml for Lactobacilli, with the maximum reduction was in the group that was exposed to (80mj for 30s) for both bacteria. Finding showed that there was a highly significant difference regarding both of bacteria at different energies and times between them (p>0.01), but levene test of homogeneity showed non significancy because the control group non irradiated with laser, so Dunnett test was used (2-sided) that treat one group as a control, and compare all other groups against it as shown in Tables (1) and (2) that there was a statistically highly significant difference (p>0.01, except in Streptococcus Mutans, in (40mj-5s), the result was non significant (p>0.05), and in (40mj-15s), the result was found significant (p<0.05).

In Table (4), showed that there was no significant difference between times (5s, 15s and 30s) within energy (80mj) (p<0.05), while the energy group (40mj) was revealed to be highly significant (p>0.01).

In Table (5) the result revealed that there was a highly significant difference, in bacterial number between time within each power group (p>0.01).

Table (6) revealed that there was a highly significant difference, in bacterial number between time within each energy group in group (5s) (p>0.01), and in groups (15s, 30s) the result was shown to be significant (p<0.05).

**Highly significant, * Significant

<table>
<thead>
<tr>
<th>(I) Groups</th>
<th>(J) Groups</th>
<th>Mean Difference (I-J)</th>
<th>Significant</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Control</td>
<td>-5.40000</td>
<td>0.826</td>
</tr>
<tr>
<td>40mj-15s</td>
<td>Control</td>
<td>-16.20000*</td>
<td>0.029*</td>
</tr>
<tr>
<td>40mj-30s</td>
<td>Control</td>
<td>-32.80000*</td>
<td>0.000**</td>
</tr>
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<td>Control</td>
<td>-44.20000*</td>
<td>0.000**</td>
</tr>
<tr>
<td>80mj-15s</td>
<td>Control</td>
<td>-79.80000*</td>
<td>0.000**</td>
</tr>
<tr>
<td>80mj-30s</td>
<td>Control</td>
<td>-100.00000*</td>
<td>0.000**</td>
</tr>
</tbody>
</table>

Table 1: Multiple comparisons of *Streptococcus Mutans* number (CFU/ml) between the control group with each group by used Dunnett t (2-sided)
Table 2: Multiple comparisons of *Lactobacilli* number (CFU/ml) between the control group with each group by used Dunnett t (2-sided)*

<table>
<thead>
<tr>
<th>(I) Groups</th>
<th>(J) Groups</th>
<th>Mean Difference (I-J)</th>
<th>Std. Error</th>
<th>Significant</th>
</tr>
</thead>
<tbody>
<tr>
<td>40mj-5s</td>
<td>Control</td>
<td>-96.60000</td>
<td>1.19523</td>
<td>0.000**</td>
</tr>
<tr>
<td>40mj-15s</td>
<td>Control</td>
<td>-98.40000</td>
<td>1.19523</td>
<td>0.000**</td>
</tr>
<tr>
<td>40mj-30s</td>
<td>Control</td>
<td>-98.60000</td>
<td>1.19523</td>
<td>0.000**</td>
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<td>80mj-30s</td>
<td>Control</td>
<td>-100.00000</td>
<td>1.19523</td>
<td>0.000**</td>
</tr>
</tbody>
</table>

Std. Error = Standard Error, **Highly significant

Table 3: Pairwise Comparisons (Bonferroni) Adjustment for multiple comparisons effect of Nd-YAG laser on *Streptococcus Mutans* number CFU/ml within time according to energy

<table>
<thead>
<tr>
<th>Energy</th>
<th>(I) Time</th>
<th>(J) Time</th>
<th>Mean Difference (I-J)</th>
<th>Significant</th>
</tr>
</thead>
<tbody>
<tr>
<td>40mj</td>
<td>5s</td>
<td>15s</td>
<td>10.800</td>
<td>0.094</td>
</tr>
<tr>
<td></td>
<td>5s</td>
<td>30s</td>
<td>27.400</td>
<td>0.000**</td>
</tr>
<tr>
<td></td>
<td>15s</td>
<td>30s</td>
<td>16.600</td>
<td>0.005**</td>
</tr>
<tr>
<td>80mj</td>
<td>5s</td>
<td>15s</td>
<td>35.600</td>
<td>0.000**</td>
</tr>
<tr>
<td></td>
<td>5s</td>
<td>30s</td>
<td>55.800</td>
<td>0.000**</td>
</tr>
<tr>
<td></td>
<td>15s</td>
<td>30s</td>
<td>20.200</td>
<td>0.001**</td>
</tr>
</tbody>
</table>

**Highly significant

Table 4: Descriptive (mean and standard deviation) and multiple comparisons of the effect of Nd-YAG laser and size of this effect on *Lactobacilli* number CFU/ml within time according to energy

<table>
<thead>
<tr>
<th>Energy</th>
<th>Time</th>
<th>Mean</th>
<th>SD</th>
<th>Levene test</th>
<th>p</th>
<th>F</th>
<th>p</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>40mj</td>
<td>5s</td>
<td>3.400</td>
<td>1.673</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>15s</td>
<td>1.600</td>
<td>0.894</td>
<td>2.835</td>
<td>0.075</td>
<td></td>
<td></td>
<td>0.378</td>
</tr>
<tr>
<td></td>
<td>30s</td>
<td>1.400</td>
<td>0.548</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>80mj</td>
<td>5s</td>
<td>0.600</td>
<td>0.894</td>
<td></td>
<td></td>
<td>0.560</td>
<td>0.578</td>
<td>0.045</td>
</tr>
<tr>
<td></td>
<td>15s</td>
<td>0.400</td>
<td>0.548</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>30s</td>
<td>0.000</td>
<td>0.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SD = Standard Deviation, F= fissure test, ** Highly significant

Table 5: Descriptive (mean and standard deviation) of the effect of Nd-YAG laser on *Streptococcus Mutans* number CFU/ml within energy according to time with statistical test

<table>
<thead>
<tr>
<th>Time</th>
<th>Energy</th>
<th>Mean</th>
<th>SD</th>
<th>F</th>
<th>p</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>5s</td>
<td>40mj</td>
<td>294.600</td>
<td>4.393</td>
<td>67.488</td>
<td>0.000**</td>
<td>0.738</td>
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<tr>
<td></td>
<td>80mj</td>
<td>255.800</td>
<td>12.911</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15s</td>
<td>40mj</td>
<td>283.800</td>
<td>4.324</td>
<td>181.334</td>
<td>0.000**</td>
<td>0.883</td>
</tr>
<tr>
<td></td>
<td>80mj</td>
<td>220.200</td>
<td>3.347</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30s</td>
<td>40mj</td>
<td>267.200</td>
<td>6.979</td>
<td>202.444</td>
<td>0.000**</td>
<td>0.894</td>
</tr>
<tr>
<td></td>
<td>80mj</td>
<td>200.000</td>
<td>8.367</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SD = Standard Deviation, F= fissure test, ** Highly significant
### Table 6: Descriptive (mean and standard deviation) of the effect of Nd-YAG laser on Lactobacilli number CFU/ml within energy according to time with statistical test

<table>
<thead>
<tr>
<th>Time</th>
<th>Power</th>
<th>Mean</th>
<th>SD</th>
<th>F</th>
<th>p</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>5s</td>
<td>40mj</td>
<td>3.400</td>
<td>1.673</td>
<td>23.520</td>
<td>0.000**</td>
<td>0.495</td>
</tr>
<tr>
<td></td>
<td>80mj</td>
<td>0.600</td>
<td>0.894</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15s</td>
<td>40mj</td>
<td>1.600</td>
<td>0.894</td>
<td>4.320</td>
<td>0.049*</td>
<td>0.153</td>
</tr>
<tr>
<td></td>
<td>80mj</td>
<td>0.400</td>
<td>0.548</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30s</td>
<td>40mj</td>
<td>1.400</td>
<td>0.548</td>
<td>5.880</td>
<td>0.023*</td>
<td>0.197</td>
</tr>
<tr>
<td></td>
<td>80mj</td>
<td>0.000</td>
<td>0.000</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SD = Standard Deviation, F = Fissure test, ** Highly significant, * significant

### Discussion

The present study showed a heavy bacterial growth in control group, but after radiation, there was a reduction in the mean values of CFU/ml for Streptococcus Mutans, while heavy reduction in the mean values of CFU/ml for Lactobacilli, with the maximum reduction was in the group that was exposed to (80mj for 30s) for both bacteria. Thermal reaction deals with biological properties related to different temperature inside the cells, depending on the kind of irradiated cell and laser parameters chosen. Therefore thermal effect of Nd:YAG laser radiation on the bacterial cell result multiple biological effect such as decrease in enzyme activity, cell immovability, disintegration of protein, increase the permeability, evaporation, and thermal breakdown (i.e great damage and burst cell) that may happen at elevated temperature. The Nd:YAG laser is absorbed selectively by definite pigment, comprising melanin, hemoglobin and probably the pigments found in bacteria and microorganisms, which might consider it as a perfect bactericidal. The blood or blood contents in a natural situation might increase the counting of porphyrins and melanin pigments in the bacteria in which the bactericidal outcome is enhanced by Nd:YAG laser. Additional remarkable feature is the dentin, which was observed more carefully in a study of Jalil. An evaluation of studies searching the antimicrobial influence of laser light is not simple to understand because the reports about energy density or experimental circumstances are almost deficient. Elevated cell density and the existence of extracellular matrix, also, nonpigmented bacteria describes the reduced effect of Nd:YAG laser on agar dishes and bacterial broth. Multiple readings have presented that the bactericidal effect of the Nd:YAG laser in the dental structure is reinforced over enamel prisms and dentinal tubules as this effort considered as a bright guide, on the other hand, more studies in vivo are necessary.

Dentine with carious lesions absorption 1064 nm extra wavelength in relationship to sound dentin, which rise the preferred bactericidal outcome. The decrease in the number of bacteria (CFU/ml) are established by Jacobs, in their work, the Nd:YAG laser effect on Lactobacillus, in vitro.

The depth of penetration in dentin influenced by many absorption of wavelengths. The bacteria establish in deeper dentinal tubules had a lesser influence by Er:YAG laser, while the Nd:YAG laser was really higher. This clarify the smaller influence of Nd:YAG on Streptococcus mutans with higher energy and additional exposure time, that used in present study. The different bacterial species could have dissimilar susceptibility to laser, besides might be because of multiple experimental techniques and materials.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding

### REFERENCES


The Activity of 5-Flourouracil Metabolizing Enzyme Dihydropyrimidine Dehydrogenase(DPD) and its Association with Tumor Progression and Markers (CEA, CA19.9) in Patients with Colorectal Cancer

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1Department of Chemistry and Biochemistry, Collage of medicine, Al-Nahrain University, Iraq

ABSTRACT

For the last seventy years, the fluoropyrimidine 5-fluorouracil (5-FU) has been placed as the first line chemotherapy in the treatment of various cancers including colorectal. DPD mediated conversion of 5-Flourouracil to dihydrofluorouracil (DHFU) is the rate-limiting step of 5-Flourouracil catabolism. The response rates of the 5-Flourouracil for advanced CRC is less. 5-FU causes severe toxic effects with deficiency of DPD enzyme. The aim of this study was to Evaluate the kinetic and concentration of DPD in tissue with different stage of CRC, as well as Correlation between enzyme concentration and biomarker (CEA.CA19.9).

Method: By using an ELISA kit for level of DPD and spectrophotometer for activity, in serum and tissue we measured The level and the activity of DPD enzyme in 60 subject in Iraq includes: 30 patients with advance stage of CRC, 30 patients with early CRC and 30 healthy control We also measured serum CEA19.9 and CEA levels.

Results: The result of the current study showed that serum and tissue activity of DPD in Advance CRC patient very high relative activity compared with early CRC patients and control. Moreover, the activity of DPD in early CRC patient higher than control. Level of tissue DPD shown a significant different between Advance and early CRC patient tissue and normal tissue. While no significant difference in mean serum level of DPD between CRC patient (advance and early) and healthy control. Moreover, DPD showed a moderate correlation with CA19-9 in CRC patients (early and advance) which was close to significant.

Conclusions: In patients with advanced CRC, there is a hyperactivity of DPD in serum and tumor tissues.

Keywords: Colorectal cancer, Dihydropyrimidin dehydrogenase, 5- Fluorouracil, Elisa

Introduction

Colorectal cancer (CRC) it is the second leading cause of the cancer-related mortality in the world, with around 655,000 deaths worldwide in every year.¹,²

The majority of this cancer-related deaths could be stopped by applying existing knowledge about cancer prevention, can increasing the use of recommended checking tests, and ensuring that’s the all patients timely received the standard treatment.³ In the past decade, there has been wonderful progress in reducing both the incidence and mortality average of the colorectal cancer in the world. Largely due to the prevention and the early detection of CRC through the screening.⁴

CRC usually develops so slowly, over a period of ten to twenty years, with most starting as non-cancerous growths develops on the inner layer of the colon or the rectum. The most current kind of polyp is called an adenomatous polyp or the adenoma these adenomas grow from glandular cells, which secrete mucus to the lubricate the colorectum. An evaluated one-third of patients will eventually develops one or more adenomas progressing to the invasive cancer. As the adenoma becomes bigger and larger, there is an increasing

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If found in patient early colorectal cancer can be successfully treated. The current treatment of the colorectal cancer at most depends on surgery, radiotherapy, chemotherapy and the targeted therapy. Depending on the stage of cancer growth, gathering of two or more treatments are often recommended to achieve the best result.

The Surgery is the main treatment option for the CRC wherein the tumor surround healthy tissue and adjacent lymph nodes must be removed. The 5 year relative survival rates of patients with CRC metastasis to distant organs is much minimize than CRC patients at the earlier stages. The current pharmacotherapy, such as chemotherapy, and the targeted therapy act on the cancer cells principally through the cell apoptosis, cell senescence and autophagy.

The existing therapeutic compounds for treatment of the CRC are several. They are include cytotoxic agents (oxaliplatin, 5-fluorouracil, capcitabine and irinotecan), targeted therapies (the anti-vascular endothelial growth factor-A antibody [bevacizumab], and the anti-epidermal growth factor receptor antibodies [cetuximab, and panitumumab]).

For the last seventy years, the fluoropyrimidine 5-fluorouracil (5-FU) has been placed as a first line chemotherapy in the treatment of various cancers including colorectal, neck, head and breast cancers. This combination has multiple mechanisms of the cytotoxicity including the inhibition of the enzyme thymidylate synthase, which is improve overall and disease-free survival of the patients with resected stage III CRC.

The response rates of the 5-Flourouracil for advanced CRC is less than fifteen percent, and the bioavailability is also limited. Furthermore, 5-Flourouracil causes severe toxic effects on gastrointestinal tract, hematological, cardiac, neural and dermatological reactions. Hence, there is a need to identify a possibility drug delivery system for 5-Flourouracil to achieve better therapeutic activity with fewer side effects.

5-Flourouracil is converted to the fluorodeoxyuridine monophosphate (FdUMP), which forms a stable complex with the enzyme thymidylate synthase (TS), and thus inhibits the deoxythymidine mono-phosphate (dTMP) production. dTMP is essential for the DNA replication and repair and its depletion therefore causes the cytotoxicity. Dihydropyrimidine dehydrogenase (DPD)-mediated conversion of 5-Flourouracil to dihydrofluorouracil (DHFU) is the rate-limiting step of 5-Flourouracil catabolism in normal and tumor cells. Up to eighty percent of administered 5-Flourouracil is broken down by DPD enzyme in the liver.

Materials and Method

Study Subjects: The present study included 90 subject includes:30 patients with advance CRC, 30 patients with early CRC and 30 healthy control. Serum and tissue was collected. The tumor tissues were surgically removed from colorectal tumor patients by either mastectomy or lumpectomy and the other from normal surrounding tissues. samples collected between September 2018 and April 2019. Patients were divided into three groups; control, Advance CRC patients and early CRC patients. All sample collected before chemotherapy.

Measurement level and activity of DPD enzyme in serum and tissue: Level of DPD in serum and tissue by using Elisa technique. while method for determination the activity of DPD enzyme in sera and tissue by using spectrophotometer according to Podschun et al. (1993)

DPD activity was measured at room temperature (25C) 1 ml of the total reaction volume contained phosphate buffer (35mM, P7.4), dithioerythritol (20mM), MgCl2.6H2O (280mM), Uracil (1500 µM) and NADPH (600µM). The Activity was measured by monitoring the lowering in the absorbance at 340nm due to oxidation of the NADPH to NADP+. One enzyme unit is defined as the oxidation of one mmol NADPH per min under the assay conditions

Statistical Analysis: The data that obtain could be analyzed using SPSS version Analysis of variance will be used to compare means between the different groups and person’s correlation will be used to find out any correlation between serum concentrations of enzymes and tumor marker

Result

Levels of DPD Enzyme in serum and tissue: Median serum level of DPD enzyme in healthy control groups (1.7 ng/ml, range 0.16-9.95 ng/ml) was slightly higher than that of early CRC patients (1.63 ng/ml, range 0.16-10 ng/ml) or advance CRC patients (1.61 ng/ml, range 0.16-8.4 ng/ml)
Data regarding tissue concentration of DPD enzymes were found to be normally distributed and therefore were expressed as mean ± SD. (Mean tissue concentration of DPD in advance CRC patients (0.32 ± 0.063 ng/mL) was far much higher than either healthy controls (0.065 ± 0.041 ng/mL) or early CRC patients (0.14 ± 0.042 ng/mL) with highly significant differences. Moreover, early CRC patients differed significantly from healthy controls as shown in (figure 1).

![Figure 1: mean PDP activity in tissue and serum in CRC patients and controls](image1)

**DPD Activity in Serum and tissue:** Mean serum activity of DPD enzyme in advance CRC patients was 3.22 ± 1.27 U/mL compared with 0.43 ± 0.194 U/mL in early CRC patients and 0.189 ± 0.08 U/mL in healthy controls with highly significant differences. Although early CRC patients had higher DPD activity than healthy controls, the difference was not a significant (Figure 2).

As in case of serum, DPD showed a very high relative activity in tissue in advance CRC patients (3.61 ± 0.44 U/mL) compared with 1.64 ± 0.36 U/mL in early CRC patients and 0.8 ± 0.15 U/mL in healthy controls with highly significant differences (Figure 2). Moreover, there was a significant difference between early CRC patients and healthy controls in DPD activity in tissue.

![Figure 2: mean PDP activity in tissue and serum in CRC patients and controls](image2)

**Correlations between Enzymes and Tumor Markers:** Generally, there were positive non-significant correlations between DPD with each of CA19,9 and CEA on the other side DPD showed a moderate correlation with CA19,9 in CRC patients (early and advance) which was close to significant (p= 0.08).

**Discussion**

ELISA technique was employed to measure serum and tissue level of DPD. The current study revealed no significant difference in mean serum level of DPD between CRC patient (advance and early) and healthy control. This is the first study in Iraq measuring serum concentration of DPD and compared with stages of CRC patient and healthy control before chemotherapy. In tissue DPD enzyme shown a significant different between Advance and early CRC patient tissue and normal tissue, which was level of DPD enzyme was approximately 4 fold higher in colorectal tissue compared with normal colorectal tissues. The DPD in advance CRC patient tissues was approximately 2 fold higher than that in early CRC patient tissue.

The study suggests increasing DPD level in tissue with differential of tumor because large amount of tissue and specimens for determination are always contaminate by lymphocytes which have the highest DPD activity in the many types of tissue measured (15).

This is consistent with the result of a study of Ishibashi, Keiichiro, et al. (2009) (16) who compared...
DPD level in primary CRC and metastasis stage of CRC in 103 individuals. Level of DPD was determined by enzyme-linked immunosorbent assay (ELISA).

The result of the current study showed that serum and tissue activity of DPD in Advance CRC patient very high relative activity compared with early CRC patients and control. Moreover, the activity of DPD in early CRC patient higher than control.

The result is totally agreeing with the result of study of Mizutani, Y., et al. (2001) (17), who investigated the activity of DPD in 74 bladder cancers and studied the relationship between the DPD activity and stages of cancer. The activity of DPD was approximately 2-fold higher in bladder cancer tissues compared with normal bladder tissues. DPD activity in invasive bladder cancers was approximately 2-fold higher than that in superficial cancers.

This high DPD activity in the CRC tissues compared with normal tissues may contribute to the unfavorable differential between anticancer effect and adverse effect of 5-FU. Thus, the high 5-FU degradation may occur in cancer tissues, compared that with normal tissues. this finding suggest that DPD may play role in 5-FU resistance through increase inactivation of 5-FU cancer cells of (17).

The present study also agrees with Nagakawa, et al. (2002) (18) The DPD activity in tumor tissue was two- to threefold higher (p < 0.01) than that in normal tissue.

The present data suggest that DPD enzyme activity might play an important role in the protecting tumor cells from the effect of anticancer (5-FU) in situ, as both concentration and activity of this enzyme are higher in malignant tissue which is accompanied by rapid degradation of 5-FU in these tissue. This effect does not only facilitate tumor growth, but also may increase the opportunity for metastasis. The DPD activity of CRC tumors may be a useful clinical marker of the responsibility of a Fluorinated pyrimidine dosing in colorectal cancer.

DPD activity may help to classify tumor in stages (advance and early)

**Conclusion**

The concentration of DPD enzymes in tumor tissues raised considerably in CRC patients especially in those with advanced stages. In patients with advanced CRC, there is a hyperactivity of DPD in serum and tumor tissues. The DPD activity of CRC tumors may be a useful clinical marker of the responsibility of a Fluorinated pyrimidine dosing in colorectal cancer.

**Ethical Clearance:** The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding.

**REFERENCE**


Diagnostic Values of Complete Blood Count in Patients with Urinary Tract Infection

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¹Department of Medical Microbiology, ²Department of Surgery, ³Department of Dermatology, College of Medicine, University of Tikrit, Salah Al-deen, Iraq

ABSTRACT

The study was carried out in Tikrit city from January 1st to July 1st 2018. These patients admitted to Sallah Al-Deen general hospital and primary health care centers in Tikrit city. The number of patients with urinary tract infection was 300 patients whom their ages ranged from 2 months to 70 years. The control group included 100 individuals who appeared healthy with no history of UTI. Urine direct and indirect examination was held for all the patients and control. 210 samples of cultured specimens gave positive results in culture media. Most isolates were Staph. aureus with 25%, Staph. saprophyticus 24%, E. coli 16%, K. pneumoneae 5%. Pseudomonas aeruginosa, Proteus and Citrobacter frundii were present in about 2%, 5% and 7% respectively. Yeast-like fungi, Candida albicans and Candida spp. was also found 7% and 2% respectively. All samples have been subjected to complete blood count with emphasis on platelets; platelet count, distribution width (PDW) and mean platelet volume (MPV). Platelet count showed a significantly higher values in patients with UTI in comparison to control group. Platelet count and parameters showed a significant increase in gram positive bacteria specifically higher for Staph. saprophyticus. which means there is maybe a correlation between platelets and the type of the causative agent of infection.

Keywords: Urinary Tract Infection; Patients; Blood Count

Introduction

Urinary tract infection (UTI) is considered as one of the most common bacterial diseases in men and women of all ages. The early diagnosis of the infection and suitable treatment are significant to reduce renal complications and in extent kidney failure. Bacteria are the main reason of infection among humans but we cannot overlook the role of certain viruses and fungi as a causative agents. However, the role of viral and fungal UTI is considered to be an infrequent phenomena. Though the infection may seems to be harmless in the onset of infection, the patient may show a variety of symptoms as the stage progresses and it may lead to death in rare cases where the infection is sever.

Urine analysis is one of the most important and essential tests used in clinical laboratories in the diagnosis and follow up of UTI (1). Microscopic urine sedimentation test has been the most used methodology for examining urine cells and microorganisms. Screening test with dipstick reagents is mostly used as complement to urinalysis examination tests.

CBC is monotonously ordered in some patients with UTI, including blood cells and platelet parameters (2). Platelets are very complex enucleated cells. They are the derivatives of bone marrow megakaryocytes. Platelets activity can stimulates inflammatory process by promoting recruitment of leukocytes and suppressing the apoptosis of monocytes, neutrophils, and eosinophil (3,4).

Mean platelet volume (MPV), is a parameter usually asserted by complete blood count (CBC) analysis. It is the indication of the average size of platelets which subsequently reverberates the stimulation and production rate of platelet (5,6). As for platelet distribution width (PDW), it is an indicator of variation in platelet size.
which reflects platelet activation. A high MPV values is an indication of increased platelet activity which means there is a very intense inflammation (7-9).

Aim of study: The aim of this study was performed in order to inspect platelet counts and platelet parameters in patients with culture positive UTI to determine if there are organism specific responses.

Method

This cross sectional study was conducted through the period of 1st January 2018 to 1st July 2018 on the patients admitted to Sallah Al-Deen hospital and health centers in Tikrit city. Their age ranged between two months and seventy years old. Our study included 300 patients with 210 culture positive UTI and one hundred sex and age matched healthy individuals as a control group.

Urine samples were collected by either midstream urination or by using sterile urine bag for infants. The samples were examined within 30 minutes of collection. After direct urine culture (physical appearance, rabid urine dipstick and microscopic examination) the samples were conducted to culturing on blood agar, MacConkey agar, Cled agar and sabroud dextrose agar. Positive plates were subjected to gram stain, biochemical tests and API 20 strip for identification.

Five ml of blood samples were drawn under sterile conditions in different blood differentiation tubes for presumed tests.

Complete blood count was performed by (Genex count 60 automated hematology analyzer) counter for measuring CBC. Data analysis and statistics by The Mann-Whitney U test, The Pearson’s correlation test were used. P <0.05 was considered statistically significant.

Results

300 sample of urine were collected from patients with UTI. 100 healthy individuals were included as a control group. The age ranged between two months and seventy years whom were distributed into five age groups according to age and gender as shown in table (1). The results revealed that 210 (70%) of UTI samples gave positive result in culture. That leaves 90 (30%) of samples registered as a negative in culture media.

Out of the 210 culture proved UTI, 130 of them were females and 80 males distributed into five age groups, table (1) The mean age of the UTI group was 26.004 ± 22.663 years, compared to the control group 20.236 ± 20.126 years (P= > 0.05) as it shown in table (3). Gram positive culture bacteria were found in (52%) of the cases with UTI; while Gram negative bacteria was found in (25%) while yeast was found in (11%) of the cases.

Table (2) reveals that Staph. aureus was the most common bacterial species isolated from urine of about (25%). In the second place comes Staph. Saprophyticus in about (24%) of samples and most of them came from female patients. E. coli was found in (16%) of samples as well as K. pneumonia and Citrobacter freundii of about (5%) and (7%) respectively. Pseudomonas aeruginosa and Proteus species were also found, (2%) for Pseudomonas aeruginosa and about (2%) and (3%) for each of Proteus vulgaris and Proteus mirabilis respectively. Strep. epidermidis was also found in (4%) of samples. In addition to that (1%) of samples were found to be positive for Salmonella typhimurium. Also about (12%) samples showed a positive result for yeast, specifically Candida albicans 16 (7%) and Candida spp. 9 (2%) on culture media.

<table>
<thead>
<tr>
<th>No. of group</th>
<th>Age groups in years</th>
<th>Female</th>
<th>Male</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>1.</td>
<td>≤ 2 month</td>
<td>15</td>
<td>6.92</td>
<td>8</td>
</tr>
<tr>
<td>2.</td>
<td>5 - 15</td>
<td>24</td>
<td>18.46</td>
<td>20</td>
</tr>
<tr>
<td>3.</td>
<td>15 - 30</td>
<td>66</td>
<td>50.76</td>
<td>31</td>
</tr>
<tr>
<td>4.</td>
<td>30 - 50</td>
<td>18</td>
<td>13.84</td>
<td>11</td>
</tr>
<tr>
<td>5.</td>
<td>50 - 70</td>
<td>7</td>
<td>5.38</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>130</td>
<td>100</td>
<td>80</td>
<td>100</td>
</tr>
</tbody>
</table>
Table 2: Distribution of microbes in urinary tract infection

<table>
<thead>
<tr>
<th>Type of isolates</th>
<th>No. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gram positive bacteria</td>
<td>110 (52%)</td>
</tr>
<tr>
<td>Staph. aureus</td>
<td>52 (25%)</td>
</tr>
<tr>
<td>Staph. epidermidis</td>
<td>8 (4%)</td>
</tr>
<tr>
<td>Staph. saprophyticus</td>
<td>50 (24%)</td>
</tr>
<tr>
<td>Gram negative bacteria</td>
<td>75 (36%)</td>
</tr>
<tr>
<td>E. coli</td>
<td>33 (16%)</td>
</tr>
<tr>
<td>K. pneumoniae</td>
<td>10 (5%)</td>
</tr>
<tr>
<td>Proteus vulgaris</td>
<td>4 (2%)</td>
</tr>
<tr>
<td>Proteus mirablis</td>
<td>6 (3%)</td>
</tr>
<tr>
<td>Pseudomonas aeruginosa</td>
<td>4 (2%)</td>
</tr>
<tr>
<td>Citrobacter Frundii</td>
<td>15 (7%)</td>
</tr>
<tr>
<td>Yeast</td>
<td>25 (11%)</td>
</tr>
<tr>
<td>Candida albicans</td>
<td>16 (7%)</td>
</tr>
<tr>
<td>Candida spp.</td>
<td>9 (2%)</td>
</tr>
<tr>
<td>Total</td>
<td>210 (100%)</td>
</tr>
</tbody>
</table>

Figure 1: Distribution of platelet count according to each type of isolate compared the control group

Concerning the hematological data, patients who are positive to UTI had statistically significant higher WBCs, neutrophil percentages than healthy individuals. Table (3) shows the details of CBC results and the comparison between UTI patients and healthy control group.

Table (4) shows a significantly higher number of platelets and its parameters (MPV & PDW) in patients with UTI compared to control group. Whilst table (5) shows a significant increase in platelet count and parameters (MPV & PDW) in patients infected with gram positive bacteria in comparison to those who have gram negative infection. Figure (1) shows the highest platelet count in patients infected with Staph. saprophyticus, which means there is maybe a correlation between platelets and the type of the causative agent of UTI.

Table 3: Comparison between laboratory and clinical data and of the studied group

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Patients of UTI (No. = 210)</th>
<th>Control group (No. = 100)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>26.004 ± 22.663</td>
<td>20.236 ± 20.126</td>
<td>&gt; 0.05</td>
</tr>
<tr>
<td>Gender (male/female)</td>
<td>80/130</td>
<td>40/60</td>
<td></td>
</tr>
<tr>
<td>CBC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HB (g/dl)</td>
<td>12.187 ± 1.766</td>
<td>11.919 ± 1.846</td>
<td>&gt; 0.05</td>
</tr>
<tr>
<td>RBCs (x10^9/L)</td>
<td>4.633 ± 0.844</td>
<td>4.439 ± 0.835</td>
<td>&gt; 0.05</td>
</tr>
<tr>
<td>WBCs (x10^9/L)</td>
<td>11.367 ± 3.339</td>
<td>6.711 ± 1.545</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>Neutrophil %</td>
<td>76.64 ± 10.465</td>
<td>58.33 ± 7.455</td>
<td>&lt; 0.001*</td>
</tr>
</tbody>
</table>
CRP (mg/dl) 25 ± 17.581 10 ± 1.665 < 0.001*
ESR (1st hour) 30.8 ± 5.329 13.1 ± 2.807 < 0.001*
Urin analysis
Pus cells 41 ± 14.552 7.45 ± 3.299 < 0.001*
RBCs 6 ± 1.491 3 ± 1.252 < 0.001*
*significant

Discussion

Results showed that UTI infection samples gave about 210 positive bacterial culture. By urinary culture those 210 culture positive cases was found to give (52%) gram positive bacteria; while Gram positive bacteria was found in (36%) of the cases. As for yeast, it was found in (11%) of all the cultured samples.

Study groups of patients with urinary tract infection were divided into five age groups according to age and gender. The infection was more frequent at the age between 5 and 30 years old and was more frequent in females as it shown in table 2.

UTI is more common in women than men. The reason of this difference is not significantly clear but there is important risk factors in those age groups that may be considered valuable. Those risk factors includes physiologic and anatomic factors, such as estrogen deficiency, obstructing lesions and genetic factors, such as blood group status and antibiotic consuming or functional statues (10).

Platelets is part of the innate immune system, it can be considered as a part of acute phase response during inflammations. The increase in thrombocytes may affect the bone marrow cell production as a response to pro-inflammatory cytokines, such as IL-1 and IL-6 (11-13).

Activating the platelets lead to some morphological changes in shape and size which may lead to changes in platelet numbers and subsequently an increasing in mean platelet volume and platelet distribution width (14).

Our current study showed that patients with UTI had a statistically higher platelet count and parameters (MPV & PDW) than healthy control group as shown in table 4. In addition to that, there was an increasing in platelet parameters (MPV & PDW) but none was noticed in platelet values in patients with gram positive UTI compared to those with gram negative infection, table 5.

<table>
<thead>
<tr>
<th>Platelets Parameters</th>
<th>Patients with UTI (No. = 210)</th>
<th>Control group (No. = 100)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Platelet count (x10*9/1)</td>
<td>572.304 ± 366.334</td>
<td>351.647 ± 128.386</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>Mean Platelet Volume (fl)</td>
<td>11.358 ± 0.734</td>
<td>9.523 ± 1.196</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>Platelet Distribution Width (%)</td>
<td>18.258 ± 1.853</td>
<td>15.213 ± 2.713</td>
<td>&lt; 0.001*</td>
</tr>
</tbody>
</table>

Table 5: Comparison between platelet count and patients with gram positive and gram negative

<table>
<thead>
<tr>
<th>Platelets Parameters</th>
<th>Patients with G+ve UTI (No. = 110)</th>
<th>Patients with G-ve UTI (No. = 75)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Platelet count (x10*9/1)</td>
<td>592.754 ± 347.089</td>
<td>435.127 ± 122.219</td>
<td>&gt; 0.05</td>
</tr>
<tr>
<td>Mean Platelet Volume (fl)</td>
<td>11.567 ± 0.663</td>
<td>10.7 ± 0.541</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>Platelet Distribution Width (%)</td>
<td>18.771 ± 1.859</td>
<td>16.99 ± 0.998</td>
<td>&lt; 0.001*</td>
</tr>
</tbody>
</table>

Tekin et al.(15) had reported an elevation in platelet values and its parameters (MPV & PDW) in patients with UTI in comparison to the control group. The results showed that there was no difference in platelet counts in children who are suffering from upper or lower UTI, also there was no significant difference in mean platelet volume among patients with Gram positive and Gram negative UTI. Some previous studies showed that early
responses to the presence of endotoxins have been positively correlated with the release of thromboxane, which elicits platelet aggregation. Both thrombocyte hyperaggregability and peripheral damage might cause a positive feedback to the bone marrow over twenty-four hours, which may result in the secretion of larger and more active platelets\(^\text{16}\).

In addition to that, some bacteria could have evolved mechanisms to block the process of platelet activation and cause platelet aggregation, perhaps to evade host defense mechanisms. Rowe et al\(^\text{17}\), they examined ninety-three postoperative pediatric patients and found that seventy-one percent of the patients infected with gram-negative sepsis had thrombocyte counts less than 100,000 whereas thrombocyte counts in the nonseptic or in gram-positive sepsis patients were higher than 150 thousand. They also noticed an elevation in thrombocyte count in patients whom treated for sepsis. In another study by Scheifele et al\(^\text{18}\), they examined endotoxinemia and thrombocytopenia during the infection of necrotizing enterocolitis. In their study, they detect \textit{E. coli} in about 49% and 28% of them had a platelet value less than 100,000 mm\(^3\). In our study, the results were compatible with these evidence, patients infected with gram positive bacteria usually had statistically higher platelet counts values than patients infected with gram negative bacteria\(^\text{19}\).

The volume of the platelet is positively correlated with the function of the platelet which means that larger platelets are evidently more active than smaller once. Platelet distribution width is a marker of platelet size, which may be an indicator of active thrombocyte release. Mean platelet volume has been reported to be an indirect sign of deficiency in the production of platelets and the response of bone marrow activity to UTI in children and adult studies\(^\text{20}\).

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding

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Evaluation of CK20 and CD8 Tumor Markers in Patients with Colorectal Cancer by Using Immunohistochemical Technique

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ABSTRACT
Colorectal cancer (CRC) is one of the common malignant tumors of gastrointestinal tract (GIT). The incidence rate of this cancer increased in frequency in the last few years. This study was carried out to investigate the possible association of some risk factors with CRC such as (age, gender, smoking, inflammatory bowel disease, and ulcerative colitis). In this study we analyzed using immunohistochemistry technique of the following markers for 30 selected cases: cytokeratin 20 (CK20), and cytotoxic T- lymphocyte (CD8), the results showed that CD8 and CK20 are positive immunostaining markers.

CD8 expression: Results indicated that CD8 levels were positive in the all cases studied. In term of scores, CRC patients with the score ++ (moderate) represented the highest percentage 14 (46.67%) compared with patients with score+ (weak) 10 (33.33%) and score+++ (strong) 6 (20.00), the statistical analysis showed increase significant in percentage of patients with score++ as compared with score+ and score+++ at (P<0.05).

CK20 expression: In this study the positive immunohistochemical expression of CK20 was significantly higher in CRC patients with score ++ (moderate) 16 (53.33) in comparison with CRC patients with scores + (weak) 9 (30.00) and score +++ (strong) 5 (16.67) at (P<0.05).

Keywords: Colorectal cancer, Immunohistochemistry, Cytotoxic T-lymphocyte, Cytokeratin 20.

Introduction
Cancer is a disease that occurs when control is lost on cell division and growth as well as on the metastasis of abnormal cells. Reasons for cancer are both intrinsic, i.e. infections, smoking, radiant sources, and pollutants, and extrinsic, i.e. genetic and metabolic mutations, along with abnormal immune responses and hormone levels (1). The abnormal growth of colon and or rectal epithelial cell is known as bowel and or colorectal cancer (CRC)/tumor that can attack other organs of the body and consequently turns into a cancerous growth, most tumors are classified as adenocarcinomas (2). CRC is more prevalent in the rectum, then sigmoid, cecum, transverse colon, flexures, ascending colon and descending colon (38, %, 29%, 15%, 10%, 10%, 5%, 3% respectively) (3). Among cancer cases in the world, women have CRC as the second cause whereas men have it as the third cause (4). Stool blood, altered movement of bowel, continuous tiredness, nausea, vomit, malaise, anorexia, abdominal distension and losing of weight are among the main symptoms of CRC (5). In patients with colorectal cancer, the clinical presentation depends on the location, size, as well as the presence or absence of metastases (6). CRC pathogenesis is of high degree of complexity, with different factors interacting with each other, these factors include somatic alterations that accumulate in the epithelial layer of the colorectum, germ-line features that determine susceptibility to cancer, as well as effects from the environment (7). Invasive CRC results from
a sequence of multiple events, starting from genetic changes being accumulated and giving the advantage to the epithelium to grow in a selective manner, stimulating its transformation to adenomatous polyp (8).

**Aims of study:** The current study was proposed to meet the following aims:

1. To evaluate and diagnose CRC according to the risk factors.
2. To study the roles of some immunohistochemical markers (CD8, and cytokeratin 20) in the diagnosis of CRC.

**Materials and Method**

**Detection of CD8, CK20 Expression in Paraffin Embedded Tissue by Immunohistochemical Technique (IHC):** We selected a total of 30 cases of colorectal adenocarcinomas. All the tissues which used in this study were archival tissue blocks collected from histopathological laboratories of Gastroenterology and Liver Diseases Teaching Hospital, Baghdad.

**Immunohistochemical scoring:** Immunostained slides were scored after the entire slide was evaluated by light microscope. Results were interpreted by a pathologist in the Iraqi Specialized Lab.

**Scoring of CD8:** CD8 infiltration was scored as the number of CD8 leukocytes per tumor area. They were assessed as:

1. No/sporadic/weak (score 1).
2. Moderate (score 2).
3. Abundant/strong (score 3).
4. Highly abundant infiltration (score 4). (9).

**Score of CK20:** CK20 expression was based on intensity of cytoplasmic staining as following:

1. No staining (0).
2. Weak intensity (score 1), up to 5% of cells.
3. Moderate intensity (score 2), up to 10% of cells.
4. Strong intensity (score 3), greater than 10% of cells (10).

**Results**

**Immunohistochemical Evaluation of Tumor Tissues:** The tissue expression of CD8 and CK20 markers was evaluated in patients with colorectal cancer. The data related to the effect of age (Table 1) demonstrate that the age stratum of more than 60 years was the most affected group with CRC (14: 46.66%), followed by the age stratum of 40-60 years (12 : 40%), then the age stratum of less than 40 years (4: 13.34%). As related to the effects of gender, the percentage of the males with colorectal cancer was higher (16, 53.33%) than the percentage of the females (14, 46.67%), but the statistical analysis showed non-significant difference. The results also showed a significant increase in the percentage of smoker (17, 56.67%) as compared with non-smoker patients (13, 43.33%) at P<0.05. Increase significant was observed in the percentage of patients with CRC in T3 (18: 60.00%) as compared with T1, and T2 (4: 13.33%, and 8: 26.67%, respectively) at P<0.05. While, the percentage of patients with CRC in G2 of moderate differentiated adenocarcinoma (20, 66.67%) was higher than the percentage in patients in G1 (4, 13.33%), and G3 poorly differentiated adenocarcinoma 6 (20.00%), there are increase significant in percentage of patients with G2 compared with G1 and G3 at (P<0.05). Regarding to the diseases that is most related to colorectal cancer, the highest percentage of CRC patients was recorded in the patients with diabetes mellitus type II (12, 40%), followed by ulcerative colitis (11, 36.67%), then polyp 5 (16.67%), and lastly the lowest affected group was those with genetic factors (2, 6.66%). In addition, percentage of patients with colorectal cancer was higher in the rectosigmoid region (12, 40%), followed by rectum (8, 26.68%), sigmoid colon (6, 20%), and the lowest percentage was in both right colon and transverse colon (2, 6.66%)

<table>
<thead>
<tr>
<th>Factors</th>
<th>Percentage (%)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age group (year)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 40</td>
<td>4 (13.34%)</td>
<td>0.0001 *</td>
</tr>
<tr>
<td>40-60</td>
<td>12 (40%)</td>
<td></td>
</tr>
<tr>
<td>More than 60</td>
<td>14 (46.66%)</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td>0.098 NS</td>
</tr>
<tr>
<td>Male</td>
<td>16(53.33%)</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>14(46.67%)</td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Distribution of sample study of immunohistochemistry of patients according to difference factors:
Signals scores

**CD8 IHC Scores in Colorectal Cancer Patients Groups:** Results indicated that CD8 levels were positive in all cases studied. In term of scores, CRC patients with the score ++ (moderate) represented the highest percentage (14, 46.67%) compared with patients with score + (weak) (10, 33.33%) and score +++ (strong) (6, 20.00). The statistical analysis showed an increase significant in percentage of patients with score ++ as compared with score + and score +++ at P<0.05 (Table 2).

<table>
<thead>
<tr>
<th>Score of CD8</th>
<th>Intensity</th>
<th>Number of patients</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>Weak</td>
<td>10</td>
<td>(33.33)</td>
</tr>
<tr>
<td>++</td>
<td>Moderate</td>
<td>14</td>
<td>(46.67)</td>
</tr>
<tr>
<td>+++</td>
<td>Strong</td>
<td>6</td>
<td>(20.00)</td>
</tr>
<tr>
<td>P-value</td>
<td>---</td>
<td></td>
<td>0.0074 *</td>
</tr>
</tbody>
</table>

* (P<0.05).

**CK20- IHC Scores in Colorectal Cancer Patients Groups:** In this study, the positive immunohistochemical expression of CK20 was significantly higher in CRC patients with score ++ (moderate) (16, 53.33%) in comparison with CRC patients with scores + (weak) (9, 30.00%) and score +++ (strong) (5, 16.67%) at P<0.05 (Table 3).

<table>
<thead>
<tr>
<th>Score of CK20</th>
<th>Intensity</th>
<th>Number of patients</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>weak</td>
<td>9</td>
<td>(30.00)</td>
</tr>
<tr>
<td>++</td>
<td>moderate</td>
<td>16</td>
<td>(53.33)</td>
</tr>
<tr>
<td>+++</td>
<td>strong</td>
<td>5</td>
<td>(16.67)</td>
</tr>
<tr>
<td>P-value</td>
<td>---</td>
<td></td>
<td>0.0026 *</td>
</tr>
</tbody>
</table>

* (P<0.05).

**Immunohistochemical diagnosis:** We investigated the expressions of CK20 and CD8 in 30 cases of colorectal carcinoma in this study of immunohistochemical technique as shown in Figures 1 and 2.
Figure 1: A- Anti-CD8 Antibody immunostaining in normal colon. IHC (10x). B- Moderate differentiated colonic adenocarcinoma with Weak reaction to CD8 (Score +). Anti-CD8 Antibody immunostaining. IHC (40x). C- Poorly differentiated colonic adenocarcinoma with Weak reaction to CD8 (Score +). Anti-CD8 Antibody immunostaining. IHC (40x). D, E- Moderate differentiated colonic adenocarcinoma with Moderate reaction to CD8 (Score ++). Anti-CD8 Antibody immunostaining. IHC (40x). F- Moderate differentiated colonic adenocarcinoma with Strong reaction to CD8 (Score +++). Anti-CD8 Antibody immunostaining. IHC (10x).

Figure 2: A- Anti-CK20 Antibody cytoplasmic staining in normal colon. IHC (10x). B- Well- differentiated colonic adenocarcinoma with Weak reaction to CK20 (Score +). Anti-CK20 Antibody immunostaining. IHC (40x). C- Well- differentiated colonic adenocarcinoma with moderate reaction to CK20 (Score ++). Anti-CK20 Antibody immunostaining. IHC (40x). D- Moderate differentiated colonic adenocarcinoma with Weak reaction to CK20 (Score +). Anti-CK20 Antibody immunostaining. IHC (40x). E- Moderate differentiated colonic adenocarcinoma with moderate reaction to CK20 (Score ++). Anti-CK20 Antibody immunostaining. IHC (40x). F- Moderate differentiated colonic adenocarcinoma with strong reaction to CK20 (Score +++). Anti-CK20 Antibody immunostaining. IHC (40x).
Interpretation of immunohistochemical reactions focused primarily over highlighting the chromogen on the antigenic targets and the number of positive tumor cells. Thus, if no cell has been immunohistochemically staining, we considered an absent reaction; if the reaction was positive in less than 10% of examined cells with a microscope, we considered a poor response (weak, score +), if they were positive in 10% to 25% of the cells, we considered a moderate reaction (score ++), and if it was positive in more than 25%, we have found that the reaction was intense (strong, score +++).

Discussion

IHC is often a diagnostic tool used to support easier and more precise classification of the gastrointestinal tumors. Thus, diagnostic tissue biomarkers are important sources for complementary information to those of clinical colonoscopy.

CD8: CD8+ cytotoxic T cells in particular have received attention not only because of their known role as cytolytic agents and demonstrated reactivity to tumor-derived self-epitopes, but also their prevalence and apparent positive prognostic effect in colorectal cancer as well as other tumor types (11). Tumor-infiltrating cells were shown to be able to recognize and remove tumor cells, but also to enhance immune evasion by these cells, thus affecting progression and metastases of the disease (12). More recent studies propose an essential function of tumor-infiltrating lymphocytes (TILs) in enhancing anti-CRC immune response with similar function in other malignancies (13).

The proportions of T cells and T cytotoxic cells in the tumor center (TC) and the invasive margin (IM) were used to build up an immunoscore (IS) (14). The IS value was suggested by some scientists to be more useful than that of the currently used TNM staging system, particularly in relation to colon cancers (15), while others showed that this benefit is only valid in diseases stages I–III (16). The major active components of the adaptive immune response such as cytotoxic T lymphocytes (CTL) have essential roles in the regulation of growth and metastasis of the tumor. The first report of the value of infiltrating CTLs in CRC prognosis was provided by Naito et al (17). The elevated numbers of TILs in CRC was frequently correlated with a favorable prognosis (18).

CK20: The cytoskeleton in mammals consists of three families of proteins. These include the microfilaments mainly made of actin, the microtubules mainly made of tubulin, and the intermediate filaments that is composed of various types of proteins, including cytokeratins (CKs) that are involved to differentiation mechanisms of the cell (19). The expression of this cytokeratin in the colon is restricted to epithelial cells with later stages of differentiation in comparison with those cells in the bases of the crypt which are usually at earlier stages of differentiation (20). However, in spite of this pattern, the expression of CK20 in CRC maintains its high level of conservation and is highly uninfluenced by the fundamental genetic changes accompanying malignant transformation. A rare and significant exception is when CK20 expression is lost in a number CRC patients with deficiency in the process of mismatch repair (21). CKs, during their secretion by the cells undergoing proliferation or apoptosis, they confer good markers to recognize the malignancies of the epithelium, clearly indicating a continuous cellular activity (22). Presence or absence of different CKs is facilitated by staining with antibody panels, while its interpretation at clinical level must be confirmed via morphological and other diagnostic examinations. A CK-specific antibody can identify a type of epithelial cells through its binding to protein epitopes (23).

Conclusions

1. In our study, we found that elderly age, male gender, smoking, and other infection, appeared to be the most possible association factors for colorectal cancer.

2. Immunohistochemistry for CD8 and CK 20 help differentiate colorectal adenocarcinoma. The most widely used immunohistochemical markers for colorectal adenocarcinoma are cytokeratin (CK) 20, and CD8. The most common immunophenotype of colorectal adenocarcinoma is positivity for CK20 and CD8, which is a relatively specific staining pattern for colorectal origin.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding
REFERENCES


Detection of Tn917 Carrying *erm*(B) Gene in a Clinical Isolates of *S. pyogenes*

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ABSTRACT

Background: This study was conducted to investigate the genetic organization of *erm*-carrying Tn917 in clinical isolates of *Streptococcus pyogenes*. Tn917 is a nonconjugative transposon which is responsible for the spread of erythromycin resistance in bacterial isolates. Over the past two decades, erythromycin resistance rates have increased in *S.pyogenes* in many countries, To obtain information that may be useful in solving the spread of antimicrobial resistance, antibiotic-resistant genes can be identified as well as their association with mobile genetic elements.

Material and Method: A total of 22 isolates of *S. pyogenes* isolates collected from the infection of upper respiratory system were examined, first by detecting their antibiotic susceptibility against three different antibiotics groups (Macrolides, Tetracycline, and lincosamides) then genomic DNA was extracted from each isolate for detection Tn917 by using specific primers to amplify *erm*(B) gene carried by this transposable element.

Results: Results showed that there is a high level of resistance to erythromycin, (90.9%), then to Minocycline (68.1%), Lincomycin (59%), Tetracycline (54.5%), Clindamycin (50%), Azithromycin and Clarithromycin (36.3%), Doxycycline (31.8%) and then to Oxytetracycline (27.2%). Results also showed that five of *S. pyogenes* isolates were harboring Tn917 transposable element carrying *erm* gene. On the other hand, results showed that there are another isolates resistant to erythromycin that may possess a chromosomal or plasmid copy of the erythromycin resistance gene, or may the resistance caused by another structural erythromycin gene carried by other type of transposable elements rather than Tn917.

Conclusion: Our findings suggest that the isolates of *S. pyogenes* are harboring chromosomal copy of Tn917 conferring erythromycin resistance. One possible explanation for the presence of genes at different isolates is due to *erm* gene, which was most likely located on Tn917.

Keywords: Tn917, Erythromycin resistance, *Streptococcus pyogenes*, *erm*(B) gene

Introduction

*Streptococcus pyogenes* is the major human pathogen connected with local or systemic infestation and post-streptococcal immunologic disorders. These bacteria colonize the throat or skin and cause several purulent infections involving pharyngitis, necrotizing fasciitis, impetigo and streptococcal toxic shock syndrome. Besides, *S. pyogenes* may stimulate autoimmune diseases like rheumatic fever, acute post-streptococcal glomerulonephritis and rheumatic heart disease. When penicillin use is inappropriate among patients with β-lactam allergy, macrolides represent the best solution for treating respiratory infections, leading to increased resistance in *S.pyogenes*. In *S. pyogenes*, macrolide resistance probably due to several mechanisms: post-transcriptional target site modifications caused by rRNA methylases [*erm*(B) or *erm*(A) genes] which modify an adenine remains in the 23S rRNA, target mutations such as mutational alterations in 23S rRNA or ribosomal proteins and acquisition of active efflux

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[mef (A) gene] which is associated with resistance to 14- and 15-membered macrolides [6,7]. Since the 1990s, the global increase in resistance to erythromycin in the S. pyogenes has led researchers around the world to conduct more epidemiological and molecular studies, which have helped to identify mechanisms, determinants and genetic components that cause resistance [8,9]. Tn917 is a nonconjugative transposon which is responsible for the spread of erythromycin resistance [10]. Originally, Tn917 was determined on a non-comparative plasmid in the E. faecalis bacteria, and the transfer of this transposon is stimulated when the cells are exposed to low concentrations of erythromycin, making it transferable to a plasmid-free recipient of the same type [11,12]. According to the importance of Tn917 in spreading erythromycin resistance between bacterial isolates, this study was aimed to explore the presence of Tn917 in S. pyogenes isolated from upper respiratory tracts.

Material and Method

Bacterial Isolates: Clinical samples were collected (January/2018 to April/2019) from patients (adults and children) complain from tonsillitis, pharyngitis and otitis media, who attends the Consulting clinic at Baquba Teaching Hospital, Al-Batoul Teaching Hospital, Private clinics in Diyala governorate, the Consulting clinic at Central Child Teaching Hospital, Medical City Teaching Hospital in Baghdad governorate, Private clinics in Erbil governorate, and American University of Beirut Medical Center/Lebanon. To ensure the viability of pathogens, samples were sent directly to the microbiology in a sterile transport medium. Several factors have been relied upon in this study to identify S. pyogenes, including colonial morphology, gram staining, and biochemical tests by using Vitek 2 system.

Susceptibility testing: Susceptibility of S. pyogenes isolates against Macrolides group (Erythromycin, Azithromycin, and Clarithromycin) Tetracycline group (Tetracycline, Minocycline, Doxycycline, and Oxytetracycline) and Lincosamides group (Clindamycin and Lincomycin) was examined on β- selective S.pyogenes agar with the addition of 5% of fresh blood according to the standard disc diffusion method, these antibiotics were supplied by Bioanalyse/Turkey.

Amplification experiments: Amplification of chromosomalDNA was performed by using specific primer ERMB1: 5’-GAAAAAGGTACTCAACAAATA-3’ and ERMB2: 5’ AGTACCGTACTAAATTGTTTAC-3’, which targeting erm(B) gene [13]. This primer was provided in lyophilized form and was dissolved in sterilized distilled water to give a final concentration of 10 picomole/µl. PCR master mix supplied by Intrion, Korea. The optimum conditions for amplification of Tn917 were described in table (1).

Table 1: The optimum conditions for amplification of Tn917

<table>
<thead>
<tr>
<th>Step</th>
<th>T_m (°C)</th>
<th>Time (min:sec)</th>
<th>No. of cycles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Denaturation</td>
<td>95</td>
<td>05:00</td>
<td>1</td>
</tr>
<tr>
<td>Denaturation</td>
<td>95</td>
<td>00:30</td>
<td></td>
</tr>
<tr>
<td>Annealing</td>
<td>55</td>
<td>00:45</td>
<td>30</td>
</tr>
<tr>
<td>Extension</td>
<td>72</td>
<td>00:45</td>
<td></td>
</tr>
<tr>
<td>Final extension</td>
<td>72</td>
<td>07:00</td>
<td>1</td>
</tr>
</tbody>
</table>

After PCR amplification, agarose gel electrophoresis (2%) was used to detect the amplified products. Aliquot of 5 µl of pure DNA solutions were mixed with 2 µl of 6x loading dye, then DNA samples were loaded into the wells. DNA bands were visualized under a UV-light transilluminator.

Nucleotide sequence: Sequencing of the amplified gene product was performed by national instrumentation center for environmental management (nicem) online at http://nicem.snu.ac.kr/main/?en_skin=index.html.

Results and Discussion

Results indicated in table (2) showed that the bacterial isolates of S. pyogenes were highly resistant to erythromycin, twenty isolates (90.9%), then to Minocycline (68.1%), Lincomycin (59%), Tetracycline (54.5%), Clindamycin (50%), Azithromycin and Clarithromycin (36.3%), Doxycycline (31.8%) and then to Oxytetracycline (27.2%).

<table>
<thead>
<tr>
<th>Group</th>
<th>Antibiotic</th>
<th>Resistance</th>
<th>Sensitive</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Macrolides</td>
<td>Erythromycin</td>
<td>20</td>
<td>90.9</td>
</tr>
<tr>
<td></td>
<td>Azithromycin</td>
<td>8</td>
<td>36.3</td>
</tr>
<tr>
<td></td>
<td>Clarithromycin</td>
<td>8</td>
<td>36.3</td>
</tr>
</tbody>
</table>
In recent years, treatment for *S. pyogenes* has become difficult owing to the global rise in the prevalence of antibiotic resistance, particularly against first-line antibiotics such as erythromycin and penicillin [14]. Increasing of antimicrobial resistance in *S.pyogenes* that cause infectious diseases is a global problem, although resistance significantly varies between geographical regions [12]. In a local study, *S.pyogenes* resistance to erythromycin was 33.33%, while tetracycline was 52.38% [15].

Globally, Most studies have shown a frighteningly high increase in antibiotic resistance ratios between *S.pyogenes* within the macrolide group, particularly erythromycin, and the tetracycline group. A study conducted in Spain between 1986 and 1997 showed that the percentage of resistance to erythromycin in Madrid in 1987 was 0.0%, then the percentage increased in 1989, 1992 and 1997 to 3.0%, 8.1%, 31.8%, respectively [16]. In Finland, the resistance of *S.pyogenes* to erythromycin recorded the highest rate of 44% [17]. On the other hand, study conducted in the United States reported that the resistance ratio of *S.pyogenes* isolates to erythromycin was 6.8%, Azithromycin 6.9%, Clarithromycin 6.6%, and Clindamycin 0.7% [18]. Also, another a study carried out in Turkey found that from a total of 127 isolates of the *S.pyogenes*, the resistance to erythromycin was 9% and tetracycline 18% [19]. Furthermore, results indicated in the table (3) showed that the multi-drug resistant was spread among the isolates of *S. pyogenes* as they give a different resistant pattern to antibiotics of different groups.

### Table 3: Pattern of antibiotic susceptibility of *S. pyogenes* to different groups of antibiotics

<table>
<thead>
<tr>
<th>Isolate symbol</th>
<th>Macrolides</th>
<th>Tetracyclines</th>
<th>Lincosamides</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AZM</td>
<td>CLR</td>
<td>E</td>
</tr>
<tr>
<td>H1</td>
<td>R</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>H2</td>
<td>S</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>H3</td>
<td>R</td>
<td>R</td>
<td>R</td>
</tr>
<tr>
<td>H4</td>
<td>S</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>H5</td>
<td>S</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>H6</td>
<td>R</td>
<td>R</td>
<td>R</td>
</tr>
<tr>
<td>H7</td>
<td>S</td>
<td>S</td>
<td>R</td>
</tr>
<tr>
<td>H8</td>
<td>R</td>
<td>S</td>
<td>R</td>
</tr>
<tr>
<td>H9</td>
<td>S</td>
<td>S</td>
<td>R</td>
</tr>
<tr>
<td>H10</td>
<td>S</td>
<td>R</td>
<td>S</td>
</tr>
<tr>
<td>H11</td>
<td>S</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>H12</td>
<td>R</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>H13</td>
<td>S</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>H14</td>
<td>S</td>
<td>R</td>
<td>S</td>
</tr>
<tr>
<td>H15</td>
<td>R</td>
<td>R</td>
<td>R</td>
</tr>
<tr>
<td>H16</td>
<td>S</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>H17</td>
<td>R</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>H18</td>
<td>S</td>
<td>S</td>
<td>R</td>
</tr>
<tr>
<td>H19</td>
<td>S</td>
<td>R</td>
<td>R</td>
</tr>
<tr>
<td>H20</td>
<td>R</td>
<td>R</td>
<td>S</td>
</tr>
<tr>
<td>H21</td>
<td>S</td>
<td>S</td>
<td>R</td>
</tr>
<tr>
<td>H22</td>
<td>S</td>
<td>R</td>
<td>R</td>
</tr>
</tbody>
</table>

AZM : Azithromycin; CLR : Clarithromycin; E : Erythromycin ; TE : Tetracycline ; DO : Doxycycline ; MI : Minocycline ; T : Oxytetracycline ; DA : Clindamycin ; L : Lincosycin ; R : Resistance; S : Sensitive
Results also showed that the isolate *S.pyogenes* H6 was resistant to all antibiotics used in this study (100%), while the isolates H14, H15, H19, and H22 were resistant to seven antibiotics (77.7%), then the isolate H8 who was resistant to six antibiotics (66.6%). Common bacterial pathogens can be resistant to all known antimicrobial agents; *Streptococcus* has special genetic elements structures called conjugative transposons. These structures can transport large-range of resistance genes and have the ability to capture other resistance elements to form composite structures allowing them to spread multi drug resistance between different bacteria [12]. To identify the resistance gene and resistance determinants a PCR-based approach by using specific Primers (ERMB1 and ERMB2). Results illustrated in figure (1) showed an amplified product of 639bp appeared after electrophoresis on agarose gel (2%), represents the presence of Tn917 conferring erythromycin resistance in many isolates of *S.pyogenes*, this result confirmed other study carried by Sutcliffe et al. [20] who detected Tn917 in *S.pyogenes* using the same primers. This transposable element was detected in five isolates of *S.pyogenes* out of the total isolates (22 isolate). All these isolates (H1, H2, H3, H4, and H7) were resistant to erythromycin as indicated in table (3).

![Figure 1](image-url)  
**Figure 1**: Amplification product for Tn917 conferring erythromycin resistance in *S. pyogenes* isolates after electrophoresis on agarose gel (2%) for 90min. Lane M: Ladder marker ; Lane (1-22): Bacterial isolates

In addition, results indicated in table (3) showed that there are another 15 isolates resistant to erythromycin symbolized H5, H6, H8, H9, H11, H12, H13, H14, H15, H16, H17, H18, H19, H21, and H22 which may that may possess a chromosomal or plasmid copy of the erythromycin resistance gene, or may the resistance caused by another structural erythromycin gene carried by other type of transposable elements rather than Tn917 in these isolates. Results also showed that there are two isolates of *S.pyogenes* (H10 and H20) were sensitive to erythromycin among the total isolates and were unable to grow on enrichment medium containing this antibiotic.

Nucleotide sequence of the amplified product of Tn917 was illustrated in figure (2). This sequence was 100% identical to the nucleotide sequence of Tn917 recorded in the NCBI database under the accession number M11180. Which supports the results concluded in this study that the five isolates of *S. pyogenes* are harboring chromosomal copies of Tn917 conferring erythromycin resistance. One possible explanation for the presence of genes at different isolates is due to erm gene, which was most likely located on Tn917 [21].
Figure 2: Nucleotide sequence of Tn917 fragment in S.pyogenes isolates

Acknowledgement

We render our special thanks to all doctors and paramedical staff in the hospitals referred to in this paper for their help, time and openness during data collection.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

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ABSTRACT

This study is the nucleus of an information and data base for scientific research trends in the field of physical education and sports sciences. “The process of surveying and publishing the research heritage is one of the first contributions in activating the scientific research movement and advancing the vision of researchers. This is not an easy matter. Scientific messages in the individual and differential games according to the specialties of the departments of the Faculty of Physical Education for Girls/Alexandria University for the period (2000 - 2017).

The research society and its sample included the letters of (Masters/PhD) for graduate students which were granted from the Faculty of Sports Education for Girls/Alexandria University for the period from (2000 to 2017) in the library of the college with a total of (941) M.Sc. After collecting the necessary data and analyzing them and conducting the appropriate statistical treatments on the sample of the study, the percentages of the number of scientific letters based on their directions and scientific sections were determined, the number of scientific thesis for the master’s program (612), while the doctoral program (329).

Keywords: Analytical study, individual and secondary games.

Introduction

The need for scientific research in the present time is more severe than ever before. The world is in a race and competition to reach as much accurate and fruitful knowledge as possible, which ensures the superiority of man over others. After realizing the importance of scientific research and the great role which he performs in progress and development, gave him much attention and provided him with all the requirements he needed as the mainstay of the economy and development.

The research carried out by universities and institutions of higher education plays an essential role in any country seeking advancement and advancement. Scientific research is one of the most important functions of the basic universities, which is the center of scientific innovation, the development of knowledge and enriching it and seeking to employ it in solving problems. The MA and PhD are not only research exercises, but are a scientific production and a real beginning for researchers coming, please innovation and innovation to contribute to the progress of science and human development and the accumulation of scientific knowledge of humanity.¹

The importance of documentation by the adoption of scientific research on what is a stock of information, and the use of this information and good use requires documentation and provision in a way that can be used in the inventory of problems and analysis and choice of solutions, and these documentation services are the pillars of scientific research and the reasons for success, it helps researchers to know what was published On the subject of their interest, and make them in constant

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contact and knowledge of all developments on the emergency and what is new.  

Despite the existence of the specialization of Physical Education at the University of Alexandria, which grants the Master’s degree and PhD several years ago, but there is no study on the documentation of scientific thesis in this specialty. Hence the idea of this study to highlight these thesis in order to know them and then to come up with proposals that would contribute to the development of a vision for a research map of these scientific thesis and accordingly contribute to guide future studies and research to the priority fields of research with the identification of areas that have not received attention. Sufficient. It is an attempt to document and analyze the master’s and doctoral dissertations. This study is an important workshop in the information cycle between those who produce it and those who need it. And analyze those trends with an attempt to interpret them. This study may be the nucleus of an information and data base for scientific research trends in the field of physical education and sports sciences. The process of surveying and publishing the research heritage is one of the first contributions to the revitalization of the scientific research movement and the development of insight among researchers.  

Research Aim  
The aim of the research is to analyze the trends of the scientific thesis in the individual and differential games according to the specialties of the departments of the Faculty of Physical Education for Girls/Alexandria University for the period (2000 - 2017).  

Research Methodology and Procedures:  
Research Methodology: The descriptive method was used by the researchers in a descriptive manner to suit the nature of the study.  

Society and sample research: The research society and its sample included the letters of (Masters/PhD) for graduate students which were granted from the Faculty of Sports Education for Girls/Alexandria University for the period from (2000 to 2017) in the library of the college with a total of (941) M.Sc.  

The number of letters of study in mathematics was (310) letters (Master/PhD), which represents a percentage of (32.94%). The number of scientific thesis in individual games (218) letters (Master/PhD), which represents a percentage of (23.18%).While the number of public letters sporadic (413) letters (Master/PhD), a rate of (43.88%). The research sample consisted of all the items of the study, ie the comprehensive survey, because it was based on the study of the research community. The following table shows the numbers and percentages.

Table 1: Shows the percentage of thesis and percentage according to the scientific sections in the Faculty of Sports Education for Girls Alexandria University for the period 2000 – 2017

<table>
<thead>
<tr>
<th>Scientific orientation</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difference Games</td>
<td>310</td>
<td>32.94 %</td>
</tr>
<tr>
<td>Individual Games</td>
<td>218</td>
<td>23.18 %</td>
</tr>
<tr>
<td>General</td>
<td>413</td>
<td>43.88 %</td>
</tr>
<tr>
<td>Total</td>
<td>941</td>
<td>100 %</td>
</tr>
</tbody>
</table>

Search procedures: The researchers conducted a comprehensive survey of all master’s and doctoral dissertations at the Faculty of Sport Education for Girls at Alexandria University, and a special table was prepared to prepare the students and their attitudes in the research according to the scientific departments in the college and the percentage of the period (2000 - 2017).

Results

Table 2: The distribution of the number of letters (master/doctorate) and their percentages according to scientific departments in the Faculty of Sports Education for Girls at Alexandria University for the period (2000 - 2017)

<table>
<thead>
<tr>
<th>Scientific department</th>
<th>Master Thesis</th>
<th>PhD Thesis</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sports Training Department</td>
<td>186</td>
<td>103</td>
<td>289</td>
</tr>
<tr>
<td>Percentage</td>
<td>64.36 %</td>
<td>35.64 %</td>
<td>100 %</td>
</tr>
<tr>
<td>Department of Curricula and Teaching Methods</td>
<td>106</td>
<td>78</td>
<td>184</td>
</tr>
<tr>
<td>Percentage</td>
<td>57.60 %</td>
<td>42.39 %</td>
<td>100 %</td>
</tr>
<tr>
<td>Department of Educational, Psychological and Social Sciences</td>
<td>59</td>
<td>44</td>
<td>103</td>
</tr>
<tr>
<td>Percentage</td>
<td>57.28 %</td>
<td>42.71 %</td>
<td>100 %</td>
</tr>
</tbody>
</table>
Table 3: Distribution of letters and directions for the games of the division according to the scientific sections and percentage in the Faculty of Sports Education for Girls, Alexandria University for the period (2000 - 2017)

<table>
<thead>
<tr>
<th>Scientific department</th>
<th>Sports Training Department</th>
<th>Department of Curricula and Teaching Methods</th>
<th>Department of Educational, Psychological and Social Sciences</th>
<th>Department of Health Sciences</th>
<th>Department of Sports Management</th>
<th>Recreation Department</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Football</td>
<td>N 37</td>
<td>N 7</td>
<td>N 12</td>
<td>N 5</td>
<td>N 6</td>
<td>N 1</td>
<td>67</td>
</tr>
<tr>
<td></td>
<td>% 35.57</td>
<td>% 12.96</td>
<td>% 70.59</td>
<td>% 45.45</td>
<td>% 54.55</td>
<td>% 78.82%</td>
<td></td>
</tr>
<tr>
<td>Volleyball</td>
<td>N 8</td>
<td>N 2</td>
<td>N 3</td>
<td>N 1</td>
<td>N 4</td>
<td>N 1</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>% 15.09</td>
<td>% 4.65</td>
<td>% 60</td>
<td>% 33.34</td>
<td>% 50</td>
<td>% 21.18%</td>
<td></td>
</tr>
<tr>
<td>Handball</td>
<td>N 20</td>
<td>N 11</td>
<td>N 12</td>
<td>N 2</td>
<td>N 2</td>
<td>N 2</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>% 19.23</td>
<td>% 10.57</td>
<td>% 11.76</td>
<td>% 18.18</td>
<td>% 100</td>
<td>% 63.16%</td>
<td></td>
</tr>
<tr>
<td>Basketball</td>
<td>N 12</td>
<td>N 15</td>
<td>N 2</td>
<td>N 9</td>
<td>N 2</td>
<td>N 1</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>% 22.64</td>
<td>% 18.60</td>
<td>% 20</td>
<td>% 36.84</td>
<td>% 44.23%</td>
<td>% 36.84%</td>
<td></td>
</tr>
<tr>
<td>Hockey</td>
<td>N 13</td>
<td>N 8</td>
<td>N 2</td>
<td>N 3</td>
<td>N 1</td>
<td>N 1</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td>% 12.5</td>
<td>% 14.81</td>
<td>% 11.76</td>
<td>% 27.27</td>
<td>% 66.67%</td>
<td>% 66.67%</td>
<td></td>
</tr>
<tr>
<td>Gymnastics</td>
<td>N 23</td>
<td>N 10</td>
<td>N 12</td>
<td>N 1</td>
<td>N 1</td>
<td>N 1</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>% 22.12</td>
<td>% 18.52</td>
<td>% 18.18</td>
<td>% 18.18</td>
<td>% 52.17%</td>
<td>% 52.17%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>N 612</td>
<td>N 329</td>
<td>N 941</td>
<td>N 103</td>
<td>N 157</td>
<td>N 105</td>
<td>941</td>
</tr>
</tbody>
</table>

Conted…

<table>
<thead>
<tr>
<th>Scientific department</th>
<th>Sports Training Department</th>
<th>Department of Curricula and Teaching Methods</th>
<th>Department of Educational, Psychological and Social Sciences</th>
<th>Department of Health Sciences</th>
<th>Department of Sports Management</th>
<th>Recreation Department</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department of Health Sciences</td>
<td>76</td>
<td>27</td>
<td>103</td>
<td>Percentage</td>
<td>73.78 %</td>
<td>26.21 %</td>
<td>100 %</td>
</tr>
<tr>
<td>Department of Sports Management</td>
<td>110</td>
<td>47</td>
<td>157</td>
<td>Percentage</td>
<td>70.06 %</td>
<td>29.93 %</td>
<td>100 %</td>
</tr>
<tr>
<td>Recreation Section</td>
<td>75</td>
<td>30</td>
<td>105</td>
<td>Percentage</td>
<td>71.42 %</td>
<td>28.57 %</td>
<td>100 %</td>
</tr>
<tr>
<td>Total</td>
<td>612</td>
<td>329</td>
<td>941</td>
<td>Percentage</td>
<td>66.24 %</td>
<td>33.76 %</td>
<td>100 %</td>
</tr>
</tbody>
</table>
Discussion of Results

The researchers attributed this preparation to the students' perception of the importance of postgraduate studies in human life at the present time. It is an important tool that leads to a distinguished future and opportunities to secure a source of earning and enjoying a higher status.4

The higher education is one of the important and advanced stages of the educational ladder. The university is the institution through which higher education, especially the postgraduate stage, is scientifically prepared to become highly qualified. Needs of economic and social development.7 The superiority of the master's program in postgraduate studies in this college is also evident in terms of the number of scientific thesis. The researchers explain this superiority that the study of the Master in particular is a conclusive certificate in the life of the human being, it gives the university student many advantages that make it one of the most important goals after studying at the university.6

As for the superiority of the individual games to the individual games in the interest and orientation of postgraduate students, researchers explain that the reason for this is the popularity of the large enjoyed by these games in the communities, because of the enjoyment of the enjoyment of the mixture of competition and by all groups, in addition to not need most of those games. To the many tools and equipment. «Telephony games have been and still are the field of attracting viewers, practitioners and researchers to the events of these games of high development in the level of technical performance, skill and plan.»7

Table (3) shows the distribution of letters and their directions for the games according to the division of the scientific sections, and it became clear that the game of football came at the forefront of interest of graduate students and targeting them to research and study. The researchers attributed the reason to the nature of the game and its attractiveness and it is the most popular and popular sport, it is at the forefront of sports activities that swept the hearts of many fans. Therefore, researchers attribute this great interest by graduate students in this game is the ambition of the researchers to upgrade the level of this game locally and then simulate the level of Arab or global through the follow-up weaknesses and try to find solutions to them according to the scientific methods followed in a step to develop important rules to develop This game avoids random solutions.8

The results show that the track and race games ranked first in the scientific thesis, and the researchers attribute this progress to these games in the possibility of obtaining medals in tournaments by the number of Less players as well as they include more effectiveness and do not need many tools to practice.

In terms of the scientific departments found in the college, the results showed in Table (2) of the distribution of Master’s and PhD thesis according to the departments. The sports training section was in the forefront of the interests and orientations of postgraduate students among the rest of the departments. The researchers attribute this interest to the scholars' belief in the importance of science Sports training, and that the development of most sports is mainly due to specialists to the development of sports training methods. Given the certainty of turn as an important means of increasing productivity efficiency.9

It is clear from the above that there is a discrepancy between the students' desires towards the theoretical approach. A move away from proper planning leads to the lack of good space for all games to be covered and covered by research and development.10

The researchers attributed the reasons for the variation in trends among postgraduate students to the availability of the sample, the popularity of sports and their impact on the society, which is reflected in the possibility of providing playgrounds and tools for games, as well as the scientific specialties of the supervisors of the Faculty of Sports Education for Girls, Alexandria University, 2000 -2017 AD). In view of the presentation, analysis and discussion of the results of the survey of the variables of the research, the researchers were able to reach the results and information that would achieve the goal of the current study.

Conclusions

After completing the research procedures, the researchers reached the following conclusions:

1. The number of scientific thesis for the master’s program (612), while the doctoral program (329).

2. Different trends in sports, as the most detailed games dealt with research and study is the game of football, while the game of hockey ranked in the final trends. As for the individual games came track games and race in the forefront of individual games, while the game came wrestling last place.
3. The Department of Sports Training came in the forefront of the interests and attitudes of postgraduate students among the rest of the scientific departments in the college.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding

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Effect of Closure of Peritoneum on Early Postoperative Outcome and Operating Time During the First Cesarean Section

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ABSTRACT

Background: Effect of closure of parietal peritoneum during the first cesarean section on early postoperative outcome including postoperative pain, fever, wound infection, postoperative distension, regain of intestinal mobility and hospital stay days.

Objective: To compare closure versus non closure of parietal peritoneum during first cesarean section regarding operative time and early postoperative time.

Methodology: This was a prospective study conducted in Bint Alhuda teaching hospital in Thiqar on 200 patient who were get their first cesarean section in a time period between September 2018 to April 2019. The patients divided into two groups; closure group (patients group who underwent closure of parietal peritoneum), and non-closure group (patients who didn’t undergo closure and we compare between 2 groups regarding operative time and early postoperative outcome.

Results: Non closure of parietal peritoneum during the first cesarean section result in reduction of the mean operating time and better early postoperative outcome.

Keywords: first cesarean section; early postoperative; closure of peritoneum

Introduction

Cesarean delivery is defined as delivering the fetus through surgical incision made through the abdominal wall (laparotomy) and the uterine wall (hysterotomy) (1). The most common indication for primary cesarean section including labor dystocia, abnormal or intermittent fetal heart rate tracing, fetal malpresentation, multiple gestation and fetal macrosomia (2). Peritoneal closure is no longer recommended as it is associated with increased adhesion formation and may increase surgical time and postoperative hospital stay (3). Furthermore these surfaces reapproximate within 24-48 hours and can heal without scar (4).

In cesarean section complication such as fever, wound infection, postoperative pain and bleeding occurs more frequently than in normal vaginal delivery and these conditions effect the postnatal care of the newborn infant. Traditionally; suturing of parietal peritoneal layer in cesarean section have been done, but in many randomized clinical trials, this stage could be easily eliminated since it doesn’t increase the rate of morbidity (5-8).

Reasons noted for closure of peritoneum include restoring anatomy and re approximating tissue, reducing infection rate by reestablishing the anatomical barrier, decreasing wound dehiscence, reducing hemorrhage and minimizing adhesion. Reasons cited for non-closure of perineum include reduction of operative time, shortening of hospitalization, early return of bowel function, reduction in the risk of bladder adhesion following next cesarean section and immediate postoperative recovery. It would also reduce the number of stiches which is the preferred option given that the body responds to stiches as if they were a foreign material (7-9).

Postoperative pain can cause unpleasant psychological responses including retention of secretion in respiratory system, ileus, increase need for analgesia, increase postoperative hospital stay and delay breast...
feeding. Reduction of postoperative pain may improve mothers comfort and eventually the outcome of newborn infant. Therefore reduction of pain and use of fewer analgesics while still providing more comfort for patients is one of the important issues following cesarean section.

A series of studies evaluated the effect of leaving the peritoneum open and compared it with closure after cesarean section. Some studies reported lower incidence of postoperative febrile morbidity, shorter hospital stay and as early return of bowel function following non-closure of peritoneum compared to closure (7,9).

Other studies have not showed significant difference about wound infection, postoperative febrile morbidity and stay in hospital in hospital (10,11).

Patients and Method

This is a prospective study conducted at Bint Alhuda teaching hospital during the period from September 2018- April 2019. The study performed on 200 women who underwent primary lower segment cesarean section.

Inclusion Criteria: Patients underwent primary cesarean section for obstetrics causes.

Exclusion Criteria:

- Any previous abdominal surgery.
- Medical disorders e.g.; diabetes mellitus, hypertension, heart disease, renal disease, and hepatic disorders.
- Any febrile morbidity before the cesarean section.

The same technique was performed in all cesarean section operations. All surgeries done under general anesthesia. Pfannestiel incision followed transvers lower segment uterine incision that was closed in two layers using continuous absorbable suture (Vicryl No 2). Both layers of peritoneum were not closed in group 1 (100 patients) and was closed in group 2 (100 patients) using continuous absorbable sutures (Vicryl No 0). The rectus sheath closed by non-absorbable sutures (Nylon No 1) while the subcutaneous tissue sutured using continuous absorbable sutures (Vicryl No 1) and the skin closed using subarticular suture (Nylone No 0) and the time of operation was recorded.

All patients received the same intra operative prophylactic antibiotics (ceftriaxone vial 1gm I.V. and metronidazole vial 500mg), the dose repeated every 12 hours for 48 hours. The patients were followed up in the hospital for 24 hours and routinely discharged after 24 hours.

The patients divided were divided into 2 groups as follow:

Group 1: 100 women performed a lower segment cesarean section with non-closure of visceral and parietal peritoneum.

Group 2: 100 women performed lower segment cesarean section with closure of parietal peritoneum.

Postoperatively the patients the patients followed up by

- vital signs
- abdominal laxity
- uterine contraction
- vaginal bleeding
- Operative time
- Postoperative pain (Postoperative pain was roughly measured by the need for postoperative pain killers).
- Postoperative fever: temperature more than 38 degree C.
- Intestinal movement was assessed by hearing of bowel sound by stethoscope at right iliac fossa (ileocecal junction).
- Postoperative hospital stay.

Results

Comparative analytic study between the 2 groups was carried out regarding

- Operative time
- Need for postoperative pain killer
- Postoperative fever
- Return of intestinal movement
- postoperative hospital stay

Table 1: Operative time comparison in both groups

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean operative time (minutes)</th>
<th>SD</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non closure</td>
<td>20.54</td>
<td>2.062</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>closure</td>
<td>25.62</td>
<td>2.156</td>
<td>Very significant</td>
</tr>
</tbody>
</table>
The time of operation is significantly lower in non-closure group as indicated by P value and standard deviation.

Table 2: Pain killer need in both groups

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean tramadol dose (mg)</th>
<th>SD</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non closure</td>
<td>200</td>
<td>33.232</td>
<td>&lt; 0.005</td>
</tr>
<tr>
<td>closure</td>
<td>300</td>
<td>37.607</td>
<td></td>
</tr>
</tbody>
</table>

It shows that the administration of postoperative pain killer was significantly higher in closure group.

Table 3: postoperative fever in both groups

<table>
<thead>
<tr>
<th>Fever</th>
<th>Non-closure</th>
<th>Closure</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>No %</td>
<td>5 (10%)</td>
<td>8 (16%)</td>
<td>0.243</td>
</tr>
<tr>
<td>Max. temperature</td>
<td>38.4 (+ - 0.1)</td>
<td>83.3 (+ - 0.2)</td>
<td>0.875</td>
</tr>
</tbody>
</table>

This table shows that that the postoperative febrile comorbidity not significantly differ between the two groups.

Table 5: Postoperative bowel motion in both groups

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean hours for intestinal motion</th>
<th>SD</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-closure</td>
<td>21.08</td>
<td>0.536</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>closure</td>
<td>27.71</td>
<td>0.695</td>
<td></td>
</tr>
</tbody>
</table>

This table shows very significant association between non-closure and early return of bowel motion.

Table 6: Postoperative hospital stay in both groups

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean postoperative hospital stay</th>
<th>SD</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-closure</td>
<td>1.0</td>
<td>0</td>
<td>1.000</td>
</tr>
<tr>
<td>closure</td>
<td>1.0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

As showed in the table there is no significant difference between both groups regarding postoperative stay

Discussion

When the parietal peritoneum left non closed in primary cesarean section there was reduction in operative time and postoperative pain with no difference in the incidence of pyrexia and postoperative duration of hospital stay (12).

In hospital based interventional study done by Avantika Sharma, Nupur Hooja, Apoorv Shastri, Brijesh Dadhich and Richa Manish in a tertiary care hospital over they found that if parietal peritoneum left open in primary cesarean section lead to less postoperative pain, the duration of surgery is less resulting in better patient outcome. This is also significantly cost effective (13).

When the mean duration of surgery is less this reduces the duration of anesthesia and exposure of wound to external environmental contamination, thus reducing risk of anesthetic complication, wound infection and thromboembolic complication (14).

There was improved short term postoperative outcome if the peritoneum was not closed (15). On other hand there are studies showed that closure of peritoneum protect against adhesion formation (16).

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

REFERENCE


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Doppler Finding in Renal Parenchymal Disease Correlated with Histopathological Finding

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ABSTRACT

A study was conducted between 1st Dec – 2016 to 1st Oct- 2017 at radiological department of Al Shaheed Ghazi Hospital in the renal disease and transplantation center (Baghdad Medical city complex) 84 patient who are suffering from renal disease manifestation in both native and transplanted kidneys. Doppler blood indices (RI, PI and AT) were measured at same day before renal biopsy. Renal biopsy finding and Doppler blood indices were compared to asses’ whether there were a correlation between chronic renal changes and the Doppler indices changes.

RI, was significantly higher in patients group with renal diseases in comparison to control group (0.70 ± 0.07vs. 0.55 ± 0.04), the accuracy was 72.9%, while PI and AT show less significant changes PI was (1.61 ± 0.25vs. 1.47 ± 0.06) and AT (0.086 ± 0.023vs. 0.024 ± 0.058). PI accuracy was 59.9 % and for AT was 54.2%. as consequence the mean value of RI was significantly differed among different renal pathologies (p=0.001) but the PI and ACT were not differed significantly (p<0.05 for both).

Conclusions: Our results suggest that Renal Doppler indices (RI) was significantly increased in patients with chronic renal disease which confirmed by pathological examination and higher accuracy than other indices PI and AT so we can use it as good marker for chronic renal disorders while other indices (P.I and A.T) can use as complimentary.

Keywords: histopathological finding ; renal disease Doppler; disease

Introduction

Gray –scale renal ultrasonography (US) is still performed as a matter of course during the initial evaluation of both native and transplanted renal dysfunction(1). Despite major technological advance, gray –scale renal (US) has remain largely unchanged since the 1970s (2). Ultrasonography finding are often normal in spite of the presence of sever renal dysfunction in some cases (3). it is not always possible to distinguish between obstructive and non-obstructive pelvicaliectasis on the basis of gray-scale alone(4).

Doppler ultrasound obviates the need for ionizing radiation and intravenous contrast material administration in situations in which they may be undesirable, such as pregnancy, allergy and renal insufficiency (5).

Doppler ultrasonography examination of vascular structure is a fundamental diagnostic technique in determine changes and pathology in these vascular organs. Doppler ultrasonography examination of the kidney, as particularly highly perfused organ(6).

Four major indices are used in clinical practice: the Systole-Diastole(S/D) ratio, the pulsatile index (PI), acceleration time (AT) and the Resistive index (RI) (7,8).

They are also used for analysis of pathological blood flow pattern and may possibly be used to discriminate among various pathophysiological conditions of the kidney. Resistive index is more widely used than S/D ratio, AT, and PI(7).

The rationale of choosing these topics because Renal Doppler ultrasound is increasingly used in our practice for assessment of renal parenchymal diseases
as investigation and for evaluation of Reno vascular disease and allograft

Dysfunction so we need to compare intra renal Doppler indices measurement to biopsy findings

**Aim of the study:** To see how much Doppler useful in assessment renal parenchymal disease and allograft dysfunction compared to renal biopsy and could be good alternative method in patient refuse biopsy or contra indicated to it.

**Subject and Method**

An observational cross sectional study performed from 1st Dec – 2016 to 1st Oct- 2017 at the radiological department of nephrology and transplantation center (Baghdad Medical city complex).

A convenient sample of 84 subject with age ranged from 12 to 65 year (83 female, 51 male), 50 normal control (group A) and 84 patients with renal parenchymal disease (group B), 14 from (84) patients have allograft dysfunction post kidney transplantation surgery.

Full information are taken from all patients through well-developed questionnair

Inclusion criteria include all patients who referred to do renal biopsy as part of their diagnostic maneuver for renal problem Ex (generalized body edema, resistant hypertension, increase serum creatinine and proteinuria without definite diagnosis and the previously B-mode exam not demonstrate any clear pathology,

Patients who are excluded from study include those who are contra indicated for renal biopsy either due to low GRF less than 30 ml/min,or malignant hyper tension that exceed systolic 20 hg and diastolic of more than 14 hg,or small size kidney.

A real-time ultrasound device with color Doppler capacity using (Philips HD 11XE – DS) to estimate both B-scale and Doppler measurement, by trans abdominal approach in supine and oblique positions. All. After taking the reading the ultrasound system parameters will calculate RI, PI, AC time automatically. We use a single measure of each indices for each patient as average of both kidney, Then the patient sends to small theatre room in same day in order to taking renal biopsy

**Statistical Analysis:** Discrete variables presented using there number and percentage, chi square test used to analyze the discrete variable, two samples t test used to analyze the differences in means between two groups (if both follow normal distribution with no significant outlier), while one way ANOVA used to analyze the differences between more than two groups (if they follow normal distribution with no significant outlier) after that in the results is significant post Hoc Tukey test used to find which pair is significant. Receiver operator curve used to see the validity of different parameters in separating active cases from control (negative cases) and area under the curve i.e. AUC and its p value prescribe this validity (if AUC ≥ 0.9 mean excellent test, 0.8 – 0.89 means good test, 0.7 – 0.79 fair test otherwise unacceptable). Trapezoidal method used for calculate the curve. In a ROC curve the true positive rate (Sensitivity) is plotted in function of the false positive rate (100-Specificity) for different cut-off points. Each point on the ROC curve represents a sensitivity/specificity pair corresponding to a particular decision threshold.

A test with perfect discrimination (no overlap in the two distributions) has a ROC curve that passes through the upper left corner (100% sensitivity, 100% specificity). Therefore the closer the ROC curve is to the upper left corner, the higher the overall accuracy of the test

**Results**

Table 1: Demographic data of studied groups

<table>
<thead>
<tr>
<th>Variables</th>
<th>Patients</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>84</td>
<td>50</td>
</tr>
<tr>
<td>Age (years), mean ± SD</td>
<td>31.4 ± 13.7</td>
<td>30.1 ± 13.5</td>
</tr>
<tr>
<td>BMI (kg/m2), mean ± SD</td>
<td>28.7 ± 4.4</td>
<td>28.4 ± 3.4</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female, no. (%)</td>
<td>51 (60.7%)</td>
<td>33 (66.0%)</td>
</tr>
<tr>
<td>Male, no. (%)</td>
<td>33 (39.3%)</td>
<td>17 (34.0%)</td>
</tr>
<tr>
<td>Smoking, no. (%)</td>
<td>24 (28.6%)</td>
<td>12 (24.0%)</td>
</tr>
</tbody>
</table>

RI, PI and AT all are significantly higher in patients with renal diseases in comparison to control as illustrated in table 2
Table 2: Assessment of renal Doppler indices between patients and control

<table>
<thead>
<tr>
<th></th>
<th>Patients</th>
<th>Control</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>84</td>
<td>50</td>
<td>-</td>
</tr>
<tr>
<td>RI, mean ± SD</td>
<td>0.70 ± 0.07</td>
<td>0.55 ± 0.04</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>PI, mean ± SD</td>
<td>1.61 ± 0.25</td>
<td>1.47 ± 0.06</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>AT, mean ± SD</td>
<td>0.076 ± 0.023</td>
<td>0.024 ± 0.018</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Receiver operator characteristics (ROC) used to assess the validity of Doppler study; RI show good ability to predict renal parenchymal disease which is higher than PI and AT, indicating it is the best predictor for renal parenchymal disease, as illustrated in figure 1 and 2.

The sensitivity, specificity, accuracy, positive predictive value and negative predictive value of RI was higher than PI and AT as seen in table 3.

Table 3: Validity of renal Doppler indices to predict parenchymal diseases

<table>
<thead>
<tr>
<th></th>
<th>SN</th>
<th>SP</th>
<th>AC</th>
<th>PPV</th>
<th>NPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>RI</td>
<td>78.6%</td>
<td>70.0%</td>
<td>72.9%</td>
<td>68.3%</td>
<td>65.9%</td>
</tr>
<tr>
<td>PI</td>
<td>69.3%</td>
<td>61%</td>
<td>59.9%</td>
<td>61%</td>
<td>51.8%</td>
</tr>
<tr>
<td>AT</td>
<td>58.8%</td>
<td>59.0%</td>
<td>54.2%</td>
<td>58.1%</td>
<td>50.1%</td>
</tr>
</tbody>
</table>

SN: sensitivity, SP: specificity, AC: accuracy, PPV: positive predictive value, NPV: negative predictive value

Figure 1: ROC curve of RI to predict disease Figure 2: ROC curve for all renal Doppler indices

The finding showed there was positive correlation between RI and hypertension of the patient but no correlation reported with age status as seen in table 4.

Table 4: Assessment of renal Doppler parameters according to renal parenchymal disease

<table>
<thead>
<tr>
<th>Pathology</th>
<th>RI</th>
<th>PI</th>
<th>ACT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mesangial hypercellularity</td>
<td>0.69 ± 0.06</td>
<td>1.64 ± 0.27</td>
<td>0.071 ± 0.015</td>
</tr>
<tr>
<td>Membranous glomerulopathy</td>
<td>0.74 ± 0.06</td>
<td>1.52 ± 0.19</td>
<td>0.069 ± 0.021</td>
</tr>
<tr>
<td>Minimum change disease</td>
<td>0.70 ± 0.07</td>
<td>1.42 ± 0.17</td>
<td>0.068 ± 0.018</td>
</tr>
<tr>
<td>Segmental glomerulosclerosis</td>
<td>0.69 ± 0.06</td>
<td>1.68 ± 0.24</td>
<td>0.071 ± 0.023</td>
</tr>
<tr>
<td>Lupus glomerulonephritis</td>
<td>0.71 ± 0.05</td>
<td>1.57 ± 0.29</td>
<td>0.070 ± 0.021</td>
</tr>
<tr>
<td>Chronic rejection</td>
<td>0.79 ± 0.07</td>
<td>1.55 ± 0.23</td>
<td>0.074 ± 0.025</td>
</tr>
<tr>
<td>Acute rejection</td>
<td>0.74 ± 0.06</td>
<td>1.61 ± 0.24</td>
<td>0.078 ± 0.028</td>
</tr>
<tr>
<td>Interstitial nephritis</td>
<td>0.72 ± 0.07</td>
<td>1.71 ± 0.32</td>
<td>0.076 ± 0.026</td>
</tr>
<tr>
<td>p-value</td>
<td>&lt;0.001</td>
<td>&lt;0.223</td>
<td>&lt;0.225</td>
</tr>
</tbody>
</table>
Discussion

Doppler study done for both groups, we found that all group (A) was totally normal indices, while Doppler indices of patients (the group B) who have histopathological diagnosed of renal parenchymal disease show significant correlation with R.I were the sensitivity of R.I was 78.6% and less significant correlation with other 2 indices, P.I were the sensitivity was 69.3 % and sensitivity of A.T.was 58.8%

The positive predictive value of elevation R.I in renal parenchymal disease was 68.3%, and the negative predictive value was 65.9% made the resistive index have agood value in predict renal parenchymal disease while the other indices, P.I and AT with their PPV 61 %, 58 % and NPV 51.8%, 50.1% respesctively made them less accurate in prediction to renal parenchymal diseases.

Series of articles published from the University of Michigan, patients with isolated glomerular disease had normal R.I, where subject with vascular or interstial disease had elevated R.I value\(^9\), finding compatible with our study results

Authors Sugiura T et al \(^{10}\), Study by Mostbeck G H et al \(^{10}\), confirmed the same correlation (our study).

A However our result are not consistent with the finding of another study that conducted by ;Ikee R et al \(^{11}\) which not proved the correlation of Doppler ultrasound indices with chronic renal diseases.

Hypertension and age are two well-known factors that influence renal resistance\(^{12}\). In our study, age represent an independent factor of increased R.I; but it may cause RI to be within normal in young age, conversely, hypertension showed mild influence on renal resistance and R.I in study of

Ikee et al. \(^{4}\) who demonstrated that increase R.I may be attributed to vascular lesion and systemic hypertension. The authors Mostbeck G H et al \(^{4}\) and Riehl J et al \(^{6}\) linked the changes in RI to aging process rather than to renal disease.

Galesic K et al study show that RI can provide diagnostic information in several renal diseases\(^{13}\) where The RI value exceeding 0.80 is associated with a reduced likelihood of improved renal function after the correlation of renal artery stenosis and The RI value exceeding 0.80 is also associated with poor allograft survival after renal transplantation \(^{14}\). RI increases in diabetic nephropathy when the kidneys start to shrink and micro albuminuria occurs \(^{15}\).

In a study parbahar mr et al (showed that RI allowed the early identification of patients with chronic tubulointerstitial nephritis \(^{16,17}\). Doppler ultrasonography, providing information about tubulointerstitial and vascular lesions, should predict renal prognosis \(^{18}\).

Conclusion

In our study we find a good relation for ultrasound Doppler indices which are the resistive index, pulsatility index and less significant acceleration time with changes in renal vascularity that occur in renal parenchymal diseases correlated with histopathological result. the segmental glumeriolosclerosis was the higher percentage (38% of patients) and the interstitial nephritis had the lower percentage (6.%) of patients.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

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Changes in Freet3;T4 Thyroxine and Thyrotropin in Hemodialysis and Non-Dialysis Chronic Renal Failure Patients

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ABSTRACT

The metabolism, degradation and excretion of thyroid hormones is associated with renal function. The study was aimed to evaluate the serum urea, creatinine and thyroid function in hemodialysis and non-dialysis patients. The levels of creatinine increased in non-dialysis. T3, FT3 and FT4 decreased in hemodialysis chronic renal failure, but T4 and TSH were within normal values.

Materials and Method: The serum urea, creatinine, (TT4), (FT4). (TT3), (FT3) and Thyrotropin (TSH) levels were estimated in serum 60 subjects with hemodialysis and non-dialysis in Baquba Teaching Hospital. They were divided into 2 groups as : Group 1 Containing 30 hemodialysis subjects (15 males, 15 females) and Group 2 containing 30 non-dialysis patients(15 males,15 females). The levels of urea were measured by Urea- Kit called end point enzymatic method of urea concentration. Creatinine levels were measured by using creatinine kit methods.

Results: Hemodialysed subjects showed significant (P< 0.05) reduction in T3, FT4, FT3 and creatinine in comparison with non-dialysis subjects group. While Urea, TT4 and TSH values showed non significant difference (p>0.05).

Conclusion: Total thyroxine and TSH don’t effected in both groups of subjects.

Keywords: Chronic renal failure(CRF), Thyroid hormones

Introduction

CRF is a more slowly disease of the renal function progressing upon a period of months and years (1). The disease is characterized by lower glomerular filtration rates (GFR) and special modified treatment of renal system such as dialysis is recommended for its treatment. (2). The rate of CRFoccurrence involved 1 of every 5000 and impacts middle-ages with older people mostly (3). The kidneys has many functions in the metabolism, degradation and thyroid hormones excretion with related substances (4). The most commonly abnormality recorded is low serum FT3 level. Generally, thyroxine levels were normal or slight reduced in dialysed subjects (5,6). Subjects with of CRF always show clinical signs suspected of thyroid dysfunction, such as dry pale skin, reduce temperature, intolerance for coldness, reduced basal metabolic rate, inactivity, exhaustion and edema. Many studies of of uremic subjects for thyroid functions showed different conflicting results. Hyperthyroidism, hypothyroidism and euthyroid condition were recorded by many researchers (7). Serum (T3) levels were recorded to be reduced with CRF. Serum total and Free thyroxine levels were seen may be low, normal or elevated. Serum (TSH) levels were noticed to be normal in overall subjects of CRF characterized by low T3 levels. (8). CKD impacts the hypothalamus -pituitary thyroid axis and circulatory thyroid hormone. Low T3 is found in subclinical hypothyroidism common thyroid dysfunction in CKD subjects (9). Levels of TSH are usually normal (8,10). In CRF there is an continuous high decline in (GFR) which leading to the accumulation of urea, creatinine and other substances in the blood. GFR less than 15 mL/minute as stage five of CKD (11). Serum creatinine level in men is more than 5.0 mg/dl in stage five, and in women more than 4.0 mg/dl (12). Hypertensive state causes renal failure affecting renal blood vessels, may further increased the blood pressure eventually leading to ESRD (13,14).
Materials and Method

60 patients (30 men and 30 females) with CRF were included in this study. Their ages ranged from 20 to 50 years. A full clinical evaluation was performed in those subjects including history of disease and physical examinations. This evaluation revealed that all the subjects have no history of thyroid dysfunction and with different stages of chronic renal failure were involved in this work. 30 subjects who suffering renal failure hemodialyzed regularly and 30 subjects with conservative managements (non-dialysis). Requested 5 ml of blood were drawn from anterior cubital vein and were used to estimate serum FT4 and total thyroxine (TT4), Free and total triiodothyronine (TT3), TSH, urea and creatinine. Urea levels were measured by standard methods Urea-Kit.\(^{(15,16)}\).

Creatinine kits were used for creatinine estimation, creatinine in alkaline solution reacts with picrate to form complex color\(^{(17)}\). Thyroid hormones were estimated by radio immune assasy techniques by hormonal Kit provides by BioMerieux, France.\(^{(18)}\)

**Statistical Analysis:** Data procession software package was used SPSS 20. Information were expressed (M ± SE). The means difference of two groups analyzed by t-test; the significance was tested at two-tail P value. The P<0.05 value of differences considered significant.

**Results**

Table (1) shows results: Urea did not show any different significant (p>0.05) between non-dialysis and in hemodialysed subjects (23.28 ± 1.52 mmol/l; 23.10 ± 1.59 mmol/l) respectively. Creatinine levels reduced significantly (p<0.05) in hemodialysis subjects (297.93 ± 31.44) in comparison with non-dialysis subjects (350.166 ± 37.03µmol/l). T3(Figure1), FT4(Figure2) and FT3 (Figure3) decreased significantly in hemodialysis patients (0.63 ± 0.56 nmol/L; 9.44 ± 0.35 nmol/L and 2.32 ± 0.17 nmol/L) when compared with non-dialysis patients (0.86 ± 0.06 nmol/L; 10.87 ± 0.56 nmol/L and 2.99 ± 0.127 nmol/L) respectively. T4 and TSH showed no any different significant (p>0.05) between two groups (82.52 ± 4.29 nmol/L and 2.29 ± 0.42 mlu/ml) in non-dialysis and (82.39 ± 4.49 nmol/L and 2.03 ± 0.36 mlu/ml) in hemodialysis. As shown in table below.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Non-dialysis Mean ± SE</th>
<th>Hemodialysis Mean ± SE</th>
<th>t-Test</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>S. Urea (mmol/l)</td>
<td>23.28 ± 1.62</td>
<td>23.10 ± 1.95</td>
<td>0.940</td>
<td>0.36</td>
</tr>
<tr>
<td>S. Creatinine (µmol/l)</td>
<td>350.166 ± 37.03</td>
<td>297.93 ± 31.44*</td>
<td>0.041</td>
<td>0.01</td>
</tr>
<tr>
<td>T4 (nmol/L)</td>
<td>82.52 ± 4.29</td>
<td>82.39 ± 4.49</td>
<td>0.982</td>
<td>0.002</td>
</tr>
<tr>
<td>T3 (nmol/L)</td>
<td>0.86 ± 0.06</td>
<td>0.63 ± 0.56**</td>
<td>0.009</td>
<td>0.008</td>
</tr>
<tr>
<td>FT4 (nmol/L)</td>
<td>10.87 ± 0.56</td>
<td>9.44 ± 0.35*</td>
<td>0.036</td>
<td>0.008</td>
</tr>
<tr>
<td>FT3 (nmol/L)</td>
<td>2.99 ± 0.17</td>
<td>2.32 ± 0.17**</td>
<td>0.008</td>
<td>0.008</td>
</tr>
<tr>
<td>TSH (mlu/ml)</td>
<td>2.29 ± 0.42</td>
<td>2.03 ± 0.36</td>
<td>0.643</td>
<td>0.008</td>
</tr>
</tbody>
</table>

**Figure 1:** Shows the level of T3 in nondialysis and hemodialysis

**Figure 2:** Shows the level of FT4 in nondialysis and hemodialysis
Discussion

The regulating metabolism is done by thyroid hormones that affecting development, protein synthesis. Triiodothyronine (T3) and thyroxine (T4) are two hormones of thyroid gland. These hormones effecting significantly on renal disease that related to chronic kidney disease (CKD)\(^8\). CKD has been shown to affect the pituitary-thyroid axis and the peripheral metabolism of thyroid hormones. Reduce T3 concentrations found commonly in laboratory tests by subclinical hypothyroidism in CKD subjects. Gupta et al (19) as recorded in present research. Low T3 syndrome is the most common disturbance in CKD subjects. The decline of serum T3 levels in CKD subjects may be due to impaired conversion of T4 to T3 results from the reduction of iodothyronine deiodinase because of malnutrition and/or chronic metabolic acidosis. From other side the decline in conversion of T4 to T3 peripheraly comes from the low clearance of inflammatory cytokines like TNF-a and IL-6 had been reported in CKD \(^{20,21}\). FreeT3 and FT4 in our study showed a decline in HD group while T4 showed normal levels but Merza and Hasson,\(^{22}\) reported non significant difference. That Free and total T3 and T4 levels were usually normal or decrease in subjects of CRF \(^{23}\). Which their levels may be normal or little decline, from otherwise free T4 may be elevated caused by heparin effects used in anticoagulation during hemodialysis (HD), inhibiting T4 binds to its thyroid globulins\(^{24}\). Serum TSH levels are always normal as noticed in the present study. The present study suggest pituitary disturbances related to uremia \(^{22}\). Clinically the renal function is estimated by serum creatinine and the blood urea nitrogen (BUN).

The decline in the GFR caused by increasing in values of serum creatinine and urea nitrogen values in CRF \(^{27}\). The laboratory haemodialysis is used for kidney therapy\(^{30}\). In this technique urea, creatinine and free water removing from the blood. \(^{25, 26}\) From above definition the levels of Creatinine increased in HD group in comparing with non dialysis group that hemodialysis lower creatinine concentration. Hence;the evaluated pre-dialysis and post-dialysis referred to levels of serum renal biochemical markers in CRF patients to elucidate the impact of dialysis on CRF subjects. That urea and creatinine levels in serum showed a significant fall in post-dialysis group in comparison with the pre-dialysis group.\(^{23}\). The amount of creatinine in serum depends on their generation, GFR and it’s secretion by renal tubules of serum creatinine. It was measured about 2% of the body’s creatine is transformed into creatinine daily, causing proliferation of creatinine at (male: 20 to 25 mg/kg/day; female 15 to 20 mg/kg/day) \(^{28}\). Males revealed higher serum creatinine levels than females due to muscle mass. Our study included male and females.

Conclusions: Low T3 and Free T4 are seen in euthyroid chronic renal failure patients while TSH values within normal range. This normal TSH revealed functional euthyroid status in CRF.

Acknowledgements

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Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

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The Culture of Terrorism Da’ashi and its Implications on Iraqi Society Medical Anthropology Study

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ABSTRACT

The main theme of the research is the culture of terrorism and its implications in the Iraqi society - a study of medical anthropology in Tikrit. The most important cultural, social, psychological and health effects of the terrorist organization on the residents of Tikrit during the period of occupation. To reach the most important of these effects, and by staying in the study community for an appropriate period, and to reach important results.

Keywords: Culture, Terrorism, SIS, Society, Religious extremism.

Introduction

The concept of culture refers to the total social heritage of the human race. In other words, the history of culture is the history of man as a human being. For thousands of years it has passed through generations and in its transmission from generation to generation, some of its elements have been lost, Culture is the sum total of ways in which human beings live, moving from generation to generation through acquisition and learning. This culture has its historical political and religious roots. Wahhabism has spread various militant movements such as al-Qaeda in Afghanistan, which have taken Wahhabism ideologically and systematically.

III. Objectives of the study: The study aims to achieve the following:

1. Identify the cultural factors that led to the spread of Da'ash thought in some areas of Iraqi society.
2. To identify the manifestations and images of the Da'ash thought by studying the institutions that they created.
3. To recognize the social changes made by the Da'ash thought in some parts of Iraqi society that he controlled.

Fourth: Study Questions: The study’s questions are:

1. What cultural factors have helped to control the flourishing and spread of its culture in some of the parts of Iraq it occupied?
2. If there is a culture of Da’ash, what are the factors leading to this culture?
3. What are the images, forms and symbols of this extremist da’is culture?

First: Culture: British anthropologist Edward Taylor has defined a “culture” as a “culture” of the broader ethnological meaning, which is the composite of knowledge, beliefs, art, ethics, law, customs and all other abilities and customs acquired by man as a member of society.¹ Harry Shapiron «is» culture «as the whole of the manifestations of acquired behavior that are shown and practiced by individuals in a society of human societies.²
Second: Terrorism: Terrorism is a set of anti-social and anti-social motives and actions by individuals, groups or organizations with the aim of changing existing social systems in society, undermining political security within society and causing terror and intimidation to humanitarian units. (3)

Fourth: Religious extremism: Extremism is defined as a set of beliefs and ideas that transcend politically, socially and religiously. (4) Extremism is always linked to what is essentially intellectual. Extremism may refer to a context in which an individual produces or reshapes extremist ideas, as well as political ideologies that oppose the very essence of values and principles and reject democracy and human rights. (5)

Chapter Two: Reference Framework for the Study

The first topic: the theory of cultural communication:
The theory of cultural communication arose from some of the questions posed by the School of Culture and Personality. (6) The analysis is based largely on some isolated cultural features, despite the fact that the anthropologists of the School of Culture and Personality. (7) since culture is all integrated because culture is an organized and structured unit. (8) The selection of aspects that are supposed to be positive in a particular culture to be combined with positive aspects of another culture in order to reach a better cultural system, apart from the value judgments that raise a series of issues involved in this proposal, seems simply untenable On the other hand, there is a focus by some authors, (9) including “Hershkovitch” on what they call cultural survival, which elements of ancient culture, which can lead to a culture that leads to the continuity of culture despite the apparent changes. (10)

The second topic: the theory of functional structure: (Durkheim) in the writing of the “Preliminary Forms” refers to how members of society exert control over each other through religious beliefs and rites. (11) He also argues that the distinguishing characteristic of religion is the division of the world into two essentially opposing kingdoms: (12) the first containing all that is holy and the other containing all that is profaned. (13) After his analysis of religion in writing functionally, he tried to prove that the function of religion is to strengthen the bonds that bind the individual to the society to which he is a member. (14) Since the forms of practice and religious beliefs may vary, they achieve the same functions everywhere and specifically (Durkheim) used social phenomena and the distinctive concept of sociology should be the study of social phenomena. (15)

Chapter Three:

Terror in the city of Tikrit: The first topic: factors and the spread of thought Da’ashi in parts of Iraq. It has become the talk of “the preacher” is the modern world, but it is not a modern one. (16) but several conversations in several languages and dialects and not only that, but several perceptions based on several approaches and ideas, and all claims to be the right talk with most of them a modern building to think. (17) He says that the establishment of the foreign intelligence industry and supported by the state to achieve the interests, including the saying that it is an adult caliphate on the methods of prophecy. (18) which is the duty of allegiance to it, and there are those who believe that “” urged “century Kharij in this era, who said the Prophet. (19) The more they come out of them, the horn will be cut off until the antichrist comes out in the sight of them. (20)

This terrorist organization has carried out many terrorist operations in parts of Iraq. (21) In order to achieve sustainability, survival and expansion, the organization has adopted a dual-track strategy:

First: the expansion and expansion of the territory surrounding the areas controlled by Syria and parts of Iraq through its military capabilities. (22)

Second: global expansion and expansion must be achieved through the system of states in locations where jihadist movements, followers and supporters exist, to accept and accept the allegiance of other jihadist movements, and to motivate al-Qaeda groups to split; and to encourage different and independent jihadist groups to join an advocacy organization. (23)

1. genocide “Spyker massacre”: The massacre took place in Tikrit, Salah al-Din province, and this massacre took place after the capture of the Air Force students at Spyker Air Base in the Iraqis on 12 June 2014. (24) after the arrest of a preacher On Tikrit in Iraq and one day after their control of Mosul. (25) where they captured “2200-2000” student from the Iraqi Air Force and led them to the presidential palaces in Tikrit and killed them there and in other areas shot dead and some of them were buried alive, and have filmed
a supporter of the course of this massacre. (26) In which some of the clan members participated And some of the students succeeded in escaping to the area of science, which was steadfast at the time did not fall by the organization of an advocate of the terrorist until 24 June 2014. (27)

2. Recruitment: The recruitment of individuals that was followed by a call was based on the propaganda discourse of the organization of the state, which is based on direct action on the Internet, and the organization was closely linked to the speech of propaganda. (28) whether the speech images or evidence transferred through traditional and digital social media, as the organization knows well that The organization’s war is primarily a media war, in which it uses all available means to achieve its propaganda objectives. (29)

3. Persecution of the Yezidi minority: The Yezidi minority has been subjected to the most severe attacks on minorities in the history of the region, so that what is happening to them is called the genocide. (30)

The results of this terrorist act are an indication of the security breach and a violation of the military and security sectors. (31)

1. Explosive devices
2. Assassinations by light weapons
3. Demolition and detonation of the graves of the righteous
4. Stealing Antiquities. (32)

The third topic: The results of the culture of terrorism Da’ashi on parts of Iraq Da’ash’s organization represents an unprecedented threat to international peace and security. (33)

The organization has sought to advocate through a media strategy in achieving limited goals

1. Recruitment and publicity to attract large numbers of those interested in organizing.
2. To establish authority as the manifestation of power in northern Iraq and Syria by establishing it intellectually and juristically.
3. Support the armed organizations that are close to the organization intellectually and morally. (34)

The study reached the following results:

1. The results of the study showed that the sample of the study according to the sex variable of the respondents indicated that the highest percentage of males included their percentage (80%).
2. The results of the study showed that there are no cases of the imposition of a polygamous system for the respondents, and according to the percentage indicated (100%), which included all members of the total study community.
3. The results of the study show that those who do not force one of the girls to marry their Mujahideen, where they accounted for 60%.
4. The results of the study show the situation of those who do not force widows to marry their Mujahideen, and their percentage (60%).
5. According to the results of the study, there are no cases of female captivity, according to the percentage of the percentage (100%), which is the highest percentage of the total study community.
6. The results of the study showed that the sample of the study according to the imposition of men’s and women’s clothing, which represented all the sample that does not impose uniforms on clothes, and by (100%).
7. The results of the study show that the sample of the study according to the variable nature of the relationship between the terrorists and the public and the people, where the type of relationship is good, the proportion of (60%).
8. The results of the study show that if the relationship is good with terrorists, according to the opinion of the respondents, those who answered the index (fear of not giving them the freedom to work), and by (27%).
9. The results of the study show that it is difficult to tolerate some special things, Those who responded to the (no) index and (67.6%).
10. The results of the study show that the opinion of respondents who answered (no) not to give an opportunity for tolerance, and those who answered the index (the fact that the other parties have an intellectual and religious approach) by 25%.
11. The results of the study indicate that there is an important role for the weakness of the means of
social control, which works on the spread of the culture of terrorism Daheshi, while the proportion (69%).

12. The results of the study show that the private economic sources to finance the terrorist advocate, according to the respondents, who answered the index of all methods and methods, and by (80.6%).

13. According to the results of the study, the type of currency of the gangs of the supporter of the terrorist according to the opinion of respondents, a number of respondents answered the index (all types of currencies mentioned), and by (100%).

14. The results of the study show that the highest percentage (87.4%) is the highest percentage of the total sample, which supports the state monopoly of resources and good things lead to increase the culture of terrorism Da’ashi, and the lowest percentage was (12.6%) is the proportion of less than.

15. The results of the study indicate whether terrorists are forced to compel people to perform religious duties such as prayer. The highest percentage of those who responded to forcing terrorists to perform prayer duties was 92.2%, which indicates that the culture of terrorists.

Conclusion

There are many influences of a provocative occupation for parts of Iraq, including the intellectual impact, where this culture has planted the ideas of violence and atonement and the murdering among children and young people.

An important aspect of the culture of terrorism is the healthy a psychological impacts. This period of occupation has affected the spread of diseases among women, children and the elderly due to lack of food and health, as well as psychological diseases through the suffering of the people of the occupied territories.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

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The Effect of Using Competitive Exercise in Motor Fitness and Speed of Transition for Football Players (Junior Class)

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1Secondary Almithaq for Boys, Directorate of Education Province of Anbar, Ministry of Education, Iraq; 2The College of Physical Education and Sport Sciences, University of Anbar, Iraq; 3Department of Physical Education and Sports Sciences, Al Maarif University College, Iraq

ABSTRACT

The aim of the research was to identify the effect of competitive exercises in the special numbers stage on physical abilities such as motor agility and the transition speed of the emerging football players. The study assumed that there is a positive effect of competitive exercises on the research variables. The research was carried out on a sample of young players of the Ramadi football club for the 2018 sports season. The researchers used the experimental method for two equal groups.

The study found that competitive exercises had a positive effect on the development of motor fitness and the transition speed of football players. Competitive exercises in the special numbers stage because of their role in the development of search variables, so that the player to perform the skills of motor used throughout the match in the competition. The researcher concluded that the competitive exercises introduced and applied to the experimental group had an effective effect in the development of the physical variables of the members of the research sample.

Keywords: Competitive Exercise, Motor Fitness and Junior Class.

Introduction

The field of sports training is one of the areas that have witnessed the recent development of remarkable.... Every day is witnessing the development of a fast pace amazing both in terms of information on the numbers of the athlete or the results of these numbers, which appear in the achievement of athletes to high levels.

Football is one of the most popular games in the world. It is the reason for the high level of excitement and excitement that this game has. The complex nature of soccer with its physical, muscular, mechanical, planning and high skills requires skills and abilities. Especially to achieve a high level of performance during the time of the game and pressure affecting, so you need to make a great effort of the player throughout the game and a high ability to perform skill efficiently to face the tremendous development in the defense methods of the competing teams, as in the requirements of bribes The motor of the transition and the speed with which the players must be owned by the attackers or defenders.

One of the requirements of the development of football players is their numbers in many areas as any sport activity is determined by the general framework through skills, performance, space and the law of the game, and uses this development a similar development in ways of training the players to prepare their numbers in an integrated. Therefore, the researchers’ tendency to highlight the importance of their research in the experience of numbers of players in the stage of special numbers, using competitive exercises and knowledge of the impact on the agility and speed of the transition of football players.

Through the experience of researchers in the field of football and the fact that they are players and coaches in their field and by watching some of the club’s youth group games, the researchers noticed that there is a lack or
a clear failure in the training status and performance of the players in the team, especially when the opposing team to click on the team winning the ball command Which led to the formation of the burden and fatigue of physical and mental consumption of the ability and efficiency of the team, resulting in frequent mistakes of players during the course of the game and lack of focus in most of the times of the game and the performance. Therefore, the researchers decided to go into the experiment of introducing competitive exercises in the special numbers stage, which is similar to the cases of play and its impact on the members of the research sample.3

Research aims: Identify the effect of the use of competitive exercises in motor fitness and the speed of transition of football players (beginner’s category).

Hypothesis:

1. There are statistically significant differences between the results of the pre and posttests of the motor agility and the transitional speed of the control and experimental groups of the research sample.

2. There are statistically significant differences between the results of posttests in motor fitness and the speed of the transition of control groups and experimental football for the members of the research sample.

Research Methodology and Field Procedures:

Research Methodology: “The choice of the appropriate approach is determined by the nature of the research problem in order to reach the appropriate solutions within the assets of scientific research and on this basis the researchers used the experimental method (the two sets of control and experimentation with pre and posttests) because it is one of the most sufficient means to reach a reliable knowledge “.4

The research sample: The sample of the research consisted of the players of the football club Ramadi football season 2016/2017, the number of (37) players were chosen by the random method of irregular then divided into two groups by lottery, one control and the other pilot and the reality of (16) player for each group after the exclusion of the researcher Number of sample players for the purpose of homogeneity.

<table>
<thead>
<tr>
<th>Tests</th>
<th>Control group</th>
<th>Experimental group</th>
<th>(t)* calculated</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Running Zigzag(Fitness)</td>
<td>11.73</td>
<td>0.30</td>
<td>11.64</td>
<td>0.45</td>
</tr>
<tr>
<td>Running (60) meters (transition speed)</td>
<td>10.16</td>
<td>0.85</td>
<td>10.15</td>
<td>0.83</td>
</tr>
</tbody>
</table>

* The value of t (tabular) value (2.04) is below the level of significance (0.05) and the imam of freedom degree (16 + 16-2) = 30

Devices and tools used in the search:

1. Medical balance.
2. Measuring device length.
5. Legal football balls.
6. Burke for planning test areas.
7. Metric measuring tape.
8. Round hoops.
9. Arab and foreign sources.
10. Internet Information Network.
11. Tests and measurement.

Description of the tests used in the research:

Motor fitness test:5

Test Objective: Measure the ability to change direction while running (Fitness).

Tools: measuring tape, stopwatch, number 4 chairs, burke, registration form.

Procedures: Draw the starting line length of 1.80 m and thickness of 5 cm and four chairs will be placed in front of the starting line where the first barrier at a distance of 3.60 m of this line and the distance between each line and the last 1.80 m and determine the points on the ends of the beginning and end, Let it be (A, B).

Performance description: When the laboratory is given the starting signal starts running between the chairs in the form of (8) and then the laboratory revolves around the
last barrier, and continue running between the barriers in the same way the other end at the point (B).

Method of recording: Calculate the time taken and give the laboratory only one attempt, adding to the time it takes the laboratory 10/1 of a second only when touching any of the four chairs.

Transition speed test:*

Test Objective: Measure the transition speed of young footballers.

Tools and possibilities: yard or playground marked by distance (60 m) set with start and end line, stopwatch, pistol launch.

Method of testing: The player stands behind the starting line (high position), and when the start signal is heard, the player runs as fast as possible until he passes the starting line.

Method of registration: The player is counted as the time spent in the distance (60 m), and gives the player only one attempt.

Pilot study:

1. The first pilot study to test physical abilities:
   The first pilot experiment was conducted on Sunday (1/10/2018) on a sample of (4) players from the research community. The objective of the experiment was:
   - Ensure the validity of the devices and tools used.
   - The adequacy of the working group and their understanding of the work process.
   - Ensure that tests are easy to apply and suitability to the sample level.
   - Determining the time required for the tests.
   - Know the obstacles that may appear to avoid errors.

2. The second pilot experiment of competitive exercises: The researchers, with the help of the team coach, conducted an exploratory training unit on (4) players who are the same players of the first pilot experiment on Monday (2 - 10 - 2018)
   - Ensure that the training modules are implemented in a timely manner.
   - Ensure the times set by the researchers when conducting competitive exercises in the training module
   - To distribute work duties to the assistant working group and to determine the sequence of measurements and tests.

Field research procedures:

Pre Tests: The tests were carried out on the Ramadi football club, where the researchers tested the spatial and temporal conditions and the method of conducting the test and the auxiliary team. Achieve the same conditions as possible when performing post-tests.

The main experience (competitive exercises): The researchers prepared competitive exercises within the period of special numbers on some physical variables of the players of the youth category for the period of (8) weeks by forming (2-1) of the training units and by (3) training units per week and in the form (2-1) of the week’s where the length of the unit (60 - 90) minutes. The main section consisted of the competitive exercises prepared by the researchers and the share of the competitive exercises from the time of the training unit was (60) minutes. The researcher took care of the training level, age and physical and skill abilities of the research sample members, Owned M sports training as well as the opinions of specialists in football, where he began to implement the vocabulary of competitive exercises on Saturday (7 - 10-2018) and continued until Wednesday (29 - 11-2018).

Posttests: The researchers carried out post tests for the members of the research sample on Saturday (2 - 12 - 2018) following the same conditions and controls in the pre tests and the auxiliary team under the direct supervision of the researcher.

Results

View, analyze, and discuss results:

Table 2: The pre and posttest of the control group shows the motor agility and the transition speed

<table>
<thead>
<tr>
<th>Tests</th>
<th>Pretest Mean</th>
<th>Pretest SD</th>
<th>Posttest Mean</th>
<th>Posttest SD</th>
<th>Mean diff.</th>
<th>SD diff.</th>
<th>(t)* calculated</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Running Zigzag(Fitness)</td>
<td>11.73</td>
<td>0.30</td>
<td>11.28</td>
<td>0.16</td>
<td>0.43</td>
<td>0.23</td>
<td>8.6</td>
<td>Sig.</td>
</tr>
<tr>
<td>Running (60) meters (transition speed)</td>
<td>10.16</td>
<td>0.85</td>
<td>9.66</td>
<td>0.73</td>
<td>0.49</td>
<td>0.41</td>
<td>4.9</td>
<td>Sig.</td>
</tr>
</tbody>
</table>

* Value (t) Tabulated (2.13) below the level (0.05) in front of the degree of freedom (16-1 = 15).
Appears from the table (2) there is a significant difference between the pre-test results and posttest control group to test agility motor and transition speed in favor of the post test.

**Table 3: The pre-test and post-experimental test is constructed in motor agility and transient speed**

<table>
<thead>
<tr>
<th>Tests</th>
<th>Pretest</th>
<th>Posttest</th>
<th>Mean diff.</th>
<th>SD diff.</th>
<th>(t)* calculated</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Running Zigzag (Fitness)</td>
<td>11.64</td>
<td>9.80</td>
<td>1.83</td>
<td>0.58</td>
<td>13.07</td>
<td>Sig.</td>
</tr>
<tr>
<td>Running (60) meters (transition speed)</td>
<td>10.15</td>
<td>8.81</td>
<td>1.29</td>
<td>0.80</td>
<td>6.45</td>
<td>Sig.</td>
</tr>
</tbody>
</table>

*The value of (t) (2.13) is below the level of significance (0.05) in front of the degree of freedom (16-1 = 15).

Table (3) shows a significant difference between the results of the pre-test and the experimental group in the test of motor agility and the transition speed and for the benefit of the post-test.

**Table 4: Shows the results of the post-test of the control and experimental groups in motor agility and transient speed**

<table>
<thead>
<tr>
<th>Tests</th>
<th>Control group</th>
<th>Experimental group</th>
<th>(t)* calculated</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Running Zigzag (Fitness)</td>
<td>11.28</td>
<td>0.16</td>
<td>9.80</td>
<td>0.54</td>
</tr>
<tr>
<td>Running (60) meters (transition speed)</td>
<td>9.66</td>
<td>0.73</td>
<td>8.81</td>
<td>0.40</td>
</tr>
</tbody>
</table>

*The value of t (tabular) (2.04) below the level of significance (0.05) in front of freedom degree (16 + 16-2 = 30)

The table shows (4) there is a significant difference in the results of the post tests of two experimental and control in agility motor and transition speed for the benefit of the experimental group, which showed the value of (t) calculated and both tests is greater than the value of (v) Tabulated at the level (0.05) and the degree of freedom (16 + 16-2 = 30).

**Discussion of Results**

The results showed that there were significant differences in both the pre and post tests for both groups. This indicates the positive effect of both methods. The control group used in its distance learning method To acquire fitness elements, and the experimental group that used competitive exercise to acquire fitness elements, as demonstrated by the search results. “Organized physical training develops public and private fitness. It gives the player agility, flexibility, mobility and durability, and gives them plenty of fun”.

Table (3) shows that the experimental group was better than the control group in the development of fitness and speed, which resulted from competitive training, which included a set of competitive exercises that correspond to the real competition conditions of the game. Competitive training is of great importance at the end of the special number stage. These exercises are an important place in training and are increasingly influenced by the use of other training methods. At the same time, in the exercise of competition exercises, all aspects of the athlete’s training situation are clear and cannot be replaced by any means other training, especially during the direct construction phase of the sportswear “.

Therefore, the exercises used close to the direct activities of the competitions, and the use of methods and methods of training are in a manner that leads to the establishment of rules that lead to the development of physical qualities of the specific and directly determine the success of competitions.

**Conclusions**

1. The use of competitive exercises in the stage of the number of young footballers has a positive impact on the development of motor agility and the speed of transition, as shown by the results of the research.

2. The results show that there are significant differences between the pre and posttest of the control group in motor agility and transition speed.
3. The results of the pre-test and post-test experimental group in motor agility and transient speed show that there are significant differences

4. The results showed that there were significant differences between the post-test of the control and experimental groups in motor agility and transition speed.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding

**REFERENCES**


Effectiveness of Electromedian Exercises to Develop Visual Attention, Perception of the Environment and Reaction of Football Players

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\(^1\)The College of Physical Education and Sport Sciences, University of Al-Qadisiyah, Iraq

ABSTRACT

The research and the importance of the research included: The importance of mental abilities in the field of physical education in general and football in particular. The research problem was to identify the possibility of electro-exercise in the development of visual attention and awareness of the environment and reaction to football players. The goal of research is

The aim of the research is to use electromedian exercises to develop visual attention, awareness of the environment and reaction to football players.

The imposition of research is

There were statistically significant differences in favor of the group using electro medians exercise.

The fields of research were:

1. Human Field/Clubs Players of Qadisiyah Governorate
3. The spatial field/the laboratory of sports psychology and the football field in the Faculty of Physical Education and Sports Sciences - University of Qadisiyah

The research method and its field procedures were also used. The researchers used the experimental method and discussed the sample of the research, which are football players in the clubs affiliated with Qadisiyah Governorate, and discussed the tools used in the research, the testing used and the statistical means.

The results of the research were presented and discussed in the form of tables and then discussed, conclusions and recommendations were the most important

Conclusions: There is an evolution of the post tests of both control and experimental groups.

Keywords: Electromedian exercises, visual attention and reaction.

Introduction

Modern technology has been introduced in all areas of life, especially in the field of psychology, as many systems have been developed to measure and develop psychological and mental abilities such as the testing system, the Cogni Plus system, the Rihacom system and others. Some of the systems allocated tests that athletes can use such as Veena sport. This interest in mental abilities and how they are measured and developed as a result of the development of the players’ abilities and their physical and technical abilities, which required them to develop their mental abilities to keep pace with the speed of the game. One of the capacities that the system has been concerned with is attention in all its forms. “The independence of the psychological factors and the abilities of each other is a fundamental pillar in dealing with all variables that affect attention”.\(^1\)

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The system also focused on the cognitive variable and its types, including the perception of the ocean, which is characterized by “the process in which the stimuli are organized or is the awareness of the ocean and the absorption of relations between the parts of the situation in the ocean.” Hence the importance of research in harnessing the electronic system and field exercises together in the development of visual attention and awareness of the environment and reaction to football players.²

**Research Aim:** The use of electromedian exercises in the development of visual attention and awareness of the environment and reaction to football players.

**Hypothesis:** There were statistically significant differences in favor of the group using electromedian exercise.

### Method and Procedures

**The sample:** The research society included football players in Qadisiyah governorate clubs and the participants in the first division of (6) clubs and the number of (192) player either the sample of the search was chosen by random method, was a draw between the clubs in the search community and was selected clubs (Diwaniyah and Al-Ittifaq) and were divided into two groups, (Al-Ittifaq Club) and Experimental Club (Diwaniyah Club) and (25) players for each group. The sample rate was 27.08%. The homogeneity and equivalence between the individuals and the sample groups were carried out in the variables under study.

**Table 1: Shows the number of the society and the sample of the research**

<table>
<thead>
<tr>
<th>Type of sample</th>
<th>The society</th>
<th>The sample</th>
<th>Ratio of sample to community</th>
</tr>
</thead>
<tbody>
<tr>
<td>Football players</td>
<td>192</td>
<td>Experimental 25</td>
<td>Control 25</td>
</tr>
</tbody>
</table>

**Study design:** The researchers used the experimental approach in the same way as the two groups to suit the nature of the problem studied.

**Tests used in research:** The researchers used the Vienna Test System to obtain the results of the search variables. The tests used in this system are:

- **Visual attention test (FVW):³** The researchers also identified the variables measured by the test of attention (number of strikes, number of false positives, reaction time, ability to discriminate, tendency to answer, time of work)

**Test description:** The test consists of a set of images, numbers, words, syllables or drawings that show the stimuli either once or twice, and the laboratory must make a decision by pressing the red button or the green button on the keyboard as in picture 1, the test phase begins once the laboratory presses the green button. The program starts displaying the elements one by one and one element only for each screen page. The test should be determined in the form (new or old) and after each operation the items are automatically displayed.

**Ocean perception test (pp.):⁴** The researchers selected the ocean perception test after direct access to the Vienna system and its equipment, including the Ocean Recognition Test. Using the test literature, researchers were able to identify the exact shape of the device, how to conduct the test and the reliability of the results obtained. The researcher also found the possibility of applying this Testing on football players because the variables measured by the ocean perception test are (the field of total vision, divided attention, visual concentration, visual reaction, emotional maturity).
Pre Test: The researchers carried out the pre-test on 24/7/2018 for both experimental and control groups at 9 am.

Exercises used in research: After the pretest, the curriculum was prepared by the researchers on the experimental group, which depends on the division of the module into the first two electronic systems using the cogniplus system and the second field using a group of motor exercises that develop the variables under study on completion of the training module on the same day.

Completion of the electronic exercise Players go to the field to perform the exercise. As for the control group, it remains on the motor exercises given by the trainer. The training modules lasted six weeks. The following table shows the details of the method used. The researchers used the level of difficulty for electronic exercises and intensity of exercise.

Post-test: The researchers conducted the pre-test on the study sample on 30/9/2018 for both experimental and control groups at 9 am.

Results

Table 2: Shows the mean, the standard deviations and the (t) value of the post tests of the control and experimental groups of the attention variable

<table>
<thead>
<tr>
<th>S.</th>
<th>Variables</th>
<th>Pretest</th>
<th>Posttest</th>
<th>Mean diff.</th>
<th>(t) value</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>The number of hits on the right button</td>
<td>73.600</td>
<td>1.020</td>
<td>76.900</td>
<td>2.809</td>
<td>3.3</td>
</tr>
<tr>
<td>2.</td>
<td>The number of positives is incorrect</td>
<td>32.100</td>
<td>1.972</td>
<td>26.500</td>
<td>1.360</td>
<td>5.6</td>
</tr>
<tr>
<td>3.</td>
<td>Reaction time of beating</td>
<td>0.801</td>
<td>0.048</td>
<td>0.657</td>
<td>0.029</td>
<td>0.144</td>
</tr>
<tr>
<td>4.</td>
<td>Ability to distinguish</td>
<td>0.730</td>
<td>0.058</td>
<td>0.883</td>
<td>0.045</td>
<td>0.153</td>
</tr>
<tr>
<td>5.</td>
<td>The tendency to answer</td>
<td>0.034</td>
<td>0.005</td>
<td>0.053</td>
<td>0.006</td>
<td>0.019</td>
</tr>
<tr>
<td>6.</td>
<td>Work time</td>
<td>2.460</td>
<td>0.069</td>
<td>1.730</td>
<td>0.315</td>
<td>0.73</td>
</tr>
</tbody>
</table>

Table 3: Shows the mean, standard deviations and the calculated value (t) for the post tests of the control and experimental groups of the ocean perception variable

<table>
<thead>
<tr>
<th>S.</th>
<th>Variables</th>
<th>Pretest</th>
<th>Posttest</th>
<th>Mean diff.</th>
<th>(t) value</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Total vision</td>
<td>168.500</td>
<td>1.204</td>
<td>172.400</td>
<td>1.114</td>
<td>3.9</td>
</tr>
<tr>
<td>2.</td>
<td>Visual focus</td>
<td>49.182</td>
<td>1.139</td>
<td>52.840</td>
<td>1.015</td>
<td>3.658</td>
</tr>
<tr>
<td>3.</td>
<td>Divided attention</td>
<td>79.379</td>
<td>1.239</td>
<td>83.600</td>
<td>0.917</td>
<td>4.221</td>
</tr>
<tr>
<td>4.</td>
<td>Emotional maturity</td>
<td>1.811</td>
<td>0.082</td>
<td>1.324</td>
<td>0.032</td>
<td>0.487</td>
</tr>
<tr>
<td>5.</td>
<td>Reaction time</td>
<td>0.675</td>
<td>0.010</td>
<td>0.638</td>
<td>0.010</td>
<td>0.037</td>
</tr>
</tbody>
</table>

Analysis and discussion of results: The results of the pre and posttests as shown in Table (2) and Table (3) indicate that there are statistically significant differences between the pre and posttests and for the benefit of the post-test and the variables of the study. The researchers found that the nature of the exercises in the experimental group, which depends on mixing electronic and field exercises in a single training module, which makes the player to benefit from the capabilities practiced on the electronic side and applied in practice in the field and thus be installed and developed faster and more. In the exercise of attention, the distribution and distribution of stimuli in a way that facilitates the installation of the sample and the result of continuing these exercises and the integration of stimuli (audio and visual) led to an increase in the level of attention and confirms The athlete has the ability to quickly draw attention from sexy (And) that the football player needs attention in its different forms and more than one source, as his attention to the ball and the player and fellow player and the competitor and the voice of the coach and other stimuli and is intended to choose the most suitable
to respond to him, so the nature Exercises used within the system Cogni Plus, which focuses on each type of attention (auditory attention, and visual attention), has an effective impact on the development process.  

In the perception of the ocean, electronic exercise has an effective effect in stabilizing the development of the sample, the subsequent physical exercise of the exercise of the dancers is an increase in the effectiveness of the awareness of the surroundings of the player, which makes him aware of the surrounding players and colleagues and competitors and spaces and the boundaries of the stadium at the same time and without This is what makes the player able to move on the pitch and execute the play plan with ease and smoothness, thus achieving what the coaches aspire to. “Batting believes that the high environmental interference practice results in higher retrieval and better learning transition.”

Conclusions

1. There is a difference in the level of attention and awareness of the environment and reaction to football players.
2. Electromedian exercises have an effect on the development of the studied variables.
3. The overlap of electronic and field exercises in one exercise has an impact on the development of the ability of football players and thus raise the level of attention and perception of the ocean and react to them.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

REFERENCES

AgNps as Antibacterial Agent Against *Klebsiella pneumoniae* Isolated from Wound Infection

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*University of al Zahraa for women, Kerbala, Iraq*

**ABSTRACT**

One hundred wound swab samples were collected from wound patients who visited the Teaching Hospital wound unit, Hillah, Babylon province, Iraq. *K. pneumoniae* was identified morphologically and biochemically. Total of 10 (10%) from total samples exhibited positive culture for *K. pneumoniae*. Antibiotic susceptibility was tested for 12 antibiotics. *K. pneumoniae* isolates showed high resistance rates to penicillins including ampicillin, amoxicillin (100%) and piperacillin (90%). The present study indicated that resistance to β-lactamase inhibitors including amoxicillin-clavulanic acid, ampicillin-sulbactam and ticarcillin-clavulanic acid were 100%, 90% and 70% respectively. This investigation also indicated that *K. pneumoniae* had high rates of resistance to the third generation of cephalosporins including cefotaxime (80%) followed by ceftazidime (80%), ceftriaxone (80%) and (Cefepime (60%). During the study period, 4 (40%) isolates were found resistant to both imipenem and meropenem. Anti-bacterial activity of silver nanoparticles (AgNps) against *K. pneumoniae* displays excessive widespread spectrum antibacterial action against established bacteria with increased zone of inhibition diameter that is proportional with the increase in nanoparticle concentration. The (MIC of AgNps ranged from 50-100μg/ml and the MBC ranged from 100-200μg/ml.

**Keywords:** Ag Nanoparticles, *K. pneumonia*, wound infection.

**Introduction**

This genus was described for the first time by Trevisan in 1885 [1]. The genus *Klebsiella* sp. are rod shaped, 0.3-1μm in diameter and 0.6-6μm in length, Gram-negative, non-motile, non sporulating, it is among the oldest known genera in the family bacteria that are encased by a prominent polysaccharide-based capsule.

The *Klebsiella* are found in different habitats including water, soils, sewage and mucosal surfaces of mammals. In humans, *K. pneumoniae* can be present in the nasopharynx and in the intestinal tract [2]. This microorganism is responsible for (3%-9%) of community and hospital acquired pneumonia and septicemia, especially in immune compromised individuals. Carrier rate (1% to 6%) found in healthy individuals rise to 20% in hospitalized patients. Higher incidence was recorded in urinary tract in specific groups of patients at risk [3]. Most *Klebsiella* are ampicillin resistant, but acquisition of plasmid-encoded resistance led to nosocomial infection outbreaks as in 1970s and 1980s due to gentamicin and tobramycin resistance [4]. *K. pneumoniae* reported resistant to cefuroxime, ceftazidime and cefotaxime. This was chromosomally encoded, but subsequently plasmid-encoded ESBL caused outbreaks of infection in intensive care units [5]. The increasing antimicrobial resistance among ESBL producing *K. pneumoniae* strains. Besides, they have acquired plasmid-mediated AmpC enzymes, unlike ESBLs, AmpCs are poorly inhibited by β- lactamase inhibitors and are less active against cefepime and ceftirome than ESBLs [6]. That makes therapy very difficult and use of expensive broad spectrum drugs like carbanpenems which are the most effective antibiotics against these bacteria [7].

**Materials and Method**

**Culture media:** Ames transport, Blood agar base, Muller-Hinton agar, Nutrientagar, Nutrient broth and Brain heart agar (Himedia, India).
Antibiotics discs were purchased from (Bioanalyse, Turkey) and are listed in table 1.

### Table 1: Antibiotic disks

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>Symbol</th>
<th>Disc potency (µg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ampicillin</td>
<td>AM</td>
<td>10</td>
</tr>
<tr>
<td>Amoxicillin</td>
<td>AX</td>
<td>25</td>
</tr>
<tr>
<td>Piperacillin</td>
<td>PC</td>
<td>10</td>
</tr>
<tr>
<td>Amoxicillin-clavulanic acid</td>
<td>AMC</td>
<td>30</td>
</tr>
<tr>
<td>Ampicillin-sulbactam</td>
<td>AMS</td>
<td></td>
</tr>
<tr>
<td>Ticarcillin-clavulanic acid</td>
<td>TIM</td>
<td>85</td>
</tr>
<tr>
<td>Cefotaxime</td>
<td>CTX</td>
<td>30</td>
</tr>
<tr>
<td>Ceftazidime</td>
<td>CAZ</td>
<td>30</td>
</tr>
<tr>
<td>Ceftriaxone</td>
<td>CTR</td>
<td>30</td>
</tr>
<tr>
<td>Cefepime</td>
<td>FEB</td>
<td>30</td>
</tr>
<tr>
<td>Imipenem</td>
<td>IPM</td>
<td>10</td>
</tr>
<tr>
<td>Meropenem</td>
<td>MEM</td>
<td>10</td>
</tr>
</tbody>
</table>

**Specimen Collection and Isolation:** Bacterial isolates were acquired from the patients who stay in the Teaching Hospital wound unit in Hillah, Babylon province, Iraq. Total of 100 specimens were collected using Ames transport media then inoculated into brain heart infusion broth (BHI) and incubated at 37°C for 24 hr. Isolated colonies were purified on nutrient agar (NA). *K. pneumoniae* (10 isolates) were identified depending on the morphological feature on culture media and biochemical tests according to Bergey’s manual [8].

**Antimicrobial Susceptibility Test by Disk Diffusion Method:** In this test, the antibiotics names and its standard inhibition diameters were used as recommended by [9]. The Inhibition zone diameter was measured using a caliper and compared with those determined by the Clinical Laboratory Standards Institute (CLSI) to conclude the resistance (R) or sensitivity (S) to each antibiotic.

**Antibacterial activity of AgNPs:** AgNPs (60nm) was acquired from (US research nanomaterials Inc USA). The antibacterial action was handed out as designated by the CLSI. Bacterial sensitivity to AgNPs is tested by disk diffusion assay as mentioned earlier [15]. Triplicates of AgNPs in dilutions of (400, 200, 100, 50, 25 and 12.5µg/ml) in sterile deionized water were prepared and ready sterile discs were emerged in each dilution. The bacteria isolates were initially incubated for 15min at 4°C then incubated at 37°C for 24hr. The Positive results were documented after a zone of inhibition was noticed [10].

**Minimum bactericidal concentration (MBC) determination** and **Minimum inhibitory concentration (MIC):** Bacterial isolates were incubated overnight at 37°C that were used to mark 0.5 McFarland. About 10ml tubes of nutrient broth medium was prepared with five dilutions of AgNPs (400, 200, 100, 50, 25 and 12.5µg/ml) in triplicates with a negative control (without AgNPs). Each tube was inoculated aseptically with 1ml of the bacterial suspension (about 10^6CFU/mL). The inoculated sets were incubated at 37°C overnight. The lesser concentration with no turbidity is represented as the MIC. Tubes with no turbidity were cultured on nutrient agar plates and incubated at 37°C overnight. Bacterial colonies growth was checked and the concentration that displays no growth is represented as the MBC [9,10].

**Results and Discussion**

Present results showed high resistant rates to penicillins including ampicillin, amoxicillin (100%) and piperacillin (90%). This result is in agreement with the results being reported by Al-Najaf [11] who found that 100% of *K. pneumoniae* isolates were resistant to ampicillin, amoxicillin and 92% were resistant to piperacillin. Resistance of *K. pneumoniae* to penicillin’s is not surprising, because *K. pneumoniae* has chromosomal encoded resistance to several penicillins [12]. The present study indicated that resistance to β-lactamase inhibitors including amoxicillin-clavulanic acid, ampicillin-sulbactam and ticarcillin-clavulanic acid were 100%, 90% and 70% respectively. This investigation also indicated that *K. pneumoniae* had high rates of resistance to cephalosporins including cefotaxime (80%) followed by ceftazidime (80%), ceftriaxone (80%) and Cefepime (60%). These data agrees with [11]. In another similar study carried out by [13], 96.7% resistance was noted for cefotaxime and 85% resistance for ceftazidime among isolates. The resistance to third generation cephalosporins is mainly due to mutations in the common group of class A β-lactamases, consisting of TEM, SHV and CTX-M β-lactamases that has extended hydrolytic spectrum activity on cephalosprins, but also a number of other rare enzymes that often exhibit ESBL activity. During the study period, 4 (40%) isolates were found resistant to both imipenem and meropenem. In other study [14], reported the rate of resistance to imipenem in
K. pneumoniae during three years elevated from 1.3% to 11.1% in US. Carbapenem resistance K. pneumoniae is an emerging phenomenon threatening the public health. As carbapenems have long been considered the antibiotic class of last resort to treat severe infections caused by pathogens that produce ESBLs as in table 2 [15].

### Table 2: Antibiotic susceptibility test of K. pneumoniae isolates

<table>
<thead>
<tr>
<th>Antibiotics</th>
<th>Antibiotic disk</th>
<th>Resistance</th>
<th>Intermediate</th>
<th>Susceptible</th>
</tr>
</thead>
<tbody>
<tr>
<td>Penicillins</td>
<td>Ampicillin</td>
<td>10(100%)</td>
<td>0(0%)</td>
<td>0(0%)</td>
</tr>
<tr>
<td></td>
<td>Amoxicillin</td>
<td>10(100%)</td>
<td>0(0%)</td>
<td>0(0%)</td>
</tr>
<tr>
<td></td>
<td>Piperacillin</td>
<td>9(90%)</td>
<td>0(0%)</td>
<td>1(10%)</td>
</tr>
<tr>
<td>Penicillins + β-lactamase Inhibitors</td>
<td>Amoxicillin-clavulanic acid</td>
<td>10(100%)</td>
<td>0(0%)</td>
<td>0(0%)</td>
</tr>
<tr>
<td></td>
<td>Ampicillin-sulbactam</td>
<td>9(90%)</td>
<td>1(10%)</td>
<td>0(0%)</td>
</tr>
<tr>
<td></td>
<td>Ticarcillin-clavulanic acid</td>
<td>70(70%)</td>
<td>1(10%)</td>
<td>2(20%)</td>
</tr>
<tr>
<td>Cephalosporins</td>
<td>Cefotaxime</td>
<td>8(80%)</td>
<td>1(10%)</td>
<td>1(10%)</td>
</tr>
<tr>
<td></td>
<td>Ceftazidime</td>
<td>8(80%)</td>
<td>1(10%)</td>
<td>1(10%)</td>
</tr>
<tr>
<td></td>
<td>Ceftriaxone</td>
<td>8(80%)</td>
<td>1(10%)</td>
<td>1(10%)</td>
</tr>
<tr>
<td></td>
<td>Cefepime</td>
<td>6(60%)</td>
<td>1(10%)</td>
<td>3(30%)</td>
</tr>
<tr>
<td>Carbapenems</td>
<td>Imipenem</td>
<td>4(40%)</td>
<td>2(20%)</td>
<td>4(40%)</td>
</tr>
<tr>
<td></td>
<td>Meropenem</td>
<td>4(40%)</td>
<td>1(10%)</td>
<td>5(50%)</td>
</tr>
</tbody>
</table>

**Antibacterial activity of AgNPs:** AgNPs showed powerful broad spectrum anti-bacterial activity against the tested bacteria and it is concentration dependent, (table 3). The 400 µ g/ml concentration showed the highest zone of inhibition. The MIC of AgNPs ranged from 50-100 µ g/ml and the MBC ranged from 100 -200 µ g/ml. AgNPs cause sudden decline in bacterial cell membrane integrity in addition to the release of reactive oxygen species (ROS) where superoxide species is generated and contributing in the degradation of biomolecules [16].

### Table 3: Anti-bacterial activity of AgNPs against K. pneumoniae

<table>
<thead>
<tr>
<th>AgNP Conc.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>400 µ g/ml</td>
<td>20</td>
<td>19</td>
<td>20</td>
<td>18</td>
<td>20</td>
<td>20</td>
<td>19</td>
<td>20</td>
<td>19</td>
<td>20</td>
</tr>
<tr>
<td>200 µ g/ml</td>
<td>18</td>
<td>17</td>
<td>16</td>
<td>16</td>
<td>17</td>
<td>18</td>
<td>16</td>
<td>18</td>
<td>17</td>
<td>17</td>
</tr>
<tr>
<td>100 µ g/ml</td>
<td>15</td>
<td>14</td>
<td>13</td>
<td>13</td>
<td>15</td>
<td>13</td>
<td>15</td>
<td>14</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>50 µ g/ml</td>
<td>12</td>
<td>10</td>
<td>910</td>
<td>10</td>
<td>12</td>
<td>11</td>
<td>11</td>
<td>12</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>25 µ g/ml</td>
<td>9</td>
<td>8</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>8</td>
<td>8</td>
<td>9</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>12.5 µ g/ml</td>
<td>6</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>7</td>
<td>6</td>
<td>6</td>
<td>7</td>
<td>6</td>
<td>5</td>
</tr>
</tbody>
</table>

**Figure 1: MIC and MBC of AgNPs of K. pneumoniae**
Conclusion

The results showed that the isolated \textit{K. pneumoniae} have high rate of resistance to Penicillins, Penicillins+β-lactamase Inhibitors, Cephalosporins and Carbapenems antibiotics. AgNPs proved its efficiency and highly recommended as safe and economic alternative antibacterial agent with significant inhibitory and antibacterial effect.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

REFERENCES


Study of Hepatitis C Virus (HCV) Genotypes in Al-Muthanna Governorate, Iraq

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¹College of Medicine, University of Al-Qadisiyah, Iraq

ABSTRACT

The current study aimed to determine the genotypic prevalence of hepatitis C virus (HCV) at Al-Muthanna province – Iraq. Then determine which genotype is predominant. The prevalence of HCV genotypes in this province was unknown. The genotypic study is important for the selection of the best antiviral drugs of the disease. This study was conducted in the health institutes of Al-Muthanna Governorate for the period from October 2018 to April 2019. The study included collection (5 ml) of the blood sample for the total number of persons (2842) from (thalassemia patients, blood donors and renal dialysis patients). Then, they were examined by the initial test using ELISA technique, where it was found that 81 (2.85%) people were positive for this test. Then, the PCR technique (RT-PCR) was carried out for serum samples which were positive for ELISA test. Results showed that 60 (74.07%) of the 81 (2.85%) samples were positive in the PCR test. DNA sequencing technique was used to determine which genotype is prevalent in Al-Muthanna Governorate, 30 samples were tested from 60 samples of positive samples in PCR. The results showed that three genotypes of HCV were detected in patients, genotype 1a 16 (53.33%), genotype 2a 9 (30%) and genotype 2b 5 (16.66%) with significant differences (p<0.05). Genotype 1a was the predominant.

Keywords: Hepatitis C Virus, Genotypes

Introduction

Hepatitis C, a serious viral disease of the liver and caused by hepatitis C virus (HCV) infection is a major health issue of global concern (1). Hepatitis C virus (HCV) belongs to the Flaviviridae family and it is the only member of the Hepacivirus genus (2). HCV is an enveloped positive-strand RNA virus (ss RNA). Six main HCV genotypes and over 100 subtypes have been therefore recognized (3). HCV genomic RNA composed of a single open reading frame (OFR) flanked by 5’ and 3’ untranslated regions (UTRs), which encodes for a single large polyprotein, processed by cellular and viral proteases to form a structural and non-structural proteins (4). In most developing countries, transmission of HCV occurs through exposure to infected blood and blood products at various healthcare facilities and localities. Such contamination usually occurs through unsafe injection, blood transfusions, organ transplants and sometimes through mother to child transmission or the sharing needles among Intravenous drug uses (IDUs) while Unlike the developed countries, where the mode of HCV transmission is mainly through intravenous drug uses (IDUs) (5,6). A recent study shows that, HCV genotypes 1 and 3 are the two most prevalent genotypes globally and account for about 76.3% cases of HCV in the world. However, most cases of HCV caused by these two genotypes are found in East and South Asia respectively. East Asia is also burdened with genotypes 2 and 6 and the two collectively account for about 14.5% cases of global HCV infections. The global cases of HCV due to genotypes 4 and 5 are approximately 8.3% and less than 1% respectively. Africa and Middle East have the most cases of genotypes 4 and 5. However, genotype 5 is considered as the least prevalent globally but most endemic in sub-Saharan Africa regions (7).
Materials and Method

Patients and Study Location: This study was conducted in the health institutes of Al-Muthanna Governorate, including (Al-Hussein Teaching Hospital- Al-Amal Center for renal dialysis, Teaching hospital for gyniatrics and pediatrics -Thalassemia Unit, Al-Rumaitha General Hospital, Al-Khader General Hospital, Main Blood bank and Public Health Laboratory for the period from October 2018 to April 2019, the study included collection of blood samples from suspected people of HCV infection (blood donors, thalassemia patients, renal dialysis patients).

Blood Samples: Venous blood sample (5ml) were collected from suspected people with HCV by using sterile disposable syringes then placed in gel tube (free of anticoagulant) and allowed to coagulate at room temperature for (15-20) minutes then centrifuged at 3000 rpm for 10 min for separation of serum. Then the serum is placed in a plane tube without gel and frozen in (-20 °C) until use.

Method

1. Investigation of anti HCV antibodies (IgG) in serum by ELISA technique: All the samples 2842 were tested by enzyme linked immune sorbent assay (ELISA) technique for detected of Anti-HCV antibody (IgG) in serum by using (Fortress company test Kit/USA) using the manufacturers protocol.

2. Investigation of HCV infection by using polymerase chain reaction (PCR) technique:

A. Viral RNA Extraction: Viral RNA was extracted from serum samples by using AccuZolTM total RNA extraction kit (Bioneer, Korea) and done according to company instructions.

B. Estimation of extracted RNA: The extracted RNA were estimated by using Nanodrop spectrophotometer that used to measurement the RNA concentration and purity at absorbance 260/280 nm at ratio 1.8 as pure RNA.

C. Nested RT-PCR: Nested RT-PCR was performed for molecular detection of Hepatitis C Virus based on core protein gene that amplified with specific primers that provided by (Macrogen. Company, Korea) by nested RT PCR method (8).

Nested RT-PCR was done by two step:

First Step: First reaction RT- PCR master mix preparation: RT-PCR master mix was prepared by using (NEXpro™ RT-PCR Master Mix, Genes Laboratories company, Korea) and done according to the company instructions.

Second Step: Second reaction Nested PCR master mix preparation: Nested-PCR master mix was prepared by using (AccuPower® PCR PreMix, Bioneer company, Korea) and done according to the company instructions.

D. Nested RT-PCR product analysis: The PCR products were electrophoresed in 1% agarose gel stained with ethidium bromide and observed under gel documentation system (Wised, Korea).

3. DNA sequencing: Nested RT-PCR products of positive Hepatitis C Virus core protein gene were sent to Macrogen Company in Korea for performed the DNA sequencing by (AB DNA sequencing system) where (30) samples were tested from (60) samples of positive samples in PCR products with in mind that equal numbers of both genders and study groups were send. The DNA sequencing analysis for HCV genotyping was conducted by using phylogenetic tree UPGMA method (MEGA 6.0 version), Multiple alignment analysis based ClustalW alignment analysis, and NCBI-BLAST for homology sequence identity.

Results and Discussion

For the purpose of studying the genotyping of the hepatitis C virus, positive samples of RT-PCR products were confirmed by gel electrophoresis method (Figure -1). Then, DNA sequencing performed by (AB DNA sequencing system), the DNA sequence analysis of HCV was performed by using phylogenic Tree UPGMA method (MEGA 6.0), Multiple alignment analysis based ClustalW alignment analysis (Figure -2), and NCBI-BLAST for homology sequence identity (Table -1).
Figure 1: Agarose gel electrophoresis image that show the Nested PCR product of core gene in hepatitis C virus serum samples. Where M: Marker (3000-100bp), lane (1-15) some positive and negative Nested PCR amplification of core gene at 405bp Nested PCR product size

Figure 2: Multiple sequence alignment analysis of core protein gene HCV partial sequence for local HCV isolates and NCBI-Blast HCV genotypes isolates (from NCBI-BLAST online). The multiple alignment analysis was constructed using ClustalW alignment tool in (MEGA 6.0 version). That showed the nucleotide alignment similarity as (*) with substation mutation core protein gene HCV nucleotide sequence
Table 1: The NCBI-BLAST Homology Sequence identity (%) between local HCV isolates and NCBI-BLAST submitted HCV genotyping based on core protein gene:

<table>
<thead>
<tr>
<th>Local HCV isolate</th>
<th>Genbank accession No.</th>
<th>NCBI BLAST Homology sequence identity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>NCBI identical isolates</td>
</tr>
<tr>
<td>HCV-No.1</td>
<td>MK656861</td>
<td>Hepatitis C virus (AF009606.1)</td>
</tr>
<tr>
<td>HCV-No.2</td>
<td>MK656862</td>
<td>Hepatitis C virus (AF009606.1)</td>
</tr>
<tr>
<td>HCV-No.3</td>
<td>MK656863</td>
<td>Hepatitis C virus (AF169004.1)</td>
</tr>
<tr>
<td>HCV-No.4</td>
<td>MK656864</td>
<td>Hepatitis C virus (AF169004.1)</td>
</tr>
<tr>
<td>HCV-No.5</td>
<td>MK656865</td>
<td>Hepatitis C virus (AF009606.1)</td>
</tr>
<tr>
<td>HCV-No.6</td>
<td>MK656866</td>
<td>Hepatitis C virus (AF169004.1)</td>
</tr>
<tr>
<td>HCV-No.7</td>
<td>MK656867</td>
<td>Hepatitis C virus (AF009606.1)</td>
</tr>
<tr>
<td>HCV-No.8</td>
<td>MK656868</td>
<td>Hepatitis C virus (AF009606.1)</td>
</tr>
<tr>
<td>HCV-No.9</td>
<td>MK656869</td>
<td>Hepatitis C virus (AF009606.1)</td>
</tr>
<tr>
<td>HCV-No.10</td>
<td>MK656870</td>
<td>Hepatitis C virus (AF009606.1)</td>
</tr>
<tr>
<td>HCV-No.11</td>
<td>MK656871</td>
<td>Hepatitis C virus (D10988.1)</td>
</tr>
<tr>
<td>HCV-No.12</td>
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<td>Hepatitis C virus (D10988.1)</td>
</tr>
<tr>
<td>HCV-No.13</td>
<td>MK656873</td>
<td>Hepatitis C virus (D10988.1)</td>
</tr>
<tr>
<td>HCV-No.14</td>
<td>MK656874</td>
<td>Hepatitis C virus (AF009606.1)</td>
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<td>HCV-No.15</td>
<td>MK656875</td>
<td>Hepatitis C virus (AF009606.1)</td>
</tr>
<tr>
<td>HCV-No.16</td>
<td>MK656876</td>
<td>Hepatitis C virus (AF169004.1)</td>
</tr>
<tr>
<td>HCV-No.17</td>
<td>MK656877</td>
<td>Hepatitis C virus (AF169004.1)</td>
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<td>HCV-No.18</td>
<td>MK656878</td>
<td>Hepatitis C virus (AF009606.1)</td>
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<td>HCV-No.19</td>
<td>MK656879</td>
<td>Hepatitis C virus (AF169004.1)</td>
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<td>MK656882</td>
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<td>MK656883</td>
<td>Hepatitis C virus (AF009606.1)</td>
</tr>
<tr>
<td>HCV-No.24</td>
<td>MK656884</td>
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<td>HCV-No.29</td>
<td>MK656889</td>
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</tr>
<tr>
<td>HCV-No.30</td>
<td>MK656890</td>
<td>Hepatitis C virus (AF009606.1)</td>
</tr>
</tbody>
</table>

The genotyping analysis results showed that the genotype (1a) was the most to give significant (P<0.05) positive results. The ratio of positive records of (1a) genotype was (53.33%) out of (16) examined samples. On the other hand, genotype (2a) showed significantly (P<0.05) lower ratio of infection comparing to that of the genotype (1a), with (30%) out of 30 total samples. Finally, genotype (2b) was the lowest to show the relation with the prevalence of the disease. Genotype (2b) revealed significant (P<0.05) decline in the ratio of the positive results when compared to genotype (1a) and genotype (2a), with (16.66%) out of (5) examined samples (Table -2).

Table 2: HCV genotyping

<table>
<thead>
<tr>
<th>Type of genotype</th>
<th>Total Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1a</td>
<td>16</td>
<td>53.33</td>
</tr>
<tr>
<td>2a</td>
<td>9</td>
<td>30</td>
</tr>
<tr>
<td>2b</td>
<td>5</td>
<td>16.66</td>
</tr>
<tr>
<td>total</td>
<td>30</td>
<td>100</td>
</tr>
<tr>
<td>X2</td>
<td>9.300(S)</td>
<td></td>
</tr>
<tr>
<td>P value</td>
<td>0.01</td>
<td></td>
</tr>
</tbody>
</table>

S: significant association (P>0.05)

Hepatitis C virus (HCV) infection is a major health problem in developing countries. Geographical distribution of various genotypes of HCV is useful for
understanding the epidemiological status, detection of mode and source of infection, designing the program of control, evaluating the response to treatment and development of diagnostic methods and vaccine production, this study was the first in Al-Muthanna province, which included the search for genotyping of hepatitis C virus among patients by using DNA sequence.

In Iraq, the results of the current study are in agreement with results of previous studies as follows: In Sulaimani province, A study showed that the genotype (1 and 2) were the most common among other genotypes in different study groups by percentage (87.5%), (8.3%) respectively (9) and In Basra province, A study has shown that the genotype (1a) were of the most common genotyping among patients in percentage (37.25%) (10) but there are other studies in Dhi Qar province, Baghdad province and another study in four Iraqi provinces are (Najaf, Babylon, Karbala and Qadisiyah Provinces) showed that genotype (4) was predominant among other genotypes with patients in Percentage (86.27%), (89.4%), (41.38%) and (84.6%) respectively(11-14).

In other countries, many previous studies agreement with the results of the present study in genotyping as follows: In Jordan, A study found that HCV genotype 1a(73.3%) is the most prevalent genotype in Jordanian patients, this genotype is also predominant in Jordanian blood donors and in hemodialysis patients of some Middle Eastern countries including Lebanon, Turkey, Cyprus and Syria (15). In Turkey and Israel, A study showed that genotype (1) was the predominant (16). In Iran, A study showed that HCV genotype (1) was the most prevalent genotype (17,18). In Lebanon and Saudi Arabia, There are studies showed that the highly prevalence of genotype (2) in dialysis patients (19).

The molecular epidemiological studies have shown marked differences in geographical distribution by geographical regions and among patients groups, genotypes (1, 2 and 3) are widely distributed throughout USA, Europe, Australia and East Asia, genotype (4) is largely confined to the Middle East, Egypt and central Africa, genotype (5) and (6) are found predominantly in South Africa and South East Asia (20).

To discuss the results in this study, it is believed that transmission of the genetic pattern occurs from one region to another during migration or travel for medical purposes or tourism and others, Where many of the residents of the province go to treatment in the neighboring provinces or for treatment outside Iraq, for example in India, Iran, Turkey, Jordan, Syria or Lebanon where previous studies have reported that epidemiological profile of genotype 1 was linked to injection drug use, patients who acquired HCV through blood transfusion or use non-sterile needles (21).

Conclusions

The present study showed that three dominant genotypes in Al-Muthanna province/Iraq, which is 1a 16 (53.33%), 2a 9(30%) and 2b 5(16.66%) respectively.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

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The Impact of an Educational Field for the Development of Perceptual-Kinetics and Skill of Passing Cub’s Football

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¹The college of Physical Education and Sports Sciences, University of Babylon, Iraq

ABSTRACT

The researcher used the experimental method to design two equal groups (control and experimental) for the sample of (20) players for the season 2018-2019, and the researcher prepared an educational field. The researcher designed a device to measure the perceptual-kinetic perceptions, the researcher conducted a pilot exploration to ensure the safety of devices and tools, and the researcher conducted pre-tests, as well as the implementation of special exercises for motor compatibility and skill passing football through the field prepared for a period of (8) (3) units per week A, then the researcher conducted post-tests and processing data statistically and then presented and analyzed, and the researcher concluded the effectiveness of the educational field of perceptual-kinetics and also recommends the use of the educational field during the educational units for players to develop other football skills.

Keywords: Educational field, perceptual-kinetics and passing.

Introduction

To reach the level of outstanding athlete in any event or sports game must have rules and fundamentals to help achieve, and most notably the multiplicity of duties and activities that are used in the context of education and preparation to achieve the optimum level. The game of football is one of these sports events, which receive increasing attention from all developed and developing countries and that of all ages and races of all kinds. This has made people with experience and competence and workers in the field of the game, always thinking about finding the best methods and methods that work to develop and refine the talents of the players to the highest levels.

The field of educational play is an important educational methods that have been used to develop the players’ skills and motor skills, as well as the use of devices and tools. Sensory-kinetics, which is an important variable for the interconnection of body parts during skill performance, is a process associated with the nervous system to regulate the work of forces.

The use of various means and tools in the process of education and training have the greatest impact in the development and upgrading of the players in terms of mental and skill where the process of performance development becomes more effective and exciting for the players. This shows the weakness in the skill of passing football, which represents the process of learning and mastery of the utmost importance when teaching age groups, so the researcher considered the study of this problem through the preparation of an educational field that includes exercises (physical - skill) that the researcher is supposed to work to develop the perception. The mobility and skill of passing football using this special educational field to develop those variables.

Passing is also a key skill in terms of the interdependence of internal forces with external forces, which play an important role in offensive situations. From this point of view came the importance of this research in the preparation of a modern playing field containing exercises and equipment and tools and aids to develop the perceptual sense of mobility and skill passing football for young people.
Research Aims:
1. Preparation of an educational field for the development of perceptual-kinetics and kinetics and skill passing of the cubs football players.
2. Design a special device to measure perceptual sense-kinetics of the football of the Cubs.

Research Methodology and Field Procedures

Research Methodology: The researcher used the experimental method in the two group's equivalent method to suit the nature of the problem and research objectives. Experimental research is one of the types of scientific research through which the relationship between research variables can be measured.

Research Community: The researcher identified the players of Al-Zawraa Sports Academy in Babil Governorate, the junior category for the ages (12-14) years and the number (25) players, the researcher chose a random sample of (20) players representing a percentage of (80%) of the original community, And randomly divided them into two groups (experimental and control) and the way of even and odd numbers by (10) players in each group for the sports season 2018-2019.

Means, tools and devices used:
1. Survey of experts and specialists.
2. Arab and foreign sources.
3. Legal football field.
4. Footballs (20).
5. Stopwatch number (2).
6. Suppression number (20).
7. Counting colored rings (12).
8. Medical balance to measure weight.
9. Measuring tape type linen length of 50 meter.
10. Camera type (Sony).
11. CD for photography.
12. Electronic calculator type (dell).

Device design for perceptual-kinetics: The researcher designed a device to measure the perceptual-kinetics (distance, direction, time) and presented the researcher to a group of experts and specialists in the specialty (sports training, motor learning).

The mechanism of work of the device: It is a device emulator for the sensors-kinetics of football cubs used to measure the speed of response and determine the direction and distance of the exciter in milliseconds (ms) (1/1000) of a second and this high accuracy that enables us to get real results when performing the test Each player consists of the original board that contains the generators in different colors (green, red, blue), which work alternately The laboratory cannot finish the flashes (9) The LEDs illuminate (9) times for each laboratory and must put his foot in A dedicated space similar to the color of the LED lighted as quickly as possible to calculate the time of each laboratory note that each laboratory sees Seek a total distance of (13.5) meter. It is not possible to know which LED will work.

Identify the tests used in the search: In the field of identifying tests and measurement and for the purpose of identifying the best tests, the researcher used the sources and scientific references as well as presented to the experts for the purpose of determining the most suitable tests of skill passing football for cubs.

Football Passing Test: Objective of the test: to measure the accuracy of the scroll.
**Tools:** markers, target (1 × 1) m, footballs, tape measure.

**Method of performance:** The laboratory stands with the ball at a distance of (10) m from the target and when you hear the signal the laboratory handles the ball and is fixed towards the target.

**Method of registration:** Each laboratory is given (5) balls to perform five attempts as follows:
- Degree for successful attempt.
- Zero for failed attempt.

**Pilot study:** The researcher conducted the pilot study on 1/9/2018 at 4:00 pm on Saturday and on a sample of 5 players from Al-Zawraa Sports Club academy aged (14) years to find out the suitability and validity of the instruments of the test.

**Scientific basis of the tests:** A scientific evaluation of the tests was carried out before the start of the implementation of the main experiment in order to determine the validity, reliability and position as applied to the survey sample.

**Validity test:** In order to ensure the validity of the test, the researcher used the content honesty through a questionnaire distributed to a group of experts and specialists in the field of physical education and football for their opinions.

**Test stability:** In order to ensure the validity of the test, the researcher used the mid-split method.

**Objective testing:** The researcher calculated the objectivity of the test by finding the Spearman Brown correlation coefficient of two arbitrators, after statistically processed.

### Table 1: Show scientific basis of the tests

<table>
<thead>
<tr>
<th>S.</th>
<th>Tests</th>
<th>Validity coefficient</th>
<th>Stability coefficient</th>
<th>Objective coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Perceptual-kinetics</td>
<td>90%</td>
<td>89%</td>
<td>92%</td>
</tr>
<tr>
<td>2.</td>
<td>Passing</td>
<td>85%</td>
<td>88%</td>
<td></td>
</tr>
</tbody>
</table>

**Pretests:** The researcher conducted the pretests on Saturday 2/11/2018 for the test of perception of kinetics and skill of passing football for cubs.

**Equal sample:** The pre-test of the research sample was conducted on Saturday 2/11/2018 after conducting the pilot study.

### Table 2: Show the equal sample for Experimental group and Control group

<table>
<thead>
<tr>
<th>Tests</th>
<th>Experimental group</th>
<th>Control group</th>
<th>Mann Whitney value</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Median    SD</td>
<td>Median        SD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceptual-kinetics</td>
<td>8.85      1.11</td>
<td>9.78          1.225</td>
<td>52</td>
<td>Non sig.</td>
</tr>
<tr>
<td>Passing</td>
<td>18        1.5</td>
<td>19             2</td>
<td>38</td>
<td>Non sig.</td>
</tr>
</tbody>
</table>

The value of Mann Whitney at sample size (20) and below the significance level (0.05).

**Posttests:** The researchers conducted the post test on Friday 5/1/2019 at (4) pm.

### Results

**Table 3:** The median and deviation of the pre- and post-tests and the value of the calculated Wilcoxon and its statistical significance shows the results of the tests under investigation (control group) under the level of significance (0.05)

<table>
<thead>
<tr>
<th>S.</th>
<th>Statistical parameters</th>
<th>Pretest</th>
<th>Posttest</th>
<th>Wilcoxon(Z) value</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tests</td>
<td>Units</td>
<td>Median</td>
<td>SD</td>
<td>Median</td>
<td>SD</td>
</tr>
<tr>
<td>1. Perceptual-kinetics</td>
<td>Sec.</td>
<td>9.78</td>
<td>1.225</td>
<td>8.72</td>
<td>1.04</td>
</tr>
<tr>
<td>2. Passing</td>
<td>Degree</td>
<td>19</td>
<td>2</td>
<td>19.5</td>
<td>1.5</td>
</tr>
</tbody>
</table>
From Table (3) which shows the median and the deviation, for the pre and post tests and for the total tests under consideration (perceptual-kinetics-passing) and for the control group, we find that the results of perceptual-kinetics test in the pre-test achieved a median of (9.78 Sec.) and a spring deviation of (1.11), either in the post-test for the same skill The median reached (8.72 Sec.) with a deviation of 1.01 below the level of (0.05) and a degree of freedom (9), while the results of the passing test and in the pre-test achieved a median of (19 times) and a deviation of (1.5), and in the post-test for the same skill, the median reached (19.5) with a spring deviation of (0.988) below the level Z (0.05) and degree of freedom (9).

Table 4: The mean and deviation of the pre- and post-tests and the value of the calculated Wilcoxon and its statistical significance are shown for the results of the tests under investigation (experimental group) under the level of significance (0.05)

<table>
<thead>
<tr>
<th>S.</th>
<th>Tests</th>
<th>Pretest</th>
<th>Posttest</th>
<th>Wilcoxon(Z) value</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Statistical parameters</td>
<td>Median</td>
<td>SD</td>
<td>Median</td>
<td>SD</td>
</tr>
<tr>
<td>1.</td>
<td>Perceptual-kinetics</td>
<td>8.85</td>
<td>1.11</td>
<td>8.23</td>
<td>1.01</td>
</tr>
<tr>
<td>2.</td>
<td>Passing</td>
<td>18</td>
<td>1.5</td>
<td>19</td>
<td>1</td>
</tr>
</tbody>
</table>

By looking at Table (4), which shows the median and deviation of the pre- and post-tests and the total tests under consideration (sensory-kinetics-passing) and for the experimental group, we find that the results of the test of perceptual-kinetics and in the pre-test achieved a median of (8.85 Sec.) In the post-test for the same skill, the median reached (8.23Sec.) With a deviation of (1.01) below the significance level (0.05) and the degree of freedom (9). We find that the results of passing test and in the pretest achieved a median of (18) and a deviation of (1.5), but in the post-test for the same skill, the median reached (19) and a spring deviation of (1) under the level of significance (0.05) and the degree of freedom (9).

Discussion of the Results

Through what has been presented in table (3) and (4), which shows the presence of significant differences and statistically significant for the benefit of the post-test of the control and experimental groups, as for the control group and attributed the researcher attribute this reason to the commitment of players to the units of the curriculum prepared by the coach for the skills that Included in the vocabulary of special exercises in the school of football, which helped to develop the level of players through the appropriate repetitions, as well as training is the key factor in the interaction of the learner with the skill. The tests attribute this development to the effectiveness of the exercises that helped the experimental group in developing the ability of the perceptual kinetics, which is an important motor abilities that must be available in the performance of basic skills reel Foot and especially the skill of passing and is the common denominator in most events and sports.7

In order to explain the findings of the researcher to test the passing skill, we highlight the details of table (4), through these results shows the impact of training clearly in the level of performance of passing skill and this development came in the performance of this skill, as a result of continuous training in the training units of Before the coach, it is the most used skill throughout the game, which requires precision and perfection in performance and focus by the coaches all plays a continuing important role in reaching the player to the high level of technical performance of the skill in terms of accuracy, integration and installation of high technical performance.8 Therefore, the researcher considers that the continuous training on the performance of passing skill and clarify the correct performance and correct errors lead to its performance become automatic and accurate without thinking about its parts, that is, the player’s performance reaches a high degree of mechanism and automatic when the training is inherent to the player ball and repetition and continuous practice and without interruption as well Focus on exercises of a variable and diverse nature.9

As for the experimental group, the researcher attributes the significant differences between the pre and post tests and in favor of the post in the development of the skill of passing football to introduce these exercises and aids and the interaction of players with them positively during the educational units and their response to all the requirements of motor performance
required of them, as well its important role in the development of the experience gained by the players from the educational units of compatibility exercises and skill football biography, as well as these exercises led to the diversity of forms and uses to the development of accuracy of performance, as well as the researcher attributes the reason for this development to the use of A variety of auxiliary tools during the educational modules, which have been important in the development of the perceptual sense and the skill of passing football, To increase the excitement of the learner must diversify the methods and tools used to make the learning process more clear and easy.11

Conclusions

1. The field of training has the effectiveness and impact in the development of motor passing of the players in the implementation of some basic skills of football.

2. There are differences in impact in favor of the curriculum applied in the field of training and in each (perceptual-kinetics, passing) football.

3. The device a great effectiveness in measuring perceptual sense-kinetics of football players Cubs.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

REFERENCES


The Impact of Compound Exercises in the Development of Some Perceptions of The Environment for Football Youth

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1The College of Physical Education and Sports Sciences, University of Babylon, Iraq

ABSTRACT

Complex exercises work to develop and refine talents for football and young ages and from the beginning of the training age of the player to reach the highest levels, and that the level of good performance of the player is reflected by a set of basic skills and abilities possessed in the face of different perceptions of the ocean and make the right decision and proper within the competition and the conditions of the game. The researchers aims to be the preparation of composite exercises (skill - planning) through the use of different training methods and a variety of football beginners and to identify the impact of these composite exercises in the development of these perceptions as they used the experimental method For a sample of (30) players, and the implementation of harmonic exercises installed in the main section only by (24) training units and we showed the results of the research that was presented and analyzed for the tests before and after the research group there were significant differences in the development (field of vision).

The researcher’s conclusions show that the combined exercises affected the effectiveness of the performance of football’s youth in the face of the diverse perceptions of the environment offensive play positions.

Keywords: compound exercises and environment.

Introduction

Specialized in the field of football to teach young people to invest play plans and integrate the educational skill with the planning side and complete other physical and psychological aspects in addition to the development of skill and plan and attention to the conditions of competition as there are several different circumstances that occur to the player and must learn and experience before entering them, including Perceptions of the ocean as many perceptions such as field of view, attention and control, the power of concentration and perception of isolation, which the player must train and adjust and try to reduce the impact on him to reach optimal performance.

The researchers noted the weakness of the football players and attention to the open ocean conditions faced by the player, which generates a weakness in the face of offensive and scoring in these various situations, so teaching them and training them to face different perceptions during the game is very necessary, especially In the junior stage, which is one of the most important stages as the player is in a crucial stage to move to the advanced stage, which is the stage of youth, where the planetary learning is late and there is a great loss of effort and time.

The importance of the research is that the impact of these exercises in the development of emerging players and the link between the performance of tactical planning with control and awareness of other variables of perceptions of the ocean in order to develop the players to make the right decision Attacking Attitudes During Competition It is a simple attempt by the researcher to develop the skillful and tactical performance of football youth.

Research aims:

1. Identify the impact of compound exercises in the development of some perceptions of the environment for young football in the specialized school - Babylon.

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Email: Hussein.s9999@gmail.com
2. Identify the preference of the two groups in the development of environmental perceptions of the youth football in the specialized school - Babylon.

Research hypotheses: Combined exercises (skill - planning) have a positive impact in the development of some perceptions of the environment for young people football.

Research Methodology and Field Procedures

Research Methodology: The researchers used the experimental method to design the two equal groups with pre- and post-test to suit the nature of the problem to be solved.

Research community and its samples:

Research community: The researcher identified the research community of the emerging players in the specialized schools for the care of talented football in the province of Babylon and the ages of (15.16) years and the number of (38) players.

Search samples:

1. Sample of the pilot: This sample consisted of (8) players randomly selected from the research community representing the specialized school.

2. Main sample (sample application): This sample consisted of (30) players representing the emerging players in the specialized football school in Babil province.

Homogeneity of the sample and equivalence of the two research groups:

Homogenization of the research sample: The researcher investigated the homogeneity of the research sample in variables related to morphological measurements (length, mass, age, training age) as shown in Table (1).

<table>
<thead>
<tr>
<th>S.</th>
<th>Variables</th>
<th>Experimental Mean</th>
<th>SD</th>
<th>Control Mean</th>
<th>SD</th>
<th>(f) value</th>
<th>Sig. Value</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Length</td>
<td>163.73</td>
<td>4.31</td>
<td>160.86</td>
<td>3.97</td>
<td>0.14</td>
<td>0.70</td>
<td>Non sig.</td>
</tr>
<tr>
<td>2.</td>
<td>Mass</td>
<td>49.26</td>
<td>4.72</td>
<td>49.46</td>
<td>4.56</td>
<td>0.40</td>
<td>0.83</td>
<td>Non sig.</td>
</tr>
<tr>
<td>3.</td>
<td>Age</td>
<td>15.46</td>
<td>0.51</td>
<td>15.53</td>
<td>0.61</td>
<td>0.17</td>
<td>0.72</td>
<td>Non sig.</td>
</tr>
<tr>
<td>4.</td>
<td>Age of training</td>
<td>14.06</td>
<td>3.65</td>
<td>15.60</td>
<td>3.39</td>
<td>0.65</td>
<td>0.42</td>
<td>Non sig.</td>
</tr>
</tbody>
</table>

The results of Table (1) show that the sig values of the variables were higher than the significance level (0.05), which indicates the homogeneity of the sample of the research sample in these variables.

Equal search groups: The researcher conducted the equivalence of the two groups (control and experimental) tests for some perceptions of the environment as shown in Table (2).

<table>
<thead>
<tr>
<th>Tests</th>
<th>Units</th>
<th>Control Mean</th>
<th>SD</th>
<th>Experimental Mean</th>
<th>SD</th>
<th>Sig. Value</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environment Perceptions</td>
<td>Field of view</td>
<td>Degree</td>
<td>138</td>
<td>4.35</td>
<td>143</td>
<td>6.9</td>
<td>0.62</td>
</tr>
<tr>
<td></td>
<td>The focus</td>
<td>Degree</td>
<td>39.4</td>
<td>6.59</td>
<td>38.8</td>
<td>5.4</td>
<td>0.17</td>
</tr>
<tr>
<td></td>
<td>Divided attention</td>
<td>Degree</td>
<td>39.4</td>
<td>4.1</td>
<td>40.4</td>
<td>4.1</td>
<td>0.13</td>
</tr>
</tbody>
</table>

The results of Table (2) show that the sig values in the pretest tests of some environment perceptions between the control and experimental groups were greater than the level of significance (0.05), which indicates the equivalence of the two groups in all pretest tests.
The means and tools used in the research:

1. Arab and foreign references and sources.
2. Interview.
3. Observation.
4. Tests and measurement.
5. Legal football field.
6. Legal footballs type (PUMA) German origin number (20) balls.
7. Plastic signs (10).
8. Legal goals.
10. Computer (laptop) type (Dell) Korean origin number (1).

Field research procedures:

Identify environment perceptions: A game of football in which there are many variables and different conditions during the game and competitions and at all times of their time and these conditions may be natural or artificial and there are many perceptions that the player must sense and the ability to change in decision-making through the rapid perception and distinctive interpretation of these Environmental perceptions, which the learner must master and apply during learning or practice exercises and before entering the competition must be prepared for them, however fast and changing perceptions, and include the audience and players colleagues and competitors and the ball and the correct expectation of all these. There are also perceptions pertaining to the law of the game, which must be carefully observed and not violated, all these are perceptions of the periphery faced by the player during the game, therefore, the player must be taught to develop the face of these perceptions and attention to them through various exercises and thus reflected on the development of performance The player during the competition, including the development of the face of different offensive positions and accuracy of scoring, especially in this stage junior stage where learning is very important at this stage in order to install this learning before moving to the youth stage and the development of the skill side etc. Fold through a variety of exercises to help the players to make the right decision and appropriate, according to the offensive position experienced by the player.

Characterization of environmental perception test:

Test application: The examiner sits and looks at the computer screen and focuses his attention to the center of the screen, which should be a distance between (40 - 60 cm), and when the examiner moves less or more than the allowed distance will appear an alert on the computer screen to alert the examiner to return within the standard range of the examination. And then the device measures the angle of field of view of the total examiner.

Stages of the test: It goes through three main stages, which can be summarized as follows:

1. Instructions Phase Instructions are given here, step-by-step instructions and information about the test and what will be the subject of the stimulus or questions and so on. And how to use the comprehensive keyboard as well as how to use the foot pedals and so. Also can use the keyboard or foot pedals by hand and right foot, or hand and left foot and according to the desire of the examiner.

2. The Practice Phase: This is the stage that follows the instruction phase, where the examiner is trained on how to respond to the test through some actual illustrative examples. If the examiner made three mistakes or if he did not make any definitive response within 5 minutes, the exercise phase will stop and the program will ask the examiner to refer to the examiner for further instructions. The test applicant can then take the appropriate action, either to return the entire phase back to the instruction phase and so on, thus ensuring that the actual test is performed only after it is found that the examiner has understood and understood the instructions accurately.

3. Test Phase: This is the phase immediately following the exercise phase, in which the rotary knob in the overall response plate should be used with the left or right foot pedal as desired, provided that the examiner is warned not to use both pedals simultaneously. One.

After the test is completed, a help screen is displayed asking us to either show the scan results directly on the computer screen or print them on the printer. Rank for each paragraph with the time taken to answer the test, with Profile showing the detailed test based on the standard scores.
Test duration: The time required for the test is about 15 minutes (including instructions and exercise phase). The variables selected by the researcher are measured within the test of environment perceptions measured by a peripheral perception system within the Vienna test system can be illustrated as follows:

1. The field of vision.
2. Control (focus force).
3. Divided attention.

The main experience: The researcher relied on the following steps after all variables and circumstances of the research were stopped in order to conduct the field experiment.

Pretests of the research sample: The pre-test was conducted on Sunday 30/7/2018.

Implementation of the contents of the combined exercises (skill - plans): The researcher presented models of educational units that include these positions and in order to be accurate results were implemented educational units on the research sample with the assistance of the team and under the direct supervision of the researcher.

The vocabulary of the content of the combined exercises are as follows:

1. It took (8) weeks to carry out the combined exercises (skill - plan).
2. The number of educational units per week (3) units.
3. The total number of units (24) educational units for the experimental group.
4. Time per unit of education (120) minutes.
5. The application of compound exercises in the main section only and time (80) minutes.

The researcher started the implementation of composite exercises prepared on Friday, 3/8/2018 at five o’clock in the housing stadium in the province of Babylon and until Wednesday, 26/9/2018.

Posttests for sample search: Tests were conducted for some environment perceptions of the members of the research sample on Sunday 30/9/2018 at nine in the morning at the University of Babylon - College of Basic Education.

Results

In order to compare the results of the post-test of some environmental perceptions between the control and experimental groups and to find out which is better, the researcher used (t.test) test for asymmetric (independent) samples, as shown in Table (3).

Table 3: Shows the mean, the standard deviations and the value (t) calculated in the post-tests of cognitive flexibility and some environmental perceptions between the control and experimental groups

<table>
<thead>
<tr>
<th>S.</th>
<th>Variables</th>
<th>Units</th>
<th>Control</th>
<th>Experimental</th>
<th>(t) *Value</th>
<th>Sig. Value</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>Field of view</td>
<td>Degree</td>
<td>Mean: 147</td>
<td>Mean: 153</td>
<td>2.6</td>
<td>0.01</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD: 5.47</td>
<td>SD: 5.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>The focus</td>
<td>Degree</td>
<td>Mean: 48.9</td>
<td>Mean: 53.9</td>
<td>2.7</td>
<td>0.01</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD: 5.54</td>
<td>SD: 5.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Divided attention</td>
<td>Degree</td>
<td>Mean: 49.3</td>
<td>Mean: 54.3</td>
<td>3.41</td>
<td>0.00</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD: 5.6</td>
<td>SD: 5.6</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* The value of (t) tabular and amounting to (1.70) indicative level (0.05) and the degree of freedom (28).

The results of Table (3) show differences and differences in the values of the computational media in the dimensional tests of some environment perceptions (field of vision, concentration, divided attention) between the control and experimental groups of the experimental group. On the significance of the differences, the researcher used the test (t.test) for the independent samples, Experimental.

Discussion of the results of the differences between the pre- and post-tests of some environment perceptions of offensive play positions and accuracy of scoring between the control and experimental groups:

Through the results presented in Table (3) which show the existence of significant differences in the dimensional tests of some environmental perceptions between the control and experimental research groups and better for the experimental group, the researcher attributes the
reason for these differences to the combined exercises and tools used by the researcher in developing some environment perceptions.  

For the experimental group in all educational units of the main section in addition to explanation and clarification for the players in how to make the best decision after watching the best model and this helped to attract the attention of the players during the performance of composite exercises in the main section of the educational units and The following is easy to encrypt and save information in the mental memory of the players and easily summoned in different offensive situations in similar situations of play and the reality of competition as he stressed to reach the player to achieve a good level in the game must focus on the good choice of targeted exercises and put the player in Training conditions especially close to the conditions of the game.

All this has a great impact on the development of players also to the perceptions of the environment faced by the player during the combined exercises and its reflection in the reality of competition and games, as well as to watch these situations and offensive situations before the application It helps the player to develop the perceptions of the environment, which includes the field of vision, focus and divided attention and this is confirmed by Attention is indispensable part in training during the games occur situations and situations require the player constant observation and constant alertness and permanent focus so that he can overcome these sudden situations and unexpected difficulties that often appear in real playing conditions, as the field of vision of the football player is very important in order to expand his vision to competing players as well as fellow players in order to pass the ball to them or receive them in addition to focus is important The divided attention that the researcher deems very important for football players because the divided attention helps players in making the best decisions during the games to pay attention to the opponent and colleagues and follow their movements and create opportunities to score in the team’s goal.

Conclusions

1. Complex exercises (skill - tactical) have an active role in the development of some perceptions of the environment for the offensive play positions and accuracy of scoring for football beginners.

2. Players of the experimental group achieved noticeable differences in the post-tests of some environment perceptions of the offensive play positions and accuracy of scoring, but less than the players of the experimental group.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

REFERENCES


Serum Levels of Lipocalin-2 and Prostate Specific Antigen in Patients with Prostate Cancer; A Comparative Study

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ABSTRACT

Background: Prostatic cancer is a common disease, increasing dramatically with age. Over one million men are biopsied annually in the United States, making this a major public health problem. Approximately one in nine men with prostate cancer the median age at diagnosis is 66 years, and the median age at death is 80 years. Lipocalin 2 has been identified as an adipokine. It is expressed in liver, lung, kidney, macrophages and epithelial cells. Lipocalin 2 function involves in a variety of physiological activities, which is an important factor in innate immune responses. Prostate-specific antigen (PSA) is the most reliable tumor marker available and is widely used for the diagnosis and management of prostate cancer, and it is another commonly test used to screening for prostate carcinoma.

Material & Method: This is a cross sectional, hospital based study, this study was carried out from Jan 2019 to July 2019. Forty – eight men with prostatic cancer were screened to participate in the present study. Men ages were between 50 - 88 years old, and they were from center and the periphery of Kirkuk city. Forty – two apparently health men without prostatic cancer and with negative family history for the first and the second degree relative of prostatic cancer were considered as a control groups, their ages were from 50 to 80 years. A serum level of Lipocalin 2 was measured by ELIZA and prostate specific antigen by VIDAS.

Results: The mean serum level of lipocalin 2 was significantly elevated in prostate cancer men compared to control men (37.03 ± 3.71 vs. 18.19 ± 2.94 ng/dl) respectively at a P 0.05. This study showed that there is the significant difference between the patients and the control group concerning PSA level, which was higher in sera of the patients (23.53 ± 8.34 vs. 2.47 ± 1.40).

Conclusion: Both of lipocalin 2 and PSA were higher in the sera of the patients with prostatic cancer, and were positively correlated with each other.

Keywords: Prostate Cancer, lipocalin 2, and prostate specific antigen.

Introduction

Prostate cancer (PCa) is the leading type of most common diagnosed urological cancer in men, and its prevalence is continuously increasing.¹ It is more common in men over the age of 65 years. There are 15% cases with positive family history of prostate cancer worldwide.² Prostate cancer is one of the solid cancers that is also the second leading cause of cancer death among males.³ It occurs when the cells in the prostate gland grow out of control and form lumps, called tumor. Prostate cancer shows that more than 95% of malignancies in prostate are adenocarcinoma (the medical term for a cancer that starts in gland cells is adenocarcinoma). Other types of cancer can also start in the prostate gland, including sarcomas, small cell carcinomas, neuroendocrine tumors, and transitional cell carcinomas.⁴ ⁵

Lipocalin 2 (LCN2) also known as neutrophil gelatinase associated lipocalin (NGAL), Lipocalin 2 is a small protein which belongs to the superfamily of lipocalins, was identified originally as a 25 KDa secreted
protein. It has become of interest to cancer researchers because its expression changes in colorectal, breast, and pancreatic cancers, and highly expression of LCN2 in hepatocellular carcinomas (HCC). Hypothesized that the serum NGAL may act as a diagnostic biomarker of early acute kidney injury (AKI). It has been documented that LCN2 can also bind to soluble siderophores of mycobacteria, namely carboxymycobactins, and that LCN2 can inhibit the in vitro growth of M. tuberculosis, and have a role in reducing bacterial outgrowth and mortality.

Members of the lipocalin protein family are characterized by their ability to bind small hydrophobic molecules (such as retinoids, hormones and fatty acids). They often bind to specific cell-surface receptors and form macromolecular complexes. Lipocalin 2 have role in iron-homeostasis: impact on cell proliferation, differentiation, and as modulator of the inflammatory response, several studies highlight the increased production of LCN2 upon diverse pro-inflammatory stimuli.

Prostate-specific antigen a member of the kallikrein gene family, is a serine protease synthesized by prostate epithelial cells, with a molecular weight (MW) of 30 KDa glycoprotein and containing 261 amino acids, the gene encoding for PSA is located on chromosome 19. It is secreted into seminal fluid in high concentration (mg/ml) that is primarily involved in liquefying human sperm through a proteolytic mechanism, which appear normally in serum from the healthy males at low concentrations (μg/L).

Patients, Materials, and Method

The patients were collected from Azadi Teaching Hospital, Kirkuk General Hospital and Kirkuk Oncology Center, that approved by Kirkuk Health Directorate, to collect the samples from the patients. This study was carried out from Jan 2019 to July 2019, in Kirkuk City-Iraq. A verbal consent was taken from each men included in this study whether considered as a case or control. A total of 48 patients with prostate cancer were enrolled in this study, their ages were from 55 to 88 years. An apparently health men without prostatic cancer and with negative family history for the first and the second degree relative of prostatic cancer were considered as a control groups, their ages were from 50 to 80 years.

By using a sterile disposable syringe 5 mls of blood sample were taken by vein puncture from each subject enrolled in this study. Blood samples were placed into disposable gel test tubes, after 20 minutes blood clotting, centrifuged at 3000 rpm for 15 minute and the obtained serum were aspirated using mechanical micropipette and transferred into clean test tubes which labeled and stored in deep freeze a - 20 until the time of estimation. Serum of the patients and controls had assay: levels of Lipocalin 2 and prostate specific antigen. Lipocalin 2 was measured by ELIZA, while prostate specific antigen by VIDAS. The correlation of lipocalin 2 to prostatic specific antigen was also estimated.

Statistical Analysis: All the date collected in this study was analyzed by using the student t-test, the mean, standard deviation, and P-value was also considered. The significance was considered at a P value of less than 0.05.

Results

This study recorded the highest rate of prostate cancer (42%) was within the age group 70 - 79 years, followed those within the age group 60 - 69 years (35%), then age group 50 – 59 years (15%). least rate of prostate cancer in this study was (8%) within the age group ≥ 80, as evident in figure (1).

![Figure 1: Relationship of prostate cancer with age](image)

This study show that the mean of BMI was recorded in prostate cancer men when compared with healthy men (23.55 5.3 vs. 22.11) Kg/m², figure (2).

![Figure 2: BMI in prostate cancer me](image)
The mean serum level of lipocalin 2 was significantly elevated in prostate cancer men compared to control men (37.03 ± 3.71 and 18.19 ± 2.94) pg/ml, respectively at a P. value < 0.05. See table 1.

Table 1: The serum level of lipocalin 2 in patients and control

<table>
<thead>
<tr>
<th>Lipocalin 2 level (pg/ml)</th>
<th>Patients</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>48</td>
<td>42</td>
</tr>
<tr>
<td>Mean</td>
<td>37.03</td>
<td>18.19</td>
</tr>
<tr>
<td>SD.</td>
<td>3.71</td>
<td>2.94</td>
</tr>
</tbody>
</table>

T. test: 3.34 P. value: < 0.05 Highly Significant

This study showed that there is the significant difference between PCa men and the control group concerning PSA level, the mean of serum level of PSA was higher in PCa men compared to control groups (13.60 ± 7.98 vs. 7.73 ± 1.22) ng/ml, table (2).

Table 2: The serum level of PSA in patients and the control

<table>
<thead>
<tr>
<th>PSA level (ng/ml)</th>
<th>Patients</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>48</td>
<td>42</td>
</tr>
<tr>
<td>Mean</td>
<td>23.53</td>
<td>2.47</td>
</tr>
<tr>
<td>SD.</td>
<td>8.34</td>
<td>1.40</td>
</tr>
</tbody>
</table>

P. value: < 0.05 Highly Significant

This study showed that there is positive correlation between LCN 2 and PSA among PCa men, figure (3).

Measurements of BMI in this study showed that the mean of BMI was higher in men with PCa when compared with healthy men. Although the precise etiology of prostate cancer is unknown, several lines of evidence suggest that environmental and/or lifestyle factors may have an important role in the development of clinically significant disease. However, even though lifetime dietary fat consumption and obesity are clearly linked, the association between obesity and PCa risk in epidemiologic studies has been inconsistent. Amling et al, (19) showed that the obesity was one of several potential risk factors like the obesity that might be related to the development of clinically significant PCa.

This study showed that there was a significantly higher mean serum level of LCN2 in prostate cancer men compared with that of the control groups. Lipocalin 2 has an important role in the regulation of cellular oncogenesis and apoptosis. The identification of biomarkers involved in the proliferation, migration, and invasion of prostate cancer cells can help create new therapies for treating this type of cancer. (20) Lipocalin 2 may have roles in prostate cancer through its effect on intracellular iron; LCN2 can either deliver or remove iron from the cell, depending on the context. The iron-bound form of LCN2 is internalized after binding to the 24P3R receptor. This leads to the release of iron and subsequent increase of intracellular iron. In contrast, when the iron-free form binds the 24P3R receptor, LCN2 is associated

Discussion

This study recorded that the highest rate of prostate cancer was within the age group of 70 to 79 years, while the lowest rate was for those of equal or less than 80 years, also the result showed that the prostate cancer risk was increase with age. In this study only 4 patients were ≥ 80 years of age; this little number was related to the limitation of the participants of the old ages. The result of study was in agreement with Bashir et al, (143) who recorded that the age was positively associated with prostate cancer risk. It is rare before the age of 40, but the chance of developing prostate cancer rises rapidly after the age of 50 years. Crawford ED, et al, (18) reported that prostate cancer is associated with aging, they recorded that in the United States of America, that 70% of all cases of prostate cancer were diagnosed in men of 65 years of age and over. It is relatively rare for prostate cancer to be diagnosed in men below 50 years of age. The probability of developing prostate cancer increases from 0.005% among individuals aged below 39 years to 2.2% for those aged 40 to 59 years and 13.7% for those aged 60 to 79 years.
with the intracellular siderophores, resulting in iron chelation and iron transfer to the extracellular medium, leading to reduced intracellular iron. Iron is critical in regulating cellular proliferation, invasion and cancer metastasis. Thus, LCN 2 may play important roles in prostate carcinogenesis and progression via regulation of iron homeostasis. (21) The higher serum level of LCN2 in patients with prostatic cancer in the current study, these results were in agreement with Sicheng BI et al, (22) suggesting that levels of serum LCN2 in PCA patients depending on the type of prostatic tumor whether benign or malignant, and LCN2 may be a potential serum marker for the diagnosis of PCA. Combined detection of LCN2 and PSA contributes to the early diagnosis of PCA. Muşlu N, et al, (23) Turkish study showed that the increased serum LCN2 levels, when sensitivity fixed to 80% specificity of LCN2 was better than PSA indicate a relation with PCA diagnosis.

The results of this study indicate that the serum level of PSA significantly increased in sera of patients with prostatic carcinoma as compare with control group, the elevation in serum level of PSA was > 20 ng/ml. The elevated PSA serum levels more than 4 ng/ml and abnormal digital rectal examinations are signs that a malignant prostatic lesion might be present and warrant multiple prostatic biopsies that put the diagnosis. However, PSA serum levels below the threshold of 4 ng/ml do not guarantee the absence of disease, the prevalence of prostate cancer in these patients being as high as 15%, of which a significant percentage are high grade tumors. Increase serum levels of PSA above threshold can be determined by a multitude of other factors besides prostate cancer, including benign prostatic hyperplasia, prostatitis, atypical small acinar proliferation, and prostatic intraepithelial neoplasia. (24, 25) The significantly increased serum level of PSA in sera of patients with prostatic carcinoma, these findings correlated with the studies by, Armstrong et al, (26)

Conclusion

This study showed that there is positive correlation between LCN 2 and PSA among PCA men. This finding was in agreement with the result of Sicheng BI et al, (22) who found a positive correlation between serum LCN2 and PSA levels in PCA men. And who reported that the lipocalin 2 may be a potential serum marker for the diagnosis of PCA. Combined detection of LCN2 and PSA contributes to the early diagnosis of PCA.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

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Practicing, Attitudes and Beliefs of Physicians at Al-Emamain Medical City towards Seasonal Influenza Vaccination

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ABSTRACT

Background: Influenza viruses are the causes of influenza epidemics in human. The virus has the characteristic of antigenic drift with a continuous emergence of new antigenic variants which are responsible for seasonal epidemics. Thus, the available vaccines should be annually adjusted in order to give the required protection level. Most health associated international organizations recommend annual vaccination of almost all people ≥ 6 months old, particularly those at high risk.

Objectives: The study is an attempt to display the practicing, attitudes and Beliefs of physicians at Al-Emamain Al-Kadhumain medical city towards Seasonal Influenza Vaccination.

Method: A cross-sectional study was conducted at Al-Emamain Al-Kadhumain medical city, from February to end of April, 2018. A total of 306 physicians were interviewed using semi constructed Questionnaires especially prepared for this purpose.

Results: The rate of vaccine uptake among this sample was (29.7%). 79.9% of them believed the Flu-vaccine was safe, 69%of them see it needed and 71% of whom take the vaccine, regard it effective in preventing Flu and it’s complications. There was significant relation between Flu-Vaccination and gender and also with the wards where the physicians work.

Conclusion: Flu-vaccination rates among the physicians was low, despite most of them were think the vaccine was safe, needed and effective. About two third of them disagree to give the vaccine to pregnant women.

Keywords: Influenza vaccine, attitude, physicians

Introduction

The two types of influenza virus, A and B, are responsible for influenza epidemics in human. Influenza A viruses are further classified into H1N1 and H3N2 subtypes according to hemagglutinin and neuraminidase; two surface antigens. On the other hand, there are two genetic lineages of influenza B viruses with no subtypes. However, the antigenic drift occurs less frequently in this type than influenza A virus. Beside these subtypes, new variants of influenza viruses continuously emerge due to the recombination and some point mutations that occur during viral replication. As such, antibodies formed against certain type or even subtype of influenza virus confer little or no protection against the other types or subtypes. It is this antigenic drift which is responsible for seasonal epidemics and requires the readjustment of the vaccine each season. (1) Despite the fact that the vast majority of individuals infected with influenza virus will recover without serious sequelae, severe illness and even death may occur especially among older patients, infants, pregnant women, patients with chronic diseases, and healthcare workers. Thus, influenza vaccine is an utmost necessity to protect those patients. (2) Influenza shots is a commonly used vaccine which is undergoes two-time a year development to pace with the rapid antigenic change in the virus. Although the vaccine varies from year to year, it provides moderate to high protection level against the virus. (3,4) The efficiency of the vaccine in children below 2 years, and in adults with 65 years or older is not known, mainly because the low quantity of research. (5,6,7) The WHO, CDC and European Center for Disease Prevention and Controls recommendations emphasize annual vaccination of almost all aged six
months or older, particularly those at high risk. (3,8,9,10). Generally, influenza vaccines contain either as inactivated or attenuated virus, and given as trivalent, quadrivalent injection, or nasal spray. Vaccines that are given as trivalent injection contains inactivated virus; while nasal spray vaccine contains attenuated virus (11). According to CDC recommendations, this latter form of the vaccine should be avoided in children blow 2 years, adults over 50 years, individuals with known hypersensitivity to any component of the vaccine, patients with asthma, children and adolescents using long-term aspirin, immunocompromised patients, and pregnant women. (12) Generally, the vaccine is safe, although some adverse reactions may occur. For example, fever may develop in 5-10% of vaccinated children. Similarly, myalgia and tiredness may occur less frequently. Moreover, there some reports which linked the vaccine with increased incidence of Guillain-Barre syndrome in elderly people to reach about one case per million doses. (3) 85 percent of the children who died were not have been vaccinated During the 2017–2018. (13,14)

The Method

A cross-sectional study was adopted at Al-Emamain Al-Kadhumain Medical City/Baghdad. The data collection was carried during February to the end of April, 2018. A total of 306 physicians were interviewed by undergraduates medical students, using a semi constructed questionnaire especially prepared for this study. The questionnaire involved the Sociodemographic information like age, gender, specialty, history of smoking and chronic diseases, the ward of practicing and attitudes and beliefs questions about the vaccine. Statistical package for social science version 20 computer software and Microsoft Excel 2010 were used for analysis. Verbal consent was taken from all the participants before they answered the questionnaire.

The Results

A total sample of 306 physicians with mean age (±) SD was (34.7 ± 8.7) year and range from (25-60) years. Among this sample 91(29.7%) of physicians received seasonal influenza vaccine and remaining 215(70.3%) were not receive it. Figure (1).

Table 1: Distribution of the sample according to some attitudes and beliefs questions

<table>
<thead>
<tr>
<th>Questions</th>
<th>Answer</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flu same as common cold</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>92</td>
<td>(30.1%)</td>
</tr>
<tr>
<td>No</td>
<td>214</td>
<td>(69.9%)</td>
</tr>
<tr>
<td>Recommend your family to take it</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>188</td>
<td>(67.1%)</td>
</tr>
<tr>
<td>No</td>
<td>92</td>
<td>(32.9%)</td>
</tr>
<tr>
<td>Recommend your patients to take it</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>198</td>
<td>(70.7%)</td>
</tr>
<tr>
<td>No</td>
<td>82</td>
<td>(29.3%)</td>
</tr>
<tr>
<td>Safety of vaccine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>239</td>
<td>(79.9%)</td>
</tr>
<tr>
<td>No</td>
<td>60</td>
<td>(20.1%)</td>
</tr>
<tr>
<td>Give it to pregnant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>83</td>
<td>(27.7%)</td>
</tr>
<tr>
<td>No</td>
<td>217</td>
<td>(72.3%)</td>
</tr>
<tr>
<td>Give it to children under 5 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>136</td>
<td>(45.5%)</td>
</tr>
<tr>
<td>No</td>
<td>163</td>
<td>(54.5%)</td>
</tr>
<tr>
<td>Was it needed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>207</td>
<td>(69%)</td>
</tr>
<tr>
<td>No</td>
<td>93</td>
<td>(31%)</td>
</tr>
<tr>
<td>Mandatory flu vaccine should Implanted</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>177</td>
<td>(59%)</td>
</tr>
<tr>
<td>No</td>
<td>123</td>
<td>(41%)</td>
</tr>
<tr>
<td>Have adequate information about vaccine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>105</td>
<td>(35.1%)</td>
</tr>
<tr>
<td>No</td>
<td>194</td>
<td>(64.9%)</td>
</tr>
</tbody>
</table>
While regards the attitudes of the physicians whom received the vaccine, the results seen in table 2.

Table 2: Attitudes and Beliefs of physicians whom receiving flu-vaccine

<table>
<thead>
<tr>
<th>Questions</th>
<th>Attitude</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taking the vaccine regularly</td>
<td>Yes</td>
<td>25 (27%)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>66 (73%)</td>
</tr>
<tr>
<td>Time they take the vaccine</td>
<td>Winter</td>
<td>53 (58%)</td>
</tr>
<tr>
<td></td>
<td>Spring</td>
<td>8 (8.8%)</td>
</tr>
<tr>
<td></td>
<td>Summer</td>
<td>2 (2.2%)</td>
</tr>
<tr>
<td></td>
<td>Autumn</td>
<td>28 (31%)</td>
</tr>
<tr>
<td>Effective in preventing flu-infection or its complication</td>
<td>Yes</td>
<td>65 (71%)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>26 (29%)</td>
</tr>
<tr>
<td>Developing any side effect</td>
<td>Yes</td>
<td>79 (87%)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>12 (13%)</td>
</tr>
<tr>
<td>Which side effect?</td>
<td>Fever</td>
<td>36 (46%)</td>
</tr>
<tr>
<td></td>
<td>Running nose</td>
<td>4 (5%)</td>
</tr>
<tr>
<td></td>
<td>Sore throat</td>
<td>1 (1%)</td>
</tr>
<tr>
<td></td>
<td>Muscle pain</td>
<td>18 (23%)</td>
</tr>
<tr>
<td></td>
<td>Allergic reaction</td>
<td>0 (0%)</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>20 (25%)</td>
</tr>
<tr>
<td>Influence to take it</td>
<td>To avoid flu or its Complications.</td>
<td>78 (86%)</td>
</tr>
<tr>
<td></td>
<td>Protect the patients</td>
<td>7 (8%)</td>
</tr>
<tr>
<td></td>
<td>Protect my family</td>
<td>4 (4%)</td>
</tr>
<tr>
<td></td>
<td>Other colleague had it</td>
<td>1 (1%)</td>
</tr>
<tr>
<td></td>
<td>Vaccine was available</td>
<td>1 (1%)</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>0 (0%)</td>
</tr>
</tbody>
</table>

According the cause that prevent the physician from vaccine uptake, see figure 2.

Figure 2: The distribution of the sample regarding the causes of not taking the vaccine by the physicians at Al-Emamain Al-Kadhumain Medical city
There was a significant relation between the vaccine intake and male gender and also between it and the wards’ types at which the physicians work. Table 3.

While there were no significant relation between intake vaccine and the marital status, Residence, Specialty, History of smoking and chronic disease (P=0.68, 0.17, 0.2, 0.6 and 0.5) respectively.

Table 3: Flu-vaccination regarding the gender and medical ward that the physicians attended in Al-Emamain medical city

<table>
<thead>
<tr>
<th>Gender</th>
<th>Vaccinated</th>
<th>Not vaccinated</th>
<th>Total</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>62 (34.3%)</td>
<td>119 (65.7%)</td>
<td>181 (100%)</td>
<td>X²=4.3</td>
</tr>
<tr>
<td>Female</td>
<td>29 (23.2%)</td>
<td>96 (76.8%)</td>
<td>125 (100%)</td>
<td>P=0.03</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Medical Ward</th>
<th>Vaccinated</th>
<th>Not vaccinated</th>
<th>Total</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>General medical</td>
<td>34 (37.8%)</td>
<td>56 (62.2%)</td>
<td>90 (100%)</td>
<td>X²= 13.5</td>
</tr>
<tr>
<td>Surgical</td>
<td>20 (22.4%)</td>
<td>69 (77.5%)</td>
<td>89 (100%)</td>
<td>P=0.01</td>
</tr>
<tr>
<td>Pediatric</td>
<td>14 (42.4%)</td>
<td>19 (57.6%)</td>
<td>33 (100%)</td>
<td></td>
</tr>
<tr>
<td>Obstetrics &amp; gynecology</td>
<td>0 (0%)</td>
<td>14 (100%)</td>
<td>14 (100%)</td>
<td></td>
</tr>
<tr>
<td>Emergency unit</td>
<td>5 (27.8%)</td>
<td>13 (72.2%)</td>
<td>18 (100%)</td>
<td></td>
</tr>
<tr>
<td>other</td>
<td>18 (29%)</td>
<td>44 (71%)</td>
<td>62 (100%)</td>
<td></td>
</tr>
</tbody>
</table>

**Discussion**

Influenza is the most common illnesses that is associated with annual epidemics worldwide. Several lines of evidence support the potential transmission of the virus from infected healthcare workers, whether symptomatic or asymptomatic, to their susceptible patients. Therefore, immunization of healthcare workers is expected to potentially reduce the risk of viral transmission. (9). Despite the availability of immunization guidelines in many countries, the uptake of influenza vaccine among health care workers was low, (11) and this like what was found in this study, as the rate of influenza vaccination among physicians was 29.7%, this nearly the same to the studies conducted in United Arabian Emirates, Lebanese general population, and one of US hospital setting, the vaccination rate among health care workers were 24.7%, 27.6%, 28%, respectively. (14,15,16). Most of physicians involved in the current study believed the Flu-Vaccination was effective and safe and half of them think mandatory vaccination of the health workers should have implemented like what found in USA studies. (11,17). Regarding the cause of non- vaccination, this study found most common cause of it was lack of time and this nearly like previous studies in French and Australia (12,18), and this one of the causes prevent vaccination which may be due to overload that the Iraqis’ physician suffering from.

The current study found decrease agreement to give a pregnant or a child less than 5 years Flu Vaccine like a study done in Jordan. (19) And this may be due to lack of information and education about influenza vaccine, and the fear from their family if any side effect developed especially in our society. Concerning the statistical significance found in this study, it found significant association between intake vaccine and the gender like which found in previous study in Turkey. (20). This study also found a significant relation between vaccine intake and the wards that physician worked in, like what was found in a UK hospital setting (21) and this may have related to more contact with patients in internal medicine or whom suffering from series diseases also physicians in medical ward may had more accurate information about the importance of this vaccine. Finally, there was no significant association between residence, history of smoking and chronic diseases and uptake of flu vaccine, like which found in Lebanese general population. This may be due to small percent of physicians having history of smoking and chronic disease. (15).

**Conclusion**

Flu-vaccination rates among the physicians was low, despite most of them were think the vaccine was safe, needed and effective. About two third of them disagree to give the vaccine to pregnant women.
Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

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The Effect of Learning Style by Playing Directly in Learning the Skill of Passing Football at the Age of (13-14) Years

Ali Qais Habeeb Majeed1, Samer Abdulhadi Ahmed1, Ahmed Murtada Abdulhussain1

1The College of Physical Education and Sports Sciences, University of Kerbala, Iraq

ABSTRACT

In order to accelerate the learning process and reach the best results and attract the learner to the proposed exercises was used learning method by playing directly on the research sample of (80) players of specialized schools for the year 2019 and in two control and experimental groups (10) players for each group, where researchers introduced a method Learning to play direct in the proposed exercises in order to accelerate the process of learning the skill of passing football and after conducting the pre-test and the application of the proposed exercises and conduct tests after the results proved that there is a positive impact of this method, which lasted (8) weeks (3) units per week and The researcher concluded that the method of learning by playing directly to the sample had a prominent role in learning the skill of passing among the sample members.

Keywords: learning style, playing directly and skill of passing.

Introduction

The method of learning by playing direct, one of the learning methods that take into account the psychology of the learner through which the learner has a positive role characterized by being an active and effective element within the educational unit because of this style of interaction between the trainer and learners during the educational process through educational activities and games are prepared in a practical way Direct play is one of the main entry points of learning that focuses on the learner’s activity and costiveness, the development of a comprehensive development personality in various aspects and the temptation of the learner to interact with educational attitudes, including good motor skills and targeted educational and educational activities.1

The skill of passing football is an important skill that requires high concentration, and because this skill is an important factor in determining the outcome of the game, which is the goal of each coach and team, so requires the football player high accuracy in its performance as accuracy is an important variable in the field of motor learning And kinetic behavior because most motor skills require the implementation of motor performance with the least possible errors.2

The fact that the learning of these skills is done in formulas or methods and organized and may not be interspersed with direct play, so the researcher considered the introduction of the learning method of direct play to contribute to learning the skill of passing football and then reach the best results. This is what the researcher will seek to achieve through the goal of the research in the recognition of the impact of learning style of direct play in learning the skill of passing football players in specialized schools age (13-14) years.

Research Methodology

The researchers used the experimental method by designing the two experimental and control equal groups as the appropriate method to solve the research problem.

Community and sample research: The researchers selected the players of the specialized schools in the middle Euphrates region for the year 2019. A total of (80) players were then selected. (20) Players were selected to represent the research sample that the researchers will conduct their research. They were divided into two experimental and control groups. The original (25%).
Tools, devices and means of data collection: It means “the means or the way in which the researcher can solve his problem whatever those tools, data, samples, devices… etc.”
- Arab and foreign sources.
- Observation.
- Personal interviews.
- Tests and measurement.
- Playing legal football.
- Goals of different sizes.
- 10 football balls.
- Stopwatch (3).
- Two beeps.
- Tape Measure (1).
- Medical scale for measuring mass (1).
- Two Adhesive Tape.
- Ropes to divide the target.
- Persons of different sizes (20).
- Forms of evaluation of tests.

Search procedures:

Equal groups: To start one line “must be research groups are completely equal in all circumstances and variables except the experimental variable that affects the totals Search” (Vandalin 0.341), the researchers conducted a parity between the two groups of search control and experimental passing football test, as in the table (1).

Table 1: Shows parity between the control and experimental research groups in the football passing test

<table>
<thead>
<tr>
<th>Variables</th>
<th>Units</th>
<th>Control group</th>
<th>Experimental group</th>
<th>(t) calculated</th>
<th>Significance level</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Passing</td>
<td>Degree</td>
<td>3.100</td>
<td>1.370</td>
<td>3.300</td>
<td>0.823</td>
<td>0.369</td>
</tr>
</tbody>
</table>

Select tests: Researchers have chosen in the test of the accuracy of the skill of passing football on the sources and references and previous studies related to the adoption of objective evaluation in the process of evaluating these tests, and according to their presence in scientific sources and consistent with the objectives of the study, and after reviewing these sources, the researchers developed a set of these tests with a special questionnaire It was presented to a group of experts and specialists in the fields of (testing, measurement and football), and after the collection of forms and unloading data, the test was accepted which received a high agreement rate and as in Table (2).

Table 2: Shows the rates of agreement of gentlemen experts and specialists to determine the validity of tests of skill passing football

<table>
<thead>
<tr>
<th>S.</th>
<th>Tests</th>
<th>Units</th>
<th>Agree</th>
<th>Disagree</th>
<th>Percentage of agreement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Test the ball passing on a target drawn on the wall</td>
<td>Degree</td>
<td>0</td>
<td>7</td>
<td>0%</td>
</tr>
<tr>
<td>2.</td>
<td>Ball rolling and passing on multiple signs</td>
<td>Degree</td>
<td>0</td>
<td>7</td>
<td>0%</td>
</tr>
<tr>
<td>3.</td>
<td>Passing towards a small target 10 meters away</td>
<td>Degree</td>
<td>7</td>
<td>0</td>
<td>100%</td>
</tr>
</tbody>
</table>

Specification of Football Passing Accuracy Performance Test:

Test the accuracy of passing performance:

Name of the test: Passing towards a small target at a distance of (10) meters.

Purpose of the test: Measuring the accuracy of the performance of passing football.

Used tools: Football field, football balls (5), Persons (3), small target width (120) cm and height (68) cm, tape measure, colored tape.

Performance description: The player stands at (16) meters from the small target placed the ball at a distance (10) meters from the goal and the first person is placed at (1.5) meters from the ball and the distance between each person and person (1.5) Meters, and the last person away from the starting line (1.5) meters.
Method of registration: Each laboratory is given three attempts as two degrees are given for the successful attempt and one score for the attempt that touches the bar and zero for the failed attempt.

Pretests: The pre tests were conducted to test the accuracy of football passing performance of the research sample (control and experimental) on 17/3/2019 at ten in the morning at Al-Ansar Sports Stadium football in the province of Karbala.

The implementation of the vocabulary of learning style direct play: Vocabulary of direct learning by playing included the following:

1. The duration of the implementation of the vocabulary of learning style by playing direct (8) weeks.
2. The number of educational units per week (3) units.
3. The total number of units (24) educational units.
4. The time of each educational unit (60) minutes.
5. The experimental group followed the method of learning by playing direct in learning the performance of skill passing football.
6. While the control group followed the approach followed by the teacher of the specialized school itself.
7. The method of learning by direct play in the main section of the educational units and by (1-3) exercise in the educational unit.

Posttest tests: The researchers conducted the post-test after the completion of the implementation of the vocabulary of direct learning method within (24) learning units in a period of 8 weeks, under the conditions and conditions of the same pretests on 17/5/2019 at ten in the morning.

Results

To identify the results of the differences between the pre- and post-tests of the skill of passing football in the control group, the researchers used the test (t) of the symmetrical samples, as shown in Table (3).

Table 3: Shows the values of the mean, the standard deviations and the values (t) calculated between the pre- and post-tests of the control skill of football for the control group

<table>
<thead>
<tr>
<th>Variables</th>
<th>Pretest</th>
<th>Posttest</th>
<th>Mean diff.</th>
<th>SD diff.</th>
<th>(t) calculated</th>
<th>Significance level</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passing</td>
<td>Mean</td>
<td>3.10</td>
<td>3.90</td>
<td>0.80</td>
<td>6.00</td>
<td>0.000</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>1.37</td>
<td>1.73</td>
<td>0.13</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table (3) shows the results of the values of the arithmetic media and the standard deviations and their differences between the pretest and posttest tests of the passing skill of the control group. The standard mean in the post-test was (3.90) with a standard deviation of (1.73). It is smaller than the significance level (0.05) and below the degree of freedom (9), and this indicates the existence of a significant difference between the pre and posttests and In favor of the post-test.

Table 4: Shows the values of the mean, the standard deviations and the calculated (t) values between the pre- and post-tests of the football skill of the experimental group

<table>
<thead>
<tr>
<th>Variables</th>
<th>Pretest</th>
<th>Posttest</th>
<th>Mean diff.</th>
<th>SD diff.</th>
<th>(t) calculated</th>
<th>Significance level</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passing</td>
<td>Mean</td>
<td>3.30</td>
<td>5.40</td>
<td>2.10</td>
<td>9.00</td>
<td>0.000</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>0.82</td>
<td>0.52</td>
<td>0.23</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table (4) shows the results of the values of the arithmetic media and the standard deviations and their differences between the pre- and post-tests of the passing skill of the experimental group. The standard mean of the test was (5.40) with a standard deviation of (0.52), and the calculated value of (t) was (9.00) at the level of significance (0.000). It is smaller than the significance level (0.05) and below the degree of freedom (9), and this indicates the existence of a significant difference between the tests before and after and in favor of the post test.
Table 5: Shows the values of the mean, the standard deviations and the values (t) calculated in the post-tests of the skill of football passing between the control and experimental groups

<table>
<thead>
<tr>
<th>Variables</th>
<th>Control group</th>
<th>Experimental group</th>
<th>(t) calculated</th>
<th>Significance level</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td></td>
</tr>
<tr>
<td>Passing</td>
<td>3.90</td>
<td>1.73</td>
<td>5.40</td>
<td>0.52</td>
<td>2.63</td>
</tr>
</tbody>
</table>

Table (5) shows the results of the values of the arithmetic media and the standard deviations and their differences in the dimensional tests of football passing skill between the control and experimental groups. (3.90) with a standard deviation of (1.73), while the mean of the experimental group was (5.40) with a standard deviation of (0.52), and the value of (t) calculated (2.63) at the level (0.017) which is smaller than the significance level (0.05) and below the degree of freedom (18), and this indicates a significance different between the control and experimental groups in favor of the experimental.

Discuss the Results

Through the results presented in tables (4,3) which showed the existence of significant differences between the pre- and post-tests of the skill of passing football for the control and experimental groups and for the benefit of the post-tests. The researchers attribute the reason for these differences for the control group, to the adoption of the members of this group to repeat exercises to implement The kinetic duties required of them during the educational units and their dependence on the teaching method, which included the appropriate repetitions that have been carried out continuously, and this is consistent with what has been stated in the practice and effort to train and continuous repetitions are necessary in The process of learning and acquisition, as well as that training is a key factor in the process of interaction of the learner or player with the skill and control of movements and achieve harmony between the movements and component of the skill in the performance of a sequential sound and appropriate time, which increases the learning and development of skill and mastery.

As for the experimental group that showed the results of table (4) that there is a superiority of the post-tests of the skill of football passing to the adoption of the members of this group to learn the method of direct play in a form that provided them to impose the performance of these skills well because they have acquired mental perception and good perception through repeated practice In the course of direct play and thus access to the correct performance of the skills in harmony and harmony and control without hardening or tension, and that the implementation of exercises this method gave members of the experimental group freedom of movement and move smoothly and good agility and increase their self-confidence through Creating an atmosphere similar to the real situations of play, as the use of the method of learning direct play has created a real competition between them through repetitions of performance in the applied part of the main section of the educational unit, which gave great importance to the ability of cognition to them, and this is consistent with what some relevant sources indicated in The player’s sense of ability to perform skill means a sense of movement.

Through the results presented in Table (5) that show the existence of significant differences in the post-tests of the skill of football passing between the control and experimental research groups and for the benefit of the experimental group, the researchers attribute the reason for these results to the adoption of experimental group learning method of direct play which led to adaptation In the performance of passing and scoring skills with a good level of accuracy and mastery due to the actual practice of them during the direct play and the multiplicity of motor performance positions that earned the learner the ability to perform the two skills in good compatibility, which enhanced the accuracy of their performance in a position commensurate with the special technical performance. This is consistent with what has been stated that “compound play exercises play an important role in the achievement of learning motor skills through which it improves compatibility and reduces the appearance of excess movements to a certain extent.

The use of the direct play learning method has provided the members of the experimental group with good mobility performance. Increasing the motivation of learners towards learning and stimulating their interest, as well as the contribution of this method to break the usual method followed, which in turn helped to perform skills and mastery and develop their accuracy more effectively, as one of the most important principles of
good learning is to give students. So be responsible for learning and evaluating its performance, which makes it more effective and less dependent on the teacher and increases his motivation which motivates him to learn and absorb and preserve as much as possible from the experience.

Conclusions

1. The method of learning by playing direct positive impact in learning the skill of passing football.

2. The existence of excellence in the level of learning the skill of passing football players in specialized schools ages (13-14) years and for the benefit of the experimental group.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

REFERENCES


Prevalence of Cutaneous Leishmaniasis in Babylon Province, Iraq

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¹Microbiology Department, College of Medicine, University of Babylon, Iraq

ABSTRACT

Leishmaniasis is a major health problem worldwide, endemic in 98 countries and around 1.3 million new cases are reported every year. A total of 50 patients infected with cutaneous leismaniasis (36 males and 14 females) during period extended from November 2018 to end of April 2019. Those patients were complained from skin lesion in exposed part of the body mostly in the face, leg, arm and the back, diagnosed clinically by special dermatologist as cutaneous leishmaniasis, monthly rates of cases Cutaneous Lesishmaniasis was have increased especially in December, it was (50 %), which is the highest percent of infection, the percent of infection was high in males compaire with females, especillyy in age ranging from (1-10) years. The percent of infection with Cutaneous leishmaniasis according to site of lesions record (58%,18% and 14%) in limbs, face and both (face and limbs) respectively while the neck abdomen appear lowest percent it was (2% and 2%) respectively.

Keywords: cutaneous leishmania, prevalence, lesion site.

Introduction

Leishmaniasis are vector-borne diseases caused by obligate protozoan parasites from the genus Leishmania (Trypanosomatida: Trypanosomatidae) (1). They are transmitted to humans through the bite of a female sand fly. The leishmaniases are now considered as neglected tropical diseases (NTD) by the World Health Organization (WHO). The word leishmaniasis is often written as a plural noun because several presentations can clinically be considered as different diseases. In humans(2). Depending on the Leishmania species, the reservoir of this parasite can be exclusively human, categorizing the disease as an anthroponosis, or, involve animal reservoirs (rodents, dogs, etc...).

Leishmaniasis is a major health problem worldwide, endemic in 98 countries and around 1.3 million new cases are reported every year, with an estimated 20,000 to 40,000 deaths every year (3). Cutaneous leishmaniasis (CL) is the most common and least fatal form of the disease, identified by ulcerative skin lesions.(CL) is caused by Leishmania major, L. tropica, L. braziliensis, L. panamensis, L. aethiopica, L. mexicana, L. guyanensis, L. peruviana, and L. amazonensis (4).

More than twenty Leishmania species are pathogenic for humans (1,5). The species classification within the genus Leishmania has always been a controversial matter, and there is not yet a definitively accepted taxonomy. Routine CBC parameters, such as white blood cell count (WBC), neutrophil, lymphocyte and platelet counts, red cell distribution width (RDW), mean platelet volume (MPV), and platelet distribution width (PDW), are used in many settings, including the evaluation of systemic inflammation and the diagnosis and treatment of disease. Recent studies have reported changes in the circulating neutrophil, lymphocyte, and platelet counts, WBC count, MPV, PDW, neutrophil/lymphocyte ratio (NLR) and platelet/lymphocyte ratio (PLR) in cancer, inflammatory disease, and infection. Hematological changes are closely associated with the severity and the prognosis of disease (6,7).

Material and Patients

1. Patients: A total of 50 patients infected with cutaneous leismaniasis (36 males and 14 females) during period extended from November 2018 to end of April 2019. Those patients were
complained from skin lesion in exposed part of the body mostly in the face, leg, arm and the back, diagnosed clinically by special dermatologist as cutaneous leishmaniasis. Clinically, only 50 cutaneous leishmaniasis patients were observed, among all patients; age range was (1 year-70 years). Diagnosis was based on history (patients coming from endemic areas, persistence of lesions), cutaneous lesions (nodules, plaques, ulcers) and response to specific antileishmanial treatment (pentostam). Duration of lesions varied from 3 weeks to 6 months.

2. Samples Collection: Five milliliters of venous blood were collected from patients as well as from controls. The collected blood samples were immediately transferred to two different test tubes, the blood fraction in the first test tube containing ethylenediaminetetraacetic acid (EDTA) was used to determine blood indices. The sample from the cutaneous lesion taken by aspiration with fine needle as the following steps:

1. The lesion and skin around the lesion was disinfected by 70% ethanol.
2. Sterile syringe of (1) ml contain 0.9 ml of sterile normal saline was used to inject the fluid intradermaly through intact skin in to the active red border of the lesion.
3. Aspirate the injected fluid as the needle draw back until the bloody stained fluid aspirate.
4. Small amount of aspirated fluid was taken and placed on clean glass slides, fixed by using absolute methanol and then Giemsa stain applied for 10 minutes to making direct Giemsa smear before the culturing. Amastigote diagnosed as round or spherical shape with kinetoplast.

3. Statistical Analysis: All Statistcal analysis represent in this study were apply by computer pro.grams such as Microsoft Excel 2015 and SPSS Version 22 statistic. Values in the current study were expressed as mean ± standard derivation (SD). The probability (P value) was estimated students t-test to determine the difference that present in patients and control gorups. The acceptable level of P value was >0.05.

4. Ethical Approval: Verbal consent from patients or their followers were obtained. Moreover, all subjects involved in this work are informed and the agreement required for doing the experiments and publication of this work is obtained from each one prior the collection of samples.

Result and Discussion

Demographic Study:

1. Distribution on the Cutaneous Leishmaniasis patients according to Months: The monthly distribution of cutaneous leishmaniasis cases was variable from one month to the other with peak of infection during December and January (Figure: 1). monthly rates of cases Cutaneous Leishmaniasis was have increased especially in December, it was (50 %), which is the highest percent of infection, then in January (24%), followed by November (14%), and then in February it was (12%). This monthly distribution of cutaneous leishmaniasis cases might be due to the transition of parasite by the sand fly occur in September which represent the month with highest intensity of vectors, therefore, the peak of infections appear after about 3-6 months of biting and this is the incubation time for cutaneous leishmaniasis disease. The monthly distribution of this study in slightly agree with (9) who also explained that the infections started in December then reach the apex in January and February. In addition (10) showed that February had the highest percent of infections (32%). Study of (11) confirmed the same in that February was the month with highest rate of infection in Euphrates area. The results of the present study in regard the monthly distribution totally, disagree with (12) who cleared up that most cases detected from September to the end of December, Figure 1: Distribution on the Cutaneous Leishmaniasis patients according to months

Months

Figure 1: Distribution on the Cutaneous Leishmaniasis patients according to months
2. Distribution of the Cutaneous Leishmaniasis in patient according to sex: The results of this study show the percent of infection in males were about (72 %), while female was (28 %). In all months, the percent of infection in males were higher than females as shown in figure (2). The reason in that infection take out in males more than females, possibly, due to the high incidence of working or sleeping males in open areas (surfaces of houses) with less coverage of body as well as more exposure to infected vectors compared with the females (13).

The results of this study nearly agree with previous studies, (11) in AL-haweja city, showed that males infected with CL more than females (57%:43%) respectively, (14) found that male the percentage of infection with cutaneous leismaniasis was 70% in male while it was 30% in female, as well as, (15) confirm that CL is more frequently in males than in females. Also study of (16) confirm that the rate of cutaneous leishmaniasis in male was (51.7%) while in female (48.3%).

![Figure 2: Distribution of the Cutaneous Leishmaniasis in patient according to sex](image)

3. Distribution of Cutaneous Leishmaniasis patients According to Age group: As shown in table (1). The percent of infection is high in the age group 1-10 years, it was 26%, while the percent of infection in age group 11-20 and 21-30 the same value equal to 22%, while the percent of infection in age group 31-40 years equal 18% in addition the percent decreased in the age group >40 years it was 12% statistical analysis show the reason in that infections less frequency in those people with age more than 20 years (adults) might be because that adults develop resistance and immunity against CL due to their previous exposure to parasite (17). Results of (11) demonstrated results disagree with present study, that incidence rate of CL infections was 57% in patients over 15 years old, and this nearly the same as (14) who found that most patients were in the age group 25-35 years in percent equal to 51%. study of (16) confirm that the highest rate cutaneous leishmaniasis were seen in age group less than 10 years old it was (43.7%) and the least rate were in the age group of 40 to 50 (1.2%). also the results of the present study was agree with (18) who confirm that the range group of 16-20 patients show highest percentage of infection with cutaneous leishmaniasis.

<table>
<thead>
<tr>
<th>Age</th>
<th>Patients</th>
<th>Controls</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>1-10</td>
<td>13</td>
<td>26</td>
</tr>
<tr>
<td>11-20</td>
<td>11</td>
<td>22</td>
</tr>
<tr>
<td>21-30</td>
<td>11</td>
<td>22</td>
</tr>
<tr>
<td>31-40</td>
<td>9</td>
<td>18</td>
</tr>
<tr>
<td>&gt;40</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100</td>
</tr>
</tbody>
</table>

P value =0.308
4. Distribution on the Cutaneous Leishmaniasis patients according to blood group: The result in figure (3) show the highest percentage of infection was in blood group (O) it was 42% in compared with other blood group. The lowest percentage of infection was 6% in blood group AB. Statistical analysis show significant different (<0.05) between blood group and infection with cutaneous leishmaniasis. The present study agree with result of (19) they confirm that blood group O was more frequent with cutaneous leishmaniasis than other group. However the results was non-significant. The A, B and O blood group system are determined by the presence or absent of A and B carbohydrate antigen on the surface of erythrocytes (20). this determines nature resistance in human to many infection disease agent that have cell surface antigens similar to the antigens of different blood groups types. Finding of (16) investigated that there is no relation between blood group type and cutaneous leishmaniasis. Blood group was not a risk factor in the occurrence of cutaneous leishmaniasis.

Figure 3: Distribution on the Cutaneous Leishmaniasis patients according to blood group

5. Distribution of Cutaneous Leishmaniasis patients according to the some Vairable: Table (2) show the highest percentage of infection regarded to duration of infection was in less than months it record (58%) while the lowest percentage of more four months it was (6%).this result was agree with (15) in Wasit. Who recorded that median duration of lesions was under 2 month it was (50 %).

According to number of lesion in patient the present study show that the percentage of infection it was (48%) in patient with more than two lesion, it was higher percent in compare with patients have single lesion (22%), this may indicate that most infection of CL are caused by L. major which is responsible for the multiple lesions, this findings was very close with results of (12) who recorded that single lesion was found in 36% of all cases, also, (15, 12) showed that 53.6% of patients presented with multiple lesions. Contrary to the findings of this study (9) found that the majority of patients have only one lesion 80.6%, while (21) found 68.4% of CL patients were had only one lesion, in comparison, with results of (22) showed that half of the patients 50% have one lesion.

The percent of infection with Cutaneous leishmaniasis according to site of lesions record (58%, 18% and 14%) in limbs, face and both (face and limbs) respectively while the neck abdomen appear lowest percent it was (2% and 2%) respection. Hot weather play important factor in distribution of infection because some people prefer to sleep out their rooms, so they become in
direct contact with insect. In addition, most of the people (especially the children) leave their faces, hands and legs without cover, exposed to the bites of sand flies (17). Regarding, the anatomical sites of lesions, the observations of this study disagree with (23) who showed that in more than 60% of cases, the lesions were on the face. In addition, the result disagree with (15) who showed that the face was the most effected part (64.3%), also (11, 22) showed that lesion site on Hand (62.8%), Leg (10.2%), Face and head (8.8%), Hand and leg (10.2%), other sites (8%), and this observations agree the observation of current study; explained that most lesions were present on exposed area of the body and this match the observations that noticed in present study.

According to residence of in patients the percent study, found that percentage of infection was (52%) in urban it was higher percent in compare with patient rural it was (48%). This results was disagree with (15) Results of this study showed that high (67.4 %) were appeared in rural areas. The percent of infection with CL according to taking treatment it was (66%) in patient without treatment it has higher percent in compare with patient with treatment it was (34%).

According to size lesion in percent in patient the percent study found that percentage of infection was (100 %) in patient with less than five cm table (2).

Table 2: Distribution of Cutaneous Leishmaniasis patients according to some Variable

<table>
<thead>
<tr>
<th>Variable</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Duration (months)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;2</td>
<td>29</td>
<td>58</td>
</tr>
<tr>
<td>2-4</td>
<td>18</td>
<td>36</td>
</tr>
<tr>
<td>&gt;4</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td><strong>Number of Lesions</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>11</td>
<td>22</td>
</tr>
<tr>
<td>2</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>&gt;2</td>
<td>24</td>
<td>48</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td><strong>Site of Lesions</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Face</td>
<td>9</td>
<td>18</td>
</tr>
</tbody>
</table>

**Type of lesion**

<table>
<thead>
<tr>
<th></th>
<th>Wet</th>
<th>Dry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent</td>
<td>32</td>
<td>18</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100</td>
</tr>
</tbody>
</table>

**Residence**

<table>
<thead>
<tr>
<th></th>
<th>Urban</th>
<th>Rural</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent</td>
<td>26</td>
<td>24</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100</td>
</tr>
</tbody>
</table>

**Treatment**

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent</td>
<td>17</td>
<td>33</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100</td>
</tr>
</tbody>
</table>

**Size of lesion**

<table>
<thead>
<tr>
<th></th>
<th>Less than 5</th>
<th>More than 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent</td>
<td>50</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100</td>
</tr>
</tbody>
</table>

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding

**REFERENCE**


Accurate Scoring According to the Brain Sovereignty of Handball Players

Ali Hussein Ali¹, Amer Hussein Ali¹, Mohammed Oudah Zaal²

ABSTRACT

The current research aims to identify the accuracy of scoring according to the brain sovereignty of the players of the Karbala Handball Club, and to achieve this goal has been prepared two tools, one to measure the brain sovereignty and the other to measure the accuracy of scoring after finding their psychometric characteristics of honesty and consistency have been applied to the sample of adult research (18) A player from Karbala Sports Club handball, after analyzing the data using statistical means resulted in the search for the superiority of players of type (D) in the accuracy of scoring.

Keywords: Accurate, scoring and brain sovereignty.

Introduction

The human brain, which weighs three pounds of intertwined neurons and controls our activity in all social, psychological and physical fields, hence the importance of the current research by knowing the patterns of brain sovereignty of outstanding and ordinary players handball as it enables coaches to absorb the thinking of all players regardless of The diversity of brain dominance patterns in players may raise some questions about the optimal pattern of brain dominance, but there is no specific pattern better than the other, but each pattern is associated with sensory, motor and intellectual characteristics that make the owner more compatible in the performance of some The importance of the current research comes from the fact that, as far as researchers know, the first study in Iraq that attempts to know the nature of the relationship of brain sovereignty patterns of outstanding and ordinary handball players, knowing that this will facilitate the work of coaches in the selection of players as well as the identification of play positions according to Of their dominant brain pattern.¹

The success of any team in any individual or team game depends on the accuracy of its performance so it was necessary to identify all the factors and variables that are related to the accuracy of scoring and that relates to the game of handball and hence the current research sheds light on one of the factors represented by brain sovereignty as the brain Is he controlling all behavioral acts of man in general and handball player as the focus of this study in particular? Hence, the researcher may wonder about the level of accuracy of scoring and the pattern of brain sovereignty for each player practicing handball game? I have handball players.²

Research aims:

1. The level of accuracy of scoring for the players of Karbala Handball Club.
2. On the pattern of cerebral sovereignty of the players of Karbala Handball Club.
3. Statistically significant differences in the level of accuracy of scoring according to the pattern of cerebral sovereignty of Karbala handball players.

Research Methodology and Procedures

Research Methodology: The researcher used the descriptive method in the survey method and comparative studies as a better method to solve the research problem due to its relevance and the nature of the current study.
The research sample: The sample included (18) Karbala handball club applicants.

Hermann Cerebral Severity Scale (HBDI): The researcher used the modified Herman scale, expressed by (Haydar Tariq Kazim 2011), which measures the patterns of brain sovereignty (ABCD) according to the classification of Herman see Appendix (1), where the scale prepared is (4) forms containing each form a pattern of expressive patterns of brain sovereignty. It is divided into a number of paragraphs (14) paragraphs for each type of cerebral dominance, and the answer is by choosing one of the two (yes, no) where the score (1, zero) is calculated so the highest score for each pattern is (14) and the lowest score is (Zero). In the middle of the hypothesis of (7) degree and for the purpose of reassurance on the application of the scale has been calculated the reliability and stability as follows: 1

1. Validity: Validity means that the test measures what it was developed for, that is, the honest test measures the function that he claims to measure and does not measure anything else instead or in addition to (6).

To achieve this, the scale was presented to a number of professors specialized in education and sports psychology to indicate their views of the paragraphs of the scale and its alternatives and instructions and after analyzing their views and found that there is full agreement on the validity of the scale.

2. Stability: A fixed test is a test that has a high degree of accuracy, mastery, consistency and objectivity in what is set to measure it. (7) To achieve this, the scale was applied to a sample of the youth category of (12) players. The correlation coefficient was calculated according to the Pearson correlation coefficient.

Tests used in the research:

Test scoring accuracy: A scoring accuracy test prepared from (Ikoula 2005) was adopted, which includes a board containing (8) squares hanging on the wall as shown in Figure (1). Test scoring accuracy. 4

Figure 1: Represents the goal of handball

The test aims to measure the accuracy of scoring and the measurements of each of the eight squares 27 cm with distributed on the right and left and center and in the top and bottom directions, the laboratory guides the ball from above the shoulder level and stability, trying to scoring once on each square (one attempt) and the hand and behind the line decree on the ground is (9) m away from the goal and thus the total attempts (8), and the attempt is successful if the ball enters or three quarters in the box and give (5) degrees for the correction in the top and bottom corners of both sides and (4) degrees for the boxes left and right, and (6) degrees for the upper and lower middle, and any m Ole outside of the boxes is a failed attempt, and thus the class Great for testing (40) score for each player. 5

In order to verify the validity of the test and its suitability to the current research sample:

1. Validity: To achieve this, the test was presented to a number of professors in the game of handball to indicate their views on the performance of the test and its alternatives and instructions and after analyzing their views and found that there is full agreement on the validity of the test.

2. Stability: To achieve this, the test was applied to a sample of the youth category of (12) players. Good stability index.

Final Application: After finding the psychometric properties represented by the honesty and stability of the cerebral sovereignty scale and the scoring accuracy test, the two tools were applied to the sample of (18) players. It is (90) minutes for the sample as a whole.

Results

In order to achieve the first goal of the research, which is to identify the level of scoring accuracy among Karbala players handball, the total score obtained by the player was calculated through (8) attempts (corrections) on the prepared plate, which contains (8) two boxes hanging on the wall and away (9) m for the player, it was found that the scores of the members of the research sample ranged between (13-36) with an average of (30.22) and a standard deviation of (4.53). From Table (1) below.
Table 1: Shows the calculated and tabulated (v) value of the scoring accuracy test

<table>
<thead>
<tr>
<th>Sample</th>
<th>Mean</th>
<th>Mean median</th>
<th>SD</th>
<th>(t) calculated</th>
<th>(t) tabulated</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>30.22</td>
<td>20</td>
<td>4.53</td>
<td>9.64</td>
<td>2.110</td>
<td>0.05</td>
</tr>
</tbody>
</table>

It is clear from the table above that the calculated (t) value of (9.64) is greater than the (T) tabular value of (2.110) at the indication level (0.05) and the degree of freedom (17). This means that Karbala handball players have a good level and high accuracy Scoring This may be attributed to the low level of psychological tension as the player performs the skill without friction with another player and the absence of an audience which constitutes a stable psychological situation and without any stress or psychological pressure as well as they represent the elite players in the province of Karbala handball have experienced methods Proper throwing on target through daily workouts and experience gained in games x DONC was an official or other and the fact that most of the physical education and sports science faculties, which increases students have the experience and skill in scoring accuracy.6

In order to achieve the second objective of the research, which is to identify the pattern of cerebral sovereignty of Karbala players handball, the answers of the respondents were analyzed on the scale of cerebral dominance and found that their scores ranged between (4-14) in type A}, and {5 -13 in Type B}, {(6-12) in Type C}, {(6-14) in Type D}, and the arithmetic media for each type were {((8), (7.5), (7.6)), (9.77)} with standard deviations of {(2.12), (2.34), (3.1), (1.98)} for the patterns (A, B, C, D) respectively, and for the purpose of determining the number of players for each pattern was calculated from During the application of the equation of confidence period and at the level of significance (0.05), namely:7

\[ X ± 1.96 \times p% \sqrt{\text{U}} \]

and for each of the types mentioned and showed according to that equation that the degrees of patterns were respectively {((8.98), (8.58), (9.03), (10.68)} for patterns (A,B,C and D), which is a cutoff point where the player is classified according to those patterns when his score is equal to or higher than the score for each pattern, and it turns out that the number of players according to those patterns was {((2), (4),(3), (9)) for patterns (A, B, C, D), respectively, as shown in Figure (2), and for the purpose of identifying the statistical significance of the differences in the patterns of cerebral dominance used test (Chi square) The results are shown in the table (2) below.

Table 2: Shows the values (Chi square) of the sample

<table>
<thead>
<tr>
<th>The Sample</th>
<th>(Chi square) calculated</th>
<th>(Chi square) tabulated</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>6.443</td>
<td>7.81</td>
<td>Non sig.</td>
</tr>
</tbody>
</table>

The table above shows the calculated square (6.443), which is less than the value (Chi square) of the table (7.81) at the significance level (0.05) and the degree of freedom (3), which means that there is no preference for a pattern over other patterns in The cerebral dominance of Karbala club players is handball, although the number of players within (Type D) was the highest among the patterns and may be attributed to the homogeneity of the sample members as most of the students of the Faculty of Physical education and sports science have passed the same experiences and received the same training and acquired the same skills Which reflected on their ways of thinking and how they deal with the situations they are going through.10

As for the third goal, which is to identify the differences of statistical significance in the level of accuracy of scoring according to brain sovereignty was used analysis of variance and the results are shown in Table (3) in the below.

Table 3: Shows the source of variance in scoring accuracy according to cerebral sovereignty

<table>
<thead>
<tr>
<th>The sample</th>
<th>Source of variation</th>
<th>Total squares</th>
<th>df</th>
<th>Mean of squares</th>
<th>(f) calculated</th>
<th>(f) tabulated</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>Between groups</td>
<td>259.29</td>
<td>3</td>
<td>86.43</td>
<td>3.90</td>
<td>3.74</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Within groups</td>
<td>310</td>
<td>14</td>
<td>22.14</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The above table (3) shows that the calculated value of F (10) was (3.90), which is higher than the tabular value (f) of (3.74) at the level of (0.05) and degrees of freedom (3.14), which means that the difference is statistically significant, therefore, the differences were calculated in the arithmetic media as shown in Table (4) below.

Table 4: Shows the calculation of differences and arithmetic media for the scale of cerebral sovereignty and test scoring accuracy

<table>
<thead>
<tr>
<th>Mean</th>
<th>X A 30</th>
<th>X B 26</th>
<th>X C 28</th>
<th>XD 33.3</th>
</tr>
</thead>
<tbody>
<tr>
<td>X A 30</td>
<td>4</td>
<td></td>
<td></td>
<td>3.3-</td>
</tr>
<tr>
<td>X B 26</td>
<td></td>
<td>2</td>
<td></td>
<td>7.3*</td>
</tr>
<tr>
<td>X C 28</td>
<td>-2</td>
<td></td>
<td></td>
<td>5.3</td>
</tr>
<tr>
<td>XD 33.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

From Table (4) above, for the purpose of identifying the statistical significance of the apparent differences in the arithmetic media, Toki test 11 was used and its calculated value was (5.09) at the level of (0.05) and two degrees of freedom (3.14). The spreadsheet with the critical value (Toki test) shows that there is one statistically significant difference between the scoring accuracy averages of the two types (D and B) and (D and C) and in favor of type D)) because the mean of that pattern is (33.3) which is higher than Arithmetic mean of type (B) (26) and arithmetic mean of type C)) of 28 (possibly due to the characteristic of individuals. This style of exploration, as well as their strategic and creative thinking and the overall view, which enables them to access many experiences and this is reflected on their performance in general and their ability to scoring particularly accurately, while these qualities and characteristics are not available to their peers of the pattern (B) and pattern (C).11

Each quarter of the four types of brain is characterized by characteristics that distinguish it from other types, and that each pattern is specific to the way the brain works. Brain (analysis, facts, data, numbers, concentration, feasibility, evaluation, results), the lower left (B) is concerned with (planning, execution, procedures, details, maintenance, arrangement, methods, system, time management, discipline, security And safety), with respect to the lower pattern Yemen (C) (with relationships with others, feelings, emotions, dealing with others, human meanings, care, attention to human, and intuitive sensory), while the upper right (D) deals with (strategic thinking, creative thinking, and a comprehensive view, perceptions, exploration (Hermann’s theory of cerebral sovereignty has resulted from four souls: “the rational self is located in the quadrant (A), the certainty is in the quadrant (B), the emotional self is the quadrant) C) The experimental self-located in the quadrant (D) “is observed Appendix (2) (A,B).12

Conclusions

1. The students of the Faculty of Physical Education and Sports Science have the ability to accurately aim.
2. Students of the Faculty of Physical Education and Sports Sciences use all types and classes (D)
3. The level of accuracy of corrections in students with type (D) exceeds the other patterns.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

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Audio Skills and Their Impact on the Development of Response Speed for Handball Goalkeepers

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1The College of Physical Education and Sports Sciences, University of Al-Qadisiyah, Iraq

ABSTRACT

The research and the importance of the research included: The importance of training in the field of physical education in general and handball in particular. The problem of the research was to identify the development of rapid response to the goalkeepers through the use of audio skills. The goal of the research is to use audio skills in developing responses to handball goalkeepers. The study hypothesized that there were significant differences of statistical significance for the group using the auditory skills. The research included the fields of research was what comes:

1. Human field/goalkeepers in clubs belonging to Qadisiyah Governorate.
3. Field Sphere/Playground College of Physical Education handball.

The research method and its field procedures were also used. The researchers used the experimental method and discussed the sample of the research and they are the goalkeepers in the clubs affiliated with Qadisiyah Governorate. They also discussed the tools used in the research, the testing used and the statistical means.

The results were then presented and discussed as the results were presented in tabular form and then discussed. The research also contains conclusions and recommendations, the most important of which are the following conclusions:

1. There is an evolution of the post tests of both control and experimental groups.
2. There are significant differences of statistical significance for the benefit of the experimental group.

Keywords: Audio skills - Speed response and Goalkeepers handball.

Introduction

Sports activities must keep abreast of the cultural and scientific developments in the world to develop the level of these games and make them an area of practice and follow-up. The effectiveness of handball is one of these sporting events where the level of physical and tactical reached by the players make the game to be faster and therefore requires Of the goal keeper to have a high response speed in dealing with the ball paid towards his goal, especially in areas close to the goal of his team and that the performance is faster and not delay, especially in the cases of fixed and the most important penalty kick as the goalkeeper in the face of one player without any Defender and considered as e This confrontation is one of the most difficult circumstances experienced by the guard during the game so it requires a good response in the right direction in a timely manner.1

The problem of the research is that researchers will inquire from the coaches of Qadisiyah handball teams found that quite a few handball goalkeepers make mistakes during the game when confronting the attacks of the opposite teams and that these errors are due to the fact that the handball goalkeepers suffer from slow The kinetic response, as well as the lack of interpretation of the audio stimuli well as they are tricked by the players of the opposite team and they do not distinguish the audio stimulator required in the case of receiving more than an

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Email: aalkroy@yahoo.com
audio stimulus to deal with, as the traditional exercises given in the training units are formal and monotonous, which makes it give. Therefore, the researchers used auditory stimuli in a new way that develops the speed of the motor response and goes out of the monotony and formal, which makes it a pleasure and pleasure for the exercise. Kinetic response speed through audio stimuli and training goalkeeper’s handball to respond to the appropriate stimulus and identify it from the house of a group of stimuli to be exposed and enrich the sports library the importance of audio stimuli in the training process.  

The auditory mechanism is the transmission of the auditory stimuli from the external ear to the middle, then to the inner ear, the auditory nerve, and then to the central nervous system; where the stimuli are explained audio». The ability to recognize sounds from sources and to associate them with some meanings is the primary environment in the process of promoting.

<table>
<thead>
<tr>
<th>Type of sample</th>
<th>The society</th>
<th>The sample</th>
<th>Ratio of sample to society</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goalkeepers handball</td>
<td>30</td>
<td>Experimental group 15</td>
<td>Control group 15</td>
</tr>
</tbody>
</table>

**Study design:** The researchers used the experimental approach in the same way as the two groups to suit the nature of the problem studied.

**Tests used in research:** The researchers used the test (color naming)

**Test Name:** Color Label

**Test Objective:** Measure response speed (20 × 25 cm) painted with 10 rows of colored squares in each row (10) boxes of red, green, blue and yellow distributed randomly,

**Test description:** The lab must name the colors following the order of the rows with the largest possible speed and then calculate the time it takes to label the entire painting.

This is followed by 90 degree plate management, repeating this previous work, and another solid board can be managed before returning to the color scheme in which the lab has started testing. The number of alarms becomes 40 alarms.

**Method of calculating the score:** The final result is calculated by dividing the time of the performance of the whole test at 300 we get the reaction time for one alarm.

Hence the importance of research in the use of audio skills to develop the speed of response to handball goalkeepers.

**Purpose of study:** The purpose of the study is Use of audio skills in developing response speed for handball goalkeepers.

**Method and Procedures**

**Sample and Research society:** The search community included goalkeepers in the 30 clubs of Al Qadisiyah Governorate and the research community was selected as a sample for research. The sample of the study was 30 goalkeeper and the sample ratio was 100%. The sample was divided into two experimental groups and each one had 15 goalkeeper. The homogeneity and equivalence between the individuals and the sample groups in the variables studying.

**Pre Test:** The researchers conducted the pre-test on the research sample on 18/11/2015 for both experimental and control groups at 9:00 am.

**Skills used in research:** After the pretest, a set of skills based on the audio variables of the experimental group of the research sample were used. These skills are given during the training module and within the main section of the training unit for eight weeks. These skills are:

1. The player stands within the goal of the handball and is blindfolded and installs on the scoreboards and the crossbar a set of small-sized speakers. The instructor issued a sound from one of the loudspeakers, the guard refers to the direction of sound directly hand in note that the type and degree of sound changes between one attempt and another.

2. The same exercise, but the instructor selects a specific voice that wants the guard to point towards it and operate two or more amplifiers different sound.

**Post-test:** The researchers conducted the pre-test on the research sample on 19/1/2016 for both experimental and control groups at 9:00 am.
Results

Table 2: Shows the mean, standard deviations and the t value of the pretests of the control and experimental groups

<table>
<thead>
<tr>
<th>Variable</th>
<th>Control group</th>
<th>Experimental group</th>
<th>(t) value</th>
<th>Sig.</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response speed</td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td>0.0291</td>
</tr>
<tr>
<td></td>
<td>0.53</td>
<td>0.058</td>
<td>0.0291</td>
<td>0.058</td>
<td></td>
</tr>
</tbody>
</table>

From Table (2), the mean value of the response speed of the control group was (0.53), the standard deviation was (0.058), and the experimental group was (0.57) and the standard deviation (0.058). Differences between the two groups.

Table 3: Shows the mean, standard deviations and the (t) value of the pre- and post-test of the control group

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pretest</th>
<th>Posttest</th>
<th>(t) value</th>
<th>Sig.</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response speed</td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td>4.096</td>
</tr>
<tr>
<td></td>
<td>0.53</td>
<td>0.058</td>
<td>0.51</td>
<td>0.057</td>
<td></td>
</tr>
</tbody>
</table>

In Table (3), the mean value of the response speed of the control group for the pretest test was (0.53), the standard deviation was (0.058), and the post test was (0.51) and the standard deviation (0.057). There are differences between the pre and post tests and in favor of the post test.

Table 4: Shows the mean, standard deviations and the (t) value of the pre- and post-test of the experimental group

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pretest</th>
<th>Posttest</th>
<th>(t) value</th>
<th>Sig.</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response speed</td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td>9.73</td>
</tr>
<tr>
<td></td>
<td>0.57</td>
<td>0.058</td>
<td>0.446</td>
<td>0.051</td>
<td></td>
</tr>
</tbody>
</table>

From Table (4), we find that the mean value of the response speed of the experimental group of the pre-test was (0.57), the standard deviation was (0.058), and the post-test was (0.446) and the standard deviation (0.051). There are differences between the pre and post tests and in favor of the post test.

Table 5: Shows the mean, standard deviations and (t) value for the post-test of the control and experimental groups

<table>
<thead>
<tr>
<th>Variable</th>
<th>Control group</th>
<th>Experimental group</th>
<th>(t) value</th>
<th>Sig.</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response speed</td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td>1.867</td>
</tr>
<tr>
<td></td>
<td>0.51</td>
<td>0.057</td>
<td>0.446</td>
<td>0.051</td>
<td></td>
</tr>
</tbody>
</table>

In table (5), the mean value of the response speed of the control group was (0.51), the standard deviation was (0.057), and the experimental group was (0.446) and the standard deviation (0.051). Differences between the two groups.

Figure 1: Shows the value of the mean and standard deviation for the posttest of the two groups
Analysis and discussion of the results: In Table (2) we find that the value of (t) calculated for the pretest tests of the experimental and control groups is (0.015) and is smaller than the spreadsheet (1.76), so there is no significant differences between the two tests and this indicates that the two groups started from the starting line One is that the respondents are equal in potential for response speed.

In Table (3) we find that the value of (t) calculated for the tests before and after the control group was (4.096), which is greater than the spreadsheet (1.76), which indicates the development of the control group, which is practicing the usual trainer.

In table (4) we find that the value of (t) calculated for the tests before and after the experimental group was (9.74), which is greater than the spreadsheet (1.76) is that there is a development in the sample of the experimental group, which used auditory skills in the exercises.

Table (5) shows that the value of (t) calculated for the post-tests of the experimental and control groups is (1.867) and is greater than the spreadsheet (1.76). Therefore, this indicates that there are significant differences in favor of the experimental group, the development in the group. Experimental is greater than the phase of the control group and this gives preference to auditory skills in the process of developing the speed of response speed for handball goalkeepers by increasing the intensity of movement through synchronization of sound and movement, which restores the audio image by excessive intensity of the athlete is assisted by electronic their measurements are arranged a It is worth mentioning that there is no separation between mind and body or thinking and motor performance which depends on human ability to work physically and withstand the effort and development and work because of the technological development that made the machines Most of the work and make this natural transition to mental work more comfortable for humans, but in return, these mental work in addition to the rapid and amazing development of audio information, which enter the human mind that the person feels mental efficiency and muscle capabilities, which is one of The most important technological factors in our modern age because despite this a The evolution that happens is ultimately the development of the mental, intellectual and auditory abilities of individuals.

Here we will recognize the need to preserve hearing capacity in training and acquire a knowledge tool for the skills you need, which gives us high abilities and create a system commensurate with our needs and you will get a look at the cognitive and auditory abilities and learn how to improve by practicing mental exercise And audio that enables us to choose any kind of training.

Conclusions

1. There is a variation in the level of motor response of handball goalkeepers.
2. The exercises used to influence the development of motor response to goalkeepers handball.
3. The diversity of audio stimuli has an impact on the development of the ability of goalkeeper’s handball and thus raise the level of motor response to them.
4. There is a development of post - tests for both control and experimental groups.
5. The presence of significant differences statistically significant for the benefit of the experimental group.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

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Academic Personality Assessment Form for Fourth Stage Students Faculty of Physical Education and Sport Sciences Karbala University

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ABSTRACT

The problem of research has been demonstrated about the importance of studying the academic personality of the university students as it is one of the most important fields of psychology and the basics of the organizational behavior of the individual in the organization of life and employment of energies and directed to the optimal way and an indicator of psychological and social compatibility, and harmony with the physical and social environment, which is characterized by continuity, change and adjustment, and that the teaching profession is the main source that supplies other occupations and provide all areas of life with trained and qualified human cadres and depends in their practice on mental, physical, psychological and social activity as well as the desire, willingness and familiarity with the type of specialized knowledge. The study aims to: Building a measure of academic personality among students of the fourth stage College of Physical Education and Sport Sciences and Identify the academic personality traits of the fourth stage students Faculty of Physical Education and Sports Science University of Karbala.

The researchers used the descriptive method in the method of surveying and comparative and standard studies to achieve the objectives of their study. The research community also included the students of the fourth stage/physical education and sports sciences Karbala University morning study.

Keywords: Calendar, academic personality and students.

Introduction

Human energies are the foundation of a rising society and one of the main pillars of the formation and organization of life from time to time, and the development and organization of those energies and human resources is a duty in all times of the life of societies using all available means to raise the community in all fields of life.

The Faculty of Physical Education and Sports Science is one of the important means and institutions in the development of the energies and abilities of members of society as it aims to educate individuals in an integrated scientific manner mentally, psychologically, ethically, socially and culturally and its return to the development of various aspects of activities, and there is no doubt that the creation and dissemination of culture in general among the sectors of society One of the important things that underlies the love and practice of various sports activities because culture in its general sense is a lifestyle and a set of values, ideas and behaviors that prevail in society and is often linked to the socio-economic conditions of this community.

Universities are considered among the public environments that influence the behavioral patterns that arise from the socialization of the individual and that attention to that environment is a fundamental duty and an urgent necessity as an institution that creates among its walls young people who are considered one of the most important human resources of society.

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Physical and sports sciences Attention to academic personality and culture as a pillar must be available to graduates in all educational sectors, being a set of values that believe in individuals within institutions and organizations that govern their behavior and affect their performance of work noting that the person has a set of positive personality traits and be understood about himself identical to reality or as others perceive him and free from the internal conflict and enjoy a life free of crisis and mental disorders, and the profession of teaching physical education and sports science needs many psychological features Social behavior because the behavior of practitioners of sports activities at different levels stemming from the environment and situations where there are factors that contribute to the direct impact on behavior, especially factors of support, motivation, reward, punishment and learning and this requires a state of mental and psychological readiness and conscience In the direction of the teaching profession in physical education and sports sciences, and the result of what was addressed to lie the importance of research, in which the researchers clarified the theoretical importance in the research results from the addition of knowledge and theory about the current research variable.²

Research Aims

1. Building the scale of academic personality among the students of the fourth phase of the Faculty of Physical Education and Sports Science.

2. Identify the characteristics of the academic personality of the fourth stage students Faculty of Physical Education and Sports Science

3. Disclosure of differences in the personality traits of the academic students of the fourth stage of the Faculty of Physical Education and Sports Science University of Karbala according to gender

4. Determine the standard levels and develop a model for the evaluation of the academic personality traits of the students of the fourth phase of the Faculty of Physical Education and Sports Science University of Karbala according to gender.

Research Methodology

The researchers used the descriptive method in the method of surveying and comparative and normative studies, which they see consistent with the specifications of their research and achieve the objectives of their study.

Community and Sample Research: The research community included the students of the fourth phase of the Faculty of Physical Education and Sports Science/University of Karbala morning study for the academic year (2018-2019) and the number (128) students distributed by (86) students and (42) students, and the selection of the research sample was random sampling method The sample was selected as (10) single sample as a survey sample and constituted (7.8%) of the society, (60) item sample was chosen based on academic personality scale and constituted (46.8%) of the society and (105) sample for the basic experiment (sample derivation criteria). It is intertwined with the construction sample and constituted 82.02% of the respondent population.

Define scale fields: After reviewing references and sources related to academic personality traits, seven areas of the scale were identified: physical features, mental traits, emotional traits, sports creativity traits, social traits, academic excellence attributes and health traits. A group of specialists in a questionnaire, and the researchers sought to determine the importance of each field and extract the value of relative importance.³

After the questionnaires were collected and the data was unloaded and processed, the attributes that got less than (65) of importance or less than (54.16%) of relative importance were excluded by taking the opinions of (12) experts and specialists.

Initial Formulation of Academic Self-Measurement: When the researchers completed the steps to identify the areas of scale, it became necessary to prepare and compile the paragraphs of their scale, relying on scientific sources and references in the field of specialization.

In order to collect, prepare and formulate an appropriate number of paragraphs concerned with measuring the characteristics of academic personality among the students of the fourth stage College of Physical Education and Sports Science/University of Karbala researchers sought to formulate (60) paragraphs concerned with measuring the characteristics of academic personality (10) paragraph for each attribute, then These paragraphs were presented to a group of experts and specialists for the purpose of evaluating and judging their validity with the necessary observations as well as the opinion on the validity of the alternatives of the adopted answer and after collecting the forms and unloading data and analyzing the opinions of experts
and specialists, they suggested deleting and changing a section of the paragraphs to be repeated. The brightest Z with other paragraphs or it is not suitable to measure developed for it, modify and move the other part of the field to another area and also suggested that the answer alternatives trilogy (apply to a large extent and do not apply to apply to).³

In light of this, the opinions of experts and experts on the adoption of alternatives to the triple answer of the measure of academic personality was taken and one section of the paragraphs were modified and the other section was deleted, and through the use of the test (Chi square 2) if (50) paragraph concerned with measuring the areas of academic personality traits were retained and then presented the scale to the expert to modify the wording of paragraphs.

Survey Scale: In order to know the clarity of the instructions and paragraphs and alternatives to answer by the students as well as determine the time required for the answer surveyed the scale on a sample of (5) students (5) students were randomly selected from the elements of society on (Sunday) corresponding to 14/10/2018.

It was found that the instructions were clear and the time taken to answer the paragraphs of the scale was between (5 - 10) minutes and thus the scale is ready to apply to the members of the research sample.

Application of the scale to the members of the construction sample: After completing the stages of building the academic personality scale consisting of (6) attributes and (56) items with objective response paragraphs, the researchers applied it to the members of the sample of construction (40) students and (20) students in the Faculty of Physical Education and Sports Sciences/University of Karbala On Wednesday, 17/10/2018, the researchers then proceeded to unload the forms, analyze them statistically and reveal the efficiency of each paragraph of the scale.

Scale correction: The measure of academic personality paragraphs formulated in a positive direction and three alternatives were given weights ranged between (3_2_1) according to the sequence of answer for paragraphs.

Basic experience: After completing the procedures that qualify the conduct of the basic experiment, the researchers carried out on the sample of the research sample of the genders and the number of (105) male and female students (70) and (35) female students began to apply the scale on Monday, 12 November 2018 taking into account the same methods, The standardized methods by which the scale is applied, after which the forms were collected and unloaded for statistical processing.⁵

Results

Table 1: Shows the significance of the differences in the mean achieved and the hypothetical mean of the attributes and the total score of the academic personality scale

<table>
<thead>
<tr>
<th>Scale attributes</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>Med.</th>
<th>Skewness</th>
<th>Std error</th>
<th>Mean med.</th>
<th>(t) value</th>
<th>Statistical Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Males</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical features</td>
<td>70</td>
<td>17.09</td>
<td>2.30</td>
<td>17</td>
<td>0.455</td>
<td>0.310</td>
<td>14</td>
<td>9.96</td>
<td>Sig.</td>
</tr>
<tr>
<td>Mental features</td>
<td>70</td>
<td>16.83</td>
<td>2.57</td>
<td>17</td>
<td>0.042</td>
<td>0.346</td>
<td>16</td>
<td>2.41</td>
<td>Sig</td>
</tr>
<tr>
<td>Emotional features</td>
<td>70</td>
<td>17.87</td>
<td>2.18</td>
<td>18</td>
<td>0.036</td>
<td>0.294</td>
<td>16</td>
<td>6.38</td>
<td>Sig</td>
</tr>
<tr>
<td>Social features</td>
<td>70</td>
<td>16.95</td>
<td>2.21</td>
<td>17</td>
<td>0.118</td>
<td>0.326</td>
<td>16</td>
<td>3.18</td>
<td>Sig</td>
</tr>
<tr>
<td>Attributes of mathematical creativity</td>
<td>70</td>
<td>19.72</td>
<td>3.06</td>
<td>19</td>
<td>0.188</td>
<td>0.413</td>
<td>18</td>
<td>4.17</td>
<td>Sig</td>
</tr>
<tr>
<td>Attributes of academic excellence</td>
<td>70</td>
<td>17.36</td>
<td>3.28</td>
<td>17</td>
<td>0.333</td>
<td>0.438</td>
<td>16</td>
<td>3.07</td>
<td>Sig</td>
</tr>
<tr>
<td>The total score of the scale</td>
<td>70</td>
<td>105.8</td>
<td>10.88</td>
<td>107</td>
<td>0.005</td>
<td>1.48</td>
<td>96</td>
<td>6.71</td>
<td>Sig</td>
</tr>
<tr>
<td><strong>Females</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical features</td>
<td>35</td>
<td>14.49</td>
<td>2.50</td>
<td>14</td>
<td>0.206</td>
<td>0.236</td>
<td>14</td>
<td>2.18</td>
<td>Sig</td>
</tr>
<tr>
<td>Mental features</td>
<td>35</td>
<td>16.27</td>
<td>2.60</td>
<td>16</td>
<td>0.075</td>
<td>0.245</td>
<td>16</td>
<td>2.15</td>
<td>Sig</td>
</tr>
<tr>
<td>Emotional features</td>
<td>35</td>
<td>17.29</td>
<td>2.20</td>
<td>17</td>
<td>0.078</td>
<td>0.207</td>
<td>16</td>
<td>5.86</td>
<td>Sig</td>
</tr>
<tr>
<td>Social features</td>
<td>35</td>
<td>17.74</td>
<td>2.31</td>
<td>18</td>
<td>0.259</td>
<td>0.218</td>
<td>16</td>
<td>3.34</td>
<td>Sig</td>
</tr>
<tr>
<td>Attributes of mathematical creativity</td>
<td>35</td>
<td>19.65</td>
<td>2.98</td>
<td>19</td>
<td>0.032</td>
<td>0.282</td>
<td>18</td>
<td>5.41</td>
<td>Sig</td>
</tr>
<tr>
<td>Attributes of academic excellence</td>
<td>35</td>
<td>16.82</td>
<td>2.88</td>
<td>16</td>
<td>0.665</td>
<td>0.272</td>
<td>16</td>
<td>2.78</td>
<td>Sig</td>
</tr>
<tr>
<td>The total score of the scale</td>
<td>35</td>
<td>102.2</td>
<td>10.3</td>
<td>103</td>
<td>0.059</td>
<td>0.977</td>
<td>96</td>
<td>5.91</td>
<td>Sig</td>
</tr>
</tbody>
</table>
The observation of Table (1) shows that the difference in favor of the arithmetic mean for both male and female students in all attributes of academic personality.

Table 2: Shows the mean of the students’ grades on the attributes and scale of the academic personality according to gender

<table>
<thead>
<tr>
<th>Personality traits academic</th>
<th>Male sample</th>
<th></th>
<th></th>
<th>Female sample</th>
<th></th>
<th></th>
<th>(T) VALUE*</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean</td>
<td>SD</td>
<td>STD error</td>
<td>N</td>
<td>Mean</td>
<td>SD</td>
<td>STD error</td>
</tr>
<tr>
<td>Physical features</td>
<td>70</td>
<td>17.09</td>
<td>2.30</td>
<td>.310</td>
<td>35</td>
<td>14.49</td>
<td>2.50</td>
<td>.236</td>
</tr>
<tr>
<td>Mental features</td>
<td>70</td>
<td>16.83</td>
<td>2.57</td>
<td>.346</td>
<td>35</td>
<td>16.27</td>
<td>2.60</td>
<td>.245</td>
</tr>
<tr>
<td>Emotional features</td>
<td>70</td>
<td>17.87</td>
<td>2.18</td>
<td>.294</td>
<td>35</td>
<td>17.29</td>
<td>2.20</td>
<td>.207</td>
</tr>
<tr>
<td>Social features</td>
<td>70</td>
<td>16.95</td>
<td>2.21</td>
<td>.326</td>
<td>35</td>
<td>17.74</td>
<td>2.31</td>
<td>.218</td>
</tr>
<tr>
<td>Attributes of mathematical creativity</td>
<td>70</td>
<td>19.72</td>
<td>3.06</td>
<td>.413</td>
<td>35</td>
<td>19.65</td>
<td>2.98</td>
<td>.282</td>
</tr>
<tr>
<td>Attributes of academic excellence</td>
<td>70</td>
<td>17.36</td>
<td>3.28</td>
<td>.438</td>
<td>35</td>
<td>16.82</td>
<td>2.88</td>
<td>.272</td>
</tr>
<tr>
<td>The total score of the scale</td>
<td>70</td>
<td>105.8</td>
<td>10.88</td>
<td>1.48</td>
<td>35</td>
<td>102.2</td>
<td>10.3</td>
<td>.977</td>
</tr>
</tbody>
</table>

* Tabular value (T) at the degree of freedom (103) and below the significance level (0.05) is equal to (1.96)

In Table (2), it is found that the results related to the analysis of data on the characteristics and measurement of academic personality of the grades of the fourth stage students college of physical education and sports sciences University of Karbala, male and female, and when making comparisons between the arithmetic circles of the characteristics of academic personality between males and females shows that there is a statistically significant difference In the attributes (physical, social, and the total score of the academic personality scale) because the value of (T) calculated at these attributes is greater than the tabular value of (1.96) at the level of significance (0.05) and the degree of freedom (103) and researchers attribute these differences to the value of the average score for the male students in the physical features and the total score of the academic personality scale being greater than the value of the arithmetic mean of female students, which confirms that male students are characterized by a high level of academic features, where young students try to achieve themselves, especially at this age as well as the climate and social environment and the accompanying Of the requirements of life and Iraqi society. The researchers believe that there is a set of social and environmental conditions lead to young people to prepare themselves (efficient and accomplished) and multi-talented and when born with this concept has a high sense of self-esteem as well as socialization methods used by most Iraqi families encourage the creation of youth characterized by a level of personality Personal because school, peer and friends of the neighborhood and the region are social organizations and small size, but that work within them towards common goals develops the status of belonging and loyalty and personality traits in males, and the large value of the arithmetic mean in the social features of students confirmed the moral When they analyzed the data of students in the attributes (mental, emotional, academic excellence, and characteristics of sports creativity) and inference about the difference in morale shows that there is a random difference Between the arithmetic circles among male and female students because the calculated (T) value is less than the tabular value of (1.96) at the degree of freedom (103) and below the level of significance (0.05) and this confirms that there is a discrepancy and difference between the arithmetic circles randomly and due to chance. That’s one of the reasons behind this is the cultural value that has become the decisions of the Faculty of Physical Education and Sports Science University of Karbala for individuals and their contribution to the formation of cultural identity of societies because the knowledge and experience gained are the pillars of cultural construction and the large amount of physical education and sports, because of the multiple fields and diversity among healthy Educational, social, psychological and recreational makes sports culture a tributary of the general culture of the individual and society.
Conclusions

1. Developing a measurement tool concerned with measuring and determining the academic personality of the students of the fourth stage, Faculty of Physical Education and Sports Science

2. The students of the fourth phase of the Faculty of Physical Education and Sport Sciences and both genders have a high level of academic personality traits

3. There are real differences between students (males and females) in the level of physical and social features and the total score of the scale

4. There are no real differences between students (males and females) in the level of mental and emotional features and academic excellence and features of sports creativity.

5. Develop an optimal method (personal model) to evaluate the characteristics of the academic personality according to the standard levels achieved by the research sample by gender in order to (diagnosis, correction, treatment, comparison, guidance, selection, development).

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

REFERENCES


Self-Organized Learning Strategies and their Relationship to the Complex Thinking of Kindergarten Students

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ABSTRACT

The importance and problem of research is summarized through the development of self-organized learning strategies that have a complex response system that enables learners to examine their environments and experiences; to make the right decision for the learning process, to judge, and review their plans, and that self-organized learning strategies help stakeholders in the Ministry of Higher Education to use methods. The second semester dealt with the procedures of the research where the sample consisted of (200) students from all stages of kindergartens department to measure self-organized learning strategies by (58) students. The first, second, third and (26) students from the fourth stage, where the researcher prepared the paragraphs of the scale (test) based on strategies of self-organized learning and testing the validity of the paragraphs of the scale after being presented to experts and specialists and choose what is appropriate for the paragraphs of the scale. Results of identifying self-organized learning strategies among kindergarten students. The main conclusions are:

- Kindergarten students have structured learning strategies.
- There is a significant correlation between the grades of self-organized learning strategies among kindergarten students.

Keywords: Self-organized, strategies and complex thinking.

Introduction

University education is one of the most important stages of education. Human, social and economic development, which provides a qualified workforce to lead the society, which requires educational institutions to prepare and pay attention to the human element so that it can respond to the data of modern life and interact with it. The general development of societies today is greatly influenced by the volume of growth in the circulation of information, its intensity and the way of dealing with it. These societal developments are efficiently commensurate with the quality and magnitude of the problems they face in the age of conflicting changes.1

The University is part of a society that is undergoing the phenomenon of change. Self-organized learning strategies are an active constructive process through which to develop the complex thinking skills of university students. Self-organized learning is useful in training learners to formulate ideas, feelings well formulated through self-planning, and to strengthen creative effort; to achieve personal standards attention is growing at present to the need for self-organized learning by developing motivation to be self-organized by making them accountable and able to develop themselves. Modern education emphasized learning that leads to behavior modification Learning is a lifelong process, and the university is only one of the institutions through which individuals learn, and the role of a teacher in the educational process is the facilitator of learning, and the best type of learning is based on the needs of learners It follows that the goal of education is no longer the transfer of information and knowledge from generation to generation, but the formation of integrated personality of learners.2
It is thought that some students are incompetent not because of their poor mental abilities, but because their methods of thinking that do not match those of those who do the evaluation process, especially in teaching or is due to their ignorance of the correct means of recall, and to the acquisition of these students many methods of false recall. We need to keep in mind students’ thinking patterns if we want to reach them and communicate with them.3

University education contexts are often more complex than previous subjects, cover more and more quickly, and focus on unfamiliar titles for students.

**Research aims:** First Objective: Self-organized learning strategies for kindergarten students.

**Research Methodology**

The present research aims at describing the self-organized learning strategies of kindergarten students. Relational studies confirm the knowledge of the size and type of relationships between the data, or to what extent the variables of the phenomenon studied are related to each other, whether their partial, total, negative or positive correlation.

**Community and Research Sample:** The community refers to the total group of elements, which the researcher seeks to generalize the results related to the problem. The current research community consists of students from the kindergartens department in the city of Baghdad/College of Basic Education for the academic year (2018/2019) and the student number (311) Student from the Faculty of Basic Education/Department of kindergartens, distributed in (4) stages and table (1) shows that.

A random sample was selected and included (200) students from all stages of kindergartens department to measure self-organized learning strategies. (58) Students from the first, second and third stage and (26) students from the fourth stage.4

<table>
<thead>
<tr>
<th>Stage</th>
<th>Number of female students</th>
</tr>
</thead>
<tbody>
<tr>
<td>The first stage</td>
<td>149</td>
</tr>
<tr>
<td>The second phase</td>
<td>55</td>
</tr>
<tr>
<td>third level</td>
<td>72</td>
</tr>
<tr>
<td>The fourth stage</td>
<td>35</td>
</tr>
<tr>
<td>Total</td>
<td>311</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stage</th>
<th>Number of students to measure self-organized learning strategies</th>
<th>Number of female students for the Hypertext Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>The first stage</td>
<td>58</td>
<td>25</td>
</tr>
<tr>
<td>The second phase</td>
<td>58</td>
<td>25</td>
</tr>
<tr>
<td>third level</td>
<td>58</td>
<td>25</td>
</tr>
<tr>
<td>The fourth stage</td>
<td>26</td>
<td>25</td>
</tr>
<tr>
<td>Total</td>
<td>200</td>
<td>100</td>
</tr>
</tbody>
</table>

**Validity of Self-Organized Learning Strategies Scales:** This procedure requires obtaining the consensus of a group of arbitrators on the validity of the scale.5

1. Validity of each paragraph of the scale
2. Clarity of instructions
3. Make amendments by deletion and addition.

In the light of the opinions of the arbitrators on the scale, Annex (3) was accepted paragraphs that received an agreement rate of 80% and more were (40) paragraphs out of (40) paragraphs and table (3) shows that.

<table>
<thead>
<tr>
<th>Paragraph numbers</th>
<th>Number of arbitrators</th>
<th>Approvers</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2-3-6-11-12-13-20-21-27-28-29-30-35-38-39</td>
<td>10</td>
<td>10</td>
<td>100%</td>
</tr>
<tr>
<td>4-5-10-14-14-15-19-22-23-31-34-36</td>
<td>10</td>
<td>9</td>
<td>90%</td>
</tr>
<tr>
<td>7-8-9-16-16-17-18-24-25-26-32-33-37-40</td>
<td>10</td>
<td>8</td>
<td>80%</td>
</tr>
</tbody>
</table>

**Preparing scale instructions:** The researchers developed instructions to answer the self-regulated learning strategies scale in the light of the following considerations
● Simple language formulation, straightforward.
● Emphasis on the accuracy of the respondent to choose the appropriate response alternative to each paragraph of the scale.
● Non-disclosure of the true purpose of the scale in order to overcome the problem of social desirability, falsify the answer in a way that makes individuals appear themselves socially acceptable.
● It was stressed that these answers are for scientific research purposes only and will not be seen by anyone except the researcher, and that there is no need to mention the respondent to her name.

**Scoping Application of the Scale:**

The purpose of this application is to identify the following:

- Clarity of scale instructions.
- The clarity of the paragraphs in terms of wording and meaning.
- Calculate the time taken to answer the scale.
- To achieve this goal, the researcher applied the scale to a sample of (20) female students of the phases (the first, second, third and fourth) of the students of kindergarten department, and by (5) students from each stage. Between (8-10) minutes and an average of (9) minutes.

**Scale Correction:** Correcting the scale is intended to obtain the total score for each member of the sample, which represents the responses to each paragraph of the scale has been adopted triple gradient and give alternatives grades as follows:

- It applies a lot to three degrees
- Apply to a little two degrees
- Does not apply to one degrees

**Statistical analysis of self-organized learning strategies:**

**(A) Discriminatory force:** The purpose of the analysis of the paragraphs is to obtain data by which the discriminatory power of the paragraphs of the scale is calculated and illustrate the discriminatory power of the paragraphs and their ability to distinguish between individuals distinguished in the quality measured by the measure, and individuals who are weak in that characteristic, and thus works to keep good paragraphs in the scale.

Paragraph analysis requires a sample size that is proportional to the number of paragraphs to be analyzed. Nunley points out that the minimum allowed is five individuals per paragraph.

According to the Self-Organized Learning Strategies Scale among the 40 kindergarten students, a sample of (200) female students was selected. Thus, the ratio of the sample to the paragraphs is (1: 5):?

- Apply the scale to a sample of (200) students (sample building scale).
- The scores obtained by the sample members were sorted in descending order from the highest to the lowest.
- The 27% of the forms with the highest scores (the highest group) and the 27% of the lowest scores (the lowest group) were assigned.
- According to the research sample, the number of respondents (200) students has reached the rate of (27%) in each group (54) students for the upper and lower groups and therefore we have two groups with the largest possible size and maximum variation.
- Taking such action is one of the most characteristic divisions of the levels of weakness and strength and depends on the division of grades on the top and bottom ends, so that the upper section consists of degrees that are (27%) of the strong and offset by the same percentage of the weak. 1971)

The mean and variance were calculated for each group separately and for each paragraph of the scale. Table (1.96) and Table (4) illustrate this.

**Relation of the degree of the paragraph to the degree of total scale:** This method of extracting the internal consistency of a paragraph is based on the correlation between the scores of each paragraph and the overall score of the scale. This gives an indication that each paragraph of the scale is on the same path as the scale in all its paragraphs. The results of the second method analysis were consistent with the results of the analysis in the first way, it indicated that the correlation coefficients for all paragraphs were a measure of self-regulated learning strategies were statistically significant at the level of significance (0.05) and table (4) shows this.
Table 4: The correlation coefficient between the degree of the paragraph and the total score of the self-organized learning strategies scale

<table>
<thead>
<tr>
<th>Paragraph number</th>
<th>Correlation coefficient</th>
<th>Paragraph number</th>
<th>Correlation coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.948</td>
<td>21</td>
<td>0.555</td>
</tr>
<tr>
<td>2</td>
<td>0.983</td>
<td>22</td>
<td>0.815</td>
</tr>
<tr>
<td>3</td>
<td>0.901</td>
<td>23</td>
<td>0.795</td>
</tr>
<tr>
<td>4</td>
<td>0.909</td>
<td>24</td>
<td>0.891</td>
</tr>
<tr>
<td>5</td>
<td>0.915</td>
<td>25</td>
<td>0.566</td>
</tr>
<tr>
<td>6</td>
<td>0.773</td>
<td>26</td>
<td>0.797</td>
</tr>
<tr>
<td>7</td>
<td>0.852</td>
<td>27</td>
<td>0.742</td>
</tr>
<tr>
<td>8</td>
<td>0.939</td>
<td>28</td>
<td>0.755</td>
</tr>
<tr>
<td>9</td>
<td>0.715</td>
<td>29</td>
<td>0.875</td>
</tr>
<tr>
<td>10</td>
<td>0.800</td>
<td>30</td>
<td>0.955</td>
</tr>
<tr>
<td>11</td>
<td>0.971</td>
<td>31</td>
<td>0.924</td>
</tr>
<tr>
<td>12</td>
<td>0.840</td>
<td>32</td>
<td>0.896</td>
</tr>
<tr>
<td>13</td>
<td>0.670</td>
<td>33</td>
<td>0.947</td>
</tr>
<tr>
<td>14</td>
<td>0.988</td>
<td>34</td>
<td>0.831</td>
</tr>
<tr>
<td>15</td>
<td>0.975</td>
<td>35</td>
<td>0.486</td>
</tr>
<tr>
<td>16</td>
<td>0.681</td>
<td>36</td>
<td>0.964</td>
</tr>
<tr>
<td>17</td>
<td>0.979</td>
<td>37</td>
<td>0.945</td>
</tr>
<tr>
<td>18</td>
<td>0.815</td>
<td>38</td>
<td>0.761</td>
</tr>
<tr>
<td>19</td>
<td>0.862</td>
<td>39</td>
<td>0.890</td>
</tr>
<tr>
<td>20</td>
<td>0.992</td>
<td>40</td>
<td>0.985</td>
</tr>
</tbody>
</table>

$r = (0.113)$ at the significance level (0.05).

$r = (0.148)$ at the significance level (0.01).

Relationship of the field degree to the total score of the scale: The correlation between the individual scores for each of the main fields and their total scores was found on the scale.

Table 5: The correlation coefficient values between the field score and the total score of the respondent on the self-organized learning strategies scale

<table>
<thead>
<tr>
<th>S.</th>
<th>Field</th>
<th>Correlation coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Browsing</td>
<td>0.736</td>
</tr>
<tr>
<td>2</td>
<td>Wonder</td>
<td>0.767</td>
</tr>
<tr>
<td>3</td>
<td>reading</td>
<td>0.794</td>
</tr>
<tr>
<td>4</td>
<td>Recalling</td>
<td>0.777</td>
</tr>
<tr>
<td>5</td>
<td>Review</td>
<td>0.745</td>
</tr>
</tbody>
</table>

$r = $ at the level of significance 0.05

$r =$ at the level of significance 0.01

View and discuss results: This chapter includes the presentation and interpretation of the results achieved on the basis of the data and the sequence of its objectives as well as recommendations and proposals.

Identify self-organized learning strategies among students of the kindergarten department: The results of the current research for the sample of (100) female students of kindergarten department, showed that the arithmetic mean includes the presentation of the results reached and interpreted based on the data and according to the sequence of objectives as well as recommendations and suggestions.

Presenting and discussing the results of identifying self-organized learning strategies among kindergarten students: The results of the current research for the sample of (100) female students of kindergartens department, showed that the arithmetic average of the scores on the scale of self-organized learning strategies has reached (920.95) degree standard deviation ([11.895]), while the hypothesis average (When using the t-test for a single sample, it was found that the calculated (t) value (634. 80) is greater than the t-value (99. 1) at the significance level (0.05) and the degree of freedom (99) where this result indicates that The research sample had structured learning strategies because the sample mean was higher than the hypothetical mean of the sample Among the calculations and the average table and premise (6) shows that.

Table 6: Show mean, standard deviation and (t) value of the individuals of the research sample on the scale of self-organized learning strategies

<table>
<thead>
<tr>
<th>Sample</th>
<th>Mean</th>
<th>SD</th>
<th>df</th>
<th>Mean median</th>
<th>(t) Value</th>
<th>Sig. Level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Calculated</td>
<td>Tabulated</td>
</tr>
<tr>
<td>100</td>
<td>920.95</td>
<td>895.11</td>
<td>99</td>
<td>80</td>
<td>634.80</td>
<td>99.1</td>
</tr>
</tbody>
</table>

The mean scores of learning strategies are self-regulated among the students of the kindergarten department in the current research sample higher than the hypothetical mean. This means that they tend to complete the tasks assigned to them in an acceptable manner where policies and practices are developed that help students to educate themselves and update good ideas to develop competitive advantage. This can be
explained by the Robinson model (General Rules for Recalling), in which he asserted that individuals have the ability to control their behavior by observing, judging, and responding to behavior according to the events they face in their daily lives, i.e., individuals can largely regulate their behavior. The result can be attributed to the fact that individuals who feel self-responsibility as a result of their learning and development of their experience and skills as well as possessing internal motivation, which makes them individuals aim to organize their own learning, as the vast majority of students. They are aware of the importance of the information they get from teachers, parents or different means of communication that serve them in organizing themselves for learning to happen and that the results of the current research are consistent.

**Conclusion**

1. Kindergarten students have structured learning strategies, where the results came with an arithmetic average higher than the hypothesis average of the scale.

2. There is a significant correlation between the degrees of self-organized learning strategies among students of kindergarten department. The authors would like to thank Mustansiriyah University (www.uomustansiriyah.edu.iq)Baghdad-Iraq for its support in the present work.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding

**REFERENCES**


The Impact of an Accelerated Learning Program on the Development of the Skill Level of Snatch Punch for Boxing Students

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¹Faculty of Physical Education and Sports Science, University of Kerbala, Iraq

ABSTRACT

The world is witnessing major developments in many fields, including the sports field, where it witnessed the development of technical performance in all sports and events at all levels, which led to accelerate learning processes and shorten its time, and focuses on rapid learning on the results achieved and not the means used, so you can Through the process of learning to diversify and increase the means and techniques that you use to reach the goal, and because of the boxing game of open skills in which the opponent is unstable, which requires the learner to recognize and care about the speed of movement and accuracy of skill, which made The objectives of the research were to prepare a program in accordance with the accelerated learning in developing the skill level of the snatch punch for boxing students, and to identify the impact of using the program according to rapid learning in the development of the skill level of the snatch punching for boxing students, and to identify its preference for the impact of the program according to the rapid learning and the approach adopted in the development of The skill level of the snatch punch for students boxing, the hypothesis of research there is a positive impact of the program according to rapid learning in the development of the skill level of the snatch punch boxing for students between the tests before and after the program and educational Accelerated Learning preference influence in the development of the skill level of snatch punch boxing students between the post tests.

Keywords: Accelerated learning, skill and snatch punch.

Introduction

The world is witnessing major developments in many fields, including the sports field, where it witnessed the development of technical performance in all sports and events at all levels, which led to accelerate the learning processes and shorten its time.

This is an indication of the great interest of specialists and researchers in the development of the educational process continuously. In order to raise technical performance and achieve sports achievement and study the finer details that lead to convergence of levels to reach the desired goals according to scientific contexts, accelerated learning focuses on the results achieved and not the means used,¹ if you want to Do not link yourself to any of the means and techniques, just keep your eye open on the results you must reach, so you can through the learning process to diversify and increase the means and techniques you use to reach the goal, and fast learning is interested in making learning an experience involving the entire body Thinking through feeding human intelligence in its various forms (rational, emotional, physical, social, innate, creative, spiritual and moral) and others at all levels to restore the effectiveness of the educational process, and the boxing game has kept pace with the progress and development in many methods of learning and training In the various aspects and accordingly progress and development focused most attention in the field of boxing specialists on several aspects (physical, skills, mental and emotional), and most prominent of these concerns related to the mental side, which coincides with the special skill level of each

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player or learner in the game, and given the enjoy the game of boxing of open skills in which the opponent is not fixed, which requires the learner to be aware and cares about the speed of movement and accuracy of skill, which made the researcher need to choose the best methods for the purpose of reaching the optimal learning of the various skills, including punch Snatch, which is the focus of the current study and which need to use special devices and tools in order to learn the correct scientific form.

**Research aims:**

1. Prepare a program according to the accelerated learning in developing the skill level of the snatch punch for boxing students.
2. Identify the impact of the use of the program in accordance with rapid learning in the development of the skill level of the snatch punch for students boxing.
3. Identify the preference of the impact of the educational program in accordance with the rapid learning and the approach taken in the development of the skill level of the snatch punch for boxing students.

**Research hypotheses:**

1. There is a positive impact of the educational program in accordance with rapid learning in the development of the skill level of the abduction punch and defenses boxing for students between the pre- and post-tests.
2. To the program according to rapid learning preference to influence the development of the skill level of the abduction punch and defenses boxing for students between post-tests.

**Research Methodology:** The researcher used the experimental method by designing the one group with the pre- and post-test, which is the closest and most sincere to solving many scientific problems in practice and theoretically and it fits with the nature of the research problem.

**Community and Research Sample:** The selection of the research community and sample is one of the most important priorities of the researcher. The research community was determined by the students of the second phase in the Faculty of Physical Education and Sports Sciences at the University of Karbala for the academic year (8201-1920) as a research community as the subject of boxing (120) students represented by (4) people (A-B-C-D) and by lot Division A was selected as the research sample, and the number of students of this division (20 students) was randomly divided into two groups each group (10 students).

**Search devices and utilities:**

1. Boxing circuit/number (1).
2. Boxing gloves/number (15).
3. Your bags/number (6).
4. Wall cushions/number (6).
5. Hand cushions/number (6).
6. Centimeter tape measure.
7. Chairs and tables (3).
8. Sportswear T-shirt/number (20).
9. Beep number/number (2).
10. Hand calculator type (Casio)/number 2.
11. Video Camera Type (Nikon, d5200)
12. Toshiba laptop calculator Japanese-made, core “i5”
13. Screen display type (Sony) size (32).
15. Sling 5 meters/number (2).
16. CD/number (30).
17. Stopwatch/2 Chinese-made.

**Characterization of punching test on numbered bag:**

**Test objective:** Measure the skill level of the left snatch punch and the right snatch punch.

**Used tools:** bag medium size (13) kg, manufacture, whistle, registration form, boxing gloves, chairs and tables, stopwatch, camera video type (Sony).

**Performance Specifications:** When the rectifier signal to the student to perform the punch and according to the correct conditions of performance and the learner to perform five side punches left and then five side punches right on the numbered pouch from the standby stand and the best attempt is chosen and the least time to be characterized by punching the front of the glove and follow the body weight of the punch and the right coverage The opposite arm as shown in Figures 1 and 2 below.
Conditions: Return to the standby pause and then perform the second punch and so on for the rest of the punches.

Registration: The researcher designed the evaluation form after presentation to experts and specialists where the skill was divided into three sections and explained each section and give him a score and three residents are sitting next to the learner at a distance of (2 meters) as each rectifier alone assesses each punch of punches and each learner In the evaluation form, which is available to each resident by giving a score of (1-10) agencies: (3 degrees/preparatory section) (5 degrees/main section) (2 degrees/final section).

Figure 1: Shows the performance of the right and left side punch on the numbered punching bag

Pretests: After the implementation of two modules within the program, which included explaining the skill of the abduction punch and live presentation by the teacher and the performance of students, the tests were punched on the numbered bag (skill level) pre sample of research on Thursday (14/3/2019) in the private room For the boxing game in the Faculty of Physical Education and Sports Science - University of Karbala at nine in the morning and the researcher has proved the conditions related to the test in terms of time and place and the tools used and the method of implementation and the team of auxiliary and in order to provide them in the post-test.

Educational program: Through access to scientific sources and previous studies and ongoing discussions with supervisors and researcher field experience in the field of boxing game, an educational program was prepared according to the tendencies and desires of learners and within the specificity of the method of rapid learning, the program included a set of educational exercises to learn the skill researched, in addition to the organization of these exercises Within the teaching units, repetition and practice were also adopted. Real-time feedback was adopted during the performance of the skill and the stages of rapid learning were used during the application of the program, and the number of teaching units of the program was (8) teaching units. The implementation of the program drowned (10) weeks and by a unit of learning per week, as the researcher used a set of skill exercises that were aimed at learning and mastering skills through diversity in its forms. The program was started on Thursday 21/3/2019 and was completed on Thursday (6/5/2019), note that the educational program was applied to the experimental group with a rapid learning method in which learning through experimentation and action versus learning clearly about the strategy of playing through explanation and clarification and video presentation, while continuing according to the program Teacher for the control group.4

Posttest: After completing the application of the educational program of the experimental group and the program followed by the teacher of the control group, which includes (8) teaching units, the researcher
conducted the post-tests of the method of rapid learning on (9/5/2019), and on the members of the basic experiment sample of experimental and control groups and the same conditions and specifications pre-testing, data acquisition and recording in questionnaires to be processed statistically. The skill level of the experimental and control groups was assessed in the same manner as in the pretest tests.

Results

Table 1: Shows the mean values and standard deviation of the pretest and posttest tests for one group

<table>
<thead>
<tr>
<th>Skill type</th>
<th>Pretest</th>
<th>Posttest</th>
<th>(t) calculate</th>
<th>Significant level</th>
<th>Significant type</th>
</tr>
</thead>
<tbody>
<tr>
<td>The skill level of the right snatch punch</td>
<td>1.53</td>
<td>7.21</td>
<td>17.906-</td>
<td>0.00</td>
<td>Sig.</td>
</tr>
<tr>
<td>Skill level of the left snatch punch</td>
<td>1.86</td>
<td>7.58</td>
<td>23.898-</td>
<td>0.00</td>
<td>Sig.</td>
</tr>
</tbody>
</table>

N = 9 under the significance level (0.05)

Discussion of the Results

The researcher attributes the difference between the pre- and post-test of the research group as a result of the positive impact of the prepared educational program that has been applied and works with all learners. Which occurs for every learner when trying to understand himself and the world around him, explaining meanings and making relationships, identifying problems, developing solutions, providing alternatives, evaluating and deciding on them.

Figure 2: Shows the mean values and standard deviation of the pretest and posttest tests for one group

Experimental group in the post-test, as the researcher attributes that the use of rapid learning method gives the learner freedom in performance and implementation through the use of this method where the learner is active to issue new ideas and creativity in performance because learning is through linking and integration with the orientation towards facts and concepts in return. Abstract thinking and orientation towards the facts and theories and thus the learner is able to overcome the greater difficulties faced and therefore make appropriate decisions.

Conclusions

1. The prepared educational program has achieved its objectives in developing the skill level of the left snatch punch and the right punch snatch boxer.

2. The program has a clear and effective impact in learning the skill of punch snatch for students in boxing.

3. The ability of students to find appropriate solutions to educational situations because the method of rapid learning helped to think, induction, conclusion and cognition, which helped to retain more information of meaning.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

REFERENCES


Selective Screening of Inborn Errors of Metabolism in Baghdad Al Karkh/Al-Ielam Sector

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¹College of Dentistry, Ibni Sina University of Medical and Pharmaceutical Sciences, Baghdad, Iraq; ²Al Karkh Directorate al Ielam, District al Shabab, Primary Health Center, Ministry of Hrealth, Iraq

ABSTRACT

Inborn error metabolism (IEM) are genetically inherited diseases, though individually rare together they represent a significant percentage of children. In Iraq the neonatal screening program is considered as a systematic public health program for infants screening in the first 3-5 days after delivery up to 2 month of age for congenital hypothyroidism (CH), phenyl ketonuria (PKU) and classical galactosemia (GALT)

Aim: To evaluate the neonatal screening program results in al-ielam district in the period 1/8/2017 to 1/8/2018.

Method: This is across sectional -retrospective study that included 6777 client from seven PHCCS in al-ielam district in the period

Result: The screened number in Baghdad/Al-Karkh-al ielam district from 1st of August 2017 -1st of August 2018 was 6777. females were 3732 and 3045 were males. aged 3-5 days to one month. eight cases were identified and confirmed to have IEM (0.1% From the total number) five of them were female and three of them were males. The metabolic disorders diagnosed were, galactosemia 4(0.06%), congenital hypothyroidism were 3(0.04%) and phenyl ketone urea 1(0.01).

Conclusions: In this study there was a low prevalence rate in in Baghdad/Al-Karkh-al ielam district compared to the international standard. And the most frequent metabolic disorder is galactosemia comparing with the other disorders

Keywords: inborn error metabolism, hypothyroidism (CH), phenyl ketonuria (PKU)

Introduction

Inborn errors of metabolism (IEM) represent a heterogeneous group of disorders caused by genetic mutations and enzyme deficiencies compose a wide spectrum of diseases in mankind which may manifest at any time from early neonatal period to adolescence. Some of the metabolic disorders may even present at adulthood (1,2). The introduction of mass spectroscopy (MS/MS) in the neonatal screening allowed the screening of cases that may have been lost, and therefore believed to be extremely rare(3) prior to irreversible clinical damage(4,5).

Most inborn errors of metabolism (IEM) surveys in Western countries have been largely highlighted, with few studies in developing country contexts. As well Newborn screening has also been integrated in all health policies in developed countries since the 70’s of the last century (6). The service is still relatively retarded in developing countries. Dried blood spot is now widely distributed as sampling device for IEM detection by MS/MS for newborns as well for older children, so that it is easy to ship, relatively rapid and cheap, especially when relevant health facilities do not exist or are limited in the area (7). International efforts are now being made to help developing countries gain the knowledge and skills to improve IEM diagnostic and follow up. Since 2004, Middle East Metabolic Group by Orphan-Europe has been organizing an annual meeting for that issue. In 2006, the National Institute of Child Health and Development launched Strengthening of the Newborn
Screening in the Middle East and North Africa meetings, which is organized every two years (8).

The earliest possible recognition of disorders by using newborn screening aims to prevent most serious consequences by timely intervention; it is not a confirmatory diagnosis and requires further investigation.

Guidelines from some developed countries recommend screening of newborn before discharge because of the high prevalence of certain endocrine disease, metabolic errors, hearing loss, and early screening for DDH (9) which, if recognized later, contribute to significant morbidity (10). Although the exact list differs among, and sometimes within countries, testing for phenylketonuria (PKU) and hypothyroidism is universal in the developed world. Amino acids disorders, fatty acids oxidation disorders and G6PDD are also common metabolic disorders which are not included in screening program in Iraq (11).

The need for an established organization for screening and costs are some reasons for the limited number of screened disorders in many countries (12). The benefit of screening programs is to improve health status of early diagnosed patients and to treat them optimally. The disadvantage of screening programs include false positives (causing additional costs, parental stress and anxiety) and false negatives (potentially delaying diagnosis in missed cases) (13).

In Iraq, the Ministry of Health paid particular attention to the newborns as they are the basis for a society free of diseases and their members are in good health, thus it establishes programs needed to achieve this goal (14).

Patients and Method


Setting: Baghdad/Al-karkh Health Directorate/al Ielam district which includes eight centers, these are:
   1. Al-shabab primary health center.
   2. Al-saydia primary health center.
   3. al -Ielam primary health center.
   4. Al-risala primary health center.
   5. Al -bayaa primary health center.
   6. Ajnadien primary health center.
   7. Al-Mowasalat primary health center.
   8. Al-Radwanyia primary health center.

All of these health center involved in the study.

Data source: The information about the newborns that are tested in the PHCC are collected in a special statistical form, then these information will be, analyzed, and interpreted.

Sample size: The number should be screened in Baghdad/Al-Karkh al, Ielam district from From 1st August 2017 – 1st August 2018, was 6777. This number was obtained from screening records in each PHCC.

Screening Method: Every infants aged 3to5 days up to 1 month are involved in the screening program. Actually Most of the infants that involved in the screening program were brought to the PHCCs for receiving BCG vaccine and not for performing dried bloodspot card test. The healthcare providers will explain the screening test and its importance to the babies families and encourage them to participate in the program.

In the PHCC: the required information about the identity of the infant is recording, the insurance of the accuracy of the demographic data on the filter paper cards and the collection of blood specimens take place. Then the blood specimens then sent to the Central Public Health Laboratory: if Positive screening tests results detected then the test is repeated in the same filter paper and if it is still positive a phone calling from PHCCs to positive cases families will be done in order to take blood serum samples for the confirmatory tests to confirm CH while in case of PKU and GALT a new filter paper is used for confirmation.

Percent of clients with positive = Number of positive screening test (+ve ST.) x 100/Number screened (NS)

Data Analysis: The data are collected, analyzed, tabulated and figured by using the Microsoft office excel 2007. The data are expressed in form of numbers and percentages.

Result

As shown in Table. 1, The screened number in Baghdad/Al-Karkh-al Ielam district from 1st of August 2017 –1st of August 2018 was 6777. females were 3732

and 3045 were males. aged 3-5 days to one month.

eight cases were identified and confirmed to have IEM (0.118% From the total number) five of them were female and three of them were males. The metabolic disorders diagnosed were, galactosemia 4(0.059%), congenital hyphothyroidism were 3 (0.044%), phenyl ketone urea 1(0.014%). four of them were in al-bayaa PHCC (2 Galactosemia, 2congenital hyphothyroidism), 3of the positive cases were in al-muwasalat PHCC (1Gal, 1PKU, 1CHT), Two cases in al-risala (1Gal, 1CHT).

<table>
<thead>
<tr>
<th>IEM</th>
<th>Female</th>
<th>%</th>
<th>Male</th>
<th>%</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>GAL</td>
<td>2</td>
<td>0.029</td>
<td>2</td>
<td>0.02</td>
<td>4</td>
<td>0.059</td>
</tr>
<tr>
<td>CHT</td>
<td>2</td>
<td>0.029</td>
<td>1</td>
<td>0.014</td>
<td>3</td>
<td>0.044</td>
</tr>
<tr>
<td>PKU</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>0.014</td>
<td>1</td>
<td>0.014</td>
</tr>
<tr>
<td>Total no.</td>
<td>4</td>
<td>%0.04</td>
<td>4</td>
<td>%0.04</td>
<td>8</td>
<td>%0.118</td>
</tr>
</tbody>
</table>

Discussion

‘newborn screening’ is the term used to describe different types of tests that are performed during the first few days of a newborn’s life, aims to separate those who may suffer from the disorder from those who do not have the disorder. In contrast, diagnostic tests are conducted to establish the presence of a condition (15).

In this study, The screening test was performed on 6777, 8 (0.118%) of those screened showed positive screening test for either CH, PKU or GALT. as shown in Table. 1, is much higher than those obtained by single observational study in Germany (16) reported that from a total of 1,084,195 neonates 0.034% of cases present with confirmed diagnosis of a metabolic disorder screened in one newborn screening laboratory between January 1, 1999, and June 30, 2009, this may be due to short period of our study and fewer disorders involved.

The total no. of screening test of GALT: From the 6777of screening test of IEM Performed there was 4, 0.06% of those screened showed positive screening test for GALT, which is higher than those obtained by Alkhazrajy et al (17), which demonstrate(The total no of screening test of GALT Performed was 80409, 0.011% of those screened showed positive screening test for GALT)while it is lower than those obtained in India (18) [the study which included 10300 newborn showed that 0.388% of those screened reveal positive screening test for GALT], in our study GALT came first in its incidence among IEM disorders this may be caused by deficiency of any one of the other two enzymes causing galactosemia (GALK and GALE) that are not included in our screening program, so referral, to pediatric metabolic specialist must be done in these cases to measure the level of the other two enzyme (Galactosemia variants).

Our study also demonstrate that, (0.04%,0.01%) of the total number of screening test was positive for CH and PKU respectively this result is consistent with Iraqi study at Baghdad/Al-Karkh Health Directorate done by Alkhazrajy et al (17), which demonstrate that from 80409of screening test of CH Performed, (0.047%) gave positive screening test for CH, and, 0.014% from 80409of screening test of PKU Performed was positive for PKU but much lower than those obtained by study done in Iran, Zohreh Karamizadeh et al (19), [in which 0.20% of 63031 had a positive screening test for CH,] and 0.011% out of 76966 newborns screened had a positive screening test for PKU]. as soon as the diagnosis of hyperphenylalaninemia is established, further studies for biopterin metabolism should be performed to rule out biopterin deficiency as th a cause of hyperphenylalaninemia. One of the tests used is BH4 loading test which is not available in our screening program

This difference in the number of recalled tests, may be due to different sampling methods, different TSH cutoff values, different methods of performing the laboratory tests, and may also reflect the levels of iodine deficiency in different regions.

The total number of the diagnosed cases is low because the program was applied on rare diseases, but it is considered worthy with minimum burden and better outcomes for patients, fewer clinically significant disabilities and fewer deaths achieved from early diagnosis and treatment of IEM diseases which in turn will come back with benefit to the society. Economic cost of early detection of such conditions should also be taken into account, as each Euro spent on the screening program saved more than 25 Euros in health and social costs (15).
Conclusion

The national neonatal screening program in Iraq currently includes screening for three disorders: phenylketonuria, galactosemia congenital hypothyroidism. In this study there was a low prevalence rate in Baghdad/Al-karkh Health Directorate/Al Ielam district compared to the international standard.

In conclusion, incidence and types of prevalent IEM differ in different countries, this explain the necessity to carry out such surveys preparing for disease selection for neonatal screening programs.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

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The Impact of Adding Silanated Pearl Powder on Some Properties of Heat Cured Acrylic Denture Base Material

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ABSTRACT

Background: The most widely used material in denture fabrication is heat cured acrylic resin. Although it has many desirable properties but still lacks some of important ones like radiopacity and high strength. Fillers added to improve some properties of this material. Natural types of fillers might be used for this purpose, so the aim of this study was to evaluate the impact of adding silanated pearl powder on radiopacity, impact strength, transverse strength, surface hardness, and surface roughness of heat cured acrylic denture base material.

Materials and Method: As pearl powder used as fillers so methacryloxypropyltrimethoxysilane (MPS) is a chemical saline used for salination of pearl powder. A pilot study was performed to select appropriate concentrations of pearl powder during process of specimens’ making. Accordingly 1.5% and 2% wt. pearl powder were used. A total number of 150 specimens were prepared and divided into three groups (0%, 1.5%, and 2%) of pearl powder by weight, each group further subdivided into five subgroups for the experimental tests which include radiopacity, impact strength, transverse strength, surface hardness, and surface roughness tests. Statistical analysis of data was performed using descriptive and inferential statistics. Data was considered statistically significant at level of $< 0.05$.

Results: FTIR analysis revealed that methacryloxypropyltrimethoxysilane was chemically bonded to pearl powder and copolymerized with acrylic resin. And results showed a statistically highly significant increase in radiopacity and a statistically non-significant decrease in surface hardness. Also there was a statistically decrease in mean values of impact strength, transverse strength and surface roughness at 2% silanated pearl powder.

Conclusion: adding 1.5% and 2% wt. silanated pearl powder to heat cured acrylic denture base material improved radiopacity and surface roughness, and this addition causes decrease in mean values of impact and transverse strength but they still within the acceptable requirements of denture base materials with no significant change in surface hardness.

Keywords: acrylic, pearl powder, silane, filler, radiopacity

Introduction

Acrylic resin denture base material is a combination of advantageous properties rather than one perfect property. However, it still not ideal in all aspects like poor mechanical properties and lack of radiopacity(1).

Several studies were conducted with different types of fillers such as fibers (2) or powder (³) in order to improve properties of acrylic resin. Silane coupling agent was used to modify fillers for adequate bonding with resin matrix (4).

Natural products play an important role in medical field especially in dentistry. Pearl powder as one of Traditional Chinese Medicine (TCM) had many applications in medical, esthetic, and dental aspects (5). This was related to the main composition $\text{CaCO}_3$ (90%) with other trace elements and amino acids.
SPP used as fillers added to heat cured denture base material and studied the impact of their addition on radiopacity and some mechanical properties of heat cured acrylic denture base material.

Materials and Method

Particle size analysis of pearl powder: Laser particle size analyzer (better size 2000/China) was used to determine the particle size of pearl powder.

Surface modification of pearl powder: Pearl powder was modified with methacryloxypropyltrimethoxysilane (MPS) according to the procedure proposed by Jasim and Ismail in 2014 (6).

FTIR analysis: This was used to determine whether or not functional groups of MPS were present in pearl powder (7).

Pilot study: Radiopacity test was used to select the appropriate percentages of SPP as filler added to heat cured acrylic denture base material. Four percentages were used including 0.5%, 1%, 1.5%, and 2% wt. SPP. And five specimens of each percentage were prepared. The obtained results were statistically analyzed using pooled t-test which showed that percentages of 1.5% and 2% had a statistically significant increase in radiopacity as compared with control group.

Specimens’ grouping: In this study 150 specimens were made up from heat cured acrylic and divided into three major categories according to the selected percentages of SPP (0%, 1.5%, and 2%). Each category further subdivided into five subgroups for performing the following tests: radiopacity, impact strength, transverse strength, surface hardness, and surface roughness tests.

Specimens’ Preparation: This step started with mold preparation from plastic patterns as following: radiopacity test (30 x 10 x 2.5) mm length, width, and depth respectively (8), impact strength test (80 x 10 x 4) mm length, width, and depth respectively (9), and transverse strength test (65 x 10 x 2.5) mm length, width, and depth respectively (10). For surface hardness and surface roughness tests the instructions of device was followed regarding specimen’s dimensions in which the same dimensions for transverse strength test used.

The procedure for sample preparation including flasking, it was performed using the same procedure used for complete denture construction. SPP in percentages of 1.5% and 2% wt. were added to monomer and well dispersed using prope sonicator apparatus (Soni prep–150/England) then acrylic powder immedietly added to monomer containing SPP according to manufacturer instructions of regular conventional heat cured acrylic denture base material by Vertex (P/L ratio 2.2g/1ml). After that, acrylic dough was loaded into stone mold and a pressure of (100KPs/cm²) applied using hydraulic press for 5 min., then the flask placed in water bath.

A short curing cycle (1.5 hr. at 70 C° and 30 min. at 100C°(10) was selected for curing of acrylic resin, this was after measuring the temprature of SPP decomposition using melting point apparatus (SPM 30/Stuart). The temprature at which SPP decompose was 330C°.

After that specimens were finished then polished using dental lathe machine (Germany). All specimens were kept in distilled water for 48 hr. before testing (10).

Testing the specimens

A. Radiopacity test: Aluminum step wedge was constructed from pure aluminum with thickness starting from 1mm reaching to 10mm with 1mm increment at each step. Radiopacity test carried out according to ISO 4049 standards (11). The specimens were placed over a wax plate of 10mm thickness to replicate the media of soft tissue absorption and reflection, and aluminum step wedge was positioned beside the specimens to standardize the density of the radiographic film (12).

The wax plate, aluminum step wedge, and specimens were putted on a cassette contained a photostimulable phosphor plate and irradiated with 50Kv, 200mA, and exposure time (0.1sec.) using computed radiographic system (CR-AGFA), with focus film distance of 1 meter that commonly used in chest x-ray as in figure (1). Digital image was obtained using scanner (CR-30 digitizer/AGFA) and this digital image converted to an x-ray image using x-ray image printer (DRYSTAR 5320/AGFA). The optical density was measured by light transmission densitometer (densonorm 21 i, pehamed/Franch). Three readings were taken for each specimen from standardized sites.
The impact strength test was conducted according to ISO 179, 2000 (9) with an impact testing machine (Amity Vielle/USA) and by using charpy method, each specimen was supported at end and then stuck by swinging pendulum of 2joules. The impact strength was calculated in kilojoules/square millimeter using the following equation:

\[ \text{Impact strength} = \frac{E}{b \times d} \times 10^3 \text{ where}^{(13)} \]

where:

- \( E \): The impact energy in Joules
- \( b \): The width of the specimen in millimeters
- \( d \): The depth of the specimen in millimeters

\[ T = \frac{3PL}{bd} \text{ where}^{(13)} \]

- \( T \): Transverse strength (N/mm²)
- \( P \): maximum force exerted on specimens (N)
- \( L \): distance between supporting wedges (mm)
- \( b \): width of specimens (mm)
- \( d \): depth of specimens (mm)

**C. Transverse strength test**: The transverse strength was measured by using three point bending test in Instron universal testing machine (WDW-20/China). The specimens were placed on two parallel supporting wedges with 50mm apart and the load was applied by rod that located halfway between the supporting wedges to make a bending until fracture occurred at a crosshead speed of (1mm/min.). It was calculated from the following equation:

\[ T = \frac{3PL}{bd} \]

**D. Surface hardness test**: Shore D hardness tester (Time TH210) was used for testing surface hardness. Hardness value determined by measuring the depth of penetration of shore D hardness indenter (0.8mm), and the readings showed directly on a digital scale. Three readings were obtained from standardized sites.

**E. Surface roughness test**: The test was performed by using portable surface roughness tester (HSR210/China). This device is capable of detecting surface microgeometry by a stylus that remained in contact with the surface of specimen for 11mm. Three readings were taken from standardized sites.

**F. Scanning electron microscope examination**: This test was performed for control specimen (0% SPP) and specimen containing 2% SPP using field emission SEM (TESCAN/Czech).

**Results**

**Pearl powder’s size confirmation**: The particle size of pearl powder was 18.76µm.

**FTIR analysis**: FTIR spectrum of pearl powder after silanation revealed that all the absorption peaks of MPS were present in addition to the absorption peak of pearl powder; this indicated that MPS was chemically bonded to pearl powder as shown in figure (2).
Figure 2: FTIR spectrum of A: Pearl powder B: Silanated pearl powder

Scanning electron microscope examination: Figure (3) showed field emission SEM image for control specimen (A) and specimen containing 2% SPP (B) which revealed the presence of SPP pointed by black arrows and this was viewed in 500 nm scale.

Figure 3: Field emission SEM image for A: Control specimen B: Specimen containing 2% SPP
Experimental tests

In table (1) addition of 2% SPP to heat cured acrylic denture base material resulted in a decrease in optical density, impact strength, and transverse strength (1.31 ± 0.02), (10.26 ± 0.94 KJ/m²), and (77.34 ± 3.69 N/mm²) respectively.

Comparison among studied groups using one way ANOVA test revealed that there was a statistically highly significant difference for radiopacity test and transverse strength test only as shown in table (3).

Results of surface hardness and surface roughness tests after adding 2% SPP showed that the lowest mean values were (85.35 ± 0.87) and (0.77 ± 0.77 µm) respectively as in table (2).

Comparison among all experimental groups revealed a non-significant difference for surface hardness test and a highly significant difference for surface roughness test as shown in table (3).

Table 1: Means of optical density, impact strength, and transverse strength values and ANOVA test

<table>
<thead>
<tr>
<th>Groups</th>
<th>No</th>
<th>Optical density</th>
<th>Impact strength (KJ/m²)</th>
<th>Transverse strength (N/mm²)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
</tr>
<tr>
<td>Control</td>
<td>10</td>
<td>1.53</td>
<td>.01</td>
<td>11.95</td>
</tr>
<tr>
<td>1.5%</td>
<td>10</td>
<td>1.41</td>
<td>.02</td>
<td>10.50</td>
</tr>
<tr>
<td>2%</td>
<td>10</td>
<td>1.31</td>
<td>.02</td>
<td>10.26</td>
</tr>
<tr>
<td>ANOVA</td>
<td></td>
<td></td>
<td></td>
<td>F-test</td>
</tr>
</tbody>
</table>

Table 2: Means of surface hardness and surface roughness values and ANOVA test

<table>
<thead>
<tr>
<th>Groups</th>
<th>No.</th>
<th>Surface Hardness</th>
<th>Surface Roughness (µm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Control</td>
<td>10</td>
<td>85.94</td>
<td>.82</td>
</tr>
<tr>
<td>1.5%</td>
<td>10</td>
<td>85.73</td>
<td>1.11</td>
</tr>
<tr>
<td>2%</td>
<td>10</td>
<td>85.35</td>
<td>.87</td>
</tr>
<tr>
<td>ANOVA</td>
<td></td>
<td>F-test</td>
<td>.89</td>
</tr>
<tr>
<td></td>
<td></td>
<td>p-value</td>
<td>.421</td>
</tr>
</tbody>
</table>

Table 3: Post hoc analysis (Tukey HSD) for comparison among studied groups

<table>
<thead>
<tr>
<th>Experimental</th>
<th>Optical density</th>
<th>Impact strength (KJ/m²)</th>
<th>Transverse strength (N/mm²)</th>
<th>Surface roughness (µm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean diff.</td>
<td>Sig.</td>
<td>Mean diff.</td>
<td>Sig.</td>
</tr>
<tr>
<td>Control</td>
<td>1.5%</td>
<td>.117</td>
<td>.000</td>
<td>1.453</td>
</tr>
<tr>
<td></td>
<td>2%</td>
<td>.217</td>
<td>.000</td>
<td>1.690</td>
</tr>
<tr>
<td>1.5%</td>
<td>2%</td>
<td>.100</td>
<td>.000</td>
<td>.237</td>
</tr>
</tbody>
</table>

Discussion

For many years, the use of acrylic resin was recommended as a denture base material. Ideally denture base material should possess some key physical attributes including biocompatibility and adequate radiopacity, also good mechanical properties. There are situations where broken pieces of acrylic denture being ingested or swallowed accidentally, so it is very important for acrylic denture base materials to have appropriate radiopacity. As this provide faster observation of these fragments before they threaten patient’s life. In this study adding SPP resulted in a highly significant increase in
radiopacity and this might be due to the influence of atomic number on radiopacity of material in such a way that higher atomic number represents a more radiopaque material (14) i.e. calcium is the main ingredient of SPP which act as an opacifier. In this study, adding 2 % SPP to heat cured acrylic denture base material resulted in a statistically highly significant increase in radiopacity with a slight change in color. And this result disagree with Mikael et al in 2018 (8), this might be due to their use of nano sized calcium carbonate pure material while in this study used SPP consists mainly (90%) calcium carbonate micronized (18.76 µm) with other ingredients like trace elements and amino acids.

In impact strength test there was a statistically significant decrease in mean values as the concentration increase which might be explained by location of SPP particles inside or between acrylic resin chains which may result in weakness and breakdown of intramolecular forces along the side of individual chain. However the intermolecular attraction forces between acrylic polymer chains may also weaken and subsequently affect the capability of acrylic resin matrix to transfer the adsorbed load between its chains using shear movement. This means that fillers might restrict mobility of chain and their ability to deform when subject to force during testing procedure (15). 0-addition of fillers to the hwesting procedure may be restricted by the addition of fillers to the hwest cured acrylic resins dMeanwhileMM Meanwhile the interfacial adhesion between inorganic fillers and organic matrix was obtained by Van der walls forces, these weak bonds at high impact loading tend to break down making the material more brittle(16).

Results of transverse strength test indicated that the addition of SPP decreased the transverse strength mean values and this can be explained by the fact that cross sectional load bearing area of acrylic polymer matrix may be reduced by the presence of increased amounts of SPP fillers (17) which may act as impurities that can decrease the rate of polymerization, thus increasing the amount of residual monomer (18). Residual monomer might act as plasticizer in acrylic resin matrix and resulted in decreased transverse strength (19).

Regarding surface hardness, there was a slight decrease in mean values as compared with control group with a statistically non-significant difference and this may be related to low concentration of SPP used (2%) that can result in low network density, or due to agglomeration of SPP within the matrix of acrylic resin (20). Another explanation may be related to the micron size of added fillers (21).

Finally, the results of surface roughness mean values revealed a highly significant decrease that may be related to surface modification of pearl powder using MPS which can increase bonding between inorganic fillers and organic resin matrix so that chipping of particles away from surface of modified polymer during deflasking and grinding procedures is difficult leading to decrease surface roughness. In addition to the small particle size of SPP fillers that can be accumulated at surface of acrylic resin and fill the micro spaces at the surface (22).

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

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The Skill of Personal Effectiveness and Management of the Profession as a Function to Predict the Adequacy of the Management of the Game for Volleyball Coaches

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ABSTRACT

The study aimed to identify the level of skill of personal effectiveness and management of the profession of Iraqi Premier League coaches and first class in the management of volleyball matches for the sports season 2017-2018, and the level of adequacy of the management of games for volleyball coaches of the Iraqi Premier League and first class, as well as to know the relationship between the skill of personal effectiveness, the management of the profession and the adequacy of the management of games for volleyball coaches and the prediction of the adequacy of the management of the volleyball coaches of the Iraqi premier league and the first degree in terms of the skill of the ability to scientific analysis.

The researchers identified the research community and they are coaches of the Iraqi league Premier and first division volleyball for the sports season 2017-2018, and the number (147) coaches (20) coaches in the Premier League and (127) in the first division, the search procedures included the construction of two metrics, measure the skill of personal effectiveness and career management and the adequacy of the management of matches Volleyball coaches consist of (6) areas (the field of planning in sports training, the field of technical and training competence, the field of adequacy of leadership and decision-making, the area of adequacy of organization and guidance, the area of communication adequacy, the field of evaluation of the training process).

Keywords: Management, predict and adequacy.

Introduction

The skill of personal effectiveness and management of the profession of a group of individuals have a common goal possess different skills complement each other to achieve the common goal of team members, personal effectiveness and management of the profession is necessary between the existing and increase the degree of cohesion of the group and rooting team values and unify the vision among team members, which increases the effectiveness of teams Reducing friction and conflict between teams within the group through unity of vision.

Self-efficacy refers to the convictions of an individual’s ability to conduct a particular behavior that leads to specific outcomes, and Schwurzer defines them as predictions of the end result of perceiving the potential consequences on an individual’s activity and indicating control of the activity. An individual’s personal power or strength as a personal judgment of an individual about his or her abilities to perform a particular task successfully.¹

Adequacy of management is the ability to do something with a certain level of performance effectively and efficiently, and the adequacy in the form of a general goal and behaviorally formulated reflect the skill or tasks that the supervisor or educational leader should be able to perform, and the ability to competence is absorbed and understood after knowledge, and the use of efficiency is In the Patricia report on the competency-based education movement, she pointed out that competencies are precisely defined goals that describe all knowledge, skills and attitudes.²
The first dimension is the content that must be included in the competencies, and includes knowledge or skills or trends or a combination of all of them and the second dimension: is the degree of determining the functions, tasks and skills involved in the competencies, and technical competencies include specialized knowledge of methods, processes, procedures and techniques required to do The implementation of a specific activity, and the training process is an organized and planned effort to provide manpower in the administrative apparatus with a certain knowledge, and improve and develop their skills and abilities, and change their behavior and attitudes positively, has long discussed the departments of sports clubs and Teams of qualified coaches who lead their players technically and administratively to win in various sports tournaments and competitions, and the competent coach at the discretion of these departments must have a positive impact on his players can increase their motivation in training and their determination to develop themselves and do their best in the competition to get their approval before Appreciation of others.\(^3\)

**Methodology**

**Society and Sample Research:** The researchers identified his research community, namely the coaches of the Iraqi Premier League and the first division volleyball for the sports season 2017-2018, through a statistical obtained by the Iraqi Central Union in Baghdad, the number (147) coaches (20) coaches representing the Premier League and (127 - Coach representing the first division, where the sample of construction (100) trainers by (68.201) from the community of origin, and the application sample (120) coach by (81.702) of the community of origin.

**Variables considered:** For the purpose of obtaining the results of the research and achieving the objectives put forward, there must be a measurement tool. Where the researcher built a skill scale of personal effectiveness and management of the profession, and built a measure of the adequacy of match management for volleyball coaches and includes (6) areas (planning in sports training, training and technical competence, leadership and decision-making efficiency, organization and guidance, adequacy For communication and coordination, the adequacy of the training process evaluated.\(^4\)

**Tests used in the research:** Steps to build the standards of skill personal effectiveness and management of the profession and the adequacy of the management of games for volleyball coaches. The researcher has the following steps and in sequence:

1. The purpose of building the standards of personal effectiveness skill and profession management and the adequacy of the management of games for volleyball coaches.

2. Determine the phenomenon to be measured: The phenomenon that the research aims to measure is to build the skill standards of personal effectiveness and management of the profession and the adequacy of the management of games for volleyball coaches.

3. Identify the areas of personal effectiveness skill management, profession management and adequacy of match management for volleyball coaches:

   For the purpose of identifying the areas of skill scales personal effectiveness and management of the profession and the adequacy of the management of games for volleyball coaches, the researcher reviewed many of the previous literature and references related to the subject (scientific research and management of games for volleyball coaches), as well as access to sources in the psychological sciences and science of sports training.

4. Determine the relative importance of the areas of the skill of the personal effectiveness skill and management of the profession and the adequacy of the management of games for volleyball coaches: Determining the relative importance of the axes of the study is very useful to know whether one of these areas is more important than the other in measuring the areas of personal effectiveness skill and profession management and the adequacy of management Matches for volleyball coaches, as well as to determine the number of paragraphs appropriate for each area of study in light of their relative importance.

5. Preparation of paragraphs of the measures of the skill of personal effectiveness skill and management of the profession and the adequacy of the management of games for volleyball coaches:

   To develop a preliminary version of the standards of personal effectiveness skill and management
of the profession and the adequacy of match management for volleyball coaches followed the following volleyball methods, (see related resources, see related metrics, open questionnaire)

6. The validity of the paragraphs of the measures of the skill of personal effectiveness and management of the profession and the adequacy of the management of games for volleyball coaches.

This procedure requires the consensus of a group of experts on the validity of the paragraphs of this measure. The researcher has prepared a questionnaire for the skill of personal effectiveness, management of the profession and the adequacy of the management of games for volleyball coaches and was presented in a questionnaire form to the experts and specialists and the number (20) adopted by the researcher for the purpose of determining the validity of phrases. Personal effectiveness, career management and adequacy of match management for volleyball coaches.5

7. Preparation of Personal Effectiveness Skill, Profession Management and Adequacy of Match Management for Volleyball Coaches in the Initial Image: After the unacceptable paragraphs were excluded by the experts and specialists, the paragraphs were redistributed on the scale form randomly in a new form (the initial form of the scale).

8. Preparation of the instructions of the skill standard of personal effectiveness and management of the profession and the adequacy of the management of games for volleyball coaches: These instructions are written in a separate page of the test pages, and included instructions on the clarity of the answer as well as explain the importance of focus in the answer and honesty and not leave any paragraph without answered and characterized by instructions. The conditions of the implementation of the test as easy, clear and objective.

9. The keys to correct the personal effectiveness skill, career management and the adequacy of the management of games for volleyball coaches: after the approval of the experts gentlemen on the alternatives of the answer formulated for the measure of personal effectiveness skill and management of the profession and the areas of the adequacy of the management of the match for volleyball coaches were (0%, 10%, 20%, 30%, 40%, 50, 60%, 70%, 80%, 90%, 100%), and the score is (0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10)

10. Main Application of Personal Effectiveness Skill, Profession Management and Adequacy of Match Management for Volleyball Coaches: After the measures of personal effectiveness skill, profession management and adequacy of match management for volleyball coaches with their instructions and paragraphs are ready to be applied (final metrics), the researcher started with the assistant team to apply the standards. On the research sample (construction sample) of (100) trainers and their percentage (76.87) of the research community, on 30/4/2018 corresponding to Monday.

11. Statistical analysis of paragraphs measure disability learner collective: The most important analysis followed in psychological research are: (indicators of discrimination, scientific indicators of the scale).

Results

Table 1: Statistical Characterization by the value of the Kolmogorph Smirnov test for the sample building model in the variables studied

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>SD</th>
<th>Test (K-S)</th>
<th>Calculated</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal skill effectiveness and management of the profession</td>
<td>7.733</td>
<td>2.207</td>
<td>0.068</td>
<td>0.195</td>
<td></td>
</tr>
<tr>
<td>Adequate match management</td>
<td>515.008</td>
<td>36.084</td>
<td>0.066</td>
<td>0.200</td>
<td></td>
</tr>
</tbody>
</table>

The results of Table (1) indicate the good prevalence of the model building sample scores (volleyball coaches in the Iraqi Premier League and the first degree) at each of the variables of skill of personal effectiveness and management of the profession, the adequacy of the management of the games, and when calculating the
value (KS) of the variables researched results (0.068 The values of the associated significance level were (0.195, 0.200) and respectively and were greater than (0.05). All variables achieved the moderation curve and confirm their selection and validity in the representation of the studied community trained in the Iraqi Premier League and the first class. The following figures illustrate this.6

Table 2: The matrix shows the correlation between personal effectiveness skill, career management and adequacy of match management for volleyball coaches

<table>
<thead>
<tr>
<th>Correlation coefficient</th>
<th>The skill of personal effectiveness and management of the profession</th>
<th>Adequate match management</th>
</tr>
</thead>
<tbody>
<tr>
<td>The skill of personal effectiveness and management of the profession</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Significance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adequate match management</td>
<td>0.954</td>
<td>1</td>
</tr>
<tr>
<td>Significance</td>
<td>0.000</td>
<td></td>
</tr>
</tbody>
</table>

Table 3: The values of the correlation coefficient between the competence of the management of the games and the skill of personal effectiveness and the management of the profession of the sample

<table>
<thead>
<tr>
<th>Variables</th>
<th>The nature of the correlation</th>
<th>Correlation coefficient</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>The skill of personal effectiveness and management of the profession</td>
<td>Simple</td>
<td>0.954</td>
<td>0.000 Sig.</td>
</tr>
</tbody>
</table>

When reviewing the results of tables (2 and 3), we find that the values of the correlation coefficient between the variable (the adequacy of the management of games for volleyball coaches) and the skill of personal effectiveness and management of the profession, reached (0.858) and the value of the associated significance level came by (0.000) which is smaller than (0.025) This indicates that the correlation is significant and the relationship is real, did not come by accident.

Table 4: Quality indicators of the linear regression equation model

<table>
<thead>
<tr>
<th>The model D</th>
<th>Nature of Factors</th>
<th>The coefficient value of the equation</th>
<th>(t) Value</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed amount</td>
<td>A</td>
<td>279.865</td>
<td>6.885</td>
<td>40.651 0.000 Sig.</td>
</tr>
<tr>
<td>Personal skill effectiveness and management of the profession</td>
<td>B1</td>
<td>2.473</td>
<td>0.072</td>
<td>0.954 34.516 0.000 Sig.</td>
</tr>
</tbody>
</table>

Table (6) indicates the significance of the intersection coefficient (a) as well as the regression coefficient - slope - (B1) where the significance level values associated with the calculated (t) values were smaller than (0.05) which indicates the significance of the parameters (A, B) for simple regression model.

The fixed amount refers to the relationship between the degree of adequacy of the management of volleyball coaches and the skill variable of personal effectiveness and management of the profession, and return to the same table we find that the value of (t) calculated for the fixed amount (b) came by (34.516), and the level of significance associated with it came by (0.000) is less than (0.025) and this means that the value of (B) is significantly different from zero, and that the variable skill ability of scientific analysis, contributes effectively in estimating the result values (the adequacy of the management of games for volleyball coaches).7
From the above we summarize that the test (t) has indicated that the values of (fixed amount) were different from zero when compared with the values (fixed amount) of similar samples, when the values of the standard error is small, any small deviation from zero can reflect a difference Important because the constant amount represents the majority of the different samples, although the values of the constant amount and their significance level are important statistics to be studied, but the interpretation of the standard versions of the constant values is easier (not independent of the units of measurement of the variables). The standard tells us how many units of standard deviation will change (B) this is the result, because predictive variables change by one standard deviation.8

After the researcher has realized that the model is able to predict the adequacy of the management of games for volleyball coaches well, it will apply the model to do some expectations, where the model will take the following form:

**Non-standard equation:**

\[ Y = A + B \times X \]

The results shown in the current study show the ability of personal skill and professional management of coaches to predict the adequacy of the management of volleyball games, as games can be managed adequately by the trainer through the skill of personal effectiveness and management of the profession, where the coaches’ methods are reflected in the performance of the players and translated their guidance to reality If the failure occurs before there is a sense of effectiveness, and success experiences are important in sports practice, which is not simple, as the sports competition includes the characteristics of winning and loss experiences and it depends on the way athletes in the interpretation of success experiences as long as they are an essential part of the characteristics of sports, especially competitive sports When an athlete experiences many experiences during a successful sporting competition, it reinforces a sense of sufficiency and strengthens the need for more excellence, and it convinces the individual of his or her own ability to conduct a particular behavior that leads to specific outcomes.9

**Conclusions**

In the light of the results obtained by the researchers, the following conclusions were reached:

1. There is a significant correlation between the skill of personal effectiveness and management of the profession and the adequacy of match management for volleyball coaches.

2. Predictability in the adequacy of the management of games for volleyball coaches of the Iraqi Premier League and first class in terms of skill personal effectiveness and management of the profession.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding

**REFERENCES**


Toxic Effects of Sodium Benzoate on the Rat Testes

Ban Thabit Al-Ani, Rana R. Al-Saadi, Hikmat Fakhri Wassef

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ABSTRACT

Objective: Humans are exposed to intricate combinations of chemicals in their food. Antioxidants are examples of these chemicals and used as food preservatives. Such chemicals are presented in the food to advance aroma, taste, and/or appearance and preserve decent qualities of food (antioxidants, preservatives) like sodium benzoate (NaB) which is commonly used as a food preservative.

Aim of study: This experiment intended to realize the sodium benzoate effects on certain hormonal and histological parameters on male rat reproductive system.

Material and Method: As a mammalian, model thirty mature albino male rats. Distributed these rats into three assemblies once tagging them in a 10 rat/group. The experimental groups (TG1 and TG2) were orally managed with sodium benzoate 400 and 800 mg/kg body weight throughout the 70 days of the experiment, control group (CG) was managed orally with purified water only. Post-anesthetic blood sampling from left ventricle was used for hormonal measurements.

Result: The statistical analysis illustrates a vital reduction in both seminal vesicles and testes masses (P < 0.05) in comparison with CG. Sperm parameters reveal a vital reduction in the means of both sperm motility and concentration in treated groups (TGs) (P < 0.05) in comparison with CG. Additionally, seminiferous tubules diameters, secondary and primary spermatocytes, and spermatids had an extremely substantial decrease, while increasing interstitial space when treated with sodium benzoate in comparison with the CG. While comparing the levels mean of the hormone in the CG, testosterone serum levels show vital (P < 0.05) reduction in TG1 and TG2. The verdicts proposes that sodium benzoate administration with (400 and 800 mg/kg body weight) for 70 days prompted destruction in the reproductive organs and cause harm less of the sperm parameters functions causing both hormonal and histological changes.

Keywords: Sodium benzoate, rats, reproductive organs, testis.

Introduction

Preservative is a substance or a chemical that is added to products such as food, pharmaceutical drugs, paints, biological samples, cosmetics, wood, and many other products to prevent decomposition by microbial growth or by undesirable chemical changes. In general, preservation is implemented in two modes, chemical and physical. Chemical preservation entails adding chemical compounds to the product (1). Traditional preservatives, such as sodium benzoate (NaB) which is commonly employed as food preservative have raised health concerns in the past. Benzoate was shown in a study to cause hypersensitivity in some asthma sufferers. This has caused reexamination of natural preservatives, which occur in vegetables (2,3).

NaB is a salt form of benzoic acid that is employed as an agent for preservation in cosmetics, drugs, mixtures and shampoos (4), it is used as part of the treatment of hyperammonaemia that occurs as an inborn error of urea cycle. In addition, a new study shows that sodium benzoate may be beneficial as add-on therapy (1 gm/day) in schizophrenia (5). However, its concentration as a preservative has been limited by Food and Drug Administration (FDA) to 0.1% by weight (6,7) and is “permitted as an animal food preservative up to 0.1%” as issued by the World Health Organization (WHO) (8). It is

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proven as non-toxic in its organic form but its synthetic form at a chronic dose is toxic to living organisms \(^9\). NaB is also connected to cancer in soft drinks, by stirring it with vitamin C; leading to the formation of benzene \(^10\). Irritations in the eyes, skin, and bronchi caused by short–term exposure to benzoates can, but large skin sensitization needs a prolonged and continuous contact \(^11,\ 12\). 

This experiment study elucidated histological changes in the albino rats testes on oral management of NaB.

**Materials and Method**

In this article, 30 albino male rats weighing 150 to 200 gm were divided into three equal groups. Group 1 (G1) with a dosage of 400 mg./Kg. NaB orally in distilled water; Group2 (G2) with a dosage of 800 mg./Kg. NaB in distilled water and Group3 (G3) was administrated orally with purified water only throughout the 70 days of the trial. A nozzle fitted into a measuring syringe was used to feed the rats.

Post-anesthetic blood sampling from left ventricle was used for hormonal measurements. Animals were sacrificed and testes dissected out instantly taking the weight of each one and conserved in 10% formalin solution. This solution was castoff after one day, an alternative fresh solution was assembled, and the tissue was conserved for secondary fix. The tissue then experienced standard procedure of dehydration, clearing and wax impregnation once appropriate injection was realized. Hereafter, segments of thickness 4-5 μm were ceased and marked with hematoxylin and eosin stain. With no prior knowledge of the drug and the dose of the samples, which were then independently analysed by two pathologists who read and revised the samples.

**Biochemical Measurements:** the biochemical measurement was realized after separation on the serum using extraordinary enzymatic kits as follow:

**Testosterone ELISA Kit:** Total testosterone concentration in plasma or serum quantitative measurement was attempted using a microplate enzyme immunoassay \(^13\).

**Sperm concentration measurement:** The epididymis was removed and chipped in 5 ml of normal saline, stored in a rocker for 10 minutes and permitted to incubate for 2 minutes at normal conditions. The supernatant was diluted once incubation at 1:100 with a solution having sodium bicarbonate and 1 ml formalin (35%). The newly renovated Neuber’s counting chamber (hemocytometer) was adopted to count spermatozoa overall number. Roughly, ten μl of the thinned sperm suspension was conveyed to every counting chamber of the hemocytometer and inspected using an ordinary light microscope.

**Results**

In this article, results were classified to three main components comprising the histological verdicts of the testes and the parameters of testes weight, testosterone hormone, and are as follows:

1. **Organs Weight Changes:** The statistical analysis showed an important reduction in weights of testes \((P < 0.05)\) in both groups in association with the CG as depicted in Figure 1.A. Comparable findings has been perceived in the seminal vesicles weight in association to the CG as depicted in Figure 1.B.

2. **Sperms parameters:** Oral treatment outcomes of sodium benzoate on sperm parameters for 30 days are presented in the table (1) and revealed:

   a. **Concentration of sperm:** The statistical investigation revealed an important reduction \((P < 0.05)\) in sperm concentration in TGs in association with the CG as depicted in Figure 2.

   b. **Motility of sperm:** There was an extremely significant reduction \((p \leq 0.01)\) in TGs, as the results of progressive sperm motility percentage suggested. Furthermore, treatment of sodium benzoate revealed an important reduction \((p \leq 0.05)\) in non-progressive motility and a rise in immotile sperm \((p \leq 0.05)\) comparing with CG.

   c. **Morphology of sperm:** An outstanding decline \((p \leq 0.05)\) in normal sperm morphology in both TGs has been noted in the results when resembled with the CG.

3. **Histological Observations:** In NaB TGs, segments indicated a rebate in the the germ cell (GC) layer thickness, stretching the lumen of the central seminiferous tubules, and prominent necrosis of the population of GCs. Multiple vacuoles were observed in the tubules. Sertoli cells were abnormal in number and shape as per the control. Furthermore,
a peritubular fibrotic switch was noticed in the testicular sections as depicted in Figure 3. There was an extremely significant reduction in seminiferous tubules diameters, as depicted in Figure 4, primary spermatocytes, spermatids and rise in interstitial space as soon as administration with sodium benzoate associated with the CG.

CG testicular sections manifested seminiferous tubules with normal GC population layer thickness with regular smooth organized pattern up to mature spermatid. Neither the malignant nor the abnormal cell was observed inside the germinal epithelium. The vacuoles in the tubules were undetectable. There were sufficient populations of Sertoli cells; the result confirms the disengagement of spermatogonial cells and necrotic debris in seminiferous tubules and germ layer necrosis, exfoliation of GCs into the lumen of seminiferous tubules and Sertoli cell hyperplasia as depicted in Figure 3.b.

4. Serum hormones level: An important reduction (P < 0.05) was noticed in the levels of testosterone hormone in the TGs when associated to the CG as depicted in Figure 5.

![Figure 1: Effects of sodium benzoate (NaB) on the male rats reproductive organs weight, 400 mg/kg, 800 mg/kg during trial, A: testes; B: seminal vesicles.](image)

![Table 1: Effects of sodium benzoate (NaB) of the trial on specific male rats sperm parameter, 400 mg/kg, and 800 mg/kg during trial.](table)

<table>
<thead>
<tr>
<th>Sperm parameters</th>
<th>Control (distill water for 70 days)</th>
<th>NaB (400 mg/kg)</th>
<th>NaB (800 mg/kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sperm concentration (millions/mL)</td>
<td>96.750 ±5.218</td>
<td>42.500 ±4.233</td>
<td>38.010 ±3.133</td>
</tr>
<tr>
<td>Progressive sperm motility (%)</td>
<td>40.750 ±2.175</td>
<td>8.500 ±1.688</td>
<td>6.300 ±1.558</td>
</tr>
<tr>
<td>Non progressive sperm motility (%)</td>
<td>32.750 ±1.109</td>
<td>21.667 ±2.929</td>
<td>19.66 ±2.828</td>
</tr>
<tr>
<td>Immotile sperm (%)</td>
<td>34.000 ±1.246</td>
<td>69.833 ±4.254</td>
<td>65.833 ±4.244</td>
</tr>
<tr>
<td>Sperm Morphology (%)</td>
<td>54.500 ±3.329</td>
<td>44.667 ±1.667</td>
<td>41.656 ±1.257</td>
</tr>
</tbody>
</table>

Differences a, b, c are significant (p < 0.05) to compression rows.
Figure 2: A: Normal sperms concentration from the CG; B, C: Abnormal sperms concentration from TGs (400 and 800 mg/kg NaB) (E X40).

Figure 3: Male rat testicular section: (A) treated with NaB. Notice the GCs necrosis (g) and the section similarly illustrates vaculation (v); (B) CG. Notice the normal organized GCs layer (g) with and normal Sertoli cells (Sc) contained well-arranged seminiferous tubules (St). (H&E, 40 x)

Figure 4: Male rat testes Photomicrograph (A) CG displaying the normal structure of seminiferous tubules. (DST- Diameter of Seminiferous tubules, IS- Interstitial space), (B) TG showing an increase in interstitial space and reduction in diameters of seminiferous. (The real measurements were done using an image analyzer software once precise calibration with a stage micrometer). (H & E, 10 x)

Figure 5: Testosterone levels influence (ng/ml) of sodium benzoate NaB (400 and 800 mg/kg) in male rat serum
Discussion

The present study revealed that administration of NaB causes a vital decline in the weight of the rats’ testes. Histopathological segments of the testes exhibited drastic degradation and seminiferous tubules necrosis and denudation of germ epithelium layers in TG. The result shows disengagement of spermatogonial cells and necrotic debris in seminiferous tubules and germ layer necrosis, exfoliation of GCs into seminiferous tubules and hyperplasia of Sertoli cells. The findings presented are in agreement with Kanth et al. and Bhelonde (14, 15), who described germ membrane necrosis, GC exfoliation in the seminiferous tubules lumen.

Sperm counting is a very sensitive sperm test because it gives the cumulative results of all sperm production stages and is deeply linked to fertility. Our results confirm that NaB is cytotoxic to the sperm because it reduced the sperm count notably during the experiment period (16). The duration of the spermatogenic cycle in rats is 52 to 60 days and our findings denote that the affected GCs were almost the spermatids, spermatocytes, and spermatogonia. The count was degraded even at the end of the 30 days. This in all probability implies its effect on the stem cells. The deterioration in sperm count was maximum at the CG. It is also likely that the Sertoli cells could have been affected and the other likelihood could be due to its effect on the epididymal function (17).

The effect of NaB on epididymal sperm characteristics and testosterone hormone, after 30 days of treatment exhibited a vital reduction in all groups in comparison with the CG; this may be due to that administration of NaB could alter the histological architecture of testis, which appeared disruption of the spermatogenic process and seminiferous tubules (18, 19). Kehinde et al. (19) reported that the histological section of testes of TGs appeared alter in sperm quality and function and it showed distorted spermatogenic cells and seminiferous tubules, delereteus basement membrane with lumen vacuolation with hyperplasia of Sertoli cells. Vulnerability to preservatives, like paraffin, benzoic acid, negatively influences the male reproductive system function and changes the adipose hormone flow (16).

Testosterone plays a vital role in the final maturation of spermatozoon and while FSH is needed for the maintenances of the gametogenic function of the testis (20). The results of this study showed a vital reduction in testosterone in rats that were exposed to NaB, which is consistent with previous observations (14). The possibility of the low levels of plasma testo concentration following NaB exposure in this study may be due to increased oxidative stress. Oxidative stress may suppress the sensitivity of the gonadotrophic cells to gonadotropin-releasing hormone and, therefore, may prevent gonadotropin secretion (19). In this regard, Sohrabi et al. reported many alterations attributed to the direct cytotoxic effects of NaB leading to reduce testosterone synthesis (20).

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

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Investigation the Role of *Lactobacillus* ssp. on *Entamoeba histolytica* Pathogenesis

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ABSTRACT

*Entamoeba histolytica* is a type of parasite with global distribution. Infection with parasite causes amoebiasis which is responsible for more than 100,000 deaths each year, that marking it the 3rd leading cause of death. Presence of parasite leads to kill host cells because of the cytotoxic activity of the parasite. 157 stool samples were collected from AL-Kindi teaching hospital and Fatima Zahara hospital in Iraq. The cysts of *Entamoeba histolytica* were isolated from the feces and inoculated the mice with cysts. After 3 days the mice infected with parasite. The infected mice showed the presence of trophozoites in the larger intestine and found in the larger intestine many histological abnormalities, while in serum of the infected mice the level of IL-10 and IFN-γ were high compared with uninfected mice, mice treated with *Lactobacillus acidophilus* and mice treated with metronidazole.

**Keywords:** *Entamoeba histolytica*, *Lactobacillus* ssp, *Lactobacillus acidophilus*, IL-10, IFN-γ, Histological study

Introduction

*Entamoeba histolytica* is a type of parasite with a global distribution, the infection by *Entamoeba histolytica* parasite was estimated reach to 50 million people in developing countries and responsible for more than 100,000 deaths each year, 1% of the infected people may improve pathologies such as acute amoebic colitis or amoebic liver abscess. Most infections have no symptoms but gastrointestinal diseases may happen with many weeks of abdominal pain, bloody or watery diarrhea, loss of weight and cramping. *E. histolytica* is characterized by two stage the first is the trophozoite and the second is the cyst, The virulent stage is the cyst, cyst is non-motile form of the *Entamoeba histolyticae* the cyst found in the feces and has the ability to stay alive for some days in the environment, Mature cysts bear four nuclei and a dimension ranging 8 to 20 µm in diameter, while the trophozoite is the motile form the a dimension ranging is from 10 to 60 µm, trophozoite resides in the intestinal tract, and has the ability to destruction the tissue of intestinal tract and cause diarrhea with bleeding. The gastrointestinal tract that infected with *Entamoeba histolytica* is common in the developing countries and the parasitic protozoa infected the human bowel. Amoebic infection occurs by ingestion of mature cysts in fecally-contaminated food or water or from the hands. Excystation of the mature cysts occurs in the small intestine and trophozoites are released; the trophozoites then move to the large intestine. The trophozoites increase by binary fission and produce cysts. Both stages pass in the feces. The cysts can survive days to weeks in the external environment because of the protection provided by the cyst wall. The cyst is responsible for further transmission of the parasite. Interferon gamma IFN-γ activated neutrophils in response to amoebic invasions which carry out amoebicidal activity. Macrophages are amoebicidal after stimulation with IFN-γ or TNF-α.

Interleukin-10 is an important regular of the intestinal immunity that block an immoderate pro-inflammatory immune response by inhibiting the production of the TNF-α. Interleukin-10 gene that disrupts in mice leads to colitis that which used as a model to study the disease of inflammatory bowel.

*Lactobacillus* is a type of friendly bacteria, There are lots of different species of *lactobacillus*, which normally
live in our digestive, urinary, and genital systems without causing disease. It is also in some fermented foods like yogurt and in dietary supplements. In this study two species of lactobacillus it would taken to experiment there effect on treatment and prevention of diarrhea which caused Lactobacillus acidophilus is a big species of lactic acid bacteria that available in some products such as yogurt, milk and daily supplements. Growth of Lactobacillus acidophilus in the milk is slow which mean that the fermentation in the milk products achieves by starter culture of yogurt and then Lactobacillus acidophilus is added for additional probiotic value.

Material and Method

Feces Samples Collection: The study including 157 stool specimens were collected from patients infected with amoebiasis in AL-Kindi Teaching hospital and Fatima Zahra hospital, from November 2018 to April 2019. Stool samples were collected in clean plastic cup and transferred to animal research laboratory in collage of science, at Mustansiriya University.

Purification of E. histolytica: According to Robert and Thombson method was utilized to isolate the parasite then cyst was suspended in phosphate buffer saline (PBS-7.2) and the final concentration was attended by rate 1 x 10^6 cells/ml.

Preparation of free cells and supernatant: Both free cells and supernatant obtained from MRS broth culture after incubated for 18hr at 37°C in an anaerobic jar, then the culture was centrifuged at 10,000 rpm for 10min. Supernatant was removed and filtered through 0.22 µm pores size filters and concentrated, while bacterial cells were taken, then washed and suspended in to contain (1×10^8 cell/ml), after that stored in refrigerator to use later.

Animals: Using 60 white albino mice male and female were obtained from Iraqi Center For Cancer Research. Their ages were between (6-13) weeks old (16-22gm). All mice setted in clean plastic cages that proved with sterile water and the special food of mice. The feces of mice were examined by wet mount to make sure there isn’t any parasitic infection and all groups were immunosuppressed by dexamethasone (0.03 ml/mouse) daily as by intramuscular for five days.

Experimental design: This study included 60 albino mice divided in to six group each group include 10 mice, 50 mice was given (1×10^8 cell/0.1ml) to make infection and ensure the mice was infected by examined their feces. A Group from 10 mice without infection as control negative. The mice were inoculated orally by single dose every day through the experimental.

1. Group one (uninfected): inoculated with (0.1ml/day) of normal saline consider it as control negative.

2. Group two (infected): inoculated orally with (0.1ml/day) of normal saline consider it as control positive.

3. Group three (infected): inoculated orally with (0.1 ml/day) of Lactobacillus acidophilus.

4. Group four (infected): inoculated orally with (0.1 ml/day) of free cells which contains (1×10^8 cell/ml/day).

5. Group five (infected): inoculated orally with (0.1 ml/day) of supernatant.

6. Group six (infected): inoculated orally with (0.1 ml/day) of metronidazole.

During the experiment, stools of mice were collected and checked by light microscope and numerate the number of parasite. After the end of experiment all mice were killed and the blood collected from ocular vein of mice, then large intestine removed from each mouse and fixed in 10% formalin for studying histopathological changes.

Result

IL-10 and IFN-γ result: The present study showed the effect of Lactobacillus acidophilus in gradually reducing the number of Entamoeba histolytica parasite in the infected mice. The level of as in all treated groups after 12 days of treatment after infected the mice by E. histolytica the results were showed in table 1 and table 2.

Table 1: The level of IFN-γ in serum in treated groups and control

<table>
<thead>
<tr>
<th>Treatment groups</th>
<th>Time (day)</th>
<th>LSD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Control negative</td>
<td>31.60 ± 0.56</td>
<td>33.15 ± 3.46</td>
</tr>
<tr>
<td>Control positive</td>
<td>41.65 ± 1.62</td>
<td>41.90 ± 0.84</td>
</tr>
<tr>
<td>Metronidazole</td>
<td>44.10 ± 2.96</td>
<td>49.00 ± 0.98</td>
</tr>
</tbody>
</table>
Conted…

<table>
<thead>
<tr>
<th>Treatment groups</th>
<th>Time (day)</th>
<th>LSD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Control negative</td>
<td>81.7±4.8</td>
<td>79.1±10.6</td>
</tr>
<tr>
<td>Control positive</td>
<td>118.3±14.1</td>
<td>115.2±14.2</td>
</tr>
<tr>
<td>Metronidazole</td>
<td>89.5±8.6</td>
<td>120.4±11.5</td>
</tr>
<tr>
<td><em>L. acidophilus</em> (1×10⁸cell/ml/day)</td>
<td>124.1±11.6</td>
<td>121.9±9.0</td>
</tr>
<tr>
<td>Free cell</td>
<td>97.6±6.05</td>
<td>97.4±2.8</td>
</tr>
<tr>
<td>Supernatant</td>
<td>116.8±18.87</td>
<td>109.9±16.4</td>
</tr>
<tr>
<td>LSD</td>
<td>4.22</td>
<td>3.95</td>
</tr>
</tbody>
</table>

P<0.05, significant different

Table 2: The level of IL-10 in serum in treated groups and control

Histology Result

1. Cross section of the large intestine of mice uninfected (control negative) showing normal histological appearance of intestine. (40x) (H&E stain)

2. Cross section of the large intestine of infected mice (control positive) showing atrophy of mucosa with sub-mucosa with chronic inflammatory cells, infiltrate in between the glands and less prominent of goblet cells. (10X) (H&E stain)

3. Cross section of the large intestine of treated mice with free cells showing near to the normal appearance but short in diameter, abundant of goblet cells and very mild inflammatory cells infiltration. (40X) (H&E stain)

4. Cross section of the large intestine of mice treated with bacterial supernatant showing look-like normal histological structure appearance with few goblet cells. (40X) (H&E stain)
5. Cross section of the large intestine of mice treated with L. acidophilus bacteria showing near to the normal appearance but with increase prominent goblet cells in numbers and its secretion. (40X) (H&E stain)

6. Cross section of the large intestine of mice was treated with Metronidazole showing near to the normal appearance with hyperplasia of epithelial cells and glands but few goblet cells. (40X) (H&E)

Discussion

In this study a species of Lactobacillus has been selected to determine its effect on Entamoeba histolytica in vivo and in vitro. Selection of this bacteria was based on their use it in some fermented foods such as yogurt and in dietary supplements. Lactobacilli are normal flora of mouth, intestine, and female genital tract with important role in the control of undesirable microorganisms that can be considered as natural bio-preservatives. Lactobacillus was successful as the metronidazole in reducing Entamoeba histolytica cyst excretion over than the control group, Lactobacilli are main component of commensal human bacteria in the gastrointestinal tract that have shown to be protective against pathogen infection, Lactobacillus species have been successfully used in clinical trials to treat various forms of diarrhea. As well as one of important reason for use of the Lactobacillus acidophilus in treatment E. histolytica was the pH value, L. acidophilus live in low pH below 5.0, while parasite prefers to live in pH neutral and thus leads to death of parasite because of changing the environment in which parasite lives. Dietary supplementation with L. acidophilus could alleviate the inflammation and intestinal impairment, which improve intestinal morphology and barrier integrity, and modulate the intestinal microflora. Consequently, L. acidophilus addition benefited the intestinal health. Lactobacillus acidophilus supplementation can influence villus height, thus inducing small intestinal goblet cell hyperplasia. Lactobacillus used for treatment and prevention of acute diarrhea and antibiotic-associated diarrhea in children and in adults. In present study Lactobacillus acidophilus was able to influence the regulation of TH1 and TH2 cytokines through increased production of IL-10 and IFN-γ. Lactobacillus acidophilus that orally administered to the mice stimulated specific systemic immune functions, such as macrophages, increases in lymphocyte proliferative responses and enhanced stimulation of IL-10 and INF-γ cytokines. Mice that inoculated with L. acidophilus had significantly enhanced IL-10 and INF-γ levels in the serum compared to the control mice. In metronidazole group, the results showed decreased IFN-γ and IL-10 due to the important role of metronidazole as antimicrobial agent that shown to be effective against other protozoal infections and causes damage to DNA and proteins in the cell.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

REFERENCES


Estimation the Level of Survivin in the Serum of Iraqi Patient with Gallbladder and Liver Disorders

Mohammed Kadhim AL-Kafajee¹, Zainab Thamer Showait AL- Asady²
¹College of Education for Pure Science Ibn AL-Haitham, University of Baghdad, Iraq; ²ALKarkh University of Science, Iraq

ABSTRACT

Aim: The present study was carried out to estimate the level of anti-apoptic protein Survivin in serum of Iraqi patients with Gallbladder and Liver disorders

Materials and Method: Serum of 63 patients with Gallbladder and Liver disorders was tasted, in addition 24 person with normal Gallbladder and Liver was tested as a control group, to estimate the level of the Survivin according to ELIZA technique.

Result: Survivin level was high expressed in serum of patient with Gallbladder cancer, Liver cancer and Bile stone (P≤0.05). While there was no significant association in patient with Liver inflammation, Gallbladder inflammation and Liver fibrosis compared with the control group

Conclusion: Result of this study indicated that the highest level of Survivin observed in the serum of patients with Liver cancer and Gallbladder cancer compared with other groups of Liver and Gallbladder disorders

Keywords: Survivin, Liver disorders, Gallbladder disorders

Introduction

There are many pathogens which can make injury of Gastrointestinal organs such as the Liver and Gallbladder and cause changes in the tissue as well as the function (1). These changes include hepatitis, biliary inflammation as well as cancerous infections(2,3) These changes occur in the liver as a result of viral infections, alcohol consumption, drugs, or genetic defects (1) and leads to an acute inflammatory response due to the stimulation of the immune cells within the liver tissue that secrete pre-inflammatory cytokines and inflammatory cytokines as well as anti-inflammatory cytokines (3). Also, any defect in the composition process of bile juice caused by hepatocyte or in the process of transferring it to the Gallbladder causes cholestasis. Liver infection by cancer tumors (Hepatocyte carcinoma) it is the most common disease and it has two type Primary Liver cancer occur due to transformation of the Hepatocytes into cancerous cells and Secondary Liver cancer, in this case it is not a direct infection but the cancer is transmitted to the liver tissue from other tissues (2). Gallbladder diseases occur as a result of many factors such as Gallstone, a cute and a chronic Cholecystitis as well as cancerous tumors (4)

Apoptosis is physiological cell death or programed cell death take part in expansion and preservation of healthy cells and tissue (5,6), and it is one of the important of the defense mechanisms in Immune system to eliminate the infected body cells without inflammatory response (7). Apoptosis regulated by family of 8 proteins named Inhibitor of apoptosis (IAPs) and these protein have been identified in almost all vertebrates (8). IAPs protein have important role in preventing the cell from entering the stage of programed death by direct binding to caspases (9) in addition regulating the Immune response of T lymphocyte against tumor cells (10). Important member of IAPs is Survivin, Survivin is the smallest member of IAPs family which regulated apoptosis, and cell proliferation and cell cycle for this reason its unique protein because it have opposite effects (8).
Survivin expressed in tumor cells and embryonic cells as well as in embryonic and adult stem cells but not diagnosed in normal cells and tissues (11), also expressed in chromosomal Kinetochores of Metaphase in tumor cells (12), and inside mitochondria (13). Survivin is an important component in chromosomal passenger complex (CPC) so it has an important role in cell division (14), and it can inhibit apoptosis by binding directly or indirectly to caspase 3 and caspase 9 (15), as well as can inhibit apoptosis mitochondrial pathway by binding to Secondary derived activator of caspase (SMAC) to inhibit caspase 9 (16). High expression of Survivin in Endothelial cells lining Bladder infected with tumors compared with normal Urothelium that indicate the Survivin is attractive target for both anti-cancer therapy and as tumor marker (17). Therefore, the aim of this research is to estimate the level of Survivin in Iraqi patients with Liver and Gallbladder disorders.

**Materials and Method**

The blood serum collected from 63 patients with Gallbladder and Liver disorders (25 male and 38 female). In addition, 24 normal persons (9 male and 15 female) as a control group, with an age ranged from 20 – 68 years. Patient samples collected from AL-Emamen AL-Kadhimin Teaching Medical city, AL-Kindi Teaching Hospital, Oncology Teaching Hospital in Medical city and Gastro-Enterology and Liver disease Hospital in Medical city in Baghdad during the period from 20/10/2018 to 15/2/2019. A questionnaire was prepared to collect information from patients including name of the patient, age, gender, chronic diseases, drugs used, previous surgical processes as well as alcohol, smoking, and time spent smoking and drinking.

The serum was kept at Temperature 20 - °C, the samples were tested to detect concentration of Survivin by using Enzyme Linked Immune - Sorbent Assay (ELISA) analysis in the laboratory of the College of Health and Medical Technology in Baghdad. Survivin level was calculated by using the standard curve.

Statistical analysis was performed with the statistical package for social sciences (SPSS). Numerical data were described as mean ± standard error also, comparison between groups done using independent sample t-test. Categorical data were described as frequency and percentage. P-value of ≤ 0.05 was used as the level of significance.

**Results**

The results of the present study showed a significant increase in the level of Survivin in patients with liver cancer, Gallbladder cancer and Gallbladder stones compared to the control group (Table 1).

<table>
<thead>
<tr>
<th>Table 1: The level of Survivin Pg./ml (mean ± S.E.) in the patients with Liver and Gallbladder disorders</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Groups</strong></td>
</tr>
<tr>
<td>Control</td>
</tr>
<tr>
<td>Liver inflammation</td>
</tr>
<tr>
<td>Liver cancer</td>
</tr>
<tr>
<td>Gallbladder stone</td>
</tr>
<tr>
<td>Gallbladder inflammation</td>
</tr>
<tr>
<td>Gallbladder cancer</td>
</tr>
<tr>
<td>Liver fibrosis</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

(∗) significant increase in level of Survivin below a potential level (P≤0.05)

The highest level was observed in serum of patient with Liver cancer compared with other patients groups, while Survivin level was higher not significantly in patient with Liver inflammation, Gallbladder inflammation and Liver fibrosis compared with control group.

The result showed a significant increase in level of Survivin in patients with liver cancer compared to the serum level of patients with Liver inflammation, Gallbladder inflammation and Liver fibrosis. The result in (Table 2) showed that there are no significant in Survivin level among male patients compared to females in the serum of patients with liver and Gallbladder disorders.
Table 2: Survivin Level Pg./ml in the serum of male and female and age groups patients with Liver and Gallbladder disorders

<table>
<thead>
<tr>
<th>Patients groups</th>
<th>Gender</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male Mean ± S.E.</td>
<td>Female Mean ± S.E.</td>
</tr>
<tr>
<td>Liver inflammation</td>
<td>23.215 ± 8.418</td>
<td>10.033 ± 0.418</td>
</tr>
<tr>
<td>Liver cancer</td>
<td>36.163 ± 10.753</td>
<td>31.903 ± 6.052</td>
</tr>
<tr>
<td>Liver fibrosis</td>
<td>15.471 ± 3.656</td>
<td>15.215 ± 4.451</td>
</tr>
<tr>
<td>Gallbladder stones</td>
<td>12.917 ± 0.111</td>
<td>30.179 ± 6.053</td>
</tr>
<tr>
<td>Gallbladder inflammation</td>
<td>11.752 ± 2.814</td>
<td>21.481 ± 2.812</td>
</tr>
<tr>
<td>Gallbladder cancer</td>
<td>29.915 ± 4.080</td>
<td>25.941 ± 2.379</td>
</tr>
</tbody>
</table>

(20-35) Mean ± S.E. (36-51) Mean ± S.E. (52-67) Mean ± S.E.

| Liver cancer          | 44.471 ± 21.185                 | 33.361 ± 8.764     | 27.836 ± 4.871  |
| Liver fibrosis        | **34.168 ± 1.591**              | *10.478 ± 1.713    | *14.618 ± 2.723 |
| Gallbladder stones    | 33.277 ± 8.752                  | 25.510 ± 7.456     | 13.283 ± 0.477  |
| Gallbladder cancer    | **39.178 ± 1.321**              | 27.208 ± 2.167     | *26.211 ± 3.676 |

(*) significant increase in level of Survivin below a potential level (P<0.05)

(**) highest significant increase

The result of present study showed that there are significant increase in Survivin level in patients with Gallbladder cancer among age group (20-35) compared to age group (52-67) the Survivin concentration was (39.1786 ± 1.32150, 26.2110 ± 3.6760) Pg./ml respectively (Table 2), as well as the result showed there are significant increase in Survivin level in patients with Liver fibrosis among age group (20-35) compared to age groups (36-51) and (52-67) the Survivin concentration was (34.1685 ± 1.5915, 10.4786 ± 1.7133, 14.6187 ± 2.7233) Pg./ml respectively. The result showed there are no significant differences in Survivin level in patients with Liver inflammation, Liver cancer, Gallbladder inflammation and Gallbladder stones between age groups.

Discussion

Survivin is the smallest member of anti-apoptotic proteins family (IAPs) which has a dual role by controlling the process of cell division in addition to inhibit programmed cell death mechanism by blocking caspase activation. Survivin level significantly increase in different type of human cancer such as Breast and Pancreas cancer and its role can be observed in tumor cell division, development and angiogenesis (18,19).

The results of the present study showed a significant increase in the level of survivin in patients with liver cancer (HCC), Gallbladder cancer (GBC) and bile stone compared with its level of healthy people, as well as its level was not significant increase in the other groups (hepatitis, cirrhosis, Gallbladder inflammation) compared to its level in the healthy group.

Previsous research indicates that Survivin is expressed in 64.7% of hepatocellular carcinoma (HCC), which is at an early stage of cancer infection (20). The high expression of Survivin mRNA was found to be 41% in HCC (21). In most type of cancer including Colon, Pancreas, Lung, Liver, Brain, Lymph nodes and Prostate (22,23). Previous research has indicated that a high level of survival in cancer cells can be useful as a diagnostic factor for patients with HCC in early stage (20). The study of (24) found that the survival rate in cancer cells within the tissue biopsies of the GBC sac was 76.27%, this is in line with the result of current study, because Survivin level was elevated in the serum of patient with Liver and Gallbladder cancer, It is therefore possible to rely on the rate of expression or high level as a diagnostic feature of these two types of cancer.

GBC arises in the BIH sac and BIHduct, but it is difficult to detect early due to rapid cell division, metastasis and Invasion, and the absence of a specific diagnostic relationship (25). Thus the result of the current study is consistent with the results of the previous, as the high level of Survivin can be relied upon as a diagnostic tool for Gallbladder cancer (24). Some studies have shown that the function of Survivin belongs to its location within the cell, it has been found that the high level in the nucleus is a good diagnostic marker for cancer suggested its predominant role in promotion of cell proliferation compared with its location in cytoplasm (19,26).

There are many factors that influence the expression of Survivin within the cell, including the gene PHLPP, which is an anti-tumor gene and prevents...
the Transformation and proliferation of cancer cells, migration and metastasis (27) it also inhibits the activity of AKT, Survivin phosphorylation and its transfer to the nucleus, thus contribute to stimulate the mechanism of programmed cell death in cancer cells (24).

Previous studies have shown that the expression of Survivin gene can occur during the initial stages of cancerous transformation and follows the imbalance in cell proliferation and death, as expressed in different polyps, including polyps of colon, breast adenomas and Bowen’s disease (28), it was also found in the cases of viral infection as well as in liver cells that surrounding cancer cells (20). In this study, there was a significant increase in the level of serum in patients with bile stones and a non-significant increase in other diseases such as hepatitis, Gallbladder inflammation and cirrhosis. In these conditions, the activation of transcriptional expression factors can be activated by Cytokines such as NF -KB and STAT3, which will affect the factors responsible for cell vitality such as anti-apoptotic proteins, including Survivin (29).

The study of (30) noted that Survivin expression was not associated with the age and sex of patients in addition to the size of the tumor mass and the degree of differentiation of hepatocytes affected by cancer and this is consistent with the results of the present study, where there was no significant difference in the level of Survivin between males and females within Study sample for different pathological conditions In terms of age groups, there was no significant difference in the survivin level among the age groups (20-35), (36-51), (52-67) for people with liver cancer, bile stone, hepatitis and Gallbladder inflammation, which makes this result consistent With the previous study (30), while its level was increased in age group (20-35) in patients with cirrhosis and GBC. This result was not consistent with the result of (31) indicating that high level of survivin was noted in the cells of older persons.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding

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The Effect of Socioeconomic Level on Dental Caries among Preschool Children in Baghdad City

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ABSTRACT

Background: Dental caries and periodontal disease are the most common oral problems. It may start early in life and if not treated may end with tooth loss. Oral health is influenced by the socioeconomic status in which the socialization of the child takes place.

Aim of the Study: The survey was made to investigate the effect of socioeconomic status on dental caries of preschool children.

Subjects and Method: The total sample composed of 893 children aged (4-5) year selected randomly from different kindergartens in Baghdad governorate. WHO 2013 index was used for assessment of the dental caries experience and questionnaire was send to parents to assess their knowledge and behavior.

Results: Results showed that the prevalence of dental caries was 98% for the total sample, highly significant differences were seen between SES and dental caries experience dmfs of primary teeth, highly significant relation between SES and parents knowledge in all questions except questions concerning tooth decay and crowding of the permanent dentition was no significant while in behavior questions a highly significant relation was seen in all questions except questions concerning the type of bristle of the brush and preferable time for eating sweets was no significant.

Conclusion: Preschool children in Baghdad were found to have a high prevalence of dental caries SES effect on the dental condition. Hence this survey highlighted the need for children to dental health education programs and public and school preventive measures among those children.

Keywords: socioeconomic status, Dental caries, Preschool children

Introduction

Dental caries most commonly affect children, the impact of the oral conditions on children life include: difficulty with chewing, oral pain, missed school days due to their cumulative dental caries experience and changes in emotional e.g being upset and worrying about being different as well as anxiety or distress about their mouth(1).

The association between social and economic condition and dental caries prevalence has been observed, Inequalities in the distribution of dental caries were observed and socioeconomic factors were found to be strong predictors of the prevalence of oral disease in preschool children, family income, occupational prestige, and educational attainment are measures of SES that have been found to influence an individuals life opportunities(2).

Iraq is one of the developing countries that exhibited an increase of dental caries prevalence and severity. Many of studies found that dental caries prevalence showed low while the other studies was high prevalence (3,4), many studies conducted to revel the relationship of socioeconomic status with dental caries all these studies depended on one or combination parameters of
socioeconomic level, In the economically developing countries the prevalence and severity of dental caries has increased with industrialization and exposure of these populations to western diets. The families with higher level of education, higher income, better occupation have higher caries experience which is attributed to the reason of consuming more refined sugar and cariogenic foods (5).

This study was conducted on group of preschool children 4-5 year old living in Baghdad governorate to find out the effect of socioeconomic level on dental condition.

**Subjects and Method**

A sample of 893 preschool children 4-5 year old were selected randomly from different kindergartens in Baghdad governorate (471 boys and 422 girls) from urban areas in Baghdad city, from different kindergartens distributed in the city. The study received approval from the Research Ethics Committee of the College of Dentistry, University of Baghdad, Iraq.

Knowledge and behavior questions was recorded by 20 questionnaire (6), which consist of: Question knowledge of parents about the mouth and teeth(Q1.and2 concerning the number of deciduous and permanent teeth, tooth composition. Q3, 4 and 6 concerning tooth decay. Q5, 8 and 10 concerning crowding of the permanent dentition, and early loss of the primary teeth and thumb suking habits. Q7 concerning the benefit of fluoride Q9. concerning visit to dentist). Question about the behavior of the parents (Q11, 12, 13,16 and19 concerning the frequency of the tooth brushing, brushing technique, use of dental floss and tooth picks, the way that child used to brush his teeth and the type of bristle of the brush respectively. Q.14 concerning the preferable time for eating sweets. Q15 concerning the number of visits to the dentist Q17 and 18 concerning with toothache of child and dental decay respectively. Q20. concerning the use of tooth in bad habits).

Intra oral examination of dental caries status was recorded according to WHO 2013 (9) using CPI probe. Dental caries was measured by dmft/s for deciduous teeth.

The statistical data analysis was approached by using statistical package (SPSS) ver.(23.0) in order to analyze and assess the results of this study through application of descriptive data analysis, by frequencies and percentages. Inferential data analysis, these types of analysis were used to test hypotheses by accept or reject it, which include the following; Spearman Rank Correlation test, analysis of variance and significant at p≥ 0.05.

**Results**

Results showed that the prevalence of dental caries was 98% for the total sample. The mean dmfs (13.180).

The highly significant of relation dmfs with the level of SES found p value equal to 0.0000.

Highly Significant differences were seen between knowledge questionnaires and dental caries experience dmfs of primary teeth, some knowledge questions were no significant, the question about concerning crowding of the permanent dentition, and early loss of the primary teeth the dmfs p value=0.172 and the question about tooth decay the dmfs p value=0.985 also the question about thumb suking habits the dmfs p value=0.150 and the question about visit to dentist the dmfs p value=0.086.

No significant differences were seen between behavior questionnaires and dental caries experience dmfs of primary teeth except the question about use of tooth in bad habits highly significant p value=0.000, and question about way that child used to brush his teeth p value=0.001.

| Table 1: Caries Experience (Mean ± SE) of Primary Teeth and dmfs in Relation to parents knowledge Questionnaires |
|-------------------|---------|----------|---------|--------|---------|----------|---------|---------|
| Knowledge          | ds      | ms       | fs      | dmfs   |
|                    | mean    | SE       | T       | p      | mean    | SE       | T       | p      | mean    | SE       | T       | p      |
| Number of deciduous | good    | 10.53    | 0.32    | 8.3    | 0.000   | 0.83     | 0.10    | 1.0    | 0.315  | 0.26     | 0.03     | 3.2    | 0.002  |
|                    | poor    | 15.06    | 0.44    | 4.6    | 0.000   | 0.68     | 0.10    | 1.2    | 0.220  | 0.25     | 0.03     | 3.5    | 0.001  |
| Tooth composition  | good    | 11.37    | 0.31    | 4.6    | 0.000   | 0.83     | 0.09    | 1.2    | 0.220  | 0.25     | 0.03     | 3.5    | 0.001  |
|                    | poor    | 14.09    | 0.50    | 3.9    | 0.001   | 0.65     | 0.11    | 1.2    | 0.220  | 0.10     | 0.03     | 3.5    | 0.001  |

Intra oral examination of dental caries status was recorded according to WHO 2013(9) using CPI probe. Dental caries was measured by dmft/s for deciduous teeth.

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**Results**

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Highly Significant differences were seen between knowledge questionnaires and dental caries experience dmfs of primary teeth, some knowledge questions were no significant, the question about concerning crowding of the permanent dentition, and early loss of the primary teeth the dmfs p value=0.172 and the question about tooth decay the dmfs p value=0.985 also the question about thumb suking habits the dmfs p value=0.150 and the question about visit to dentist the dmfs p value=0.086.

No significant differences were seen between behavior questionnaires and dental caries experience dmfs of primary teeth except the question about use of tooth in bad habits highly significant p value=0.000, and question about way that child used to brush his teeth p value=0.001.

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| Knowledge          | ds      | ms       | fs      | dmfs   |
|                    | mean    | SE       | T       | p      | mean    | SE       | T       | p      | mean    | SE       | T       | p      |
| Number of deciduous | good    | 10.53    | 0.32    | 8.3    | 0.000   | 0.83     | 0.10    | 1.0    | 0.315  | 0.26     | 0.03     | 3.2    | 0.002  |
|                    | poor    | 15.06    | 0.44    | 4.6    | 0.000   | 0.68     | 0.10    | 1.2    | 0.220  | 0.25     | 0.03     | 3.5    | 0.001  |
| Tooth composition  | good    | 11.37    | 0.31    | 4.6    | 0.000   | 0.83     | 0.09    | 1.2    | 0.220  | 0.25     | 0.03     | 3.5    | 0.001  |
|                    | poor    | 14.09    | 0.50    | 3.9    | 0.001   | 0.65     | 0.11    | 1.2    | 0.220  | 0.10     | 0.03     | 3.5    | 0.001  |
Conted…

| Tooth decay | good | 12.21 | 0.27 | 0.76 | 0.07 | 0.8 | 0.426 | 0.20 | 0.02 | 0.6 | 0.556 | 13.18 | 0.29 | 0.707 | 0.76 | 0.07 | 0.8 | 0.426 | 0.20 | 0.02 | 0.6 | 0.556 | 13.18 | 0.29 | 0.707 | 0.76 | 0.07 | 0.8 | 0.426 | 0.20 | 0.02 | 0.6 | 0.556 | 13.18 | 0.29 | 0.707 | 0.76 | 0.07 | 0.8 | 0.426 | 0.20 | 0.02 | 0.6 | 0.556 | 13.18 | 0.29 | 0.707 | 0.76 | 0.07 | 0.8 | 0.426 | 0.20 | 0.02 | 0.6 | 0.556 | 13.18 | 0.29 | 0.707 | 0.76 | 0.07 | 0.8 | 0.426 | 0.20 | 0.02 | 0.6 | 0.556 | 13.18 | 0.29 | 0.707 | 0.76 | 0.07 | 0.8 | 0.426 | 0.20 | 0.02 | 0.6 | 0.556 | 13.18 | 0.29 | 0.707 | 0.76 | 0.07 | 0.8 | 0.426 | 0.20 | 0.02 | 0.6 | 0.556 | 13.18 | 0.29 | 0.707 | 0.76 | 0.07 | 0.8 | 0.426 | 0.20 | 0.02 | 0.6 | 0.556 | 13.18 | 0.29 | 0.707 | 0.76 | 0.07 | 0.8 | 0.426 | 0.20 | 0.02 | 0.6 | 0.556 | 13.18 | 0.29 | 0.707 | 0.76 | 0.07 | 0.8 | 0.426 | 0.20 | 0.02 | 0.6 | 0.556 | 13.18 | 0.29 | 0.707 | 0.76 | 0.07 | 0.8 | 0.426 | 0.20 | 0.02 | 0.6 | 0.556 | 13.18 | 0.29 | 0.707 | 0.76 | 0.07 | 0.8 | 0.426 | 0.20 | 0.02 | 0.6 | 0.556 | 13.18 | 0.29 | 0.707 | 0.76 | 0.07 | 0.8 | 0.426 | 0.20 | 0.02 | 0.6 | 0.556 | 13.18 | 0.29 | 0.707 | 0.76 | 0.07 | 0.8 | 0.426 | 0.20 | 0.02 | 0.6 | 0.556 | 13.18 | 0.29 | 0.707 | 0.76 | 0.07 | 0.8 | 0.426 | 0.20 | 0.02 | 0.6 | 0.556 | 13.18 | 0.29 | 0.707 | 0.76 | 0.07 | 0.8 | 0.426 | 0.20 | 0.02 | 0.6 | 0.556 | 13.18 | 0.29 | 0.707 | 0.76 | 0.07 | 0.8 | 0.426 | 0.20 | 0.02 | 0.6 | 0.556 | 13.18 | 0.29 | 0.707 | 0.76 | 0.07 | 0.8 | 0.426 | 0.20 | 0.02 | 0.6 | 0.556 | 13.18 | 0.29 | 0.707 | 0.76 | 0.07 | 0.8 | 0.426 | 0.20 | 0.02 | 0.6 | 0.556 | 13.18 | 0.29 | 0.707 | 0.76 | 0.07 | 0.8 | 0.426 | 0.20 | 0.02 | 0.6 | 0.556 | 13.18 | 0.29 | 0.707 |

Not significant at p≥ 0.05,* significant p<0.05

### Table 2: Level of SES in Relation to behavior Questionnaires

<table>
<thead>
<tr>
<th>Socioeconomic level</th>
<th>Frequency of the tooth brushing</th>
<th>Brushing technique</th>
<th>Dental floss and tooth picks</th>
<th>Way that child used to brush his teeth</th>
<th>The type of bristle of the brush</th>
<th>Preferable time for eating sweets</th>
<th>Number of visits to the dentist</th>
<th>Toothache of child</th>
<th>Dental decay</th>
<th>Use of tooth in bad habits</th>
</tr>
</thead>
<tbody>
<tr>
<td>low</td>
<td>40.37%</td>
<td>30%</td>
<td>14%</td>
<td>15.11%</td>
<td>15.62%</td>
<td>13.11%</td>
<td>72.8%</td>
<td>40.67%</td>
<td>40.67%</td>
<td>41.66%</td>
</tr>
<tr>
<td>middle</td>
<td>40.37%</td>
<td>30%</td>
<td>14%</td>
<td>15.11%</td>
<td>15.62%</td>
<td>13.11%</td>
<td>72.8%</td>
<td>40.67%</td>
<td>40.67%</td>
<td>41.66%</td>
</tr>
<tr>
<td>high</td>
<td>40.37%</td>
<td>30%</td>
<td>14%</td>
<td>15.11%</td>
<td>15.62%</td>
<td>13.11%</td>
<td>72.8%</td>
<td>40.67%</td>
<td>40.67%</td>
<td>41.66%</td>
</tr>
<tr>
<td>Chi-square</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Not significant at p≥ 0.05,* significant p<0.05

### Table 3: Caries Experience (Mean ± SE) of Primary Teeth and dmfs in Relation to SES

<table>
<thead>
<tr>
<th>Dental caries</th>
<th>Low SES</th>
<th>Middle SES</th>
<th>High SES</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>ds</td>
<td>Mean</td>
<td>SE</td>
<td>Mean</td>
<td>SE</td>
<td>Mean</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ms</td>
<td>0.688</td>
<td>0.104</td>
<td>0.887</td>
<td>0.148</td>
<td>0.788</td>
</tr>
<tr>
<td>fs</td>
<td>0.118</td>
<td>0.030</td>
<td>0.294</td>
<td>0.056</td>
<td>0.237</td>
</tr>
<tr>
<td>dmfS</td>
<td>15.85</td>
<td>0.460</td>
<td>13.38</td>
<td>0.534</td>
<td>9.491</td>
</tr>
</tbody>
</table>

Not significant at p≥ 0.05,* significant p<0.05
Discussion

In this study, the prevalence of dental caries was found to be high for primary school (4-5) year children. This percentage was more than study done in Indian (7) and more than some Iraqi studies (3,8,9,10). The high caries prevalence recorded by this study may partly be attributed to lower fluoride level in drinking water in Iraq that was ranging between 0.12-0.22 (11), and may also related to other factors related to the socioeconomic condition and living style of the families (12). For the diagnosis and recording of caries-experience; dmfs indices was used in present study. This indices allows measurement of the past caries-experience indicated by missing and filled fraction, and the present caries by the decayed fraction. In addition, dmfs index allow the measurement of dental caries by severity. The mean dmfs value was (13.180) compare with other Iraqi studies (14,15).

This study showed that the mean of ds fraction (12.205) was higher than ms and fs components of dmfs index, which is an indication of a poor dental treatment. which is mean that even if treatment is present, it is directed toward extraction rather than restoration. This result is in agreement with other studies (8,13,9).

In this study, the knowledge questionnaire has highly significant difference with SES, may be attributed that low knowledge group compared to children from high SES families. This discrepancy differences in the home learning environment and in parent beliefs (16), except the question about dental caries and crowding in permanent teeth had no significant difference. Also the study showed that there was highly significant difference in the relation behavior questionnaires to SES, may be attributed, The relationship between family life events and rates of maternal reports of child behavior and child rearing problems preschool-aged children. Mothers experiencing a large number of life events reported higher rates of child rearing problems (17), except the question about type of bristle and preferable time of eating sweet had no significant difference.

Conclusion

This survey highlighted the need of children to preventive measures and dental health education and improvement of dental knowledge and attitude towards good oral hygiene.

Acknowledgment

I thank all the participants in the study and Dr. M.Galib for helping in the data analysis and statistical work.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

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The Effect of Mouth Wash Containing Alcohol on Force Degradation of Colored Elastomeric Chains

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ABSTRACT

Objective: To test the effect of alcohol and non-alcohol containing mouthwashes on the force decay of clear and colored elastomeric chains.

Method: An in-vitro prospective study to test the effect of exposure to alcohol on orthodontic elastomeric chains clear and colored. A sample of 72 specimens divided into three test groups, each group exposed to a single type mouth wash (deionized water (control); Listerine-zero; Listerine-original (26.9% alcohol)) for 60 seconds twice a day. Force measurements by a digital force tester were taken at days 0, 1, 7, 21.

Finding: Increase in force decay over time was observed in all test groups, and is observed more with colored elastics. The test group exposed to Listerine original mouth wash had the highest mean force decays in all types of elastomeric chains, being more with colored chains. All of those findings were statistically significant.

Conclusions: Mouth wash containing alcohol increase force decay of colored elastomeric chains with time, with color related differences in force decay of elastomeric chains.

Keywords: Force decay; colored Elastomeric chain; Alcohol; Mouth wash.

Introduction

Elastomeric chains are force generating units that aim to consolidate space and facilitate movement of teeth, are composed of polyurethane materials and manufactured as a spool of linked elastic chains, used in orthodontic practice since 1960s due to their minimal adverse effects during effective tooth movement.1,2,3

Elastomers have many advantages of being inexpensive, convenient, patient cooperation not required, and relatively hygienic despite of the inherited disadvantages that they undergo permanent staining and deformation in the oral environment 4 that is besides the unavoidable loss of force due to stress relaxation.

Various factors affecting the degree of force decay were observed with elastomeric chains. Immersion in water bath leads to quick force decay; acidic fluoride and initial load applied to the elastomers have appositive correlation with the percentage of force degradation of elastomeric chains 5, yet the effect of temperature and pH remains controversial.6,7

Some researchers 8,9,10,11 have reported that a force decay of 50 to 75 percentage was noticed after 24 hours of stretching and followed by 10 percentage more by 21 days and only 30 to 40 percentage of the initial force after 28 days is retained.

Orthodontists recommended the patients to use mouth washes in order to maintain a good oral hygiene during treatment. Many mouth washes contain alcohol in different concentrations ranging from 0%–26.9%.12

Although increase in force decay of elastomeric chains with time is known to be caused by alcohol. Yet dependence of force decay of elastomeric chains on alcohol concentration was not observed.13
Distinct configurations of clear elastomeric chains tested in vitro showed rapid force degradation in Listerine original mouth wash containing alcohol and showed more force decay compared to those tested in alcohol free mouth wash (Listerine zero).  

Many manufacturers have added colored elastomeric chains to their inventories by adding Filler particles to provide color to elastic chains due to the increasing esthetic demands and to solve the staining problem of elastomeric materials from certain types of food.

Despite the widespread use of colored elastomeric chains in clinical practice there are relatively few studies describing the effect of addition of pigments on the mechanical property of elastomeric chains, some researchers found that force delivery behavior of colored elastomeric chains were significantly affected by the filler material used in tinting the chains. Other researchers found various manufacturer effect on force delivery properties of elastomeric chains due to color specification, but the differences in force levels did not appear to be clinically relevant  

The present study was designed to examine the effect of alcohol and non-alcohol containing mouthwashes on the force degradation of clear and colored orthodontic elastomeric chains in vitro.

**Materials and Method**

This is a prospective cohort in vitro experimental study over 21 days. A total of 72 specimens were collected and tested within two weeks of reception from the manufacturer, they were divided into three groups, each containing 24 specimens having 8 elastomeric chains from each type of specimens. A specimen is described as a closed looped configuration elastomeric chain (Morelli; Brazil) that is either: 1. Clear ; or 2. Crystal yellow ; or 3. Pearl lilac, these colored specifications constitutes the specimen types. Each group is mounted on an acrylic board of 30x4x1 cm dimensions, and each acrylic board includes a total of 48 circular pins arranged in 2 parallel lines, with 1 cm distance between each two pins on the same line, to hold the stretched elastomeric chains at a constant length of 29 mm across.

Each group of specimens was kept in a separate glass container water bath, containing Deionized water, in an incubator at 37°C and monitored daily with a thermometer, and then was submerged in a single type of mouth rinse for 60 seconds according to manufacturer recommendations, twice a day, for a whole 21-day test period which was calculated by a digital clock, with 9 hours separating each of the two daily exposures; after the 60 seconds of submerging in the mouth rinse the specimens were immediately washed in a new DI water bath (separate from the above mentioned 3 water baths) for 10 seconds to mimic salivary rinsing of the alcohol from the oral cavity after each exposure, and then returned back into the same 37°C, DI water bath from which they were pulled out. The control group constituted of 24 specimens mounted on a single acrylic board that were only exposed to DI water washes and underwent the same protocol.

Two types of mouth rinses were used:

1. Listerine original mouth wash (alcohol content 26.9% by volume) (Johnson & Johnson, UK);
2. Listerine zero (0% alcohol: mild Mint Johnson & Johnson, UK).

On each group four test measurements of load values in (gm) were taken at days 0,1,7, 21, and the percentages of force decay were calculated as: [(load value at day 0 - load value at day n)/load value at day 0] x 100%. Measurements of force were taken with a digital force tester (Weiheng, sensitive to 3 digits, Japan) which was reset back to zero before making each new measurement.

Measurements were done by securing one end of the elastomeric chain on the pin and fixing the other end to the force tester; measurements of the tensile force were recorded with the elastomeric chain stretched to the same 2.9 cm length the board pins had previously secured. All chains were measured in the same manner to guarantee accurate measurements.

**Statistical workup:** Data were analyzed using the statistical package of social science “SPSS” software version 21. Those included:

1. Descriptive statistics: including means and standard deviations.
2. Inferential statistics: including:
   a. One-way ANOVA test: to compare the percentage of force decay among the different mouth washes, durations and elastomeric colors.
b. Tukey’s honestly significant difference test: to check for any statistically significant difference in the percentage of force decay between each two mouth washes, durations, and elastomeric colors.

Significance level: $P<0.05$

Finding

Tables 1, 2 illustrate the means of initial loads and force decay: lilac elastics showed highest percentage of force decay followed by yellow then the clear elastics.

**Table 1: Descriptive statistics of load values (gm) of distinct elastomeric chains in the three test groups at four points in time**

<table>
<thead>
<tr>
<th>Duration</th>
<th>Color</th>
<th>N</th>
<th>Control (gm)</th>
<th>Listene Original (gm)</th>
<th>Listerine Zero (gm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean</td>
<td>S.D.</td>
<td>Mean</td>
</tr>
<tr>
<td>0 day</td>
<td>Clear</td>
<td>8</td>
<td>359.95</td>
<td>0.65</td>
<td>360.15</td>
</tr>
<tr>
<td></td>
<td>Lilac</td>
<td>8</td>
<td>354.34</td>
<td>0.67</td>
<td>354.01</td>
</tr>
<tr>
<td></td>
<td>Yellow</td>
<td>8</td>
<td>356.19</td>
<td>0.68</td>
<td>356.21</td>
</tr>
<tr>
<td>1 day</td>
<td>Clear</td>
<td>8</td>
<td>181.03</td>
<td>0.65</td>
<td>185.15</td>
</tr>
<tr>
<td></td>
<td>Lilac</td>
<td>8</td>
<td>176.18</td>
<td>0.67</td>
<td>172.11</td>
</tr>
<tr>
<td></td>
<td>Yellow</td>
<td>8</td>
<td>178.33</td>
<td>0.66</td>
<td>178.93</td>
</tr>
<tr>
<td>7 days</td>
<td>Clear</td>
<td>8</td>
<td>174.16</td>
<td>0.63</td>
<td>178.18</td>
</tr>
<tr>
<td></td>
<td>Lilac</td>
<td>8</td>
<td>170.15</td>
<td>0.62</td>
<td>165.14</td>
</tr>
<tr>
<td></td>
<td>Yellow</td>
<td>8</td>
<td>171.08</td>
<td>0.88</td>
<td>169.16</td>
</tr>
<tr>
<td>21 days</td>
<td>Clear</td>
<td>8</td>
<td>165.10</td>
<td>0.67</td>
<td>162.19</td>
</tr>
<tr>
<td></td>
<td>Lilac</td>
<td>8</td>
<td>153.28</td>
<td>0.52</td>
<td>149.23</td>
</tr>
<tr>
<td></td>
<td>Yellow</td>
<td>8</td>
<td>165.10</td>
<td>0.67</td>
<td>151.29</td>
</tr>
</tbody>
</table>

**Table 2: Descriptive statistics of percentage force decays of distinct types of elastomeric chains in the three test groups at 4 points in time**

<table>
<thead>
<tr>
<th>Duration (days)</th>
<th>Types</th>
<th>Control</th>
<th>Listerine Original</th>
<th>Listerine Zero</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>S.D.</td>
<td>Mean</td>
</tr>
<tr>
<td>0</td>
<td>Clear</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>Clear</td>
<td>49.71</td>
<td>0.19</td>
<td>48.59</td>
</tr>
<tr>
<td>7</td>
<td>Clear</td>
<td>51.61</td>
<td>0.19</td>
<td>50.53</td>
</tr>
<tr>
<td>21</td>
<td>Clear</td>
<td>54.13</td>
<td>0.21</td>
<td>54.97</td>
</tr>
<tr>
<td>1</td>
<td>Lilac</td>
<td>50.28</td>
<td>0.20</td>
<td>51.38</td>
</tr>
<tr>
<td>7</td>
<td>Lilac</td>
<td>51.98</td>
<td>0.21</td>
<td>53.35</td>
</tr>
<tr>
<td>21</td>
<td>Lilac</td>
<td>56.74</td>
<td>0.14</td>
<td>57.85</td>
</tr>
<tr>
<td>1</td>
<td>Yellow</td>
<td>49.94</td>
<td>0.19</td>
<td>49.77</td>
</tr>
<tr>
<td>7</td>
<td>Yellow</td>
<td>51.97</td>
<td>0.20</td>
<td>52.51</td>
</tr>
<tr>
<td>21</td>
<td>Yellow</td>
<td>53.65</td>
<td>0.16</td>
<td>57.53</td>
</tr>
</tbody>
</table>
In the 1st day, the force decay was higher than in all other experimental periods (P<0.001), Lilac elastics showed highest force decay throughout the different exposure media followed by the Yellow elastics while the clear ones showed least force decay, all differences were statistically significant. Tables (2, 3)

Table 3: Effect of immersion period on force decay of the three types of chains in the three test groups

<table>
<thead>
<tr>
<th>Media</th>
<th>Type</th>
<th>ANOVA test</th>
<th>Duration difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>F-test</td>
<td>p-value</td>
</tr>
<tr>
<td>Cont.</td>
<td>C</td>
<td>183241.79</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>L</td>
<td>216826.74</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>Y</td>
<td>214860.81</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>L-O</td>
<td>C</td>
<td>306517.97</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>L</td>
<td>373225.71</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>Y</td>
<td>333260.18</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>L-0</td>
<td>C</td>
<td>293433.17</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>L</td>
<td>322391.6</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>Y</td>
<td>142120.88</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Cont = Control, L-0 = Listerine Zero, L-O = Listerine Original, C=Clear, L=Lilac, Y=Yellow

For colored elastics: Listerine original increased force decay more than Listerine zero which in turn was more than D.W., in a statistically significant manner (with one exception) at days 1, 7, 21. Figure (1), Table (4)

Table 4: Effect of 3 distinct solutions on the force decay of various elastomeric chains

<table>
<thead>
<tr>
<th>Durations (days)</th>
<th>Type</th>
<th>ANOVA test</th>
<th>Media difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>F-test</td>
<td>p-value</td>
</tr>
<tr>
<td>1</td>
<td>Clear</td>
<td>188.046</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>Lilac</td>
<td>235.629</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>Yellow</td>
<td>54.224</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Figure 1: Mean load values of colored elastomeric chains in 3 different solutions at 4 points in time

For clear elastics: Listerine zero showed a statistically significant less force decay than Listerine original at days 1, 7, 21. Table (2,4)
Clear differences in force decay were noticed for colored rather than for the clear elastomeric chains, in spite of the matter that all of the studied elastomeric chains were stretched to the same length, still there was significant variation in the force delivery property among the pigmented elastomeric chains, force decay was more in pearl-lilac color than crystal-yellow ones (Table 5), these differences in the force delivery regarding the color could be attributed to the filler material used in tinting the chains, these findings was consistent with findings of many researchers (Williams and von Fraunhofer) who believed that the filler material used in tinting the chains had significant effect on colored elastomeric chains.

This study showed that all types of elastomeric chains exposed to mouth rinse containing alcohol demonstrated an increment in force decay compared to those exposed only to distilled water or mouth washes without alcohol, with p<0.05. (Table 4, Figure 1). That was similar to that noticed in many other studies, where it was demonstrated for clear elastomeric chains and not tested for colored elastomeric chains. Besides that, this study illustrates that alcohol had significantly

**Discussion**

No known studies have been published regarding the effect of mouth washes containing alcohol on the colored orthodontic elastic chains that are widely used for force transmission to obtain different types of tooth movement.

The colored elastomeric chains generated less force at all 3 time intervals compared to clear ones. Force decay was higher during the first 24 hours, followed by a gradual decrease in force levels in the remaining time periods (Table 2,3), the difference in the force decay manner between colored and clear elastomeric chains over all time intervals may be due to the presence of pigment and variation in the manufacturing process. The results of the present study is in agreement with the findings of previous studies on the force decay of colored elastomeric chains.

C = Control, L0 = Listerine Zero, LO = Listerine Original

Differences in load values of clear and colored elastics, and in between colored elastic themselves at days 1, 7, 21; in all study groups, were (with only two exceptions) statistically significant. Table (5).

**Table 5: Elastics’ color type difference in load values in different media**

<table>
<thead>
<tr>
<th>Media</th>
<th>Duration (days)</th>
<th>ANOVA test</th>
<th>Elastomeric types difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>F-test</td>
<td>p-value</td>
</tr>
<tr>
<td>Control</td>
<td>1</td>
<td>17.891</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>8.507</td>
<td>0.002</td>
</tr>
<tr>
<td></td>
<td>21</td>
<td>745.373</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Listerine Original</td>
<td>1</td>
<td>759.356</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>885.760</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>21</td>
<td>719.077</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Listerine Zero</td>
<td>1</td>
<td>98.552</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>330.154</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>21</td>
<td>307.547</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>
more effect on the force decay of colored elastomeric chains than on the clear ones that by the end of 3 weeks the clear elastics had 54.97% force decay compared to 57.53% and 57.85% force decay of yellow and lilac elastics respectively (Table 2). This finding is first tested in this study.

The force applied by elastomeric chains can be classified either to those managed by the orthodontist or to those related to the components of the elastomeric material which are altered by the manufacturing process; as a result of that, there would be a difference of force applied by different orthodontists. 20

In our study colored elastomeric chains showed a significant but not total force decay when exposed to mouthwashes containing alcohol in vitro. Further research is ought to be conducted in-vivo to investigate the degree of force decay associated with these mouthwashes. Otherwise, the current practice of replacement of elastomeric chains every 21 days seems acceptable from the aspect of work of dental materials.

Conclusions

Alcohol containing mouth washes increase force degradation rate of colored orthodontic elastomeric chains with time, with color related differences in force decay.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

REFERENCES


Serum Levels of Adrenomedullin in Women with PCOS before and after Rosuvastatin Treatment

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¹Kirkuk General Hospital, Ministry of Health, Iraq; ²Clinical & Medical Biochemistry, Pediatrician, College of Medicine, University of Tikrit, Iraq

ABSTRACT

Background: Polycystic ovary syndrome is one of the prevalent endocrine disorders in women of reproductive age. A part from the important sequel of polycystic ovarian syndrome such as menstrual disturbance, infertility, and excessive hair growth, women with polycystic ovarian syndrome also presented with wide range of secondary consequences including abnormal lipid profile, hypertension, insulin resistance, hyperandrogenaemia and eventually amplified risk of cardiovascular injury.(1-3) Adrenomedullin is a vasodilator peptide with 52 amino acids.(4)

Materials and Method: This is follow-up study concerning women with polycystic ovarian syndrome, which constitutes a total of 45 women affected with polycystic ovarian syndrome, this study was conducted in Kirkuk City. The serum levels of adrenomedullin was compared before treatment with rosuvastatin with its levels after 3 months treatment with rosuvastatinin a dose of 10 mg/day. The body mass index was calculated for each women included in this study as well as 4 milliliters of venous blood samples were obtained by using a disposable syringe and the samples were kept in plain tubes before and after treatment with rosuvastatin therapy, serum was separated. Serum adrenomedullin was tested by an enzyme linked immunosorbenet assay method.

Results: This study showed that the majority of women with polycystic syndrome enrolled in this study were within the age group of 21 to 35 years, this study also reveals that the mean of body mass index was 26.01 ± 1.49 Kg/m² for women with polycystic ovariansyndrome before treatment and decreased significantly (22.42 ± 1.153 Kg/m²) at a P<0.01 after treatment with rosuvastatin. The current study found that the serum level of adrenomedullin was elevated significantly (P<0.01) in women with polycystic ovarian syndrome after treatment (397.6 ± 65.1 ng/dl) compared with that before treatment (122.0 ± 12.3 ng/ml). There was a positive correlation between BMI before and after treatment (r = 0.68), also there was a positive correlation between the serum levels adrenomedullin in women with polycystic ovarian syndrome before and after treatment with rosuvastatin (r = 0.36).

Conclusions: It is concluded from this study that the serum levels of adrenomedullin was significantly increased after 3 months of treatment with rosuvastatinin a dose of 10 mg/day in women with polycystic ovarian syndrome.

Keywords: Polycystic ovarian syndrome, adrenomedullin, and rosuvastatin.

Introduction

The name “polycystic” suggests, many cysts typically develop in the ovaries of a woman with this condition. These cysts or follicles (fluid filled sacs) remain and build up in the ovaries, preventing ovulation, in addition, the ovaries tend to produce excess levels of androgens (male hormones) in women with PCOS, which can also negatively impact ovulation and fertility.(5) Stein and
Leventhal in 1935 presented a group of 7 women with common features: menstruation disturbances, hirsutism and enlarged ovaries with the presence of many small follicles. They were also the first to describe the lack of menstruation in women with increased volume of ovaries and to suggest using ovarian wedge resection. The syndrome has been re-evaluated during the years and is no longer regarded as a uniform condition, but a syndrome with a spectrum of different manifestations with different complexity and a considerable phenotypic variability.

Diagnostic criteria based on oligo menorrhea, amenorrhea and clinical or biochemical hyperandrogenism were broadened in the 2003 Rotterdam criteria to include PCO findings at ultrasound. recently the Androgen Excess Society (AES) suggested that the diagnostic criteria should be modified to exclude those with PCO on ultrasound and oligo menorrhea/amenorrhea but no hyperandrogenism. It is now recognized that women with regular cycles and hyperandrogenism and/or polycystic ovaries (PCO) may have the syndrome.

Figure 1: In a normal ovary, eggs mature and are released every cycle. In women with PCOS, the ovary does not produce enough hormones for egg maturation. Immature follicles may remain in the ovary and ovarian walls may thicken.

Adrenomedullin (ADM)is a vasodilator peptide hormone composed of 52 amino acids, it was first discovered in 1993 in human pheochromocytoma tissue of adrenal medulla tumor. Adrenomedullin has local paracrine or autocrine effects on the tissue and it can trigger many physiologic events by remaining in the plasma like the circulating hormone. Rosuvastatin is a lipid lower drug, rosuvastatin reduced total plasma cholesterol. This study aims to evaluate the effect of rosuvastatin therapy on the serum level of adrenomedullin in women with polycystic ovarian syndrome.

Materials and Method

This study was designed as a follow-up of a total of 45 women with polycystic ovarian syndrome; their ages range from 18 to 45 years of age. This study was conducted from the 1st of February 2019 till the end July 2019 in Kirkuk City. The serum levels of adrenomedullin was compared before treatment with rosuvastatin with its levels after 3 months treatment with rosuvastatin in a dose of 10 mg/day. The body mass index was calculated for each women included in this study as well as ten milliliters of venous blood samples were obtained by using a disposable syringe and the samples were kept in plain tubes before and after treatment with rosuvastatin therapy, the blood samples were left at room temperature to be clotted, then the samples were transferred to a centrifuge for the separation of serum and the serum samples were kept in plain tubes and stored at -20 °C until the time of analysis of adrenomedullin by an enzyme linked immunosorbent assay method.

Results

This study showed that 71.05% of PCOS women enrolled in this study were within the age group 21-35 year with mean age 29.41 year, table 1.
Table 1: Distribution of PCOS women according to age

<table>
<thead>
<tr>
<th>Age group (years)</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤20</td>
<td>7</td>
<td>18.42</td>
</tr>
<tr>
<td>21–35</td>
<td>27</td>
<td>71.05</td>
</tr>
<tr>
<td>&gt;35</td>
<td>4</td>
<td>10.53</td>
</tr>
<tr>
<td>Total</td>
<td>38</td>
<td>100</td>
</tr>
</tbody>
</table>

Mean age = 27.5 years

The study reveals that the mean level of body mass index (BMI) was 26.01 ± 1.49 Kg/m², which was recorded in PCOS women before treatment and decreased significantly at a P of less than 0.01 after treatment with rosuvastatin (Table 2) and there was a positive correlation between BMI before and after treatment (r:0.68), figure 2.

Table 2: The BMI in PCOS women before and after treatment with rosuvastatin

<table>
<thead>
<tr>
<th>PCOS women (No. = 38)</th>
<th>BMI (Kg/m²) (Mean ± SD.)</th>
<th>t-test</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before treatment</td>
<td>26.01 ± 1.49</td>
<td>20.18</td>
<td>0.001 HS*</td>
</tr>
<tr>
<td>After treatment</td>
<td>22.42 ± 1.153</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 2: Correlation between BMI in PCOS women before and after treatment with rosuvastatin (10 mg/day)

The study also demonstrates that ADM level was elevated significantly (P<0.01) in PCOS women after treatment (397.6 ± 65.1 ng/dl) than before treatment (122.0 ± 12.3 ng/ml), as shown in Table 3 and there was a positive correlation concerning the serum level of ADM between PCOS women before and after treatment (r = 0.36), figure 3.

Table 3: Serum level of ADM in PCOS women before and after treatment with rosuvastatin.

<table>
<thead>
<tr>
<th>PCOS women (No. = 38)</th>
<th>ADM (pg/ml) (Mean ± SD.)</th>
<th>t-test</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before treatment</td>
<td>122.0 ± 12.3</td>
<td>25.83</td>
<td>0.001 HS</td>
</tr>
<tr>
<td>After treatment</td>
<td>397.6 ± 65.1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 3: Correlation between ADM in PCOS women before and after treatment with rosuvastatin

Discussion

PCOS is the most common form of chronic anovulation associated with androgen excess, occurring in 5 to 10% of reproductive age women. Beyond its reproductive consequences, PCOS is characterized by a metabolic disorder in which hyperinsulinemia are central features.

It is evident from this study that the majority of women with PCOS were from the age 20 to 30 years, this finding initiate the idea that younger age group are more prone to PCOS, this finding may be related to that the ovaries are more physiologically active in women at the child-bearing age, therefor the ovaries are more liable to undergo cystic changes. This finding was in agreement with the finding of Banu Ucar et al, (14) who found that the mean age group for women with PCOS was 23.53 ± 5.51 years. While Ali I. Al-Gareeb (15) reported that the age of women with PCOS was 27.4 ± 7.5 years.

This study demonstrate that women with PCOS included in this study were an overweight, while after treatment the body weight retrain back to normal. This finding reveals the benefit of rosuvastatin in reducing the body fat deposition which affect the mean body weight. The finding of this study was in agreement with the finding of Maitham Ali Abdul-Nabi. (15) While Ali I. Al-Gareeb et al (16) demonstrate that BMI of the women with PCOS were within the normal limit, this discrepancy with the present study could be attributed to sample collection.

Adrenomedullin, a unique regulatory peptide with different action, has been intensively studied due to its...
remarkable range of effects (vasodilatation, regulation of vascular cell growth, angiogenic properties in endothelial progenitor cell, and natriuresis) and promising therapeutic potential. It is shown to be related to various conditions including congesting heart failure, sepsis, hypertension and renal failure. The previous research on animal models revealed that hyperglycemia increases vascular ADM expression; in addition circulating ADM levels are increased with severity and poor metabolic control in Type 2 diabetic patients.

The study showed that there is a significant difference between women with PCOS before and after treatment with rosuvastatin concerning ADM level and the level of ADM was higher after treatment as evident in table 4. and figure 4. This increase may be related to an improvement in ovarian function after treatment compared to that before treatment. This finding was in agreement with the finding of Ali I. Al-Gareeb et al who found that rosuvastatin as adjuvant therapy in patients with polycystic ovarian syndrome has many beneficial effects. Banu Ucar et al, reveals that there was a non-significantly lower serum level of ADM in patients with PCOS compared to control. The plasma levels are mainly a result of production in the vascular endothelial and smooth muscle cells, why ADM is regarded as a marker of endothelial function, ADM is elevated in CVD and obesity. Similar results were described in Chang et al study, the authors found that plasma ADM is significantly decrease in subjects diagnosed with overweight and or obesity.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding

**REFERENCES**


Training According to The Required Calories as a Function of Muscular Work and its Impact on the Development of Some Physical Abilities and the Achievement of Long Distances Running 5000 Meters

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¹The College of Physical Education & Sports Sciences, University of Babylon, Iraq

ABSTRACT

The idea of the research is to prepare daily exercises in accordance with the calories required to complete the work muscle appropriate to run 5000 m for students of the Higher Institute for Security and Administrative Development in Baghdad, and the total volume of training (jogging periods and positive rest periods as completed distances) is measured in advance before application and the corresponding calories required for the body. Using a special electronic program, there is no demolition in the cells at the expense of their construction according to the standard that says that each calorie corresponds to 4.186 kilocalories as a work. In order to be prepared and applied these exercises according to the scientific bases based on the type of food appropriate for daily exercises to enhance the physical and physiological situation and reach them to the ideal and appropriate state to achieve the best achievements.

The researcher believes that the current exercises are applied according to the special physical abilities and general endurance without paying attention to the needs of these exercises of a special diet suited to the effort exerted on the application of these exercises. The researchers concluded that the daily exercises did not fit the daily energy expenditure spent by the research sample, which causes a decrease in the level of achievement. They recommended the need to pay attention to the type of food appropriate to the level of daily training.

Keywords: Work, calories, joule and sponsorship.

Introduction

The term energy was first associated with mechanical movement or the ability of the body to accomplish a mechanical job, which helps in achieving the goal of performance and related to the physical, functional and mechanical aspects. The importance of the research is that it is studying the assessment of mechanical and vital energy for students of the Higher Institute for Security and Administrative Development, and compare what changes occur in accordance with the diet and physical training (endurance when ran 5000 m) and the associated assessment of the health of the associate and the level of development and calorie depletion reflects the harmony of exertion of effort and the output of biological energy and mechanical during this effort according to calories. Thermal and physical labor, which can be specialists in the field of training in the detection of some scientific facts to put them into the eye when training staff for this competition and in accordance with the requirements of the physical, functional and mechanical game.

The “joule” refers to the body’s possession of energy can be measured by the indications of the calories spent during the effort, which leads to his movement and do all the required kinetic acts, and the law of energy survival stipulates the stability of the amount of energy in a particular system (for example, the human body) Turn from one image to another. You can monitor the

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energy level available to athletes of different distances, including running 5000 meters and consumed during the daily training per 1 kg of lean body to monitor the health of athletes and their progress according to the type of effort used and the suitability of the type of energy available to these athletes. 1 Carbohydrates are one of the main sources of thermal energy generation in the body, 2 as one gram of these substances gives 4.1 its price, and athletes may need from (500) grams to (700) grams of carbohydrates per day depending on the difference The quality of sports activity, and experiments have shown Ziad The actual capacity in the case of giving food rich in carbohydrates. It was found that when the available energy level falls below the average daily intake of 30 calories/kg (per 1 kg) fat-free mass this leads to a energy level falls below the average daily intake of 30 calories/kg (per 1 kg) fat-free mass this leads to a significant impairment in the function of metabolism and hormonal, 3 and this deficiency can affect performance, growth and health. This is because each ATP molecule is equal to 30.5 calories/mol? On this basis, the results of the research sample will be extracted because this can be a guide for coaches to monitor their players in order to maintain their health.

The use of the correct scientific bases and based on many scientific and cognitive theories in the field of running 5000 m, which is linked to indicators indicating the need for this effectiveness of the integration of physiological and mechanical aspects can give indicators of high coherence of the Institute’s staff of the biological efficiency of physiological commensurate with the effort During the run or exercise without the destruction of vital tissues at the expense of insufficient metabolic processes and fits with the kinetic energy products required for this competition, as no study had previously been conducted on the monitoring of physical effort exerted according to the results Mechanical energy and what you need suitable calories for that effort through the use of the law and the ability associated with this law of calories required output. Which reflects the need for the development of physical abilities and the consequent development of functional and mechanical aspects of the players of this competition, and for all that the researchers wanted to study this topic to put some solutions related to this aspect contribute to the detection of some scientific facts that have not yet taken their share in the investigation and the study. Therefore, the aim of the research is to identify the amount of work done during the daily training of the staff of the Institute to run the suburb of 5000 m. And identify the amounts of calories spent in terms of the work done during the daily training. And to identify the differences between the pre and physical tests of the two groups of research in anaerobic variables.4

Methodology

The researchers used the experimental research method, and the sample was selected from the members of the Higher Institute for Security and Administrative Development of the Iraqi Ministry of Interior by (100), with an arithmetic mean of their age (27.80 and standard deviation ± 2.64) and their apparent weights (73.49 with standard deviation ± 9.4) and their height (170 cm). The standard deviation of 8.088 was divided into two groups, one experimental and the other controlled by (50) affiliated to each group.

Table 1: Statistical parameters, value (t) and significance differences for the physical characteristics variables of the two research groups

<table>
<thead>
<tr>
<th>Statistical processors</th>
<th>Units</th>
<th>Control group</th>
<th>Experimental group</th>
<th>(t) calculated</th>
<th>Significance level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Variables</td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td></td>
<td>Withstand speed ran 180 m</td>
<td>Sec.</td>
<td>40.56</td>
<td>2.70</td>
<td>40.72</td>
</tr>
<tr>
<td></td>
<td>Ran 600 m</td>
<td>Min.</td>
<td>2.91</td>
<td>0.35</td>
<td>2.87</td>
</tr>
</tbody>
</table>

* Tabular value (t) at the level of significance (0.05) = 1.984 and the degree of freedom (N 1 + N 2) - 2 = 98.

The researchers used the information related to the subject of research and derived from the international information network and research and related studies, stopwatch (range of 100 sequential timing) number 3, tests and measurements, a special balance to measure the length and weight of the virtual body. Body mass index, body mass index and calories needed to sustain the vitality of the body were measured according to a special program ((Calculator. Net) which calculates the above variables after the introduction of age, weight, height, gender and type of private practitioner activity (see Figure 1).
To measure BMR (calories spent at training), the researchers used the following program shown in Figure (2).

Pretest tests: The researchers conducted the pretest tests on 22/2/2019 and included tests of anaerobic and pneumatic abilities for the 5000 meters as follows:

- Test ran 180 meters (anaerobic) to measure muscle tolerance for a special speed.
- An attempt is given to each member of the sample and the player starts from standing. It is measured by a certified timer for the nearest ten seconds.
- Test ran 600 meters carrying your muscular performance, given each member of the sample one attempt and measured for the nearest 1 second.
- Achievement test for a distance of 5000 meters is timed by three temporary for each member of the sample according to international law.

The researchers applied the high intensity interval training method and adopted the maximum time of the
tests used in determining the intensity of training and calculating training volumes, and the adoption of the working period to rest in the calculation of recovery periods between the repetition of exercises (Appendix 1), the researchers were calculating the amount of effort during the daily training in terms of Joule as follows:

1. Running training (5 × 200 m) is equivalent to the size of 1000 meters, which is equal to the joule (695,800) according to each 1 kg of the weight of the adult player (for example 71 kg), which is equivalent to joules (695800 kilojoules) which is equivalent to 16566.5 kilocalories, and so calculates the joule performed by training and the corresponding calories.

**Post-test:** Post-test was conducted with the same procedures as the pre-test on 8/4/2019.

## Results

### Table 2: Results of the differences between the pre and posttests in the research variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Units</th>
<th>Groups</th>
<th>Pretest Mean</th>
<th>Posttest Mean</th>
<th>Mean diff.</th>
<th>SD diff.</th>
<th>(t) value</th>
<th>Standard error</th>
<th>Significance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>180 meter</td>
<td>Sec.</td>
<td>Experimental</td>
<td>40.72</td>
<td>37.60</td>
<td>3.12</td>
<td>0.320</td>
<td>6</td>
<td>0.031</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Control</td>
<td>40.56</td>
<td>39.38</td>
<td>2.66</td>
<td>1.18</td>
<td>0.488</td>
<td>2.185</td>
<td>Non sig.</td>
</tr>
<tr>
<td>600 meter</td>
<td>Sec.</td>
<td>Experimental</td>
<td>207</td>
<td>181</td>
<td>27</td>
<td>0.285</td>
<td>7.71</td>
<td>0.001</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Control</td>
<td>211</td>
<td>189</td>
<td>22</td>
<td>0.100</td>
<td>2.21</td>
<td>0.051</td>
<td>Non sig.</td>
</tr>
<tr>
<td>5000 meter</td>
<td>Sec.</td>
<td>Experimental</td>
<td>1550</td>
<td>1260</td>
<td>290</td>
<td>0.016</td>
<td>5.34</td>
<td>0.042</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Control</td>
<td>1552</td>
<td>1469</td>
<td>83</td>
<td>1.433</td>
<td>1.169</td>
<td>0.092</td>
<td>Non sig.</td>
</tr>
</tbody>
</table>

### Table 3: Results of the differences between the pre and posttests in calories for the research sample

<table>
<thead>
<tr>
<th>Variables</th>
<th>Groups</th>
<th>Units</th>
<th>Pretest Mean</th>
<th>Posttest Mean</th>
<th>Mean diff.</th>
<th>SD diff.</th>
<th>(t) value</th>
<th>Standard error</th>
<th>Significance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available calories</td>
<td>Exp.</td>
<td>Kilocalories</td>
<td>1730</td>
<td>1770</td>
<td>10</td>
<td>3.1</td>
<td>3.23</td>
<td>0.021</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td></td>
<td>1732</td>
<td>1733</td>
<td>1</td>
<td>1.15</td>
<td>0.87</td>
<td>0.982</td>
<td>Non sig.</td>
</tr>
<tr>
<td>Calories spent</td>
<td>Exp.</td>
<td>Kilocalories</td>
<td>7277</td>
<td>7308</td>
<td>11</td>
<td>3.56</td>
<td>2.18</td>
<td>0.051</td>
<td>Non sig.</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td></td>
<td>7266</td>
<td>7278.6</td>
<td>12.6</td>
<td>8.29</td>
<td>1.52</td>
<td>0.065</td>
<td>Non sig.</td>
</tr>
<tr>
<td>The remaining</td>
<td>Exp.</td>
<td>Kilocalories</td>
<td>555.5</td>
<td>400</td>
<td>345.5</td>
<td>3.94</td>
<td>3.94</td>
<td>0.048</td>
<td>Sig.</td>
</tr>
<tr>
<td>energy</td>
<td>Control</td>
<td></td>
<td>527.8</td>
<td>504</td>
<td>123.776</td>
<td>12.84</td>
<td>1.85</td>
<td>0.431</td>
<td>Non sig.</td>
</tr>
<tr>
<td>Energy cost per (1) kg</td>
<td>Exp.</td>
<td>Kilocalories/</td>
<td>1184.5</td>
<td>1370</td>
<td>155.5</td>
<td>46.5</td>
<td>3.34</td>
<td>0.008</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td></td>
<td>1205.2</td>
<td>1228</td>
<td>155.5</td>
<td>46.5</td>
<td>3.34</td>
<td>0.008</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Exp.</td>
<td>Kilocalories</td>
<td>4974.7</td>
<td>5166</td>
<td>191.31</td>
<td>59.9</td>
<td>3.19</td>
<td>0.031</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td></td>
<td>5061.8</td>
<td>5157.6</td>
<td>95.76</td>
<td>38.61</td>
<td>2.48</td>
<td>0.056</td>
<td>Non sig.</td>
</tr>
<tr>
<td></td>
<td>Exp.</td>
<td>Kilocalories/</td>
<td>20.9</td>
<td>24.12</td>
<td>3.22</td>
<td>1.063</td>
<td>3.03</td>
<td>0.043</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td></td>
<td>21.64</td>
<td>22.06</td>
<td>0.41</td>
<td>0.19</td>
<td>2.17</td>
<td>0.654</td>
<td>Non sig.</td>
</tr>
<tr>
<td></td>
<td>Exp.</td>
<td>Kilocalories/</td>
<td>87.78</td>
<td>101.30</td>
<td>13.52</td>
<td>5.124</td>
<td>1.53</td>
<td>3.34</td>
<td>0.042</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td></td>
<td>90.88</td>
<td>92.65</td>
<td>1.77</td>
<td>1.14</td>
<td>1.55</td>
<td>0.076</td>
<td>Non sig.</td>
</tr>
</tbody>
</table>

As for the special muscle endurance variable (600 meter running test), the differences were also significant. This means that the biological efficiency of the research sample has evolved in the post-test as a result of exercises based on work values performed and that oxidation is done economically in the muscles
working in the cells of the group members. Experimental and the resulting heat from the metabolic rates required for this effort and according to the energy possessed by the sample members before the effort.6

As well as the result above indicates that energy systems and adaptation become more efficient and allow more exercise time and at the highest intensity. These axioms are associated with the quantity and type of appropriate food, which can give a positive impact in the development of functional efficiency and capabilities of the type of effectiveness, which reflects the biological and physical efficiency and the desired work output, as we can identify the required and appropriate calories as a cost per 1 kg of body mass, through Work output exerted and measured in kilojoules in terms of body mass and ground acceleration. This reflected on the development of the completion of the 5000 m range of the experimental group.7

It is noted from Table (3) that there are significant differences between each calorie variable available between the members of the experimental group between the pre and post as the value of (t) calculated (3.23) in front of an error level greater than 0.05, and this indicates that the group members have calories Good in the post-tests due to their regular diet similar and according to what the researcher provided to members of the experimental group during the training period, as well as the measurement of these calories equivalent in kilojoules was statistically significant differences, indicates that the available calories in the post-test according to the verification of physical occupation (Kinetic energy) was better than the pretest as it was The energy storage rate of the members of the research sample in the post-test is better than the pre-test according to the statistically significant differences of this variable. There were no significant differences in the results of the control group for the same modulator.8

As for the residual energy variable in the body after performing the effort, whether in calories or kilojoules, the differences were a function of the experimental group. This means that the quantities of energy remained the same in both the pre- and post-test. Larger than the post-test and be similarly in the cells of the body of the sample individuals and the resulting quantities of heat resulting from the metabolic rates needed for this effort and according to the energy possessed by the sample before the effort.9

The energy cost index per 1 kg of body showed that the differences were significant between the experimental group between what the body consumes during physical activity and the remaining calories in the body for both tests and that there is a balance between calories and output in kilojoules taken by the sample of food, and calories The index indicates that the output was less than 30 calories/1 kg (equivalent to 126 kJ/kg) of energy available per 1 kg of body mass and this indicates that the calories consumed by the experimental group Fulfills the purpose required for physical progress despite the This system should be subjected to medical supervision in order to improve the physical effort appropriate to the type of calories, it was found that when the level of energy available below the average daily consumption by 30 kilocalories (1265 kilojoules) per 1 kg fat-free mass leads to Having a significant impairment in the function of metabolism and hormonal, this deficiency can affect performance, growth and health.10

**Conclusions**

1. Better physical activity (kinetic energy) is achieved in the post-test of the research sample due to the calories they have from their normal diet.

2. The special variable speed has evolved considerably as a result of the rationing of food and the application of the exercises consistent with it.

3. Evolution of variable speed tolerance as a result of the calories taken from the food which is proportional to the effort of the experimental group.

4. The evolution of special muscular endurance also showed that oxidation was similar in the cells of the body in the sample and the resulting heat from the metabolic rates required for this effort and according to the energy possessed by the sample before the effort.

5. The results indicated that there is a balance between calories and output in kilojoules taken by the sample of food, and the calories they burn to exert physical effort as the indicator indicates that the output was greater than 30 calories/1 kg (equivalent to 126 kilojoules/Kg of energy available per 1 kg of fat-free body mass.

6. The cost output per 1 kg of the body indicates that construction is more than demolitions and that the daily diet available is proportional to the daily experience of the sample.
Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

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REFERENCES


Indications of Intra-Vitreal Anti-VEGF

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ABSTRACT

Background: Anti-vascular endothelial growth factors are being widely used in the field of ophthalmology, with a variety of indications which are expanding over time.

Aim: To assess the frequency of different types of diseases treated with anti-VEGF agents.

Method: A cross-sectional study involving 100 patients, data included: age, gender, indication for anti-VEGF & presence or absence of diabetes.

Results: The mean age was 57.7 years; males represent 61% while females 39%, and the most common indication for intravitreal anti-VEGF was diabetic maculopathy with clinically significant macular oedema (CSMO) which represent 80% of cases, the second and third indications were vitreous hemorrhage 6% and wet type age related macular degeneration (AMD) 5%. Diabetes was present in 94% of all cases.

Conclusion: Diabetes is the major risk factor causing varieties of retinal diseases that need intravitreal anti-VEGF agents, among which clinically significant macular oedema is the most common pathology.

Keywords: Anti-VEGF, Clinically significant macular oedema, diabetes

Introduction

Anti-vascular endothelial growth factor (anti-VEGF) drugs, for the last decade, became a very important and commonly used class of medications in the field of ophthalmology, as VEGF plays a basic role in endothelial cell proliferation and vascular permeability involved in a variety of retinal diseases such as: diabetic retinopathy and maculopathy, retinal venous occlusion, age related macular degeneration and others. The currently available anti-VEGF agents include: bevacizumab (avastin), ranibizumab (lucentis), and aflibercept (eyelea) (1).

Diabetic retinopathy: In general is a microangiopathy where high glucose levels particularly damages small blood vessels, and here vascular endothelial growth factors (VEGF) appears to play an important role in the pathophysiology, however, hyperglycaemia may also have a direct effect on retinal cells. Diabetic maculopathy: is the leading cause of visual impairment in diabetic patients, especially type 2, mainly in the form of oedema, exudation & or ischaemia. Extensive capillary leakage leads to diffuse oedema, where fluid spreads from the space between the outer plexiform and inner nuclear layer, where it initially collects, to sometimes involves the entire retinal thickness. Oedema is caused by focal leakage from microaneurysms and dilated capillaries (2).

1. Clinically significant macular oedema (CSMO): defined by the Early Treatment Diabetic Retinopathy Study (ETDRS) classification; protocol14, as: retinal thickening at the center of the macula or within 500 micron from it, hard exudates at the center of the macula or within 500 μm from it when associated with thickening of adjacent retina, and/or retinal thickening of one disc diameter in size, any part of which is within 1 disc diameter of the macular center (3).

2. Age-related macular degeneration (AMD), at the age of 50 years and above is a leading cause of irreversible blindness in the developed world (4).
The neovascular form of the disease (wet AMD) in which there is abnormal new blood vessels growing under or within the macula, causes severe visual loss, as it destroys the central portion of the retina which is responsible for high-resolution vision (6).

Pharmacologic therapies that was available for neovascular disease included: verteporfin photodynamic therapy (7,8) and pegaptanib sodium (9).

The pathophysiology for neovascularization still incompletely understood, but (VEGF-A) vascular endothelial growth factor A, which is a diffusible cytokine, promotes angiogenesis and vascular permeability, so has been implicated as an important factor promoting neovascularization (10,11).

3. Vitreous Hemorrhage: Proliferative diabetic retinopathy causes 31–54% of vitreous hemorrhages. Neovascularization from central or branch retinal vein occlusion causes 4–16%, AMD causes 0.6–4% (12).

4. Retinal vein occlusion (RVO): Retinal vein thrombosis (whether central or branch) typically causes edema, hemorrhages & or cotton wool spots in the area drained by the occluded vein. Formerly laser was the standard treatment for macular edema, but intravitreal injections of anti-VEGF are being widely used & probably raises aquity more than laser (2).

5. Central serous chorioretinopathy (CSC): An idiopathic disease that causes serous detachment of the neurosensory retinal or retinal pigment epithelial (RPE). Angiography shows leakage of the dye at the level of the RPE (13,14).

CSCR has been given a variety of names, reflecting the long-standing debate about its pathophysiology. Von Graefe regarded it as a recurrent central retinitis (15,16). Other names included central serous retinopathy, pigment epitheliopathy, (17). However it typically affects men in their working age, who are otherwise healthy (18).

Visual acuity show mild to moderate reduction with hyperopic shift (19). The diagnosis of CSCR is often made clinically, and beside other diagnostic technique, OCT (optical coherence tomography) is a very good tool for diagnosis and treatment planning (20). For many cases, the disease is self-limited; although some experience recurrent attacks and signs of chronicity. The standard treatment for the persistent or recurrent cases was thermal laser and photodynamic therapy, however definitive randomized trials are lacking (21-24).

Guye and his colleagues, hypothesized that the pathogenesis of CSCR could be choroidal vascular hyper-permeability, with or without associated active pigment epithelial leaks and detachment (25).

Prolonged detachment may cause photoreceptor and RPE degeneration and permanent reduction in vision. Cystoid macular edema and choroidal neovascularization may develop in some case (2).

6. Neovascular glaucoma: It is a secondary glaucoma previously called (hemorrhagic glaucoma) or Rubeotic glaucoma. At 1906 the histologic finding of new vessels in the irides of eyes of patients suffering from central retinal vein occlusion was first described by Coats1. In 1928, Salus 2 found similar new vessels at irides of diabetic patients (26). Usually iris neovascularization is seen in eyes with longstanding retinal ischemia or those with failed pars plana-vitrectomy who suffer persistent retinal detachment (2).

Patient & Method

A Cross sectional study was conducted, data collected from patients who were admitted to the ophthalmology surgical theater at AL-Emamain Al-kadhimain medical city for intraviteal injection of anti-VEGF, from first of September till the end of November 2018.

Data from 100 patients were taken included; age, gender, indication of intravitreal anti-VEGF & presence or absence of diabetes).

Results

Mean age was 57.7 years ± 9.55. The youngest patient who received injection was 26 year old male with proliferative diabetic retinopathy and vitreous haemorrhage, and the oldest patient was a 74 year old man with wet AMD.

According to sex, there was male preponderance with a percentage of 61%, in comparison with females 39%, as shown in figure (1).
According to age, the most common age group affected by different types of pathologies that necessitate intravitreal anti-VEGF was those above 60 years which involved 44 patients out of 100 (44%). The second age group affected were those between 51 & 60 years which included 36 patients out of 100 (36%), the least age group affected were those below 30 years which involved 2 patients only (2%), as shown in table (1).

**Table 1: Indications of anti-VEGF according to age groups**

<table>
<thead>
<tr>
<th>Indication</th>
<th>Age groups</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;30</td>
</tr>
<tr>
<td>Clinically significant macular edema in DM</td>
<td>1</td>
</tr>
<tr>
<td>Vitreous hemorrhage</td>
<td>1</td>
</tr>
<tr>
<td>Age-related macular degeneration – wet type</td>
<td>0</td>
</tr>
<tr>
<td>Neovascular glaucoma</td>
<td>0</td>
</tr>
<tr>
<td>Vein occlusion with macular edema</td>
<td>0</td>
</tr>
<tr>
<td>Central serous chorioretinopathy</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>2</td>
</tr>
</tbody>
</table>

According to indications of anti-VEGF, the most common indication was clinically significant macular edema (CSMO) in diabetic patients which represented 80 patients out of 100 (80%), and the least indication was central serous chorioretinopathy CSR involving only 2 patients out of 100 (2%).

Among all age groups, and among different indications of anti-VEGF, diabetes was present in 94% of cases.

**Discussion**

The mean age in current study was 57.71 years, it is almost similar to a study done in University of Port Harcourt, Nigeria (27) where their mean age was 59.56 year.

The most common age group affected in this study and their study was those patients above 60 years old, however males were more in the current study (61%), while females were more in their study (52%).

Regarding indications the current study found that diabetic macular edema was the most frequent indication for intravitreal anti –VEGF representing 80% of cases, while Bassey and his colleagues (27) found that retinal vein occlusion was the most common indication for anti –VEGF representing 32.11% of all cases.

On the contrary, to some extent, and like what we found in our study, Shuaib and Hassan (1) found that diabetic macular edema was the most frequent indication representing 42.5% of patients, while retinal vein occlusion representing the second most frequent indication 25.9%.

However, in our study, diabetic macular edema in the form of clinically significant macular edema was much more (80%) of cases, and the second and third indications were vitreous haemorrhage (6%) and retinal vein occlusion (5%), probably this reflects the very high prevalence of diabetes as a major risk factor for retinal diseases in our community.

Another study done in Ibadan, Sub-Saharan Africa (28) also found that the most frequent age group who needed intravitreal anti-VEGF were those patients above 60 years old, but the most frequent indication was retinal vein occlusion associated macular edema 19.4%, the second most common indication was wet AMD 17.1%, whereas diabetic macular edema represented only 7.5% and proliferative diabetic retinopathy with vitreous haemorrhage 9.7%.they attributed their results to the
fact that systemic hypertension, the strongest risk factor for retinal vein occlusion, is the most common medical disease in Nigerians\(^{(29)}\), several studies showed that the prevalence of hypertension in Nigeria ranges between 11.2\% \(^{(30)}\) to 25\% \(^{(31-33)}\). Back to our study, the major risk factor for retinal diseases that required intravitreal anti-VEGF agents was Diabetes Mellitus, which was present in 94\% of cases and this might be due to the fact that Iraq is facing an epidemic of diabetes mellitus just like that in the middle east, this was mentioned in a study done by Abbas Mansour & Fadhil Al Douri \(^{(34)}\), who stated that the prevalence of DM in Iraq increased from 5\% in 1978 to 19.7\% in 2012, in addition the prevalence of dysglycemia was 48.8\% in their study.

**Conclusion**

Our study showed that Diabetes Mellites is a major risk factor causing retinal damage that requires intravitreal antivascular endothelial growth factor agents and the most common age group affected are those above 60 years, this causes a great social and economic burden on Iraqi people and it has several implications:

- The necessity of providing anti-VEGF agents with affordable prices, hoping to be supported routinely by health insurance.
- Increasing awareness of people about the effect of diabetes on the retina, providing programs for screening.
- Further studies are needed including higher number of patients to establish all possible indications of anti-VEGF which are increasing with time.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding

**REFERENCES**

Noël A, Munaut C. Placental growth factor, a member of the VEGF family, contributes to the development of choroidal neovascularization. Investigative ophthalmology & visual science. 2003 Jul 1;44(7):3186-93.


Sera Troponin-I Levels in Rheumatoid Arthritis Patients

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ABSTRACT

Background: Rheumatoid arthritis (RA) define as chronic inflammatory disease with autoimmune pathogenesis disease which affects nearly 1.5% of the community. Cardiac troponin-I (cTnI) is falsely elevated in patients with seropositive rheumatoid arthritis.

Objective: Determine if rheumatoid arthritis patients with seropositive and seronegative have unusually raised concentrations of cardiac troponin-I (cTnI), in order to find out if this cardiac marker is elevated or not and its association with other inflammatory diagnostic markers.

Method: Serum samples were drawn from early diagnosis patients with RA groups 110 (60 without treatment group; 50 treated group) and (30) subjects as healthy control group. cTnI levels measured by using Immunoassay System.

Results: forty nine of the 73 patients with seropositive RA had cTnI levels upper than 0.8 ng per ml that had no significant difference P=0.062, while 11 of the patients with seronegative RA levels above this value and P-value in this group non-significant P= 0.350. With RF+/− the sensitivity of troponine-1 was 100%, but the specificity with rheumatoid factor (RF)+ve 20% while with RF_−ve 100%. The correlation of troponine-1 with other studied marker had high significant value P<0.05.

Conclusion: cTnI quantification was create more in patients with seropositive RF than patients with seronegative RF with no significant difference among studied groups, this recommends that inflammation might not be the primary driver of troponin raise in RA.

Keywords: Cardiac troponin-I, Rheumatoid Arthritis, rheumatoid factor.

Introduction

A troponin complex consist of three subunits. Each subunit is a protein, and together they regulate the calcium-dependent connections concerning actin and myosin, which cause striated muscle contraction and relaxation. While the identical troponin-C is expressed by together cardiac and skeletal muscles. Cardiovascular (CV) disease is now recognized as a major cause of morbidity and mortality in patients with rheumatoid arthritis (RA). (1,2) Certain biomarkers appeared as strong analysts of cardiac diseases, even in a very early course of the disease such as troponins. Cardiac troponins (cTn) are indicators of injury and myocyte necrosis. Assessment cTn with highly sensitive assays demonstrated to hold respected prognostic value in several conditions, comprising patients with chest pain, heart failure, doubted acute myocardial infarction. (4) According to existence of cTnI certain reports suggest the antibodies presence may cause cTnI to be falsely elevated; (5) while others propose that rheumatoid factor (RF) is not effected on troponin levels. (6)

So study aimed to detect serum cTnI concentrations in RA patients and their correlation with other markers among seropositive and seronegative patients. according to hypothesis that (cTn-I) may raise in RA patients, and RF seropositive have cTnI oddly raised.

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Method

We examined serum samples from 110 eligible patients with early rheumatoid arthritis encountered the American College of Rheumatology classification for RA (7) and 30 control subjects without RA were studied. RA patients with early diagnosis of less than 1 year duration, and classify into two groups 60 patients without treatment and 50 patients with treatment. All recruited patients were seen in rheumatic disease of Baghdad infirmary in Iraq. None of patients had infection or flares of their diseases at the time of blood samples collected. Questionnaire form formulated involved age, sex, clinical history, disease duration, family history. The patients were excepted from the study for the ensuing reasons: age < 18 years, chronic renal failure, pregnancy, congestive heart failure. The 30 healthy controls were recruited from subjected to the above exclusion criteria. Blood was collected for determination of C-reactive protein (CRP) by (AGAPPE, 52009002 cat. number, Switzerland) kit, Westergren erythrocyte sedimentation rate (ESR), cTnI tested by using the Immunoassay System (VEDALAB Inc, 28091 cat. number, France), The IgG-RF concentrations measured by Immunoassay System (Chorus Inc, 86038 cat. number, Italy) and Anti-antibody against citrullinated peptides/proteins (ACPA) determine by (Chorus Anti-CCP device, 86094 cat. number, Italy).

Statistical analysis performed by the SPSS 10 statistical package. T-test and ANOVA methods were used to compare the difference in mean of continuous numeric variables. Receiver-operating characteristic (ROC) curve was used to assess the diagnostic usefulness of marker as valued by the area under the curve (AUC). and Pearson’s correlation for normally distributed variables, a p-value of less than 0.05 was reflected to be significant.(8)

Results

Table (1) shows demographical characteristics variables, the patients mean age (42.22±11.23 years) while (36.40±11.15 years) of healthy controls, gender of patients comprised female 80 (72.7%) and male 30 (27.3%), disease duration (49(44.5%), 61(55.5%) for first and second periods respectively. The study showed positively results of ESR, RF, CRP and Anti-CCP of patients [87(79.09%),70(63.6%),93 (84.5%), and99 (90.0%) respectively]. Mean results of cTn-I showed in patients (48.08±6.61ng/ml) vs (6.19±2.73 ng/ml) in control.

Table 1: Characteristics data of studied groups

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Patients (No. = 110)</th>
<th>Control (No. = 30)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Yrs.)</td>
<td>Mean± SD</td>
<td>42.22± 11.23</td>
</tr>
<tr>
<td>Gender</td>
<td>Female</td>
<td>80 (72.7%)</td>
</tr>
<tr>
<td>No. (%)</td>
<td>Male</td>
<td>30 (27.3%)</td>
</tr>
<tr>
<td>Disease Duration (Months)</td>
<td>No. (%)</td>
<td>Elevated</td>
</tr>
<tr>
<td>(1 - 6)</td>
<td>49(44.5%)</td>
<td></td>
</tr>
<tr>
<td>(7 - 12)</td>
<td>61(55.5%)</td>
<td></td>
</tr>
<tr>
<td>Family History</td>
<td>No</td>
<td>77 (70.0%)</td>
</tr>
<tr>
<td>No. (no/yes)</td>
<td>Yes</td>
<td>33 (30.0%)</td>
</tr>
<tr>
<td>ESR</td>
<td>Elevated</td>
<td>87 (79.09%)</td>
</tr>
<tr>
<td>No. (%)</td>
<td>Normal</td>
<td>23 (20.91%)</td>
</tr>
<tr>
<td>CRP</td>
<td>Positive</td>
<td>93 (84.5%)</td>
</tr>
<tr>
<td>No. (%)</td>
<td>Negative</td>
<td>17 (15.5%)</td>
</tr>
<tr>
<td>Anti-CCP</td>
<td>Positive</td>
<td>99 (90.0%)</td>
</tr>
<tr>
<td>No. (%)</td>
<td>Negative</td>
<td>11 (10.0%)</td>
</tr>
<tr>
<td>RF</td>
<td>Positive</td>
<td>73 (66.4%)</td>
</tr>
<tr>
<td>No. (%)</td>
<td>Negative</td>
<td>37 (33.6%)</td>
</tr>
<tr>
<td>Troponin-1 (ng/ml)</td>
<td>Mean±SE</td>
<td>48.08±6.61</td>
</tr>
</tbody>
</table>

(*) ESR: Normal value for female: 0 - 20 mm/h; Normal value for male: 0 - 9 mm/l = 0 - 20 mm/h.
CRP: Positive value (up to 6 mg/l) in Serum; Negative value less than 6mg/l.
Anti CCP: Positive value >18 AU/ml, and Negative value ≤ 18 AU/ml.
Troponin-1: Positive value>0.8; Negative value<0.8 ng/ml.
Table (2) represents a summary statistics for (ESR, CRP, Anti CCP, and Troponin-I). Regarding to ESR, CRP and Anti- CCP results shows that vast majority of 5% trimmed mean were accounted in RF+ve of non-treated group, then followed in RF+ve treated group, and similarly results in RF–ve groups. Results illustrated that ESR,CRP and Anti CCP marker could be reliable indicators for RF patients and especially for non-treated groups. Troponin-I marker shows similarly concentration in sera RF+ve, either for treated or non-treated groups, as well as somewhat low in RF-ve, concerning non-treated group. Kruskal Wallis test’s statistic for testing the distribution of ESR,CRP, Anti-CCP, and Troponin-I marker’s among studied groups, appeared that a highly significant differences are considered at P<0.01 at least between two studied groups, and that needs to be continuing the test statistics in order to be sure in which pair are forming that significant differences, As well as not should doing that comparison with Troponin-I marker.

### Table 2: Descriptive Statistics of ESR, CRP, Anti CCP, and Troponin-I among studied groups

<table>
<thead>
<tr>
<th>Parameters</th>
<th>RF-ve (Non treated)</th>
<th>RF +ve (Non treated)</th>
<th>RF-ve (Treated)</th>
<th>RF +ve (Treated)</th>
<th>Control</th>
<th>Kruskal Wallis test</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ESR</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5% Trimmed Mean</td>
<td>28.22</td>
<td>59.81</td>
<td>25.63</td>
<td>49.84</td>
<td>9.86</td>
<td>Chi-Square=60.832</td>
</tr>
<tr>
<td>Median</td>
<td>15.50</td>
<td>53.50</td>
<td>30.00</td>
<td>44.50</td>
<td>10.00</td>
<td>d.f.=4</td>
</tr>
<tr>
<td>Minimum</td>
<td>10.00</td>
<td>7.00</td>
<td>7.00</td>
<td>25.00</td>
<td>3.00</td>
<td>P-value= 0.000</td>
</tr>
<tr>
<td>Maximum</td>
<td>59.00</td>
<td>118.00</td>
<td>37.00</td>
<td>92.00</td>
<td>21.00</td>
<td>HS*</td>
</tr>
<tr>
<td>Range</td>
<td>49.00</td>
<td>111.00</td>
<td>30.00</td>
<td>67.00</td>
<td>18.00</td>
<td></td>
</tr>
<tr>
<td>Interquartile Range</td>
<td>44.50</td>
<td>64.00</td>
<td>19.00</td>
<td>36.25</td>
<td>7.00</td>
<td></td>
</tr>
<tr>
<td><strong>CRP</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5% Trimmed Mean</td>
<td>14.06</td>
<td>20.21</td>
<td>6.29</td>
<td>14.30</td>
<td>0.60</td>
<td>Chi-Square=73.731</td>
</tr>
<tr>
<td>Median</td>
<td>7.25</td>
<td>16.71</td>
<td>6.20</td>
<td>10.33</td>
<td>0.61</td>
<td>d.f.=4</td>
</tr>
<tr>
<td>Minimum</td>
<td>3.10</td>
<td>5.40</td>
<td>1.73</td>
<td>1.73</td>
<td>0.39</td>
<td>P-value= 0.000</td>
</tr>
<tr>
<td>Maximum</td>
<td>91.00</td>
<td>96.00</td>
<td>20.10</td>
<td>71.80</td>
<td>0.91</td>
<td>HS*</td>
</tr>
<tr>
<td>Range</td>
<td>87.90</td>
<td>90.60</td>
<td>18.37</td>
<td>70.07</td>
<td>0.52</td>
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<tr>
<td>Interquartile Range</td>
<td>11.01</td>
<td>14.40</td>
<td>3.51</td>
<td>13.58</td>
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<tr>
<td><strong>Anti-CCP</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5% Trimmed Mean</td>
<td>22.51</td>
<td>96.46</td>
<td>24.1</td>
<td>37.25</td>
<td>6.10</td>
<td>Chi-Square=77.572</td>
</tr>
<tr>
<td>Median</td>
<td>20.10</td>
<td>30.20</td>
<td>25.1</td>
<td>29.20</td>
<td>6.10</td>
<td>d.f.=4</td>
</tr>
<tr>
<td>Minimum</td>
<td>11.00</td>
<td>20.10</td>
<td>18.2</td>
<td>19.10</td>
<td>3.10</td>
<td>P-value= 0.000</td>
</tr>
<tr>
<td>Maximum</td>
<td>36.00</td>
<td>300.00</td>
<td>30.2</td>
<td>200</td>
<td>11.0</td>
<td>HS*</td>
</tr>
<tr>
<td>Range</td>
<td>25.00</td>
<td>279.9</td>
<td>12.0</td>
<td>180.9</td>
<td>7.90</td>
<td></td>
</tr>
<tr>
<td>Interquartile Range</td>
<td>17.83</td>
<td>158.4</td>
<td>9.9</td>
<td>22.8</td>
<td>5.65</td>
<td></td>
</tr>
<tr>
<td><strong>Troponin-I</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5% Trimmed Mean</td>
<td>0.71</td>
<td>0.79</td>
<td>0.56</td>
<td>0.82</td>
<td>0.43</td>
<td>Chi-Square=2.885</td>
</tr>
<tr>
<td>Median</td>
<td>0.71</td>
<td>0.00</td>
<td>0.62</td>
<td>0.90</td>
<td>0.32</td>
<td>d.f.=3</td>
</tr>
<tr>
<td>Minimum</td>
<td>0.31</td>
<td>0.79</td>
<td>0.23</td>
<td>0.20</td>
<td>0.42</td>
<td>P-value= 0.410</td>
</tr>
<tr>
<td>Maximum</td>
<td>1.10</td>
<td>0.89</td>
<td>0.70</td>
<td>1.10</td>
<td>0.54</td>
<td>NS**</td>
</tr>
<tr>
<td>Range</td>
<td>0.79</td>
<td>0.10</td>
<td>0.47</td>
<td>0.90</td>
<td>0.12</td>
<td></td>
</tr>
<tr>
<td>Interquartile Range</td>
<td>0.79</td>
<td>0.10</td>
<td>0.21</td>
<td>0.31</td>
<td>0.08</td>
<td></td>
</tr>
</tbody>
</table>

(*) HS: Highly Sig. at P< 0.01; (**)NS: Non Sig. at P>0.01

Table (3) shows the distribution of studied troponin-I marker in RA patients and control, to make definite that different independent groups are thrown from the same population in light of that variable. The troponin-I showed non-significant differences among studied groups at (p=0.175,CC=0.421).Results shows more part of RF+ve of diseased patients concerning troponin-I marker has a positive diagnosed, and they are accounted 49(67.1%), which non-significant different at P>0.05.In addition to that for RF-ve group result showed that 11(29.7%) of studied sample has a positive diagnosed concerning troponin-I, but no significant differences.
Table 4: Distribution of Troponin-I according to Studied Groups

<table>
<thead>
<tr>
<th>Studied Group</th>
<th>No. &amp; percentage</th>
<th>Troponin 1</th>
<th>Total</th>
<th>C.C. (*)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Positive</td>
<td>Negative</td>
<td></td>
</tr>
</tbody>
</table>
| RF-ve (Non treated) | No. 5            | 5          | 12     | 17       | C.C. = 0.333  
P = 0.350  
NS          |
|                     | % within Group   | 29.4%      | 70.6%  | 100%     |
|                     | % Troponin 1     | 7.4%       | 17.1%  | 12.2%    |
| RF-ve (Treated)     | No. 6            | 6          | 14     | 20       |
|                     | % within Group   | 30%        | 70%    | 100%     |
|                     | % Troponin 1     | 8.6%       | 20.0%  | 14.3%    |
| Total RF-ve group   | 11               | 26         | 37     |          |
|                     |                  | 29.7%      | 70.3%  | 100%     |
| RF+ve (Non treated) | No. 23           | 23         | 20     | 43       | C.C. = 0.423  
P = 0.062  
NS          |
|                     | % within Group   | 53.5%      | 46.5%  | 100%     |
|                     | % Troponin 1     | 32.9%      | 28.6%  | 30.7%    |
| RF+ve (Treated)     | No. 26           | 26         | 4      | 30       |
|                     | % within Group   | 86.6%      | 13.4%  | 100%     |
|                     | % Troponin 1     | 37.1%      | 5.7%   | 21.4%    |
| Total RF+ve group   | 49               | 24         | 73     |          |
|                     |                  | 67.1%      | 32.9%  | 100%     |
| Total patients      | 85.7%            | 71.4%      | 100%   |          |
| Control             | No. 10           | 10         | 20     | 30       | C.C. = 0.421  
P = 0.175  
NS          |
|                     | % within Group   | 33.3%      | 66.7%  | 100%     |
|                     | % Troponin-1     | 14.3%      | 28.6%  | 21.4%    |
| Total               | 70               | 70         | 140    |          |
|                     | % within Groups  | 53.5%      | 46.5%  | 100%     |
|                     | % Troponin-1     | 100%       | 100%   | 100%     |

(*) NS: Non Sig. at P > 0.05; [ C.C.: Testing based on a Contingency tests].

Estimation area of trade-off between sensitivity and specificity to observe that trade-off, which is termed ROC curve, results shows area below the ROC curve is frequently cited (here it is 0.283) for RF+ve group. In addition to that, rather than perfect outcome are obtaining for area under the ROC curve concerning RF-ve, since sensitivity, and specificity rates has recorded complete level (i.e. 100%), and that interpreted preceding outcome. Table(4) Figure (1)

Table 4: ROC Curve for (Tropnin-I) among RA patients

<table>
<thead>
<tr>
<th></th>
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<th></th>
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</thead>
<tbody>
<tr>
<td>RF +ve</td>
<td>0.545</td>
<td>1.000</td>
<td>0.200</td>
<td>0.283</td>
<td>0.133</td>
<td>0.159</td>
<td>0.023</td>
<td>0.544</td>
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<tr>
<td>RF -ve</td>
<td>0.305</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>0.000</td>
<td>0.134</td>
<td>1.000</td>
<td>1.000</td>
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</tbody>
</table>

(*) Non Sig. at P > 0.05; The positive real state is Positive.

Figure 1: ROC Curve distribution for positive (Tropnin-I) according to RF
Table (5) displays Person’s correlation coefficients for different RA groups. Some studies markers has accounted strong and significant associations by least at \( p < 0.05 \) concerning new early diagnosis RA without treated groups, either with RF+ve, and with RF-ve.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Parameter</th>
<th>Pearson Correlation</th>
<th>ESR</th>
<th>Anti CCP</th>
<th>(RF)</th>
<th>Troponin-I</th>
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<tbody>
<tr>
<td>RF- NON TREAT</td>
<td>(C.R.P.)</td>
<td>Corr. 0.334</td>
<td>0.262</td>
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<tr>
<td></td>
<td></td>
<td>Sig. 0.150</td>
<td>0.265</td>
<td>0.104</td>
<td>0.000</td>
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<tr>
<td></td>
<td>(E.S.R.)</td>
<td>Corr. 0.950</td>
<td>0.007</td>
<td>-1.00</td>
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<tr>
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<td></td>
<td>Sig. 0.000</td>
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<td>Anti CCP</td>
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<td>Sig. 0.533</td>
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<td>0.000</td>
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</tr>
<tr>
<td></td>
<td>(RF)</td>
<td>Corr. -1.00</td>
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<tr>
<td></td>
<td></td>
<td>Sig. 0.000</td>
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<tr>
<td>RF+ NON TREAT</td>
<td>(C.R.P.)</td>
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<td>0.550</td>
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<td>Sig. 0.470</td>
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<td>0.010</td>
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<td>(E.S.R.)</td>
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<td>0.000</td>
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<tr>
<td></td>
<td>(RF)</td>
<td>Corr. -1.00</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Sig. 0.000</td>
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<tr>
<td>RF- TREAT</td>
<td>(C.R.P.)</td>
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<td>(E.S.R.)</td>
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<td>(RF)</td>
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<tr>
<td></td>
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<tr>
<td>FR +TREAT</td>
<td>(C.R.P.)</td>
<td>Corr. 0.528</td>
<td>0.349</td>
<td>0.425</td>
<td>-1.00</td>
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</tr>
<tr>
<td></td>
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<td>Sig. 0.002</td>
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<tr>
<td></td>
<td>(E.S.R.)</td>
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<td>0.165</td>
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<td></td>
<td>Anti CCP</td>
<td>Corr. 0.898</td>
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<tr>
<td></td>
<td>(RF)</td>
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<td></td>
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<td>Sig. 0.488</td>
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<td></td>
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</table>

Person’s correlation coefficients Sig. at \( P<0.05 \)

**Discussion**

The present study revealed RA prevalence more in female patients similar to result in 2014 showed (75.25% female vs 24.75% male). Few studies appeared opposite result more frequent in male. Sex hormones affect the immune system and assist as modulators of autoimmune disease, women experience significantly more natural and artificial sex hormone inconstancy through their lifespans, for example through the puberty onset the
menstruation, contraceptive use, and pregnancy, this led researchers to carefully observe the sex hormones effectiveness on the RA progression. The female hormones, estrogen and prolactin as pro-inflammatory hormones and androgens as anti-inflammatory hormones influence RA predisposition. The general increased exposure to pro-inflammatory hormones along the women’s lifetime could clarify the greater female to male ratio in RA, supportive the indication that androgens are defensive.\(^{(11)}\) In present study the percentage of patients had 7-12 months of disease duration more than the 1-6 months, 53% with disease interval of \(\leq 3\) months, matched with 94% of patients who offered with disease period of \(>12\) weeks, therefore the potent predictor of persistent disease was a disease period of \(>3\) months.\(^{(12)}\) Although family history of RA is an old concept,\(^{(13)}\) present data appeared patients had family history less than non historical family this whether the small sample that taken in this study or due to it differs by age, sex or serology. A high rate RA in female offspring with a maternal history of RA.\(^{(14)}\)

Non-specific ESR and CRP showed high positivity results, could significant assisting indicators for the diagnosis of RA. Concurrent revealing of RF, ESR Anti-CCP, and CRP stays cooperative the complete diagnosis of RA.\(^{(15)}\) Patients that had positive RF and Anti-CCP more than with negative test results, A data suggested that Anti-CCP have the power to expect the development of RA in patients with early arthritis.\(^{(16)}\) Chief results of present study appeared that concentrations of cTn-I, were higher in patients with RA compared to controls, cTn-I concentrations were 67.1% higher in seropositive RA than seronegative 29.7% but non-significant, similar to result that reported in 2012, cTn-I levels were 49% higher in patients with RA than controls, the difference remained significant after modulation for demographic features.\(^{(17)}\) Other results reported that RA patients with seropositive RF do not possess sera falsely elevation of cTnl levels. Results appeared no significant opposite link between cTn-I and inflammatory markers unlike to paper reports that high significant correlation of cTn-I with other inflammatory markers.\(^{(6)}\) The behavior of cTn-I concentrations for each RF-ve and RF+ve of treated and untreated patients is similar. However, the concentrations of cTn-I remained significantly higher in patients with RA than controls, this proposes could be extra mechanisms fundamental raised cTn-I in RA, The greatest probable clarification the elevation of cTnI in RA patients may be return to subclinical myocardial damage, or small vessel disease or age, or hypertension, and other cardiovascular peril factors. Enlarged cTn-I concentrations might be misleading subsequently rheumatoid factor and other heterophilic antibodies possibly intervene with antibody-based immunoassays by non-specific compulsory with exposure agents.\(^{(17)}\) Rheumatoid factor, present in 66.4% of studied groups however, was not associated with higher circulating cTnI the most correlations were opposite, inadequacy of the study because it did not consideration in myocardial functions, also elevation and diminishing levels of some inflammatory mediators through RA exacerbations may influence on cTn-I levels, it is probable that high stages of inflammation, as happens in unwell controlled disease, can impact on concentrations of cTn-I. Outcome inflammation could not be cause troponin-I raise in RA. Stress, anxiety and tension of lifestyle which due to illness and its treatment could causing rise myocardial stretch which may play a turn in the elevation of troponin concentrations in RA. Further studies are necessary to determine the value of cTn-I to expect Cardiovascular disease in RA.

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The Effects of Obesity and Mothers’ Education Levels on the Periodontal Health Status of Iraqi School-Aged Children

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²Assistant Lecturer, Department of Preventive Dentistry, ²Assistant Lecturer, Department of Periodontology, Al-Rafidain University College, Baghdad, Iraq

ABSTRACT

Background: It is evident from the literature that an increased body mass index (BMI) and low socioeconomic status are potential risk factors for periodontal diseases. Most related studies are international and have investigated such associations in adults, and there have been few Iraqi studies targeting school-aged children.

Objective: To investigate the impact of paediatric obesity and mothers’ educational levels on the periodontal health status of children.

Method: The study sample was composed of 300 children (152 males, 148 females) aged 6-12 years. The subjects’ weight and height were measured, and the body mass index was calculated for each child to obtain a percentile ranking; the percentiles were used to allocate the total sample population into four subgroups (underweight, normal weight, overweight and obese). The children’s periodontal health was assessed using the Plaque Index (PLI) and Gingival Index (GI), and the mothers’ educational level was assessed by direct parental interview.

Results: Compared with the other categories of children, obese male (84.35) and overweight female (82.92) children had greater values for the PLI, while overweight children of both sexes (89.47 male, 92.11 female) had greater values of the GI. Male and female children with mothers who had the lowest level of education were found to have the highest values of PLI & GI. Non-significant differences were recorded between the male –female matched study groups with regard to the body mass index and mothers’ educational levels.

Conclusions: Childhood obesity and socioeconomic disadvantages have negative impacts on children’s gingival health in this representative sample.

Keywords: Obesity, Mothers’ Education, Plaque Index, Gingival Index, Body Mass Index, Iraq.

Introduction

Periodontal diseases are a multifactorial entity in which host, microbial, environmental and socioeconomic factors control disease development and progression. Current approaches in dealing with chronic illness, such as periodontal diseases, are directed towards the identification and management of risk factors and disease modifiers, such as obesity and socioeconomic status, to establish a state of health in the young population¹⁻².

In the Middle East, Iraq and other Arabic countries have high prevalence rates of childhood obesity³⁻⁷. Obesity refers to excess body fat that alters the balance of the affected individual. The most scientifically accurate method of determining the amount of fat mass in a subject is the Body Mass Index (BMI). The link between obesity and periodontal health has been explored extensively through several epidemiological and case-control studies⁸⁻⁹, and it was found that obesity is a risk factor for periodontitis¹⁰.

Previous studies revealed a link between socioeconomic status, as represented by mothers’

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educational levels, and children’s oral health status because the child’s oral hygiene patterns are influenced by socioeconomic factors. Low familial socioeconomic status is associated with deficient oral hygiene and greater susceptibility to frequent oral diseases; the postulated explanations for that connection are the effects of limited knowledge concerning health and oral hygiene habits and economical restraints, which mean that those families cannot afford dental appointments or oral hygiene products.

To the best of our knowledge, only a limited number of Iraqi studies have linked BMI and mothers’ educational levels to periodontal health status in Iraqi children. The present study aimed to investigate the association between obesity, mothers’ educational level and periodontal health status in a sample of children aged 6-12 years.

Materials and Method

The present observational cross-sectional study was conducted with children attending the Paediatrics and Prevention Dentistry Clinics of the Dentistry Department at Al Rafidain University College, Baghdad-Iraq.

The sample population was composed of 300 children (152 males, 148 females) with an age range of (6-12) years and a median age of 9 years. All the children and their parents who were willing to participate in the present study were enrolled after signing an informed consent form.

Through a questionnaire, the following were assessed: child’s name, age, address, hospitalization history, medication history, and mothers’ educational level. All the enrolled children were healthy and had a non-contributory medical history.

The children’s weight and height were measured when they were dressed in light clothing and barefooted. Body weight was measured to the nearest 0.5 kg with a mechanical scale, and height was measured with a portable measuring unit to the nearest 0.5 cm.

The BMI was calculated according to the following formula: body weight/height² = BMI kg/m². According to the obtained BMI value, the following categories were defined: underweight (BMI < 18.5 kg/m²), normal weight (BMI from 18.5 to 24.9 kg/m²), overweight (BMI from 25 to 29.9 kg/m²) and obese (BMI > 30 kg/m²). The BMI number was plotted on the BMI-for-age CDC Growth Charts for either girls or boys to obtain the percentile ranking. For each gender, the children were stratified into four subgroups based on their percentile ranking: the underweight group was defined as below the 5th percentile, the normal weight group as between the 5th and 85th percentiles, the overweight group as between the 85th and 95th percentiles and the obese group as greater than or equal to the 95th percentile.

Due to the lack of Iraqi reference values, the values of nutritional indicators were compared with international reference values using the CDC growth charts.

The mothers’ educational levels (MEs) were categorized into five levels based on a modified Kuppuswamy’s scale: 1 for illiterate (neither read nor writes), 2 for completed primary school, 3 for completed secondary school, 4 for who completed higher education, and 5 for education beyond college (Diploma, M.Sc., and Ph.D.).

Periodontal health status was assessed using the plaque index (PI) developed by Sillness and Löe in 1964 and the gingival index (GI) developed by Löe and Sillness in 1963. Ramfjord’s index teeth were examined as representatives of the whole dentition; only fully erupted teeth were scored, and in cases of partially erupted or missing index teeth, that segment was excluded. The periodontal examination was conducted in the dental clinic in a dental chair under artificial light by the researchers using plane dental mirrors and colour-coded WHO probes. The data were tested for normality of distribution with the Shapiro-Wilk test. For the descriptive statistics, the following tests were applied: mean, median, number, percentage and P-value; a value of p < 0.05 was considered statistically significant. For the inferential statistics, the following tests were applied: the Mann-Whitney U, Dunn-Bonferroni, and Chi-square tests. All statistical analyses were performed with SPSS version 21.0.

Results

As illustrated in Table (1), greater values for the PLI were recorded for male children in the obese group (84.35) than in the normal weight (82.92), overweight (74.26) and underweight (64.98) groups, with no significant differences among the groups. Among female children, the highest PLI was recorded in the overweight group (82.92) compared with the underweight (68.31) and normal weight (74.97) groups, with no significant differences among the groups.
Table 1: Sample Characteristics Categorized By Gender, PLI, GI and BMI

<table>
<thead>
<tr>
<th>Gender</th>
<th>Nutrition</th>
<th>N</th>
<th>Mean Rank</th>
<th>Chi-square</th>
<th>Df</th>
<th>P value</th>
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<tr>
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</table>

Abbreviations: N: number, DF: degree of freedom, PLI: plaque index and GI: gingival index

Regarding the GI, the highest values were recorded for children of both sexes in the overweight groups (89.47 male, 92.11 female), followed by the normal weight (77.70), underweight (70.93) and obese (68.20) groups for male children, with no significant differences among the groups, and followed by the underweight (76.13) and normal weight (70.73) groups for female children, with no significant differences among the groups.

Table (2) illustrates that there were no statistically significant differences between males and females with regard to the health parameters when the data were stratified according to BMI.

Table 2: Inter-Sex Comparison of Periodontal Health Parameters According to BMI

<table>
<thead>
<tr>
<th>Nutrition</th>
<th>Male</th>
<th>Female</th>
<th>Mann-Whitney U test</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PLI</td>
<td>46</td>
<td>32</td>
<td>0.032</td>
<td>.975</td>
</tr>
<tr>
<td>GI</td>
<td>46</td>
<td>32</td>
<td>0.125</td>
<td>.901</td>
</tr>
<tr>
<td>Normal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PLI</td>
<td>77</td>
<td>98</td>
<td>1.380</td>
<td>.167</td>
</tr>
<tr>
<td>GI</td>
<td>77</td>
<td>98</td>
<td>1.655</td>
<td>.098</td>
</tr>
<tr>
<td>Overweight</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PLI</td>
<td>19</td>
<td>18</td>
<td>0.219</td>
<td>.826</td>
</tr>
<tr>
<td>GI</td>
<td>19</td>
<td>18</td>
<td>0.098</td>
<td>.922</td>
</tr>
<tr>
<td>Obese</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PLI</td>
<td>10</td>
<td>0</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>GI</td>
<td>10</td>
<td>0</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

Abbreviations: M: male and F: female

The descriptive statistics for the periodontal health parameters according to the ME are illustrated in Table (3). Among the groups stratified by ME level, male children with mothers with MEs of 1 were found to have the highest values of PLI and GI values, with a significant difference among the groups. Similarly, among the groups stratified by ME level, female children with mothers with the lowest ME (1) were found to have the highest PLI and GI values, with a highly significant difference among the study groups.
Table 3: Sample Characteristics Categorized By Sex, PLI, GI and Mothers’ Educational Level

<table>
<thead>
<tr>
<th>Sex</th>
<th>ME</th>
<th>N</th>
<th>Mean Rank</th>
<th>Chi-square</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>PLI</td>
<td>1.00</td>
<td>11</td>
<td>114.79</td>
<td>12.747</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.00</td>
<td>19</td>
<td>73.92</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.00</td>
<td>53</td>
<td>72.68</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.00</td>
<td>62</td>
<td>81.57</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>5.00</td>
<td>7</td>
<td>46.41</td>
<td></td>
</tr>
<tr>
<td>GI</td>
<td></td>
<td>1.00</td>
<td>11</td>
<td>113.00</td>
<td>10.930</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.00</td>
<td>19</td>
<td>72.26</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.00</td>
<td>53</td>
<td>70.15</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.00</td>
<td>62</td>
<td>82.81</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>5.00</td>
<td>7</td>
<td>55.65</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>PLI</td>
<td>1.00</td>
<td>4</td>
<td>128.00</td>
<td>22.960</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.00</td>
<td>18</td>
<td>82.19</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.00</td>
<td>46</td>
<td>60.09</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.00</td>
<td>69</td>
<td>72.62</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>5.00</td>
<td>11</td>
<td>114.55</td>
<td></td>
</tr>
<tr>
<td>GI</td>
<td></td>
<td>1.00</td>
<td>4</td>
<td>118.36</td>
<td>20.296</td>
</tr>
<tr>
<td></td>
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<td>2.00</td>
<td>18</td>
<td>81.81</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.00</td>
<td>46</td>
<td>64.50</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.00</td>
<td>69</td>
<td>69.96</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>5.00</td>
<td>11</td>
<td>104.25</td>
<td></td>
</tr>
</tbody>
</table>

Abbreviations: ME: mother’s education

As shown in Table (4), the male–female comparisons with the Mann-Whitney U test revealed that there were no statistically significant differences in periodontal health parameters between male and female children stratified according to ME, with the following exceptions: a highly significant difference between the PLI scores male and female children in the ME level 1 group, a significant difference in the PLI scores of male and female children in the ME level 3 group and a significant difference in the GI scores of male and female children in the ME level 4 group.

Table 4: Inter-Sex Comparison of Periodontal Heath Parameters According to Mothers’ Education Levels

<table>
<thead>
<tr>
<th>Mother’s Education level</th>
<th>Sex</th>
<th>Male</th>
<th>Female</th>
<th>Mann-Whitney U test</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>N</td>
<td>Mean Rank</td>
<td>N</td>
<td>Mean Rank</td>
</tr>
<tr>
<td>1.00</td>
<td>PLI</td>
<td>11</td>
<td>6.36</td>
<td>4</td>
<td>12.50</td>
</tr>
<tr>
<td></td>
<td>GI</td>
<td>11</td>
<td>6.82</td>
<td>4</td>
<td>11.25</td>
</tr>
<tr>
<td>2.00</td>
<td>PLI</td>
<td>19</td>
<td>18.74</td>
<td>18</td>
<td>19.28</td>
</tr>
<tr>
<td></td>
<td>GI</td>
<td>19</td>
<td>18.24</td>
<td>18</td>
<td>19.81</td>
</tr>
<tr>
<td>3.00</td>
<td>PLI</td>
<td>53</td>
<td>55.19</td>
<td>46</td>
<td>44.02</td>
</tr>
<tr>
<td></td>
<td>GI</td>
<td>53</td>
<td>53.53</td>
<td>46</td>
<td>45.93</td>
</tr>
<tr>
<td>4.00</td>
<td>PLI</td>
<td>62</td>
<td>71.65</td>
<td>69</td>
<td>60.92</td>
</tr>
<tr>
<td></td>
<td>GI</td>
<td>62</td>
<td>73.60</td>
<td>69</td>
<td>59.17</td>
</tr>
<tr>
<td>5.00</td>
<td>PLI</td>
<td>7</td>
<td>9.43</td>
<td>11</td>
<td>9.55</td>
</tr>
<tr>
<td></td>
<td>GI</td>
<td>7</td>
<td>7.29</td>
<td>11</td>
<td>10.91</td>
</tr>
</tbody>
</table>
Discussion

The microbial biofilm undoubtedly plays a role in the pathogenesis of periodontal diseases. Researchers emphasizing the importance of the microbial biofilm among a long list of other secondary aetiologic factors or risk factors that co-determine the initiation, progression and clinical picture of periodontal diseases. These risk factors negatively affect both the tissue and the immune response of the host, increasing his/her susceptibility to the disease process (23). Since childhood is the critical period during which an individual acquires the knowledge and habits that are later reflected in his/her behaviour patterns as an adult (2), two of the aforementioned critical determinants of childhood periodontal health, namely, obesity and ME level, were assessed in a total of 300 school-aged children Iraqi.

The results of this study confirm that among children stratified by BMI, both obese and overweight children have the highest values for the PLI and GI, revealing the presence of an association between poor periodontal health status and increased BMI; these results agree with those of accordance with the results of multiple studies 6,22,23.

The negative impact of paediatric obesity on gingival health can be explained first by the metabolic profile related to the biological consequences of an unhealthy diet, including impaired glucose tolerance due to excess sugar and an abnormally high lipid profile, which in turn affects the inflammatory profile, resulting in a deficient immune response, such as hyperactive macrophages, altered microcirculation and the secretion of pro-inflammatory substances, such as TNF-a, IL-6 and C-reactive protein by the adipose tissue, which act as an endocrine organ (21). Second, a lifestyle with the reduced exercise greatly affects periodontal health (24). Third, periodontal health can be affected by the attitude towards general and oral health, including nutritional awareness, the practice of oral hygiene procedures at home, and understanding the need for periodic dental and medical check-up.

The second variable explored in this study was the ME level as a representative of the sample population’s socioeconomic status. Our study revealed that ME level had a major impact on the child’s oral health, as the highest values for the PLI and GI were recorded in children of mothers with the lowest ME level, reflecting the pivotal role of the mother as the main caregiver in the family. Mothers are generally responsible for the implementation of oral health behaviours in their children. A mother with a low level of education may not be well informed regarding good oral hygiene practices; hence, it is expected for her offspring to exhibit deficient oral health attitudes due to the limited availability of information.

Conclusion

Childhood obesity and socioeconomic disadvantages had negative impacts on children’s gingival health in the representative sample. Both obesity and periodontal diseases can be prevented; prevention first starts in the home and family, so it is of prime importance to carefully supervise and check the oral health, healthcare attitudes and dietary profiles of all children, with special attention paid to overweight/obese children to prevent future systemic and oral health problems.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

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Comparison of Anti Mullerian Hormone in Working Women with Different Social Class in Babylon City, Iraq

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ABSTRACT

Many factors have been claimed to impact fertility in women, fertility in Iraq starts deteriorating in the past years, the effect of wars on fertility of Iraqi women have been demonstrated in our previous study. Aim of this study: To look for the association of socio-economic class with Anti Mullerian Hormone in reproductive age women in Babylon city in Iraq.

Total of 166 married educated, working women, with age between 17-35 years, belonging to different socio-economic class. These women were assessed for ovarian reserve using Antimullerian hormone. The study was a cross-sectional study including women who attended fertility management clinic in Babylon City. They were interviewed using a structured questionnaire.

AntiMullerian Hormone shows a significant positive association with socio-economic class (P = 0.0009). Higher socio-economic state of the women, are associated with better ovarian reserve as assessed by Anti Mullerian Hormone.

Keywords: Antimullerian hormone, socioeconomic status, Fertility, mid-reproductive age women.

Introduction

Socio-economic status (SES) is considered a vital factor that affects reproductive potential of women in many ways; it is widely studied variable in public health and social science research. Besides women level of education has been found to effect couples fertility (1-3).

Socio-economic parameters, such as type of work, religion and geographic location were also found to have impact on fertility status. Fertility rates have started declining in Iraq during the past three decade, as documented by Al-Jebouri and Altaee (4, 5).

Fertility potential of women can be estimated by ovarian reserve parameters, which may include hormones (Folliclal stimulating hormone and Antimullerian hormone) and ultrasonic markers (Antral follicle count). These markers also may help in choosing the appropriate programme and adjusting the dose of gonadotropin in infertility treatment (6-9).

Ant-Müllerian hormone (AMH) is a dimeric glycoprotein, belongs to the transforming growth factor-beta superfamily (10, 11). In women AMH is a product of granulosa cells of pre-antral and antral follicles (12), its main physiological role seems to be limited to the early inhibition of follicular development (13,14). AMH testing can be done at any day of the women cycle, and it is not influenced by oral contraceptive pills, and has very little intra- and inter-cycle changes.

Limited numbers of studies focused on the relationship between social class and AMH (15-20). The purpose of this study is: was to find out if any inference of social class on AMH in mid reproductive women selected for this study.

Materials and Method

A total of 166 married, educated women, age between 17-35 years, belonging to different socio-economic class were assessed for the clinical ovarian reserve parameter Antimullerian hormone. The study was
a cross-sectional study including women who attended fertility management clinic in Babylon City. They were interviewed using a special questionnaire. Informed written consent was signed by all participants. The work have been confirmed by the research ethical committee of College of Medicine/University of Babylon

**Inclusion Criteria:**
1. Healthy, mid reproductive age women with cycle length of (25-35) days.
2. Women whose AMH measurements were performed with the same kit.
3. Women living in urban places
4. Women with body mass index (BMI) less than 30 kg/m²
5. Women working as clerks, or work at money transfer company, water and piping company, car sailing company, tourism company or teachers in high or primary school.

**Exclusion Criteria:**
1. Women on oral contraceptives.
2. Smokers,
3. Pregnant women
5. Women with any endocrine disorders.

In reviewing the literatures, there were many suggestions for how to calculate socioeconomic class (SEC), the life chances of individuals and families are largely determined by their occupation which is is taken to be the central indicator system \(^{(21, 22)}\), and there is a high level of agreement over occupational rankings in the population \(^{(23)}\). We didn’t find such studies in Iraq, but on asking about that issue the socioeconomics, we noticed this verbal classification, those who attain below 500,000 Iraqi dinner (ID)\(\) month were classified as low income class, those how gain between500,000-1,000 000 ID as medium and above one million ID as high income.

**Hormonal Analysis:** Ten milliliters of venous blood was withdrawn from the women for estimation of AMH. Patient name was written on the plain plastic tube. The samples were left to stand at least 15 min at room temperature. Centrifugation at 3000rpm for 10min to separate the serum was done, they were kept at (-20°C) temperature deep freeze until the time of analysis. The Serum samples for AMH were examined by sensitive Enzyme Linked Immune Sorbent Assay (ELISA) method, and the kit used for hormonal analysis is Anash labs which (Germany).

Statistical examination was done using (SPSS version 16 IBM). Pearson correlation was used and curve were measured for correlation. \(P < 0.05\) was considered to be statistically significant \(^{(24)}\).

**Results**

Demographic characters of the study group:

**Age:** The total number of the patients was 166, their mean age ± (SD) (28.6 ± 5.6), ranging (17- 35) years.

**Residence:** All women were living in urban areas

**Educational level:** All females attain college level of education or institute graduate

**BMI:** (mean ± SD) (28.8 ± 6.84) Kg/m²,

**AMH:** (Mean ± SD) (5.08 ± 4.93) ng/ml

**Job:** The women were working as clerks, or work at money transfer company, water and piping company, car sailing company, tourism company or teachers in high or primary school.)

![Figure 1: Correlation of anti mullerian hormone (ng/ml) with women income, there were significant positive correlation r= 0.203; p = 0.009.](image)

**Discussion**

This study demonstrates that there is a significant Positive Correlation between Socioeconomic class and AMH in our selected population. This finding confirms that of Tadisetti and his team in India \(^{(24)}\) and Barut and his coworkers in Turkey \(^{(25)}\). The strength of the study is the homogeneity of the investigated group, the selected population was chosen so that AMH is affected only by the income factor, that’s to say that all women were belonging to nearly same reproductive age (Figure 1), all attain same level of education, nearly the same
working circumstances and finally they live in urban area, although migration factor is well seen in Iraq in the last 10 years, but recent study done in Poland concluded that no effect of inhabiting rural areas, large cities on ovarian reserve (26,27).

A low socioeconomic class associated by stress such as under nutrition and financial suffering may have effect on ovarian reserve. In addition Iraqi women have many other stressor factors which add to the above mentioned factor, Iraqi population suffered from severe environmental stress like war impact, different types of pollution and psychological stress since 1980 (4). The circumstances of wars and sanction might led to unbearable stress on women and their families. The result of this study may be confirmed by larger sample size to determine the impact of SEC on ovarian reserve.

Conclusion

Positive correlation exists between socio-economic state of the women and Anti Mullerian Hormone.

Acknowledgment

I would like the ministry of higher education and scientific research for funding this work, and great thanks for B.A, for statistical advice.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

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Role of Interleukin-12 Cytokine in the Cellular Response to Mycobacterial Disease

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ABSTRACT

Interleukin-12 (IL-12) is a multifunctional cytokine acting as a key regulator of cell-mediated immune responses through the differentiation of naive CD4+ T cells into type 1 helper T cells (Th1) producing interferon-gamma. IL-12 act as a chemoattractant for macrophages, promotes the migration of stimulated dendritic cells and associated with several pathogenic inflammatory responses such as a mycobacterial infection.

This study, have suggested that IL-12 could play a vital role in treating mycobacterial diseases.

This case-controlled study used The enzyme-linked immunosorbent assay (ELISA) to detect the role of IL-12 in 42 patients with pTB who were referred to consultant clinic for respiratory diseases in Hillah – Babylon province/Iraq during the period from December 2017 to July 2018, and 42 healthy persons’ control. Blood samples were collected from both groups according to the standard methods.

Data analysis revealed that median serum level of IL-12 in patients was 38.91 pg/mL (range 15.68-540.29 pg/mL) which was significantly higher than controls (34.06 pg/mL, range 10.97-672.44 pg/mL) (P= 0.042).

IL-12 Cytokine showed significant protective role against Mycobacterium tuberculosis through activated Th1 cellular immunity.

Keywords: Interleukin 12, Mycobacterial infection, Tuberculosis.

Introduction

Tuberculosis (TB) is an acute or chronic bacterial infection caused by Mycobacterium tuberculosis (M. tuberculosis). It primarily affects the lungs, but may spread to other organs (extra-pulmonary TB) (¹). Nearly one-third of the world’s population (two billion people) are infected with M. tuberculosis and is at risk of developing tuberculosis (TB). Every year, about nine million people get infected with active TB and approximately 1.5 million people die of this disease, more than 90% of the infections and deaths arising from TB occur in developing countries (²). Interleukin 12 (IL-12) is an important immunoregulatory cytokine that is produced mainly by antigen-presenting cells. The expression of IL-12 during infection regulates innate responses and determines the type of adaptive immune responses. IL-12 induces interferon- gamma (IFN-γ) production and CD4+ triggers T cells to differentiate into type 1 T helper (Th1) cells. Studies have suggested that IL-12 could play a vital role in treating many diseases, such as M. tuberculosis infection (³).

Materials and Method

Study Groups: This study designed into two groups. The first group involved 42 TB patients. Those patients were referred to consultant clinic for respiratory diseases in Hilla – Iraq during the period from December 2017 to July 2018. All patients were subjected to full clinical and radiological examinations prior to laboratory examination. The subjects with TB were selected from those who had a confirmed diagnosis by a healthcare professional and who presented clinical symptoms, radiological evidence and positive sputum acid-fast bacillus (AFB) smears. The second group involved 42 apparently healthy individuals were considered as control.
group. This control subjects had no previous history of TB, autoimmune disease, diabetes, and chronic disease.

**Collection of Blood Samples:** The blood was collected by venous procedure. The site of venipuncture is sterilized by 2% iodine. Five milliliters of venous blood were collected in gel tube from each participant and this 5ml was centrifuged to obtain serum, preserved at -20°C until be used. A total of 84 blood samples were collected (42 subjects with pTB patients and 42 healthy controls). ELISA assay was used to measure levels of IL-12 in serum of TB patients and controls. ELISA assay was accomplished using (Elabsience/China) kit according to the manufacturer’s instructions.

**Statistical Analysis:** The Statistical Package for the Social sciences (SPSS, version 20) was used for statistical analysis. Mann Whitney test was used to compare median (range) of IL-12 between patients and controls. Chi-square was used for testing the deviation to compare between categorical variables such as age and gender. A P-value ≤ 0.05 was considered statistically significant.

### Results

The demographic characteristics of study population for pTB patients and controls groups were involved the following factors as in (Table 1).

**Table 1: Demographics characteristic of study population**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Patients group No (%)</th>
<th>Control group No (%)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age groups</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-30</td>
<td>29 (48%)</td>
<td>23 (38%)</td>
<td>0.269</td>
</tr>
<tr>
<td>31-50</td>
<td>18 (31%)</td>
<td>22 (36%)</td>
<td>0.439</td>
</tr>
<tr>
<td>51-70</td>
<td>13 (21%)</td>
<td>15 (26%)</td>
<td>0.666</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>35 (58%)</td>
<td>41 (68%)</td>
<td>0.256</td>
</tr>
<tr>
<td>Female</td>
<td>25 (42%)</td>
<td>19 (32%)</td>
<td></td>
</tr>
<tr>
<td><strong>Residence</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>42 (70%)</td>
<td>25 (42%)</td>
<td>0.002</td>
</tr>
<tr>
<td>Urban</td>
<td>18 (30%)</td>
<td>35 (58%)</td>
<td></td>
</tr>
<tr>
<td><strong>Smoking</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoker</td>
<td>24 (40%)</td>
<td>20 (30%)</td>
<td>0.444</td>
</tr>
<tr>
<td>Non-smoker</td>
<td>36 (60%)</td>
<td>40 (70%)</td>
<td></td>
</tr>
</tbody>
</table>

Data analysis revealed that median serum level of IL-12 in patients was 38.91 pg/mL (range 15.68-540.29 pg/mL) which was significantly higher than controls (34.06 pg/mL, range 10.97-672.44 pg/mL) (P= 0.042) as shown in (figure -1). Immunity to *M. tuberculosis* infection is associated with the emergence of protective CD4 T cells that secrete cytokines, resulting in activation of macrophages and the recruitment of monocytes to initiate granuloma formation. The cytokine-mediating macrophage activation is IFN-γ, which is largely dependent on IL-12 for its induction (4).

### Discussion

In active pTB, the main immune response is cell mediated immunity (CMI) in which the *M. tuberculosis* is engulfed by macrophage which activate the Th1 through MHC II through produce IL-12 (5).

The early phase of acquired cellular immunity to *M. tuberculosis* infection is mediated by the emergence of protective CD+4 T lymphocytes that secrete cytokines including IFN- γ, IL-2 and TGF-β a molecule which is pivotal in the expression of resistance to tuberculosis. Recent evidence demonstrates that infection with *M. tuberculosis* induces peripheral blood mononuclear cells to release the cytokine IL-12, a molecule that promotes the emergence of T-helper type-1 (Th1). Demonstrate that
IL-12 mRNA expression was induced by *M. tuberculosis* infection both in vivo and in vitro and that exogenous administration of IL-12 to mice transiently resulted in increased resistance to the infection (6).

When the *M. tuberculosis* engulfed by phagocytes cells (dendritic and Macrophages cells) leading to produced IL-12 and IFN-γ. These cells present *M. tuberculosis* antigen to CD+4 Th1 cells which are activated and start to release IL-12 and IFN-γ aims to destroy *M. tuberculosis* (7).

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding

**REFERENCES**


Impact of Breast Feeding Duration on the Presence of *Candida* in Relation to Nonnutritive Sucking Habit among Group of Iraqi Children

**Ohud Faik Taha, Aseel Haidar M. J. Al Haidar**

*Department of Pedodontics and Preventive Dentistry, College of Dentistry, University of Baghdad, Iraq*

**ABSTRACT**

The objective of this study was to evaluate the effect of breast feeding duration on the presence of *Candida* in relation to nonnutritive sucking habits.

This study was conducted by multistage sampling method. In the first stage calculation of the sample size was done, while in the second stage questionnaires were distributed to obtain the children personal information including: the date of birthday, gender, type of feeding, breast feeding duration, presence the nonnutritive sucking habits (dummy sucking, thumb sucking) with the duration of the habit. In the third stage, a sample of 100 children attending private and public kindergarten in Baquba city/ Iraq were identified (50 children with nonnutritive sucking habits and the other 50 were without any sucking habits). Samples had been obtained from the oral cavity of the selected children and cultured on sabauraud dextrose agar media, identification of *Candida albicans* was done by germ tube under the light microscope.

A highly significant relation was found between the duration of breast-feeding and the presence of *Candida*, by which the mean rank of the presence of *Candida* was higher among children with breast feeding duration less than 6 months than children who got breast-feeding for more than 6 months. Although the mean rank of the candida among the study group was higher than that among the control group, the difference was statistically not significant. The mean rank of *Candida* was higher among children with mixed feeding than the children with breast-feeding and the difference was statistically highly significant.

Type of feeding has an impact on the presence of *Candida* among children. Concerning the presence of *Candida*, children who fed with their mother’s milk for 6 months or more had the lowered median.

**Keywords:** Breast-feeding duration, *Candida* infection, Nonnutritive-sucking habits (NNSH).

**Introduction**

The ideal nutrient for newborn babies is the mother’s milk, which is considered as a necessary element that is required for their proper growth and development. It provides them with the essential and the bioactive nutrients (as a digestible and complete food) . Breast-feeding has an immunization effects, which is important for the protection of the infants against various infectious diseases while the development of the infant’s immune system is complete. It acts as a link between the mother and her infant that transfers the immune components, which have a vital factor in the immunity system development later in life. Many immune modulatory compounds are found in the breast milk; including “antibodies, immunoglobulins, cytokines, chemokines, soluble receptors (CD4, TLRs), oligosaccharides and intact immune system cells”.

Human milk oligosaccharides are important, because they modulate the immune system and act as a prebiotic; eliminate bacteria that stimulate the host defense . Breast-feeding had long-term health outcomes as it was reported by many researches including decrease the occurrence of diabetes type 2, reduction of obesity, reduction of the complications of necrotizing enterocolitis, hospitalization and respiratory diseases .

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The duration of breast-feeding varies as the opinions and the cultural environments vary between the countries. Harmful effects on the child’s health may arise if the duration of the breast-feeding was less than two months, which in turn may lead to lack in the protective factors that are found in the breast milk. Therefore, nowadays the studies showed that newborns babies must be fed from their mothers’ breast until six months of age.

Sucking habit is the first coordinate muscular activity of the infant that is considered as a natural reflex. There are two types of sucking; the nutritive type which feed the child with the essential nutrients, while the nonnutritive type of sucking NNSH (on a thumb or pacifier) insures a feeling of warmth and sense of security. This form of sucking had a vital role in the child’s physiological growth and psychological control of emotions. Babies use non-nutritive sucking, to comfort themselves when they are upset to satisfy their urge and need for contact. It is considered as a method for exploring the world and in some instances, sucking practicing by babies to spend the time. On the other hand, if the NNSH (especially pacifier sucking) last for 3 years, and after this age, deleterious effects may arise. Some of these unfavorable effects may include interference with the proper breastfeeding or even early weaning. It may increase the risk of recurrent otitis media, dental caries, in addition to the development of malocclusion.

*Candida albicans* is commensals that may found in several areas of the human body like the gastrointestinal tract, genitourinary system and skin but when the immune system had been weakened, these opportunistic commensals invade the host tissue causing serious consequences. *Candida* infection and oral thrush had been reported to be associated with prolonged use of pacifier sucking habit.

In Iraq, there is no available data concerning the impact of breastfeeding duration on the presence of *Candida* in relation to nonnutritive sucking habit. Therefore, this study was done to assess the impact of breastfeeding duration on the presence of *Candida* infection in relation to nonnutritive sucking habit among group of Iraqi children aged 3 to 5 years old in Baquba city.

**Materials and Method**

The scientific and the ethical committee at College of Dentistry/University of Baghdad approved this study (Ref No: 2019-58318).

Sample selection was done using a “multi-stage cluster random sampling”. Firstly, children aging (3-5) years old were chosen by random sampling clustering technique from 18 kindergartens in Baquba city (the capital of Iraq’s Diyala Governorate, which is located some 60 km to the northeast of Baghdad). Secondly, information through questioners concerning the personal information for each child included in this study was collected. The questionnaires included the date of the child birthday, gender, type of feeding, breast-feeding duration, presence of NNSH (pacifier sucking or thumb sucking) and duration of the sucking habit. After that, a study group composed of 100 children who attending the public and private kindergartens in Baquba city/ Iraq and who were aging from 3-5 years old of both genders was chosen. They were divided into two groups: study group (those children who had sucking habit) and the control group (those children who had no sucking habit and they were matching the age and gender of the study group). Microbiological samples were obtained from four areas of the oral cavity of the selected children (floor of the mouth, dorsal surface of the tongue, oral mucosa of the cheek and hard palate) using un contaminated cotton swap. Each sterile swab had been streaked on “Sabauraud dextrose agar” then the plates were aerobically incubated for 48 hours at 37°C. The morphological features of *Candida* was identified according to Emnous and Binford (1974) and Fingold and Baron (1986). Slides was prepared, stained by lactophenol cotton blue technique and examined under light microscope for identification of *Candida albicans*. *Candida* is oval in shape with budding cells also germ tube was used for identification.

Statistical analysis was done depending on SPSS program version 23. Level of significance was set at 5%, by which if the p>0.05, it was considered not significant. If the p value was ≤0.05, it was considered as statistically significant while if the p value was <0.001, it was considered as highly significant. Data was not normally distributed, so Mann Whitney U test was used for the statistical analysis.

**Results**

The sample consisted of 100 children who were divided into two groups (fifty for each); study group consists of children with NNSH and control group composed of children without any sucking habits. The highest percentage of children with NNSH was found within the age group of 4 years, as shown in Table (1).
Table 1: Distribution of both groups by age

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Study group</th>
<th>Control group</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>3</td>
<td>7</td>
<td>14.00</td>
<td>7</td>
</tr>
<tr>
<td>4</td>
<td>27</td>
<td>54.00</td>
<td>27</td>
</tr>
<tr>
<td>5</td>
<td>16</td>
<td>32.00</td>
<td>16</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100.00</td>
<td>50</td>
</tr>
</tbody>
</table>

Table (2) illustrates a highly significant association between breast-feeding duration and the *Candida* infection. The mean rank was higher among children with breast feeding duration (less than 6 months) while the mean rank was less among children with breast-feeding duration (more than six months). The median of the *Candida* presence was 40 among children with breast feeding duration (less than 6months) while it was 0 among children with breast feeding duration that last for 6months or more.

Table 2: Relation between breast feeding duration and the *Candida* count

<table>
<thead>
<tr>
<th>Duration</th>
<th>No.</th>
<th>Median of <em>Candida</em> count</th>
<th>Mean Rank</th>
<th>Z</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 6 months</td>
<td>35</td>
<td>40</td>
<td>70.56</td>
<td>5.323</td>
<td>0.000 HS*</td>
</tr>
<tr>
<td>More 6 months</td>
<td>65</td>
<td>0</td>
<td>39.70</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*HS: Highly significant

The presence of the *Candida* in relation to the presence of the NNSH was highlighted in Table (3). Although the mean rank of the *Candida* among the group with NNSH (the study group) was higher than that among the control group, the difference was statistically not significant.

Table 3: The presence of *Candida* in relation to nonnutritive sucking habits

<table>
<thead>
<tr>
<th>H</th>
<th>The groups</th>
<th>No.</th>
<th>Median</th>
<th>Mean Rank</th>
<th>Z</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Study group</td>
<td>50</td>
<td>6</td>
<td>55.53</td>
<td>1.819</td>
<td>0.069 NS*</td>
</tr>
<tr>
<td></td>
<td>Control group</td>
<td>50</td>
<td>0</td>
<td>45.47</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*NS: Not significant p>0.05.

The type of feeding in relation to the presence of *Candida* was elucidated in Table (4). The mean rank of *Candida* was higher among children with mixed feeding than the children with breast-feeding and the difference was statistically highly significant. The median of the presence of the *Candida* was (0) among children who were fed by breast-feeding while the median was (10) among children who were fed by mixed feeding.

Table 4: Type of feeding in relation to the presence of *Candida*

<table>
<thead>
<tr>
<th>Type of feeding</th>
<th>No.</th>
<th>Median</th>
<th>Mean Rank</th>
<th>Z</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast</td>
<td>25</td>
<td>0</td>
<td>26.38</td>
<td>5.036</td>
<td>0.000 HS*</td>
</tr>
<tr>
<td>Mixed</td>
<td>75</td>
<td>10</td>
<td>58.54</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*HS: Highly significant.

Discussion

The short-date mother’s milk benefits (as well as the long-date) on both, the health and growth of the new born baby, in addition to the effects on his/her mother health, had been well recognized 21,22. In infants, less than six months aged, prevalence of exclusive breastfeeding had been increased globally from about 24.9% to 35.7% 21.

It is well known that the use of pacifier has an adverse influence on breastfeeding duration by increasing the tendency of early weaning 10,23,24. This study revealed that (NNSH) was higher among the four years old children (27 children 54%), Table (1). This result came in accordance with the findings of other study 25. Nonnutritive-sucking habit at 36 months of age considered as a natural condition and if it persists after this age, it means a presence of a psychological disturbances 26.
The current study tried to analyse the impact of the duration of breast feeding on the presence *Candida*. There was an inverse relationship between breast feeding duration and the occurrence of *Candida albicans* by which children who were breastfed for more than six months had significantly less *Candida* presence. However, *Candida albicans* had been presented among children with breastfeeding duration of less than six months, Table (2), and this was in agreement with other studies 3,6.

According to the results of the present study, that had been showed in Table (3), the median of the presence of the *Candida* was higher among the children with NNSH. This finding was coincide with the results of many other studies, 16,17,25,27,28. After certain duration, the pacifier itself (thumb), like any other oral removable appliance, may be colonized with microorganisms that in turn can alter and modify the oral flora, 29,30. In addition, sucking of a pacifier/thumb can be considered as a risk factor for the cross infection as it has a role in the horizontal transmission of the microorganisms which can facilitate the *Candida* presence and proliferation. Meanwhile, stagnation of saliva, which is related to the sucking habit, and subsequent drop of its pH will favor and facilitate the growth of *Candida* and other aciduric microorganisms 18.

Breastfeeding is important to increase the infant immunity against infection 2-4. As shown in Table (4), a highly significant association had been found between the feeding type and the presence of *Candida*, supporting the role, stated by many studies 10,11, of the type of feeding on the presence of the *Candida*.

**Conclusion**

In conclusion, NNSH was associated with the higher presence of *Candida* among children. Type of feeding has an effect on the presence of *Candida* among children. Duration of breastfeeding has a potential impact on the presence of *Candida* in relation to NNSH among the Iraqi children. Therefore, all the efforts should be made to increase the duration of breastfeeding more than six months to decrease the likelihood of *Candida* infection and not engaging in NNSH.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding

**REFERENCES**


The Occurrence of Certain HDV Genotype in Patients with Chronic Hepatitis and Hepatocellular Carcinoma

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¹Medical City, Baghdad Hospital, Ministry of Health, Iraq; ²Ministry of Higher Education and Scientific Research, Middle Technical University, Iraq; ³Medical City, Gastroenterology and Hepatology Hospital, Ministry of Health, Iraq

ABSTRACT

Objective: Analysis of hepatitis delta virus (HDV) isolates from around the world has indicated that there are at least three phylogenetically distinct genotypes with different geographic distributions. The aim of this study was to determine the occurrence of HDV genotypes by direct sequencing in patients with chronic delta hepatitis in Iraq.

A cross-sectional analytical study was done on 364 chronic hepatitis B patients from both Gastroenterology and Hepatology Hospital and Baghdad teaching hospital from August 2017 till August 2018. Serological tests for HDV Ag was measured by ELISA in these patients and confirmed by Nested PCR. All patients with chronic hepatitis B had positive hepatitis B surface antigen for at least 6 months before the study entrance, it confirmed by ELISA for HBs Ag.

Design and methods: Serum samples from 364 chronic hepatitis patients (males to females ratio was 2: 1 with mean age 37 years, range 18—63 years). Samples with positive HDV Ag were undergoing RNA extraction. After reverse transcription, cDNA of partial delta antigen was amplified by nested PCR. The products of the HDV PCR were direction sequenced of 327 bp for HDV gene and it was performed by the National Instrumentation Center for Environmental Management (NICEM), at biotechnology lab. Nucleotide sequences of HDV were compared with previously reported sequences and aligned by using BioEdit.

Keywords: Genotype, Hepatitis delta virus, Sequencing

Introduction

Hepatitis is a disorder in which viruses or other mechanisms produce inflammation in the liver cells, resulting in their injury or destruction (¹).

Hepatitis may be temporary (acute) or long term (chronic) depending on whether it lasts for less than or more than six months (², ³). Viral hepatitis is the most common type of hepatitis worldwide. Viral hepatitis is caused by five different viruses (hepatitis A, B, C, D, and E (⁴).

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HDV is a defective satellite RNA virus which requires the helper function of HBV for its replication and assembly of new visions (⁵). The smallest virus known to infect humans, is increasingly again becoming a cause of fulminant hepatitis or a more rapid progression of liver disease in the setting of chronic hepatitis B virus (HBV) infection (⁶).

A single stranded RNA that can have a linear or circular conformation is 35-37 nm viruses like particles consisting of Coat of HBs Ag and a unique internal antigen (D Ag). The delta encapsulated with delta antigen is the genome. The RNA does not hybridize with HBV DNA. Synthesis of HDV results in suppression of synthesis of HBV component temporarily (⁷). Hepatitis delta (D) virus (HDV) is a small, replicatively incomplete RNA virus belonging to the Deltaviridae family that requires the presence of Hepatitis B virus (HBV) for virion packaging and transmission (⁸).
Infection with HDV can occur concurrently with HBV infection or as a super-infection in those already HBV positive. HDV infection is associated with poorer outcomes compared to those with HBV mono-infection, with increased rates of fulminant hepatitis and faster progression to cirrhosis and end-stage liver disease, resulting in high rates of liver-related morbidity and mortality \(^{(9)}\). Studies regarding the risk of HDV infection and hepatocellular carcinoma (HCC) formation are inconsistent. Some showed no increase in incidence \(^{(10)}\), whereas one \(^{(11)}\) found that HDV co-infection increased the risk of HCC threefold and mortality twofold compared to HBV mono-infection. HDV appears to suppress HBV replication, with HBV DNA levels tending to be lower in co-infection \(^{(12,13)}\). HDV is highly pathogenic. Whereas coinfection evolves to chronicity in only 2% of the cases, superinfection results in chronic infection in over 90% of the cases\(^{(9)}\). Hepatocellular carcinoma (HCC) is the second most common cause of cancer-related death in men worldwide \(^{(14)}\). Persistent HDV replication and hepatic inflammation end up with cirrhosis and HCC formation \(^{(15)}\). Active replication of both HBV and HDV may be associated with a more progressive disease pattern leading to early cirrhosis and HCC \(^{(16)}\).

To date, there are eight genotypes of HDV which have been reported with unexplained variations in their pathogenicity. Furthermore, HDV genotypes have a distinct geographical distribution, apart from HDV genotype 1 which has been observed universally \(^{(17)}\).

In this study HDV type I seem to be the unique genotype found in the Iraqi population. The aim of this Study is Determination the occurrence of HDV in chronic hepatitis and hepatocellular carcinoma, Assessment of HDV genotype in these patients.

**Materials and Method**

Three hundred and sixty four patients aged from 18 to 63 years, CHB patients had positive hepatitis B surface antigen for at least 6 months before the study entrance from both Gastroenterology and Hepatology Hospital and Baghdad teaching hospital from August 2017 till August 2018.

Questionnaire sheet was complated for each patients including personal data (age,sex)only.

Five ml of blood was collected from each patient by vein puncture using disposable syringes. The blood was placed in plastic disposable tube then the serum was separated by centrifugation at 3000 rpm for 10 minutes then stored of samples at - 45°C until the time of test HBsAg (Acon- USA), HDVAg (Cusabio-China) by enzyme-linked immunosorbent assay (ELISA), PCR (intron biotechnology/Korea) for HDVAg (positive samples).

HDV-RNA was extracted from 150 μL of serum samples by extraction Patho Gene-spinTM DNA/ RNA Extraction Kit (intron biotechnology/Korea) and 50-μL eluate was prepared. The RNA pellet was reverse transcribed to complementary DNA (cDNA), 1.5 microliters of the resultant cDNA preparation were added to 25 μL of a PCR solution containing 20 pmol of external sense primer (nucleotides (nt) 858–881) 5’ GCC CAG GTC GGA CCG CGA GGA GGT 3’ and external antisense primer (nt 1289–1312) 5’ ACA AGG AGA GCC AGG ACC ACC GAC 3’, and 5U Taq polymerase. The mixture was amplified by 50 cycles of PCR (95 °C for 1 min, 62°C for 1 min, 72 °C for 1 min) followed by a 7-min extension at 72 °C. 1.5 microliters of the product were used for the second round PCR using 20pmol internal sense primer (nt 883–906) 5’ GAG ATGCCA TGC CGA CCC GAA GAG 3’ and internal antisense primer (nt 1265–1288) 5’ GAA GGA AGG CCC TCG AGA ACA AGA 3’ set with the same conditions as the first PCR. PCR working precautions were strictly followed and negative controls were added between samples. Products were analyzed by electrophoresis on 1% agarose gel and the expected 327 base pair length was confirmed.

The products of the HDV PCR were direction sequenced of 327 bp for HDV gene and it was performed by the National Instrumentation Center for Environmental Management (NICEM), at biotechnology lab. Nucleotide sequences of HDV were compared with previously reported sequences and aligned by using BioEdit(The BioEdit Sequence Alignment Editor software) for sequencing analysis.

The HDV sequences used in this study were deposited in GenBank under accession number MK185100.1

Nucleotide sequence accession numbers of the reference HDV sequences

The accession numbers of the reference sequences used were as follows: (MF175319.1, MF175258.1, LT604938.1, AM779582.1, AF352570.1, MF175337.1, KT722840.1, AM779591.1, KJ744234.1, KF660602.1, AB201270.1).
Results

In this study we can demonstrate in table (1), the distribution of group study by age and gender. This table show age range (<20 years) 14 (3.8%) and (20-29 years) 101 (27.7%) while age range (30-39years) 117(32.1%) Whilst age range (40-49years) 72 (19.8%), (50-59 years) 50 (13.7%) and also age range (>=60y years) 10 (2.7%). From 364 cases with chronic hepatitis, 199(54.7%) males and 165(45.3%) females; there was no significant difference between male and female among patients (p >0.05).

Table 1: Distribution of Group Study by Age (years) and Gender

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;20y</td>
<td>14</td>
<td>3.8</td>
</tr>
<tr>
<td>20---29</td>
<td>101</td>
<td>27.7</td>
</tr>
<tr>
<td>30---39</td>
<td>117</td>
<td>32.1</td>
</tr>
<tr>
<td>40---49</td>
<td>72</td>
<td>19.8</td>
</tr>
<tr>
<td>50---59</td>
<td>50</td>
<td>13.7</td>
</tr>
<tr>
<td>=&gt;60y</td>
<td>10</td>
<td>2.7</td>
</tr>
<tr>
<td>Mean ± SD (Range)</td>
<td>36.9 ± 11.3 (18-63)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gender</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>199</td>
<td>54.7</td>
</tr>
<tr>
<td>Female</td>
<td>165</td>
<td>45.3</td>
</tr>
</tbody>
</table>

This means infection can occur at any age group. The mean age for hepatitis B virus was 36 years, these results agreed with (18) who found that mean ages of 37 years. Moreover, other studies agreed with this study were done by (19) who reported a mean age of 35.6 years, and (20) who indicated a mean age of 41.9 years. The difference in the source of infection or the environmental and geographical distribution could be led to lower mean age which was 27 years and this result agreed with (21).

The gender difference in HBV patients could be explained by the fact that males may have a greater chance to come in contact with the risk factors for HBV more than females and this agreed with (22) who showed a male to female ratio of 3:1 Other researchers showed similar results as well (20,23). The higher rate of chronic HBV infection among males may be due either to a prolonged replicative phase of the virus in male or to differences in sexual behavior (24).

The Mean ± SD (Range) as seen in the table (2) was showed the distribution of cases by HDV Ag. The result showed Positive (=>0.17) 16(4.4%), while Negative (<0.17) 348 (95.6%).

Table 2: Distribution of Cases by HDV Ag

<table>
<thead>
<tr>
<th>HDV Ag</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive (=&gt;0.17)</td>
<td>16</td>
<td>4.4</td>
</tr>
<tr>
<td>Negative (&lt;0.17)</td>
<td>348</td>
<td>95.6</td>
</tr>
<tr>
<td>Mean ± SD (Range)</td>
<td>0.104 ± 0.044 (0.0103-0.4410)</td>
<td></td>
</tr>
</tbody>
</table>

The correlations among study parameters HDV Ag with age and gender are seen in a table 3. The result showed the a non- significant positive relationship (p>0.05) when comparing between HDV Ag with age and gender Ag by using Pearson correlation.

Table 3: Correlation between HDV Ag with age and gender

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>HDV Ag</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive (=&gt;0.17) (n=16)</td>
<td>Negative (&lt;0.17) (n=348)</td>
</tr>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>&lt;20y</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>20---29</td>
<td>3</td>
<td>3.0</td>
</tr>
<tr>
<td>30---39</td>
<td>10</td>
<td>8.5</td>
</tr>
<tr>
<td>40---49</td>
<td>1</td>
<td>1.4</td>
</tr>
<tr>
<td>50---59</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td>=&gt;60y</td>
<td>1</td>
<td>10.0</td>
</tr>
<tr>
<td>Mean ± SD (Range)</td>
<td>38.1 ± 10.5</td>
<td>36.8 ± 11.4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gender</th>
<th>HDV Ag</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Male</td>
<td>9</td>
<td>5.5</td>
</tr>
<tr>
<td>Female</td>
<td>7</td>
<td>3.5</td>
</tr>
</tbody>
</table>
Table 4 has shown the correlations between HDV Ag and PCR for HDV when analyzed by Pearson correlation. The result showed a high significantly positive relationship (p<0.0001).

These Results Agreed With (25) who showed difference Percentage when Comparison Between HDV Serology and PCR Positive Samples. The sensitivity of HDV RNA detection can be influenced by the variability of the HDV genome and the primers selection. Today, there is no available international or control to calibrate a quantitative assay for HDV.

**Table 4: Correlation between HDV Ag and PCR for HDV**

<table>
<thead>
<tr>
<th>PCR for HDV</th>
<th>HDV Ag</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive (=&gt;0.17) (n=16)</td>
<td>Negative (&lt;0.17) (n=348)</td>
</tr>
<tr>
<td>No</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>Positive</td>
<td>4</td>
<td>100.0</td>
</tr>
<tr>
<td>Negative</td>
<td>12</td>
<td>3.3</td>
</tr>
</tbody>
</table>

One and half µl of PCR Product (PCR 1) external were used for each PCR reaction. A conventional PCR protocol was used to analyze simultaneously the presence of HDV viral was identified by 327bp as shown in Fig. 1.

The results of sequences of this study were compared with the reference sequence of in national center biotechnology information (NCBI) Gene Bank and showed that the degree of similarity was high between sequences which give greater confidence (16).

From the Gene Bank, found that having 99% compatibility with standard in Gene Bank. This sequence was submitted to gene bank NCBI, DNA data bank of Korea/Macrogen (26). In another study on geographic distribution and genetic variability of hepatitis delta virus genotype I, sequence divergence among genotype I isolates from different countries ranged from 3.1% to 13.4% (27).

**Conclusion**

HDV genotyping was successfully performed by direct sequencing of the amplicons obtained from routine HDV-RNA screening PCR tests. The HDV isolates from the chronic delta hepatitis patients included in this study were found to be genotype I. HDV type I seems to be the unique genotype found in the Iraqi population, which is an expected finding in agreement with similar epidemiological studies from the Mediterranean region and confirms previously published data.

The occurrence of hepatitis Delta virus was significantly in patients with chronic hepatitis and hepatocellular carcinoma. The distribution of hepatitis Delta virus in patients with Chronic hepatitis and hepatocellular carcinoma revealed non signification association regarding age and gender.
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Organizational Loyalty and its Correlation to the Creativity of Members of the Federations in Tennis Games in Iraq

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ABSTRACT

The research problem centered on studying one of the important aspects of the organizational loyalty of the members of the Union as well as their ability to administrative creativity in the work of the Union to promote it and whether there is a correlation between them, and certainly the level of sports leaders represented by the President of the sub-union have a positive and negative impact on the work of the Union. The problem of research is the need to know the extent of the organizational loyalty of the president of the sub-union of the tennis games and the characteristics that should be characterized by the president in order to be a successful leader because his work in the field is an important and decisive factor in improving the performance of the federation and its reflection on the ability of creativity of the members of the federation and thus in achieving the desired results for the members of the federations in racket games.

The objectives of the research was to identify the level of organizational loyalty and administrative creativity of the members of the federations Iraq, and identify the relationship between organizational loyalty and creativity ability of members of the federations in tennis games in Iraq, and predict the level of organizational loyalty in terms of the ability to creativity among members of the federations in tennis games in Iraq, Descriptive of the members of the federations in tennis games (tennis, table tennis, badminton and squash) in Iraq for the season (2017-2018) and the number (84) members distributed in (18) provinces, the researchers concluded the validity of organizational loyalty and creativity measures used in measuring the degree of organizational loyalty and ability. There is a positive correlation between the organizational loyalty and the ability of the members of the federations to play tennis in Iraq.

Keywords: Organizational loyalty, creativity and federations.

Introduction

Organizational loyalty promises to be the employee’s reaction to the characteristics of the organization to which he belongs. It also means the employee’s sense of his association with the goals and values of the organization and the role he plays to achieve these goals and commitment to functional values for the organization, and creativity is new and useful ideas related to solving specific problems or grouping Restructuring known patterns of knowledge into unique forms. Creativity is not limited to the technical side, as it involves not only the development of goods and related processes, the preparation of the market, but also the machinery and equipment, manufacturing methods, improvements in the organization itself, and the results of training and satisfaction. Creativity requires the ability to sense a problem that requires treatment, and then the ability to think differently and creatively and then find the right solution.¹

One of the important aspects of the organizational loyalty of the members of the Union as well as their ability to administrative creativity in the work of the Union to promote it and whether there is a relationship

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between them, and certainly the level of sports leaders represented by the President of the sub-union have a positive and negative impact on the work of the Union, so a good choice the problem of research is the need to know the extent of the organizational loyalty of the president of the sub-federation for tennis games and the characteristics that must be characterized by the president in order to be a successful leader because his work in the field constitutes An important and decisive factor in improving the performance of the federation and its reflection on the ability of creativity of the members of the federation and thus in achieving the desired results of the members of the federations in racket games.²

The objectives of the research was to identify the level of organizational loyalty and administrative creativity of the members of the federations of the games. Researchers have assumed a significant relationship between the level of organizational loyalty and ability the creativity of the members of the federations in the tennis games in Iraq, and the predictability of the level of organizational loyalty in terms of the ability to creativity among the members of the federations in the tennis games in Iraq.

Research Methodology

The researcher used the descriptive method of survey methods, correlations and standard studies to suit the requirements of the research on the members of the federations in tennis games (tennis, table tennis, badminton and squash) in Iraq for the season (2017-2018) and the number (84) members distributed in (18) governorates.

Description of organizational loyalty scale: The measure consists of (35 paragraphs) distributed over its three domains (11) paragraphs for the emotional field, (14) paragraphs for the moral field, and (10) paragraphs for the continuous field, it is corrected by the correction key which consists of five alternatives namely (always, Often, sometimes, rarely, at all) weights were given (5-4-3-2-1), respectively, the highest score obtained by the subject (175) and the lowest score (35). The hypothetical mean of the scale (105), and whenever the degree obtained by the examiner is equal to or higher than the hypothetical mean that indicates the prevalence of organizational loyalty when the member was added paragraphs lie detector outside the total number.

Describe the ability to creativity: After examining the researcher on a number of tests related to creativity. It was found that the scale is the most suitable for research, which consists of (70) items aimed at measuring the creativity of the members of the federations in racket games and answered by five alternatives (always, often, sometimes, rarely, Absolutely) Since the total degree of the scale of (70-350) degree, the scale was adjusted to suit the nature of the sample of the research sample, then it was presented to the gentlemen experts to ensure the validity of its use as they confirmed the safety of the procedures followed and the validity of its use on the members of the research sample, and thus The scale is made up of (60) items and is ready for application.³

This section includes the presentation, analysis and discussion of the results reached in the light of the objectives set as a result of its application of research tools, and verified by the first research objectives, which was to identify the reality of organizational loyalty and creativity among members of the federations in tennis games as follows:

1. The reality of organizational loyalty and creativity among the members of the federations in racket games: To achieve the first objective in identifying the reality of organizational loyalty and creativity among the members of the unions, after analyzing the data, the mean of the organizational loyalty scale was (134.72) and a standard deviation of (6.24). 248.99 with a standard deviation of (23.62) and table (1) shows this.

Results

Table 1: Shows the mean and standard deviation and the calculated (t) value of the members of the federations in the racket games for the organizational loyalty and creativity measure

<table>
<thead>
<tr>
<th>Scale</th>
<th>Sample</th>
<th>Mean</th>
<th>Mean median</th>
<th>SD</th>
<th>Calculated (t) value</th>
<th>sig</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organizational Loyalty</td>
<td>78</td>
<td>134.72</td>
<td>105</td>
<td>14.76</td>
<td>6.24</td>
<td>0.000</td>
<td>Sig.</td>
</tr>
<tr>
<td>Creativity</td>
<td>248.99</td>
<td>180</td>
<td>23.62</td>
<td>9.91</td>
<td>0.000</td>
<td></td>
<td>Sig.</td>
</tr>
</tbody>
</table>
From Table (1), there are many benefits such as commitment, motivation, and increasing morale. In contrast, there are benefits that the member of the Union can get from his job in the Union as a source of livelihood. At the same time, these benefits increase the belonging and loyalty that may be due to Physical and social values of respect and appreciation in society, which increases the emotional attachment to the organization, and therefore increased the average emotional sphere, and whether physical or social reasons, it is a direct factor to achieve self-fulfillment that leads to job satisfaction, the latter enables the Union member to accept on performance His duties are enthusiastic and harness his full potential and energies, and bear the responsibilities assigned to it, and thus increase the level of integration and membership in the Union, which reflects positively on the continuity of work in the Union, and this result is consistent with the study, conducted on a sample of faculty members in Jordanian universities, The study conducted at the University of Sana’a in Yemen, which concluded that the level of organizational loyalty was high, and can be attributed to the low level of continuous loyalty among members of the Union compared to other dimensions of organizational loyalty, due to the lack of material advantages of rewards, incentives and promotion opportunities, This gives them a sense of job satisfaction and makes them more associated with the union, as well as a sense of instability and job stability and that they work in temporary jobs, as a result of the unions adopted a four-year election policy in their appointment. The results of this study are consistent with the results of the study, whose results indicated that employees have a moderate degree of organizational loyalty in its three dimensions (emotional, continuous and normative) and a study that found that faculty members in private universities have an average level of organizational loyalty to their universities.

Also, Table (1) shows that the mean average of the sample on the creativity scale was (248.99) and the standard deviation (23.62) degree, that the average achieved is greater than the hypothetical mean of the scale of (4.91). It is found that the value of (sig) is smaller than (0.05), and this result explains that the members of the unions have a high level of creativity.

The reason for this is that creativity means the distinctive activities that people do and cannot be done by the machine, so a good creativity system focuses on retaining highly skilled and highly trained staff, providing them with additional knowledge, encouraging them and making them able to think and work creatively. It also requires the diagnosis and provision of suitable conditions for creative activity and help in achieving the target creative output. The focus was on the components of the system of creativity or pillars on which to determine the level of creativity and development and included a range of factors, including organizational culture It means the creativity values that encourage employees to think distinctly and calculate risk and challenge the existing situation, as well as responsibility, which is to determine who is responsible for creativity and that means all employees in the organization and everyone should work to make proposals and implement improvements to the workflow, as well as the human resources system that contributes In developing individuals and encouraging them to be creative, this requires following up the requirements of training, evaluation, monitoring and rewards in order to encourage social behavior, and in the same context the system of measuring the performance of individuals, by developing accurate and objective systems to measure the performance of individuals. E level of creativity and its effects in improving the performance of individuals working in the organization, as well as the acquisition of knowledge the exercise of administrative processes that provide the organization with new ideas, information, concepts and knowledge through the use of specialized centers in the acquisition and development of knowledge, and the management of knowledge and creativity.

Table 2: Shows correlation between organizational loyalty and creativity among members of federations in racket games

<table>
<thead>
<tr>
<th>Variables</th>
<th>Correlation coefficient</th>
<th>df</th>
<th>(t) calculated</th>
<th>(t) tabulated</th>
<th>Significance level</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organizational loyalty and creativity</td>
<td>0.543</td>
<td>76</td>
<td>8.205</td>
<td>1.96</td>
<td>0.05</td>
<td>Sig.</td>
</tr>
</tbody>
</table>

The above table shows that there is a correlation between organizational loyalty and creativity. This result can be explained by the fact that it is the members of the federations who have organizational loyalty as belonging
to the organization in which they work and because it is
the art of influencing others with the desired criteria of
loyalty and creativity. Thus, their performance in sporting
events and activities necessitating their administrative
work in the management of their federations and their
practices. Artistic and as influential must be followed
by organizational loyalty and educational help to the
cohesion and commitment of members of society and
the values that affect them positively, and also that some
members are working to raise organizational and sports
at the level of loyalty of their colleagues.9

This finding is consistent with the findings of
the Moller et al. 2001 study (1). The results show
that organizational loyalty helps to guide colleagues,
achieve a higher level of education and develop positive
relationships between management and teachers, which
means collaboration through joint leadership. Without
organizational loyalty, there is no effectiveness for the
organization. Organizational loyalty is reflected in all
its employees through its actions, where employees
learn modern behaviors and how the principles of
organizational loyalty are entrenched by their subordinates and thus reflect on their ability to innovate
at work and affect them in the future.

And encourage some to follow the desired modern
methods in order to create a kind of effective interaction
as well as their responsibility, which results in building
strong relationships between the group and move their
performance and social organization in order to obtain
distinctive results. As well as their sense of importance
and value between their colleagues and the community
they work with, and also that the members of the unions
attach importance to social relations because of the
exercise of sports activities within and outside the union.

| Table 3: Shows the significance of the correlation coefficient and the percentage of organizational loyalty contribution to creativity |
|---|---|---|---|---|---|
| Variables | Correlation coefficient | The value of correlation coefficient (r) | Contribution rate $r^2$ | df | (f) value |
| Organizational loyalty and creativity | Simple | 0.64 | 0.40 | 1-233 | 168.44 |

The researchers attribute this to the fact that organizational loyalty has a significant impact on the creativity
of members as a result of the fact that organizational loyalty is a cornerstone of leadership and is also the way of
successful management, so there is a close relationship between each of them, the more the member has a high
organizational loyalty, the positive impact Organizational loyalty instills in individuals a set of values that help them
identify acceptable and unacceptable behavior, and what is beautiful, true, disliked and wrong, and increases the
adherence of individuals to the organization and increases the character of altruism and self-denial and present the
interest of the institution on the private interest.10

| Table 4: Shows the results of the predictive equation of the variables contributing to transformational leadership |
|---|---|---|---|
| Variables | Value of the factor | Value (t) | Significance level |
| Organizational Loyalty | A 16.242 | 1.413 | 0.05 |
| | B 0.586 | 12.975 | 0.05 |
| Predictive equation | Organizational Loyalty = 16.241 + 0.585 * Creativity |

This shows the possibility of predicting
organizational loyalty in terms of the ability to creativity,
including the behavior of members of the federations
in tennis games in Iraq, and through the results and
predictive equations reached to note the possibility of
detecting any member of the federations in the case of
characterized or possessed organizational loyalty to
reveal its potential in the ability to This early detection is
a positive step for them in correcting their performance
because the prediction process is a speculative and
discretionary process based on sound scientific bases
that gain full confidence and that this process is not
necessarily to be 100% identical with reality but has a percentage A beer to know the attitudes of the members of the Union and the manner of its actions, actions or performance in the administration of the Union.\textsuperscript{11}

**Conclusions**

1. The validity of the organizational loyalty and creativity measures used in measuring the degree of organizational loyalty and creativity among the members of the federations in the racket games in Iraq.

2. The members of the federations enjoy a good amount of games (organizational loyalty, creativity).

3. There is a positive correlation between organizational loyalty and creativity among the members of the federations with tennis games in Iraq.

4. The possibility of predicting organizational loyalty in terms of the ability to creativity among members of the federations in tennis games in Iraq.

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**REFERENCES**


Leeches Review: Biology, Ecology and Medical Important

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ABSTRACT

Hirudotherapy (HT) is the submission of healing leeches (Hirudo medicinalis) for beneficial use. It is one of the firstborn medications, being active by several healing experts. HT contains the accessory of cultivated leeches against the pretentious zones. Leech treatment includes an original chew, which is frequently an easy mouthful, trailed by the slurping of 5 and 15 ml of blood. Its main healing assistances are not only owing to blood drunk during the piercing, but also from the many bioactive matters, such as Hirudin, Calin, Hyaluronidase, and Histamine-like ingredients, to name a scarce.

HT has been active in numerous illness circumstances and clinical difficulties. It has been effectively used in soft and reconstructive operations, cardiovascular difficulties, varicose veins, hemorrhoids and various joint ailments. Nowadays, it is also being utilized in intestinal complaints, dermatology and antenatal irregularities.

More newly, HT has created new claims in tumor healing, sensitivity situations, like asthma, male/female sterility and diabetes. Attractive into deliberation all the truths, HT labors should be made in improving the achievement of remedial leech therapy in scientific and isolated practice.

Keywords: Hirudotherapy, leech, annelid, saliva, bioactive, reconstructive surgery

Introduction

Leeches are of worldwide distribution they are ectoparasites animals wild and domesticated animals, they return to phylum Annelida and to subclass Hirudinea¹, distinguished from other annelids by having two suckers in the interior end and the posterior end have well developed sucker, the body contain from 34 body segments no setae or parapodia like other species returns to phylum Annelida² and³ (Figure 1).

Figure 1: Anatomy of leeches⁴

They life in freshwater, marine and on the surface of trees, grass and under stones in damp places. Some are parasites and other are involved lifecycle of parasites, they consider vectors of Protozoans like Trypanosoma, Cryptodira, Haemogregarina on fish, Amphibians,
Reptiles, Cattles, Man and other domestic animals cause anemia for them, they can serve as hosts, both intermediate and final, they demonstrate both pathogenic and beneficial effect on humans and animals (5 and 6).

**Biology of Leeches:** They have slender, leaf shape body that distinguished them from other species return to phylum Annelida, no have any appendages on their bodies, they have tow suckers the first one large adhesive the posterior while the anterior sucker was small and located surrounds its pointed apical mouth finally they have soft body that lacks a skeleton for protection (7), their eyes commonly vary from one to five pairs depended on species. They small animals their long range from 10 to 35 cm but ectoparasites leech their long range from 5 mm to 45 cm and they have brightly color but their dorsal surface is olive green (8), clitellum region extends from 10 – 12 segments, contain male and female genital openings, secrete the eggs cocoon which is only visible in summer and they excretion by Nephridia found in special segmental in the body, they respiration through the body wall, their blood is red because has hemoglobin dissolved in blood, that help to transport oxygen via capillary network to all parts of the body (9). They are hermaphrodites animals that meaning each has both ovaries and testes, sperms transfers from leech to another by spermaphores they occur during copulation, clitellum hold their eggs and secrete cocoon during reproduction time, the type of fertilization called X- fertilization and each leech shoots spermaphore into pores in clitellum of his partner the cocoon damped into the soil (10).

Young leeches hatch from cocoon after they feed for a few days on yolk every cocoon contains different number of fertilizer eggs depended on species, adult leech lives 18-27 years (11).

**Digestive system and feeding in Leeches:** They are have jaws and three blades set at the angle to each other, they slice the skin of their hosts and contain Y-shape behind the blades there is mouth located at ventrally in the anterior end of the body then there is pharynx, esophagus, crop, gizzard finally intestine, which end at the posterior sucker, the function of crop is storage while in blood sucking species of leeches when crop storage blood mail it produced an anti-coagulant that prevent clotting (Figure 2) . In the predatory leeches instead jaws there are proboscis and some of leeches feed small invertebrates or detritus so they have proboscis nor jaws but simply engulf their food with the mouth. (12)Most predatory leeches are feed on worms, snail and insect larvae, they swallowed the soft parts of preys bodies in the digestive tract of leeches there are many types of bacteria they live like colonized (13), they synthesizing essential nutrient digesting food and killing harmful animals, they are obligatory symbiotic relationship with leeches like *Aeromonas veronii, Rikenella* species, *Euphobella punctate, Pseudomonas aeromonas, P. hirudinicyla, Klebsiella spp* and *Bacterium hirudinicolum*, all these bacteria produced many vitamins for example (B complex) to participate in food digestion, bacteria are passed to offspring in the cocoon as it is formed (14 and 15). These organisms have many touch receptors upper lip region to find a good site to feeding blood that site specialized with good taste – glucose and feels pulsating movements that indicate to artery before feeding leeches starts to pump air into and out of cavity after that positions its jaws on its victim, after that leech secretes saliva into the wound while teeth deeper into hosts skin like efficient micro pipettes that inject substances into wound, through feed period they appear to fall asleep after 20 – 60 minutes they release victim by open its jaws, continue involved to host for 30 minutes 6 hours for nourishing, they can taste about 5 – 15 ml of body fluid (16).

**Figure 2: Digestive system of Leech**(17)

**Nervous system:** Nervous system of leeches contain large nerve cells, so researcher use their nervous system as an example in the study of the nervous system of Invertebrate (16), the main nerve center consist of cerebral ganglion, ventral ganglion, posterior ganglion and
various sensory receptors and there is lower pharyngeal ganglion consist of four fused ganglia and there is caudal ganglion consist of seven fused ganglia, they have large neurons that models for neural performance in higher animals (19). They have 2 – 10 pigment spot ocelli and they have sensory papillae each one contain sensory cells. They can detect touch movement of nearby objects, vibration and chemicals that secret by their hosts with movement head and waving body (20).

Environmental Factors: Many environmental factors will lead to great important on diversity of leeches in aquatic habitat destruction and fragmentation, perhaps cause disappear some of leech’s species in the next century (21). Urban areas are increasing rapidly day by day so that during construction the roads all wastes with precipitate may kill leeches and destroy the cocoon breeding field in wetlands.

(22) When people used leeches in medical purposes that lead to decline in their habitats, (23) and many of factors effect on leeches like Endocrine disrupting compounds (EDC5) are pollutants have the ability to alter the growth, reproduction and general embryonic and morphological development of aquatic animals (24), these EDC5 come from a variety of sources like pharmaceutical, plastics, pesticides, ordinary household chemicals and industrial chemicals.

All these can anomaly leech offspring deformities in leech embryos and disruption of leech reproduction, they poikilotherms and they live in 0 C° - 30 C° temperature but when temperature changes rapidly these animals’ death (25).

Finally, leeches are one of the most important components of freshwater lakes, streams, rivers and in many marine and terrestrial habitats, and leeches constitute the most important element of fish diet in their habitat (26).

History of Leeches therapy: AL-Hijamah (Bloodletting=Phlebotomy) was part of Islamic medicine and was mentioned by Prophet Mohammed (peace be upon him) many elaboration on different type of bloodletting was done in Islamic time, after that Ibn –al-Quff put many guidelines on beneficial and toxic types of Leeches (27), Linnaeus in 1758 he is first described two worms they return to Annelida the first one was Lumbricus terrestris while the other was Hirudo medicinalis (28). The Indian God of Ayurveda held Leeches in one of his hand some presumed the snake of Asquiliboons (Esculptian) staff in actually leech (29), while (30) remember in 1955 that Markwardt was first one who isolate hirudin from pharyngeal glands of Leeches and Fourcher himself described used Leeches in medical treatments.

The world Leech resultant since an ancient English world for medical doctor lace (31). In Egypt as 155 BC, where used leeches to treat nose blood and gout, in Greece, Chine, India and Pre-Columbian America they used leeches for therapeutic purpose, in 19th America were frequently a homebased remedy for secretion complaints hemorrhoids and great discolorations (32), In 1884 Haycraft remember esophagus and entrance of leeches confined a material prohibited the body fluid from clotting while Jacoby in 1904 explained that material was named hirudin (33).

Discussion

To date, many scientific studies published and some part of effect mechanisms were enlightened. a leech bite, it has to open a “sucking” pathway (extracellular matrix destruction), inhibit adhesion, aggregation and coagulation (inhibition of platelet functions, anticoagulant effect), increase the blood flow, protect itself (antimicrobial activity) and try not to be noticed (analgesic and anti-inflammatory effects). leeches immediately release hyaluronidase and collagenase enzymes to easily penetrate the tissue and spread its bioactive molecules. These enzymes also have supportive effect on antimicrobial activity. some studies indicate that some kinds of kininases and “antistasin” molecule may inhibit the kinin kallikrein mechanism which is a major pain-composer route. Destabilase has beta glycosidase activity which directly disrupts beta 1-4 binds that are key of the peptidoglycan layer in cell walls of bacteria. It is clear that this act is similar with Lysozyme (muramidase) that is commonly found in human saliva and lachrymal fluid. Furthermore, additional studies stated that antimicrobial activity does not only depend on enzymatic glycosidase activity, but it has also non-enzymatic ways to show this action. Of note, it is shown that dose dependently, even the denaturated form shows bacteriostatic effect on Staphylococcus aureus, Pseudomonas aeruginosa and Escherichia coli. Chloromycetyn is a potent antibiotic.
found in leech secretions, but unfortunately the data is limited about this issue. Additionally, theromacin, therymyzin and peptide B were isolated as antimicrobial peptides. In vitro studies were published indicating anti-cancer effects of leech saliva extracts. Since coagulation is related to metastasis and tumor progression, blocking the cascade can be an anti-tumor act. Hirudin has been studied upon this topic and very promising results about metastasis, especially with mesothelioma were reported. In addition, another anticoagulant derivates were claimed to have similar effect, but also reducing cell growth and tumor angiogenesis. The extracts were found to be provoking apoptosis and cell differentiation and causing cell cycle arrest. The main action mechanisms seem to be depending on suppressing ongogenic gene expression and upregulating apoptotic chains. On the other hand, effects against cell degeneration were also reported. Eglin C, bdellastasin, destabilase, bdellins and hirudin were found to be very protective and/or stimulative actions positively, especially on neurons, but these studies are on just preliminary phase.

Conclusion

Leeches have slender, leaf shape body that distinguished them from other species return to phylum Annelida, they have clitellum region contain male and female genital openings secrete the eggs cocoon, they excretion by Nephridia, they respiration through the body wall, their blood is red because has hemoglobin dissolved in blood. They are hermaphrodites’ animals, the type of fertilization called X- fertilization. They are having jaws and three blades set at the angle to each other, there is mouth located at ventrally in the anterior end of the body then there is pharynx, esophagus, crop, gizzard finally intestine, while in blood sucking species of leeches when crop storage blood mail it produced an anticoagulant that prevent clotting. In the predatory leeches instead jaws there are proboscis and some of leeches feed small invertebrates, they synthesizing essential nutrient digesting food, they are obligatory symbiotic relationship with bacteria produced many vitamins.

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REFERENCES


The Personality of the Obsessive and Their Relation to the Motivation of Achievement of Volleyball Players

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ABSTRACT

The objective of the research is to find the relationship between the personalities of the obsessive and identify the relationship between them and the motivation of achievement of the teams of the University of the Middle Euphrates Volleyball, the researcher assumed that there are no significant differences between the personality and aerodynamic achievement volleyball. The study sample consisted of (96) athletes representing the Middle Euphrates Technical University for the 2016-2017 sports season, 12 of whom were excluded for participating in the exploratory experiment. The researcher used statistical means (percentage, arithmetic mean, standard deviation, and global analysis).

Through the results obtained by the researcher, they derived the following:

1. The relationship that has emerged is a negative relationship between the personality Obsessive and motivation to achieve volleyball.

2. The plane players enjoy varying degrees of personality and under the conditions of sports competition and low grades during the training modules.

Keywords: Obsessive, motivation and achievement.

Introduction

The relationship between psychology and sports and physical games is an interrelated and dialectical relationship that is characterized by the interaction of the living and cannot be separated from this link as psychology generally addresses the problems experienced by individuals in their lives, which appear in the form of emotions and acute and sometimes abnormal and in the form of deviations, disorders and diseases and psychological contract. Psychological problems are always the result of the poor compatibility of the individual with himself on the one hand and poor compatibility of the individual with his environment and the environment on the other. This causes failure to achieve the individual’s goals and satisfy his psychological needs. And social and social.

“Sport psychology plays an important role in the lives of individuals, as it directly affects their behavior, and therefore we see its effects in many of their actions. Sports psychology can be seen as a kind of motivation, desires, mental and physical abilities, attitudes, personality, Attention, control, stability and other situations are acquired, fungus and development of experience in the first case and since birth in the second case can be developed. The individual must strive for success and that “feeling inferior is normal for people and can lead to a state of creativity and the goals are In order to overcome problems by the creative force inherent in the human that helps to achieve the natural talents of self-realization.” Hence the importance of research in finding the relationship between the personality and aerodynamic achievement of volleyball players as it tries to shed light on the nature of the relationship between Two variables are important, the first relates to the psychological aspect of the personality of the obsessive of the players the other variable is the motivation of achievement as well as that the study comes in the field of volleyball game and the motivation of achievement to urge the player to be advanced and

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distinguished among his peers in the team, Achievement and excellence work on stimulating and raising the potential energy of the friendly and working to double and directing its efforts and energies towards achieving the goal of higher achievement. As a result of the above, the importance of research lies in the identification of the level of personal intuition of the players as well as the level of motivation achievement and thus know the type of relationship and influence between the personality and motivation and motivation to achieve.

**Research Aims:**

1. Identifying the personality of the virtuoso and the motivation of achievement among the players of the Euphrates Middle Technical University.

2. To identify the type of relationship between personality and motivation and motivation of achievement of players.

**Hypothesis:** There is a significant relationship between the identity of the obsessive and the motivation of achievement in the players of Al-Furat Al-Awsat Technical University volleyball.

**Research Methodology:** The nature of the study necessitated the use of the descriptive method of surveying, which aims to “collect data to try to select hypotheses or answer questions related to the current or current situation of the members of the research sample”.

**Community and Sample Search:** The research community included the players of the Middle Euphrates Technical University and participated in the Middle Euphrates Technical University for the academic year (2017-2018). Therefore, the sample consisted of (96) players representing the players of the Middle Euphrates Technical University of institutes and colleges Technical Institute of Kufa, Diwaniyah, Technical Institute of Samawah (participation in this tournament as shown in table (1).

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Players</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td>96</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Search tools and devices:** The search included the following tools and devices:

- Arab Sources
- Observation.
- Questionnaire

**Either used equipment:**

1. Hand calculator.
2. A computer type (dell).

**Field research procedures:**

**Procedures for setting up the research criteria:** It was based on the scientific sources and the personal scale of (Essam Mohammed Abd Al-Redha), which consists of (24) items to be answered by the examinee. The scale was presented to a group of experts and specialists (Appendix 3) and they expressed their opinion on the adequacy of the scale with some minor modifications and appeared in His final image. As for the measure of achievement motivation, it was based on the measure of achievement motivation which has been applied in the Iraqi environment, where the scale consists of (31) paragraph answered by the examinee and also presented to the experts and specialists and showed his suitability to work.

**Pilot study:** The researcher carried out the pilot study on 12/12/2017 on 12 players from Al-Furat Middle Technical University from the Technical Institute in Kufa, where he was able to identify the extent of the players’ understanding of the standards and the clarity of the instructions and overcome the difficulties that may occur in order to prepare for the main application of the measurements.

**Correction method for the meter:** The measurement of the personality of the obsessive (24) paragraph and answer them according to three alternatives (often, rarely, rarely) and weights are given to grades (1,2,3) respectively for the positive paragraphs and vice versa.
negative paragraphs As for the measure of achievement motivation consists of (31) The player answers them according to four alternatives (which apply to me to a large extent, apply to me to a medium degree, apply to me to a small degree, do not apply to me) and score (1,2,3,4) respectively, and this answer to the positive paragraphs and vice versa negative paragraphs.

**Total score calculation:** Since the measure of personality is composed of (24) paragraphs, the highest score of the player is (72) and the lowest score is (24) and the mean of the rate (57.34) and the standard deviation reached (4.97) As for the measure of achievement motivation consists of (31), So the highest score for the player is (124) and the lowest score is (31) and the mean (39.76) and the standard deviation reached (3.85).

**Main experience:** This was done during the Euphrates Middle East Technical tournament for the period 6-11/12/2017 and in the collective style and at the Technical Institute in Kufa where the questionnaire forms were distributed on the sample of (96) players and after the measurement by the players the forms were collected for the results of the research.

**Results**

View and discuss results:

**Table 2: Shows the relationship between the arithmetic mean and the mean medium**

<table>
<thead>
<tr>
<th>Name of college or institute</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>Mean medium</th>
<th>df</th>
<th>(t)value Calculated</th>
<th>Tabulated</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Babylon Technical Institute</td>
<td>12</td>
<td>54</td>
<td>43.6</td>
<td>62</td>
<td>11</td>
<td>24.1</td>
<td>20.2</td>
<td>Non sig.</td>
</tr>
<tr>
<td>Technical Institute of Samawah</td>
<td>12</td>
<td>56.67</td>
<td>24.3</td>
<td>62</td>
<td>11</td>
<td>02.2</td>
<td>20.2</td>
<td>Non sig.</td>
</tr>
<tr>
<td>Total</td>
<td>48</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

It is evident from Table (2) that the value of the arithmetic mean is greater than the mean value of the research sample, which indicates that they have an unbalanced, obsessive personality. Therefore, the calculated value is less than the tabular value at the level of freedom (11) (0.05) indicating significant differences between calculated and tabular scores. As for achievement motivation, Table (3) shows how to identify the motivation of achievement in the research sample and the relationship between the arithmetic mean and the mean medium.

**Table 3: Shows the relationship between the arithmetic mean and the mean medium**

<table>
<thead>
<tr>
<th>Name of college or institute</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>Mean medium</th>
<th>df</th>
<th>(t)value Calculated</th>
<th>Tabulated</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Najaf Technical Institute</td>
<td>12</td>
<td>41.41</td>
<td>6.21</td>
<td>77.5</td>
<td>11</td>
<td>1.44</td>
<td>20.2</td>
<td>Non sig.</td>
</tr>
<tr>
<td>Technical Institute Musayib</td>
<td>12</td>
<td>32.19</td>
<td>5.11</td>
<td>77.5</td>
<td>11</td>
<td>1.97</td>
<td>20.2</td>
<td>Non sig.</td>
</tr>
<tr>
<td>Karbala Technical Institute</td>
<td>12</td>
<td>33.11</td>
<td>3.76</td>
<td>77.5</td>
<td>11</td>
<td>1.74</td>
<td>20.2</td>
<td>Non sig.</td>
</tr>
<tr>
<td>Technical College Kufa</td>
<td>12</td>
<td>33.45</td>
<td>5.32</td>
<td>77.5</td>
<td>11</td>
<td>2.03</td>
<td>20.2</td>
<td>Non sig.</td>
</tr>
<tr>
<td>Total</td>
<td>48</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table (3) shows that the value of the arithmetic mean is less than the mean value of the mean, indicating that the sample of the research in the achievement motivation is low. Therefore, the value of (t) between the arithmetic mean and the mean is not significant at the significance level (0.05) (t) is smaller than the tabular value (t), indicating that the differences between them are not significant between the calculated and the tabular of all the participating teams.

**Identify the relationship between the personality and the motivation of achievement in the research sample:**

To find out the relationship between the personality and the motivation of achievement in the sample of the research, it is necessary to find correlation coefficient (Pearson) as in Table (4).
Table 4: Shows the correlation coefficient and the calculated value of (t) for the significance of the correlation, the scale and the significance level

<table>
<thead>
<tr>
<th>S.</th>
<th>Variables</th>
<th>Coefficient of correlation</th>
<th>df</th>
<th>(t) calculated</th>
<th>(t) tabulated</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Personal obsessive</td>
<td>0.42</td>
<td>82</td>
<td>0.24</td>
<td>0.29</td>
<td>Non sig.</td>
</tr>
<tr>
<td>2.</td>
<td>Achievement motivation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As shown in table (4), the relationship between intuition and motivation is negative, and the reasons are many. The researcher attributes it to the concerned personality in the study sample, which affects the level of performance of the players because “there is a statistically significant inverse relationship in the level of personality and skill performance at the level of the player. For the player to achieve the psychological stability and personal stability of the player to achieve stability in the level of the player and the success of the player in the achievement of motivation to achieve an effective motivation to achieve otherwise the opposite happened and balance and control and stability depends on the experience of the player because “sports experience has an important role and effective in the to control unwanted psychological situations before racing and competition, as providing emotional excitability at a good level helps to achieve motivation for a good achievement. “The motivation, motivation, pleasure, joy and pleasure of the trainer in the training modules have a positive effect to increase the motivation of achievement of the player so.” The successful coach is skilled in organizing the physical and psychological energies of the players and how to control and control the ideas and feelings of players during the competition, making the performance develops correctly “. The construction of an influential and balanced personality that depends on stability distanced the tension and anxiety and dispersion of the ideas that accompany the performance in strong games because”. The optimum excitation rate leads to behavior and effective performance. “It has been achieved by imposing the search for a relationship Between the personality of the obsession and motivation of achievement, but this obsessive must be at a level that can be used and is not effective in the player’s motivation is done through the preparation of good psychological by the coach during the training period and to familiarize the player on how to cope with the difficult conditions with control and without nervous in order to benefit from this personality Positivistically to increase motivation and achieve good team performance “.

Conclusions

1. Owning a sample of the search on a personality and a large and high and low motivation and achievement.

2. There is an inverse relationship between the achievement motivation and the obsessive personality of the research sample.

3. The adoption of one of the means of mental training works to reduce the degree of personal obsessive and the player’s level of good after the end of warm-up and the beginning of competition.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

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7. Abdel K. & Mahmoud H. M., Personality and its relationship to some physiological variables and performance skills in volleyball, scientific conference (human development between challenges and ambitions), Faculty of Physical Education for Boys, Helwan University, Cairo, 1996.


Building the Predictive Scale for the Psychological Efficiency of the Athletes Students at Al-Furat Al-Awsat Technical University

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Directorate of Student Activities, Al-Furat Al-Awsat Technical University, Iraq

ABSTRACT

The objectives of the research focused on the preparation of a questionnaire to build a predictive measure of psychological efficiency for the students of the athletes of the University of the Middle Euphrates technical, as well as “the recognition of predictions of psychological efficiency, and applied research on a group of athletes at the University of the Euphrates Middle Tech for the period of 22/11/2017 and The researcher used the descriptive method in the survey method. The most important steps of the research are to limit the number of athletes in Al-Furat Al-Awsat Technical University from the students. The main questionnaire was composed of (48) Building a collective and individual scale, as required (325) questionnaires were returned (301), (24) of which were excluded due to lack of complete answer.

The number of valid questionnaires reached (265) questionnaires In the final statistical analysis, using the appropriate statistical methods, and then presenting them, analyzing them and discussing them in a scientific manner based on the relevant sources and references, and then concluding the conclusions, the most important of which was the establishment of a suitable questionnaire to build a predictive measure for the psychological efficiency of the students. In the light of these conclusions, the researcher recommended a number of recommendations, including the possibility of using the current measure by the supervisors of athletes at the University of the Euphrates Middle Tech, as well as the need to pay attention to the psychological side, especially with regard to students in the same physical, skill and educational aspects.

Keywords: Building, predictive scale and psychological efficiency.

Introduction

The relationship between psychology and sports and physical games is an interrelated and dialectical relationship that is characterized by the interaction of the living and cannot be separated from this link as psychology generally addresses the problems experienced by individuals in their lives, which appear in the form of emotions and acute and sometimes abnormal and in the form of deviations, disorders and diseases and psychological contract. Psychological problems are always the result of the poor compatibility of the individual with himself on the one hand and poor compatibility of the individual with his environment and the environment on the other. This causes failure to achieve the individual’s goals and satisfy his psychological needs. And social and social. “Mathematical psychology plays an important role in the lives of individuals, as it directly affects their behavior, and therefore we can see its effects in many of their actions. Sports psychology can be seen as a kind of motivation, desires, mental and physical abilities, attitudes, skepticism, fear, And control and stability and other cases are acquired and fungus and develop experiences in the first case and since birth in the second case can be developed. 1

The individual must strive for success and that “feeling inferior is normal for people and can lead to a state of creativity and that the goals are In order to overcome the problems by the creative force inherent in the human that helps to achieve the natural talents.
to achieve the psychological.” Hence the importance of research in the creation of the measure and test the relationship between testosterone and the accuracy of the performance of some of the basic skills of volleyball players being trying to shed the first is the accuracy of the performance of the skilled as well as the study comes in the field of volleyball.²

The choice of the problem has major criteria that must be taken into consideration, including the originality of the problem, its novelty, its theoretical importance, its scientific value, the availability of adequate literature relevant to the problem and its compatibility with the researcher’s interest, experience and qualifications. In the process of research, which prompted the researcher to choose his problem when he felt the existence of a confusing and mysterious situation needs to know and answer or solve through the guidance of expert opinions and sources of information, which provides knowledge about the problem. And through the follow-up of the researcher for most of the matches of the Iraqi league and the Iraqi universities and for many years, noted the weakness of the result of lack of interest in the trainers most of the vocabulary of the current training modules do not rely on appropriate psychological situations commensurate with the effort and emotions that appear on the players, Iraqi teams during interviews, Thus, through the work of the researcher in the field of training of the university sports teams and coach of the team of the University of the Euphrates Middle Tech and the Kufa Sports Volleyball Club for many years, observed in different games, especially for Iraqi universities, the player is different in the elements of predictions of psychological efficiency during matches and at the same time noticeable changes in the level Predictions of psychological competence and for that the researcher has always overcome negative situations and find the appropriate level of balanced personality of players and access to the level of good championship.³

Research Methodology

The researcher used the descriptive approach in the method of correlative relations to suit the study, which is the method used by the researchers to be able to obtain accurate and accurate information to portray the social reality that affects all activities.

Research community: Is “all individuals, objects or persons who constitute the subject of the research problem, which is all elements related to the problem of the study to which the researcher seeks to generalize the results of his study”. Thus, the research society included the athletes of the University of the Middle Euphrates technical (325) athletes as shown in Table (1).

Sample: The sample was selected from the original community consisting of (325) players from the teams of institutes and colleges (312) athletes, who constitute 96% of the society of origin. They are distributed among eight institutes and colleges. The 13 respondents who were randomly selected from the community of origin were excluded (4.16%).

Table 1: Shows the names of institutes and colleges participating in the championship of Al-Furat Al-Awsat Technical University volleyball and the numbers of players

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>The number</td>
<td>44</td>
<td>43</td>
<td>40</td>
<td>37</td>
<td>37</td>
<td>40</td>
<td>40</td>
<td>44</td>
</tr>
<tr>
<td>Total</td>
<td>325</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Scientific steps of the psychological efficiency prediction scale: The initial preparation of the scale formula for prediction of psychological efficiency requires many procedures, including the process of drafting the standard paragraphs that are appropriate to the study society, as well as setting instructions on how to answer them and methods of correction.

1. See the sources and references.

2. To see the previous studies, standards and questionnaires in physical education and self-employment that relate to personality and predictions of psychological competence.

Determining the method of drafting and responding to paragraphs: The process of setting up the scale paragraphs is one of the most important steps in the
construction of the scales. The measuring instrument stops measuring what is being measured to a large extent on the accuracy of its performance and its representation of the attribute to be measured. “Therefore, the researcher must be attentive and fully aware of the instructions the preparation of the paragraphs and their specifications because the standard characteristics (paragraphs) of the paragraphs, has been adopted (3) In the selection of alternatives to the scale, and the alternatives of the scale were chosen on the proportion of the agreement (75%) by choosing one of two alternatives (yes) or (no).”

Format the paragraphs of the scale: Of the “Building Conditions of Psychological Standards” that the instructions to answer them are clear to those who prepare the scale, as well as to conceal the true purpose of the scale (not to write the scale name) to obtain true data “(1). (38) of the Psychological Prediction Scale, and was presented to the experts and specialists to demonstrate their validity to measure the purpose that was developed and excluded ((75%). Thus, the agreed paragraphs are (12) paragraphs and the proportion of agreement (80%). “Bloom points out that (0) the rate of reliance on expert approval is 75% and more in such a kind of truth “.

Pilot study: To demonstrate the validity of the scale, the pilot study was conducted on a sample of (13) athletes representing the Technical Institute Kufa volleyball on 22/12/2017. The purpose of conducting the exploratory experiment is as follows:

1. Understand the comprehension and comprehension of the subjects of the scale.
2. Identify the constraints and factors that appear when the scale is implemented and exceeded in the exploratory experiment.

Statistical Analysis of Psychometric Prediction Scale:
“The criterion of testing and the good measure is to conduct statistical analysis of its poverty to distinguish between individuals who have obtained high grades and who have obtained low degrees of the scale, that is, the extraction of the power of the parity of the paragraphs.”

1. Internal consistency factor: In order to reach the power of excellence, we must use and extract the internal consistency of the paragraphs. “This method gives us a homogeneous scale in its paragraphs. Each paragraph measures the same behavioral dimension measured by the scale as a whole. With an internal check that is the scale of the scale as a whole. “(2) Table 2 is also constructed.

2. The two radical groups: One of the objectives of the analysis of the paragraphs is to “ensure that they are sufficient to achieve the principle of individual differences on which the scale is measured. Therefore, the power of distinction is calculated for the purpose of retaining the distinguishing paragraphs and deleting the undefined paragraphs.” The scores obtained by the players were arranged in descending order (27%) of the upper and lower grades of the two extremes were selected. Stanley and Hopkins assert that “this ratio makes the two groups ideal for reservation and differentiation”.

Stability of the scale: “The stability tests are necessary indicators and the researcher used the half-way method because it requires a one-time test.” The data obtained by the researcher regarding the scores of answers (13) were adopted. This method depends on the split of the test into two parts, the first part contains the individual numbers, and the second part contains the even numbers. The simple correlation coefficient (Pearson) was calculated between the scores indicated between the scores which reached (0.841). This method represents the stability coefficient of half the test.
Table 2: Correlation coefficients between the score of each paragraph in the total number of the construction sample of the psycho-psychological efficiency prediction scale

<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Discrimination coefficient</th>
<th>Paragraph</th>
<th>Discrimination coefficient</th>
<th>Paragraph</th>
<th>Discrimination coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.400</td>
<td>17</td>
<td>0.098*</td>
<td>33</td>
<td>*0.117</td>
</tr>
<tr>
<td>2</td>
<td>0.339</td>
<td>18</td>
<td>0.711</td>
<td>34</td>
<td>*0.163</td>
</tr>
<tr>
<td>3</td>
<td>0429</td>
<td>19</td>
<td>0.334</td>
<td>35</td>
<td>0.469</td>
</tr>
<tr>
<td>4</td>
<td>0511</td>
<td>20</td>
<td>0.521</td>
<td>36</td>
<td>0.181*</td>
</tr>
<tr>
<td>5</td>
<td>0441</td>
<td>21</td>
<td>0.143*</td>
<td>37</td>
<td>0.277</td>
</tr>
<tr>
<td>6</td>
<td>1.009*</td>
<td>22</td>
<td>0.391</td>
<td>38</td>
<td>0.255</td>
</tr>
<tr>
<td>7</td>
<td>0677</td>
<td>23</td>
<td>0.554</td>
<td>39</td>
<td>0.333</td>
</tr>
<tr>
<td>8</td>
<td>0.429</td>
<td>24</td>
<td>0.155*</td>
<td>40</td>
<td>0.551</td>
</tr>
<tr>
<td>9</td>
<td>0.539</td>
<td>25</td>
<td>0.443</td>
<td>41</td>
<td>0.162*</td>
</tr>
<tr>
<td>10</td>
<td>0.197*</td>
<td>26</td>
<td>0.162*</td>
<td>42</td>
<td>0.250</td>
</tr>
<tr>
<td>11</td>
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<td>43</td>
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<tr>
<td>12</td>
<td>0.163*</td>
<td>28</td>
<td>0.306</td>
<td>44</td>
<td>0.288</td>
</tr>
<tr>
<td>12</td>
<td>0.222</td>
<td>29</td>
<td>0.192*</td>
<td>45</td>
<td>0.609</td>
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<tr>
<td>14</td>
<td>0.629</td>
<td>30</td>
<td>0.139*</td>
<td>46</td>
<td>0.490</td>
</tr>
<tr>
<td>15</td>
<td>0.443</td>
<td>31</td>
<td>0.982</td>
<td>47</td>
<td>0.0321</td>
</tr>
<tr>
<td>16</td>
<td>0499</td>
<td>32</td>
<td>0.393</td>
<td>48</td>
<td>0.109*</td>
</tr>
</tbody>
</table>

* Weak discrimination clause

Table 3: Value (t) for the psychometric efficiency prediction scales using the extreme group approach

<table>
<thead>
<tr>
<th>Paragraph</th>
<th>(t) value</th>
<th>Paragraph</th>
<th>(t) value</th>
<th>Paragraph</th>
<th>(t) value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2.246</td>
<td>17</td>
<td>3.581</td>
<td>33</td>
<td>3.438</td>
</tr>
<tr>
<td>2</td>
<td>1.552*</td>
<td>18</td>
<td>3.482</td>
<td>34</td>
<td>2.532</td>
</tr>
<tr>
<td>3</td>
<td>1.731</td>
<td>19</td>
<td>1.691*</td>
<td>35</td>
<td>4.438</td>
</tr>
<tr>
<td>4</td>
<td>2.549</td>
<td>20</td>
<td>1998</td>
<td>36</td>
<td>3.711</td>
</tr>
<tr>
<td>5</td>
<td>3.321</td>
<td>21</td>
<td>1.844</td>
<td>37</td>
<td>2.539</td>
</tr>
<tr>
<td>6</td>
<td>2.975</td>
<td>22</td>
<td>3.095</td>
<td>38</td>
<td>1.295*</td>
</tr>
<tr>
<td>7</td>
<td>2.199</td>
<td>23</td>
<td>1.772*</td>
<td>39</td>
<td>3.270</td>
</tr>
<tr>
<td>8</td>
<td>1.652*</td>
<td>24</td>
<td>3.129</td>
<td>40</td>
<td>2.982</td>
</tr>
<tr>
<td>9</td>
<td>1.711*</td>
<td>25</td>
<td>1.542*</td>
<td>41</td>
<td>1.481*</td>
</tr>
<tr>
<td>10</td>
<td>3.310</td>
<td>26</td>
<td>4.192</td>
<td>42</td>
<td>3.751</td>
</tr>
<tr>
<td>11</td>
<td>3.183</td>
<td>27</td>
<td>6.237</td>
<td>43</td>
<td>2.709</td>
</tr>
<tr>
<td>12</td>
<td>3.622</td>
<td>28</td>
<td>2.593</td>
<td>44</td>
<td>3.055</td>
</tr>
<tr>
<td>13</td>
<td>2.129</td>
<td>29</td>
<td>2.700</td>
<td>45</td>
<td>3.731</td>
</tr>
<tr>
<td>14</td>
<td>0.654*</td>
<td>30</td>
<td>3.218</td>
<td>46</td>
<td>2.052</td>
</tr>
<tr>
<td>15</td>
<td>3.099</td>
<td>31</td>
<td>5.172</td>
<td>47</td>
<td>3.194</td>
</tr>
<tr>
<td>16</td>
<td>3.183</td>
<td>32</td>
<td>0.799*</td>
<td>48</td>
<td>2.841</td>
</tr>
</tbody>
</table>
Correction of scale: After the completion of the scientific transactions by the researcher for the paragraphs of the scale of predictions of psychological efficiency, based on the previous procedures, the standard in its final form consists of (13) paragraphs see Annex (1). The answer will be answered by choosing one of two alternatives, namely (yes) or (no), with two degrees of response (yes) and one score for the answer (no) and the total score of the scale ranged between (48 - 96).

Results

Table 4: Shows the mean, standard deviation, standard error, and torsion coefficient to predict the psychological efficiency of the sample members

<table>
<thead>
<tr>
<th>S,</th>
<th>Building a scale</th>
<th>The mean</th>
<th>medium</th>
<th>Mean</th>
<th>SD</th>
<th>Mode</th>
<th>Skewness</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Predictions of psychological competence</td>
<td>33</td>
<td>32.11</td>
<td>2.22</td>
<td>34</td>
<td>- 0.59</td>
<td></td>
</tr>
</tbody>
</table>

Table (4) shows that there are no significant differences. This indicates that there is an inverse relationship between the predictions of psychological efficiency and the skill tests. The higher the scores, the lower the tests were. The researcher attributed these results that whenever players have a lack of stability and stability and anxiety and tension whenever there is a lack of relaxation and calm as a result of the personality during training and this means that there is psychological pressure is exposed to players and therefore their performance is unacceptable due to lack of stability and stability they have and this “ The impact of anxiety, tension and predictions of psychological efficiency and low level of stability varies from individual to individual according to the type of pressure and size, strength and extent and nature of the psychological construction of the athlete and his ability and efficiency of his muscular and nervous systems and the integrity of his personality and the strength he wanted on the resistor And not to bow to these pressures and how they feel and control events “.10

Table 5: Shows the ranges and levels and the number of frequencies and their percentages (0.59)

Psychological efficiency predictions of the members of the research sample

<table>
<thead>
<tr>
<th>S.</th>
<th>Scales</th>
<th>Levels</th>
<th>Repetition</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>10-20</td>
<td>good</td>
<td>55</td>
<td>48%</td>
</tr>
<tr>
<td>2.</td>
<td>21-30</td>
<td>Weak</td>
<td>98</td>
<td>10%</td>
</tr>
<tr>
<td>3.</td>
<td>31-40</td>
<td>Average</td>
<td>159</td>
<td>42%</td>
</tr>
<tr>
<td>4.</td>
<td>Total</td>
<td></td>
<td>312</td>
<td>100%</td>
</tr>
</tbody>
</table>

Discussion of results: The study showed that the majority of the study sample was centered in the intermediate level and (159) out of (312) athletes from Al-Furat Al-Awsat Technical University of the Psychometric Prediction Scale. And the provision of support and incentives to them and provide the requirements that help them to provide a better level, especially on the psychological side, which led to the prediction (average), because most of the activities of the University of the Middle Euphrates technical focus on the physical, technical and technical rather than on the psychological side, especially Efficiency prediction Psychological competence is one of the basic dimensions of the mathematical personality and the athlete’s appreciation of it has a good impact on facing the problems, obstacles or obstacles facing him during his sports career and achieving the desired goals and aspirations towards the predictions as well as their affiliation to Al-Furat Al-Awsat Technical University to enhance their tendencies and achieve and develop the social aspects of During the various activities which are part of the curriculum and various activities that include the formation of values, habits, skills and methods of thinking in the construction of personality.11

Conclusions

1. Achieving the construction of an appropriate measure of self-efficacy predictions for athletes at Al-Furat Al-Awsat Technical University.
2. The vast majority of the research sample was at the intermediate level in the current scale.
3. The poor level was (10%) and the good level was (48%).
4. Athletes at Al-Furat Al-Awsat Technical University have enjoyed general efficiency.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

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Lymphocytosis and Increases in Complement Protein C3 Level in Women with Polycystic Ovarian Syndrome

Sahlah Kh. Abbas¹, Aseel Sh. Abdullah²

¹Department of Biology, ²Environmental Research Unit, College of Science, University of Kirkuk, Iraq

ABSTRACT

Background: Polycystic ovarian syndrome is a common endocrine disorder affects women in reproductive age. The inflammatory markers play an important role in this disease. Therefore, this study was aimed to evaluate the hematological, some biochemical and serum levels of C3 in women with polycystic ovary syndrome compared with healthy women.

Method: Hematological parameters, lipid profile and complement protein C3 serum levels, were evaluated in 60 women (30 obese and 30 lean) women with Polycystic ovarian syndrome whose age ranged between (17-43 years), in addition to 30 healthy women as controls. The patients attended Azady Teaching Hospital in Kirkuk city, Iraq for diagnosis and treatment during the period from September 2017 to March 2018.

Results: Analyzing the collected data, we observed significant increase in total white blood cells, monocytes, lymphocytes count, and serum level of complement protein C3 in women with Polycystic ovarian syndrome compared to control subjects ($P<0.001$).

Conclusion: This study suggested that changes in inflammatory markers in women with Polycystic ovarian syndrome predispose them to increased risk of type 2 diabetes mellitus and cardiovascular events. Raised thyroid stimulating hormone suggested a possible role of thyroid dysfunction in the pathogenesis of Polycystic ovarian syndrome.

Keywords: Polycystic ovarian syndrome, Hematological parameters, Lipid profile, Complement protein C3, TSH.

Introduction

Polycystic ovarian syndrome (PCOS) is one of the most common hormonal disorders affecting approximately 6-20% of women in reproductive age [¹] and it’s characterized by the presence of small sacs filled with ovarian fluid causes infertility resulting from non-ovulation, this is identified by irregular menstruation [²].

PCOS is characterizing by many clinical symptoms such as diabetes, coronary artery disease, hyper-androgenism, obesity [³], the appearance of acne and hirsutism. The causes are not known accurately and multiple opinions in the interpretation of the occurrence, including disorders of the hormones stimulating Menopausal Gonadotropins or a defect in the pituitary gland resulting in an increase in the hormone Lutin to the hormone stimulating the follicle, or the result of disorders in the adrenal gland [⁴]. The other opinion has pointed to the role of insulin in increasing the secretion of male hormones, especially testosterone resulting from the presence of resistance to insulin. The syndrome leads to a disorder in the distribution of fat, cardiovascular disease and endometrial cancer, and affects the external appearance of women due to obesity, acne and hirsutism [⁵]. It is widely known that total and deferential count of white blood cells (WBC) [⁶] and serum level of complement protein C3 were elevated in women with PCOS [⁷]. Complement protein C3 is highly related with dyslipidemia, insulin resistance and hypertension. It is considered a high risk factor in the causation of diabetes mellitus type II [⁸]. Accordingly, this study was aimed to evaluate the role of total and differential count of white blood cells, dyslipidemia and change in the serum
level of complement protein C3 in patients suffered from polycystic ovaries syndrome compared to healthy women in Kirkuk governorate, Iraq.

Materials and Method

This study conducted in the laboratories of Azady Teaching Hospital in Kirkuk governorate for the period from September 2017 to March 2018. Sixty women with polycystic ovarian syndrome and an age range of 17 to 42 years enrolled in this study. Special questionnaires were prepared and the diagnosis confirmed clinically and by using ultra sound scanning by the medical staff at the hospital. In addition to the patients group, the study included 20 women as control group after ensuring their safety of hormonal disorders or other chronic diseases.

A 5-ml sample of fresh venous blood was collected from each woman under study and 2ml placed in a tube containing the anticoagulant (EDTA) for the examination of hematological parameters using self-work Auto-analysis hematology, and 3ml transferred in a test tube and centrifuged at 1500rpm for 15min to obtain serum for serological tests.

Levels of cholesterol and high-density lipoprotein in the serum were determined using kit from the British company Randox according to the instructions provided by the company. To determine serum level of triglycerides used kit processed by CTM (UK) according to the instructions of the supplier company. Complement protein C3 determined using single radial immunodifusion plate provided by Busserio company/ Italy. CRP agglutinin test measured using Biocon/ German kit.

Statistical Analysis: Data were analyzed using statistical package for the social science (SPSS) version 13, and presented as mean±SD. A t-test used to measure the differences between the two groups. P-value less than 0.05 considered statistically significant.

Result and Discussion

As shown in Table (1), out of the 60 patients with PCOS, 45 were married (75%) and 15 were single (25%). Irregular menstrual cycle presented in 80% of patients, it is a feature of polycystic ovarian syndrome. Hirsutism found in 81.6% of patients. In addition, 31.1% had primary infertility (that affects women since the beginning of life) and 68.8% had secondary infertility (affecting women after one or two children reproduction or after abortion). In addition, 18% had higher level of TSH. Moreover, all women (100%) had positive agglutination for C-reactive protein (CRP) test, it is a non-specific marker of inflammation and the most predictor of risk of cardiovascular conditions in women with polycystic ovarian syndrome with or without of cardiovascular events [9].

<table>
<thead>
<tr>
<th>Feature</th>
<th>No.</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Married</td>
<td>45</td>
<td>75</td>
</tr>
<tr>
<td>Single</td>
<td>15</td>
<td>25</td>
</tr>
<tr>
<td>Irregular menstrual</td>
<td>48</td>
<td>80</td>
</tr>
<tr>
<td>Hirsutism</td>
<td>49</td>
<td>81.6</td>
</tr>
<tr>
<td>First infertility</td>
<td>14</td>
<td>31.1</td>
</tr>
<tr>
<td>Second infertility</td>
<td>31</td>
<td>68.8</td>
</tr>
<tr>
<td>Thyroid dysfunction</td>
<td>11</td>
<td>18</td>
</tr>
<tr>
<td>Euthyroid</td>
<td>49</td>
<td>82</td>
</tr>
<tr>
<td>CRP seropositive</td>
<td>60</td>
<td>100</td>
</tr>
</tbody>
</table>

In Table (2) the mean±SD of age was (25.89±6.90) years in patients, and (23.89±4.56) years in controls (P=0.329). Body mass index in cases and controls was 27.14±4.7 and 23.22±2.17 kg/m², respectively, (P ≤0.05). The waist circumference in patients and controls recorded as 85.36±4.04cm and 73.3±5.1cm, respectively, the mean of waist hip ratio were 0.87±0.03cm and 0.80±0.05cm, respectively. The systolic and diastolic blood pressures was (122±16.43mmHg) and (82±8.36mmHg) in patients.

<table>
<thead>
<tr>
<th>Variable</th>
<th>PCOS group Mean ± SD</th>
<th>Control group Mean ± SD</th>
<th>P-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age(year)</td>
<td>25.89±6.90</td>
<td>23.89±4.56</td>
<td>0.324</td>
</tr>
<tr>
<td>Body mass index (kg/m²)</td>
<td>27.14±4.7</td>
<td>23.22±2.17</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Waist to hip ratio (cm)</td>
<td>0.83±0.03</td>
<td>0.80±0.05</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Systolic blood pressure (mmHg)</td>
<td>122±16.43</td>
<td>116±5.47</td>
<td>0.46</td>
</tr>
<tr>
<td>Diastolic blood pressure (mmHg)</td>
<td>82±8.36</td>
<td>80±7.07</td>
<td>0.693</td>
</tr>
</tbody>
</table>
Our study indicated significantly increased count of the total white blood cells, monocytes and lymphocytes in patients compared with healthy women. These results were in agreement with other studies which revealed elevated count of total WBC and lymphocyte in PCOS patients [6,10]. Increased total and differential counts may give an indication of chronic inflammation in infected women [11]. These cells have immune functions that may be complementary to each other and contribute positively to enhancing the immune response. Increased WBC is involved in the process of atherosclerosis and recognized as a marker of cardiovascular disease [12]. Also, the increase in these cells may be due to increased production of IL-1 and IL-6, which stimulate production of white blood cells and proliferation of all their kinds from bone marrow, causing an increase in the number of peripheral blood cells [11,12]. Increased monocytes count may lead to development of cardiovascular disease by stimulating the formation of thrombosis in the affected endothelial cells of blood vessel [13]. Increased lymphocytes count (Lymphocytosis) may reflect the chronic status of disease, lymphocytes play a role in identification of non-self-antigens and then respond against them with help of other immune cells modulated through inflammatory cytokine [14]. Metabolic abnormality, especially, dyslipidemia is a common metabolic disturbance in women with PCOS [15]. Our study confirmed the increased level of total cholesterol, which is considered as a risk factor for cardiovascular disease when combined with a low level of high-density lipoproteins in adult women [16].

In addition, the mean serum level of complement protein C3 increased significantly in patients compared with control group. This finding was consistent with previous studies [7,8], but not in agreement with [17] who did not find such relation between level of complement component C3 and poly cystic ovarian syndrome. Complement protein C3 is an acute phase protein produced by the hepatocyte, macrophage and by the adipose tissue. Increased level of this protein maybe associated with obesity, dyslipidemia, and hypertension as well as insulin resistance [7].

C3 fragments enhance proliferation of T lymphocyte when fixed to the APCs and form a bridge between the APCs and T lymphocyte, which enhances cell-to-cell contacting intracellular signaling.

This study revealed that 11 women out of 60, who did not respond to the treatment, had higher levels of thyroid stimulating hormone (TSH; 6.32±3.22nmol/L) and all of them considered to have hypothyroidism. This observation was in agreement with others who revealed a close association between polycystic ovarian syndrome and abnormal thyroid function [4,18]. Furthermore, [19] stated that long time hypothyroidism enhances cyst formation and bigger ovarian size.

When we analyzed the results between obese and lean women with polycystic ovarian syndrome, obese patients had higher levels of total cholesterol and LDL (P<0.05) than did lean patients (Table 3).
Table 3: Hematological and Serological parameters between obese and lean women with PCOS

<table>
<thead>
<tr>
<th>Variable</th>
<th>Obese PCOS Mean ± SD</th>
<th>Lean PCOS Mean ± SD</th>
<th>*P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>WBC (/mm$^3$)</td>
<td>9750±2668.9</td>
<td>8200±1100.56</td>
<td>0.355</td>
</tr>
<tr>
<td>Neutrophils (/mm$^3$)</td>
<td>2288.25±496.5</td>
<td>1505±141.45</td>
<td>0.250</td>
</tr>
<tr>
<td>Lymphocytes (/mm$^3$)</td>
<td>4215±972</td>
<td>4091±852</td>
<td>0.873</td>
</tr>
<tr>
<td>Monocytes (/mm$^3$)</td>
<td>2142±140</td>
<td>2165.5±247.71</td>
<td>0.932</td>
</tr>
<tr>
<td>Total cholesterol (mg/dl)</td>
<td>215.45±29.41</td>
<td>172.4±26.23</td>
<td>0.017</td>
</tr>
<tr>
<td>TGL (mg/dl)</td>
<td>150.62±31.42</td>
<td>90.71±22.20</td>
<td>0.057</td>
</tr>
<tr>
<td>HDL (mg/dl)</td>
<td>45.4±2.25</td>
<td>47.64±2.76</td>
<td>0.198</td>
</tr>
<tr>
<td>LDL (mg/dl)</td>
<td>144.43±31.21</td>
<td>95.3±0.43</td>
<td>0.003</td>
</tr>
<tr>
<td>C3 (mg/dl)</td>
<td>238.86±31.03</td>
<td>211.66±5.1</td>
<td>0.060</td>
</tr>
</tbody>
</table>

*: P<0.05 considered significant difference between groups.

Many studies had reported that LDL-C is increased in obese or over-weight women with PCOS [20,21]. Increased LDL-C levels may be related to genetic factor and hyperandrogenism in women with polycystic ovarian syndrome, and such alterations may be associated with increased cardiovascular risk [16,22]. Previous studies revealed that C3 level associated with abdominal adipose tissue [23], and it had important role in the pathogenesis of low-grade inflammation [24]. Obesity increases the risk of metabolic dysfunction and insulin resistance. Moreover, increased C3 concentration reflected metabolic syndrome in obese subjects especially when related with other factors such as CRP and ESR, and these were strongly related to insulin resistance [25].

**Conclusion**

From this study, we concluded that women with PCOS had higher levels of some inflammatory markers such as TWBC, monocytes, lymphocytes count, increased serum level of complement C3 and CRP. All that might reflect a chronic low-grade inflammatory status, which is considered as a risk factor for cardiovascular complications. On the other hand, increased TSH level may suggest a possible causational relationship between thyroid dysfunction and polycystic ovarian syndrome.

**Ethical Clearance:** The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding.

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The Prevalence of PCOS in Infertile Women According to Clinical Features and its Associated Hormonal Changes in Al-Hilla City, Iraq

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Department of Gynecology and Obstetrics, College of Medicine, University of Babylon, Iraq

ABSTRACT

Background: Polycystic ovary syndrome is a significant hormonal condition that occurs due to ovulatory reason of infertility in reproductive age females. Polycystic Ovary Syndrome is a group of clinical features. These with Polycystic Ovary Syndrome commonly have two of the following criteria: (menstrual) ovulation disorders, abnormal levels of androgens (biochemical or clinical) and polycystic variations in the ovary (thick stroma looks-like “string of pearls” on the surface of an ovary by U/S). Polycystic Ovary Syndrome was a women problem which cumulating in our women society without significant reasons. The aim of current study was to estimate and diagnosis infertile women with Polycystic Ovary Syndrome and its degree confer to procedures of diagnosis concerning markings outcomes of its investigations as well as appraisal of its spread in AL- Hilla City, Iraq.

Method: A case-control study carried out for patients from infertility unit in private clinic and Babylon Teaching Hospital during the period from January 2017 to the end of December 2017. In this study, 100 infertile women were enrolled randomly. Their histories regarding symptoms like (excessive hair growth, acne and amenorrhea) were recorded, their age, number of infertility years. In addition, Prolactin, FSH/LH ratio, BMI, AMH hormones were done in lab. Then antral follicular count was estimated for them through vaginal U/S. Verbal and written consents were taken from participants for their admission.

Results: Data from current study showed that the percentage of PCO in infertile women, who were diagnosed by signs and symptoms, was 33.0%. In addition, the Mean ± SD of LH/FSH ratio, LH, FSH, AMH and prolactin of infertile women with PCOS, who were diagnosed through signs and symptoms, was 1.8, 2.07 ± 0.77, 12.19 ± 4.55, 5.97 ± 0.77, 12.19 ± 4.55, 5.97 ± 0.77, 6.62 ± 2.17 and 33.97 ± 10.36, respectively. Also, data showed that the Mean ± SD AFC and ovarian size of infertile women with PCOs, who were diagnosed by signs and symptoms, was 13.58 ± 5.1 and 16.45 ± 4.48, respectively.

Conclusions: Data from present study and other same studies revealed that the incidence of infertility is about 12% and found fright increase of infertility in couples. In addition, with progress of age the incidence of PCO in general females is about 35%.

Keyword: infertility, Anti-mullerian hormone, polycystic ovary syndrome, antral follicular count, FSH.

Introduction

Ladies present with irregular cycles, period of prolonged aminohrria, excessive hair growth on her face and body, scalp hair loss, acne, dark skin pattern on body folds such as thighs and neck and history of gaining weight (1). Incidence of infertility in the world is about 12%. Infertility is an increasing challenge between couples wanted babies and had multiples causes with 1/3 male causes, 1/3 female causes and 1/3 unexplained causes, but especially in Iraq, it has more incidence than that written
in books for a lot of reasons which need a lot of studies to document the real problem and try to find possible solutions. Numerous principles for diagnosis of Ovarian Syndrome commonly (PCOS) have been proposed. The Rotterdam criteria are highest broadly used diagnostic method for PCOS detection which is established with existence of two from the following features (2):

1. Oligomenorrhea and amenorrhea.
2. Presence of overexcited androgenism.
3. Polycystic ovaries texture on vaginal U/S.

It has been confirmed that ladies with PCOS have an amplified danger for infertility, hypertension, cardiovascular disease, metabolic disorders, Type 2 diabetes mellitus, obesity (carbohydrate intolerances), sleep apnea and endometrial hyperplasia and endometrial carcinoma. A probable connection between all these disorders in addition to cardiovascular disease was insulin resistance, which was existent irrespective of BMI, but exploited by obesity (7). It was newly recognized a compromised cardiopulmonary functional capacity strictly related to insulin resistance in women with these diseases (8). Hence, it should be diagnosed as quickly as possible to avoid and treat related disorders earlier if possible. Diagnosis of PCOS depends on clinical features and method of diagnosis being used. Also, the incidence of PCOS differs from region to region (3). Causes of PCOS at this time are unknown, even though scientists consider that hereditary and ecological features had major causes for its occurrence. Main threatening factor for it is having a family history of PCOS.

There is no cure for this syndrome but there are methods to improve symptoms. The latter include lifestyle modifications like decreasing weight, diet, taking adequate exercise and leaving smoking if present. The prevalence of PCOS varies with diagnostic principles. PCO on U/S was distinguished in up to 25%-30% from reproductive aged females (4,6). Anti-mullerian hormone (AMH) was one of prospective blood tests for evaluation for female fertility done at any time of the cycle, especially to detect ovarian reserve and there are other important test currently used in the last decades for evaluation of the remaining ova in ovaries supply which is the antral follicles count (9). Fertility professionals frequently use a mixture of fertility investigations to best evaluate female’s ovarian reserve, comprising transvaginal U/S to count the number of antral follicles and AMH levels. It is important to remember that AMH levels decrease and FSH levels rise as females age progresses. Age-related Standard FSH and AMH Levels (10) are shown in Table (1).

The aim of current study was to estimate and diagnosis infertile women with Polycystic Ovary Syndrome and its degree confer to procedures of diagnosis concerning markings outcomes of its investigations as well as appraisal of its spread in AL- Hilla City, Iraq.

### Table 1: Age-related Standard FSH and AMH Levels

<table>
<thead>
<tr>
<th>Age/yr</th>
<th>FSH (mIU/mL)</th>
<th>AMH (ng/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;33</td>
<td>&lt;7.0</td>
<td>= 2.1</td>
</tr>
<tr>
<td>33-37</td>
<td>&lt;7.9</td>
<td>= 1.7</td>
</tr>
<tr>
<td>38-40</td>
<td>&lt;8.4</td>
<td>= 1.1</td>
</tr>
<tr>
<td>≥41</td>
<td>&lt;8.5</td>
<td>= 0.5</td>
</tr>
</tbody>
</table>

### Materials and Method

Current study was cross-sectional study that involved 100 infertile females. Their histories about important related symptoms such as (acne, amenorrhea and excessive hair growth) were recorded; their age was between (21-44) years, period of infertility (3-20) years, their BMI ranged from 24 to 37Kg/m². Then, their hormonal analysis (FSH, LH, Prolactin, and AMH) was done. Also, their ovarian size and antral follicular count were measured by endovaginal U/S at day 2-4 of the cycle.

Data were presented as numbers, range, mean and standard deviation. Comparisons were made using unpaired t-test. Level of significance was considered at $P \leq 0.05$.

### Results

Figure (1) showed that the percentage of PCO in infertile women, who were diagnosed by signs and symptoms, was 33.0%.

![Figure 1: Proportions of the patients with polycystic ovary diagnosed via signs and symptoms](image-url)
Table (2) showed that the Mean ± SD of LH/FSH ratio, LH, FSH, AMH and prolactin of infertile women with PCOS, who were diagnosed through signs and symptoms, was 1.8, 2.07 ± 0.77, 12.19 ± 4.55, 5.97 ± 6.62 ± 2.17 and 33.97 ± 10.36, respectively.

**Table 2: Mean and standard deviation of variables of the infertile women with PCOS**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean ± SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>LH</td>
<td>12.19 ± 4.55</td>
<td>(3.9-18)</td>
</tr>
<tr>
<td>FSH</td>
<td>5.97 ± 1.8</td>
<td>(3.6-9.9)</td>
</tr>
<tr>
<td>LH/FSH ratio</td>
<td>2.07 ± 0.77</td>
<td>(1.08-3.75)</td>
</tr>
<tr>
<td>AMH</td>
<td>6.62 ± 2.17</td>
<td>(2.2-9.0)</td>
</tr>
<tr>
<td>Prolactin</td>
<td>33.97 ± 10.36</td>
<td>(22.0-50.0)</td>
</tr>
</tbody>
</table>

Table (3) showed that the Mean ± SD AFC and ovarian size of infertile women with PCOS, who were diagnosed by signs and symptoms, was 13.58 ± 5.1 and 16.45 ± 4.48, respectively.

**Table 3: Mean and standard deviation of variables of the infertile women with PCOS**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean ± SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>AFC (follicles)</td>
<td>13.58 ± 5.1</td>
<td>(2.2-20.0)</td>
</tr>
<tr>
<td>Ovarian size (cm³)</td>
<td>16.45 ± 4.48</td>
<td>(9.0-24.0)</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>29.15 ± 3.67</td>
<td>(25.0-35.0)</td>
</tr>
</tbody>
</table>

Table (4) showed that t-test was conducted to show the mean difference of AMH, prolactin and LH/FSH ratio according to presence of PCOS in infertile women. There were significant mean differences in all circumstances (P value<0.05).

**Table 4: Mean difference of AMH, prolactin and LH/FSH ratio in PCOS infertile women**

<table>
<thead>
<tr>
<th>Study variable</th>
<th>PCO</th>
<th>No.</th>
<th>Mean ± SD</th>
<th>t-test</th>
<th>P–value</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMH</td>
<td>Yes</td>
<td>33</td>
<td>6.62 ± 2.17</td>
<td>9.831</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>67</td>
<td>2.46 ± 1.54</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prolactin</td>
<td>Yes</td>
<td>33</td>
<td>33.97 ± 10.36</td>
<td>2.137</td>
<td>0.035*</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>67</td>
<td>29.16 ± 10.67</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LH/FSH ratio</td>
<td>Yes</td>
<td>33</td>
<td>2.07 ± 0.77</td>
<td>8.979</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>67</td>
<td>0.78 ± 0.38</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*P value ≤0.05 was considered significant.

**Discussion**

Antral Follicle count (AFC) has been found to be a credible sign for ovarian reserve (9). Women with PCOS are exceedingly sensitive to gonadotropin stimulation, information of age-related AFC is clinically important. Age-related normogram for AFC in women with PCOS by using transvaginal ultrasound were published by (9) who found that the decline in number of AFC as the age progresses was linear and slower in PCOS when compared to infertile women without PCOS.

AFC correlates negatively with age. A percentile normogram will be useful to inform a woman about her ovarian reserve relative to her age group. The ovarian reserve decline rate relative to age group is important because of declining fertility with increasing age (7).

The prevalence of PCOS is conventionally estimated at 4% to 8% of all reproductive age females based on studies performed in Spain, Greece and the USA (10-13). The prevalence of PCOS has increased with the use of different diagnostic criteria and has recently been shown to be 18% (17.8 ± 2.8%) in the first community-based prevalence study based on current Rotterdam diagnostic criteria (14).

Significantly, 70% of women in this recent study were undiagnosed (15). PCOS has also been noted to affect 28% of unselected obese and 5% of lean women (15-18). Hopefully, lifestyle interventions including dietary, exercise and behavioral therapy improve fertility and reduces costs per birth significantly (19).

AFC is considered one of the authoritative signs for evaluation of ovarian reserve (19-21). The total ovarian volume and the number of antral follicles measured through transvaginal US predict declining fertility related to reproductive age. AFC has the closest connotation lower in infertile women than in matched controls with increased chronological age. In Indian women the baseline and cut-off values are lower than that mentioned in the Western literature (21). Because of low cost and high predictive value, AFC is commonly used and is careful best clinical predictor for ovarian response in assisted reproductive technology (21).

**Conclusion**

Data from present study and other same studies revealed that the incidence of infertility is about 12% and found fright increase of infertility in couples. In
addition, with progress of age the incidence of PCO in general females is about 35%.

**Ethical Clearance:** The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding.

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The Role of Minimum Fluid Requirement Post Laparoscopic Cholecystectomy in Comparison to Open Cholecystectomy

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ABSTRACT

Background: The post-operative management of a patient’s fluid balance is one of the most critical aspects of hospital care. Nowadays, many opinions exist as to the best volume of intravenous fluid after elective surgery, as recent studies suggested that a reduction in fluid need after operation to lowest need to reduce complication and postoperative hospital stay. The aim of current study was to evaluate fluid requirement and maintenance in patients after elective laparoscopic cholecystectomy in comparison with elective open cholecystectomy.

Method: A prospective study involving cholecystectomized patients at Al-Diwaniyah Teaching Hospital for the period from February 2018 to February 2019. Age, sex, body mass index, bowel sound parameters used and selection with aid of American society of anesthesiologists classification also used. Post-operative fluid regime of formula with 10ml/kg of glucose saline was used for the first 8 post-operative hours, with follow up chart. Onset of oral intake and discharge from hospital were discussed and evaluated.

Results: Our study included 140 patients who underwent cholecystectomy; 90 patients with laparoscopic cholecystectomy and 50 patients with open cholecystectomy. The patient’s median age was 40 years. There were ninety two females (66%) and forty eight male (34%) patients. In patients with laparoscopic cholecystectomy; 78 patients (87%) needed no further fluid support, resumed oral intake and discharged home within 10-14 hours after operation, whereas 34 patients (68%) of open cholecystectomy were continued on intravenous fluid support. Discharge of all patients with open cholecystectomy was after 24 hours. Statistically, there was highly significant timing change in starting oral feeding in laparoscopic cholecystectomy and timing to start oral intake in comparison with open cholecystectomy, and showed highly significant relation between age of patient and timing needed to start oral intake postoperatively. On the other hand, there was no significant relation between age and time needed to start oral intake postoperatively in open cholecystectomy.

Conclusions: Restrict post-operative intravenous fluid for maintenance therapy in elective and uncomplicated laparoscopic cholecystectomy in fit patients in the aim of early discharge of patients from hospital as a day case surgery.

Keywords: laparoscopy, cholecystectomy, intravenous fluid, oral intake, postoperative.

Introduction

The post-operative management of a patient’s fluid balance is one of the most critical aspects of hospital care. Nowadays, many opinions exist as to the best volume of intravenous fluid after elective surgery, as recent studies suggested that a reduction in fluid need after operation to lowest need to reduce complication and postoperative hospital stay (1).

Normally, the optimum physiological change secondary to stimulant factor like operation leads to increase intake of water and sodium, and loss of potassium (1). Open cholecystectomy increases the levels of antidiuretic hormone (ADH), cortisol, aldosterone and catecholamines where they play many physiological changes to maintain osmotic stability (2).
Minimally-invasive technique that require general anesthesia have a greater physiologic effect because of the anesthesia pneumoperitoneum which may lead to lowering renal blood flow and urine output (4). This decrease in renal blood flow leads to increasing sodium retention. Pneumoperitoneum also leads to increase ADH (5). Also, insensible fluid loss in open cholecystectomy is absent during laparoscopic operation.

Regulation of total body water: If water loss exceeds gain, a reduction in total body water content and the osmolality of body fluid increase. This has two effects; Thirst, with consequent ingestion of water and Release of ADH so that water is retained by the kidneys. Other mechanisms are available for stimulation of thirst and ADH release, these include:

1. Reduced arterial blood pressure (signals via carotid and aortic baroreceptors),
2. Reduced central venous pressure (signals via atrial low pressure receptors) and
3. Increase angiotensin II in the brain. These mechanisms reflected by change in pulse rate and blood pressure, both can be used for patient’s monitoring (7).

The aim of current study was to evaluate fluid requirement and maintenance in patients after elective laparoscopic cholecystectomy in comparison with elective open cholecystectomy.

The objectives of current study were

1. to sharpen the effect of restriction of post-operative intravenous fluid in laparoscopic cholecystectomy on discharge of patients from hospital as a day case surgery,

2. To study the influence of application of this regimen to different age groups and sex, and

3. To make the results of the study available to the health authority in order to improve the services required to deal with this condition.

Patients and Method

It’s prospective, comparative study performed at Al–Diwaniyah Teaching hospital for the period between February 2018 and February 2019. The study included 140 patients presented with symptomatic chronic cholelithiasis, proved by clinical examination and ultra-sonic evaluation, were prepared for elective cholecystectomy. The decision for the type of operation (open or laparoscopic cholecystectomy) was determined according to surgeon’s recommendation, anesthetic opinion and patient’s preference. Patients who had ASA grade 3 or more and those with laparoscopic operation converted to open cholecystectomy were excluded from the study. Patients were entered to the hospital one day before surgery and an informed consent was taken. All patients were fasting for eight hours for solid food and 4 hours for fluid before surgery. Patients received a single prophylactic dose of ceftriaxone 1gm intravenously at the induction of anesthesia. No intravenous fluids were received before operation. The operation was done under general anesthesia. Post-operatively, all patients received 10mL/kg of intravenous glucose saline (5% dextrose with 0.45 NaCl) infused over 8 hours through a peripheral intravenous line. Patients were also given paracetamol vial (1000mg/100ml) every eight hours. A follow up chart that included pulse rate, blood pressure and bowel sounds to be assessed every two hours together with absence or presence of vomiting.

These parameters were collected and registered in a special formula together with patient’s body parameters (body weight, height and body mass index). Comparison was made between the two groups (open vs. laparoscopic) regarding the aforementioned parameters after 8 hours and the ability to resume oral intake was assessed depending on the return of bowel sounds and the absence of vomiting as well as hemodynamic stability. All patients were advised to mobilize 6 hours post operation.

Data were presented as numbers and percentages. Comparisons were made using Chi-squared test and level of significance was considered at P value ≤0.05.

Results

Our study included 140 patients who underwent cholecystectomy at AL-Diwaniyah Teaching Hospital, 90 patients with laparoscopic cholecystectomy and 50 patients with open cholecystectomy. Patients’ age varied from 20 to 60 years with an average of 40 years. In addition, ninety two were females (66%) and forty eight were males (34%).

Assessment of patients who underwent laparoscopic cholecystectomy revealed that 78 patients (87%) were hemodynamically stable, had audible bowel sounds and got no vomiting at the end of the first 8 hour
postoperatively. Therefore, those patients required no further fluid support and they resumed oral intake. They were discharged home within 10–14 hours after operation and given an appointment for further surgical follow-up.

On the other hand, 12 patients (13%) did not resume bowel activity, had vomiting or showed unstable hemodynamic state, they were not allowed to resume oral intake, kept on intravenous fluid and their discharge from hospital was delayed until stabilization and resumption of oral intake.

Sixteen of patients (32%) with open cholecystectomy could start oral intake after the first 8 hours, whereas 34 patients (68%) were continued on intravenous fluid support as they had vomiting, absent bowel sounds, or hemodynamic instability. Discharge of all patients with open cholecystectomy was after 24 hours. Those who started oral intake were discharged next morning; others were kept in hospital till resumption of oral intake and discharged within 24–28 after operation.

Statistical studies showed highly significant relation between laparoscopic cholecystectomy and time needed for starting oral intake ($X^2 = 13.8; P$-value < 0.001 at 99.9 confidence interval) in comparison with open cholecystectomy as shown in Table (1).

<table>
<thead>
<tr>
<th>Time of starting oral intake (stop intravenous fluid)</th>
<th>Laparoscopic cholecystectomy No.(%)</th>
<th>Open cholecystectomy No.(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eight hours or less</td>
<td>78(87%)</td>
<td>16(32%)</td>
</tr>
<tr>
<td>More than eight hours</td>
<td>12(13%)</td>
<td>34(68%)</td>
</tr>
<tr>
<td>Total</td>
<td>90(100%)</td>
<td>50(100%)</td>
</tr>
</tbody>
</table>

The relation between age of patients and resuming oral fluid intake was shown in Table (2). For those with laparoscopic cholecystectomy it showed highly significant relation between age of patient and time needed to start oral intake postoperatively in laparoscopic cholecystectomy ($X^2 = 12.7; P$-value < 0.001 at 99% confidence interval). On the other hand, Table (3) showed the relation of age of patients and resuming oral fluid intake for those with open cholecystectomy. Statistical analyses showed no significant relation between age and time needed to start oral intake postoperatively in open cholecystectomy ($X^2 = 1.7; P$-value > 0.005 at 95% confidence interval).

<table>
<thead>
<tr>
<th>Time of starting oral intake (stop intravenous fluid)</th>
<th>Age of patients/yr</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>20 - 30</td>
</tr>
<tr>
<td>Eight hours or less</td>
<td>28(93%)</td>
</tr>
<tr>
<td>More than eight hours</td>
<td>2(7%)</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time of starting oral intake (stop intravenous fluid)</th>
<th>Age of patients/yr</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>20 – 30</td>
</tr>
<tr>
<td>Eight hours or less</td>
<td>5(45%)</td>
</tr>
<tr>
<td>More than eight hours</td>
<td>6(55%)</td>
</tr>
<tr>
<td>Total</td>
<td>11</td>
</tr>
</tbody>
</table>
Discussion

The aim of postoperative fluid is maintaining normal functional volume indicated by optimum recovery \(^{(10)}\). As known that both fluid overload and underload should be avoided, the suitable volumes needed to achieve euovolemic status have not been decided yet \(^{(10)}\). A previous study \(^{(13)}\) found that excessive post-operative fluid administration is a recognized most important cause of postoperative morbidity, prolonged hospital stay, organ failure and mortality. The level of surgical stress is related directly to the degree of surgical trauma \(^{(14)}\). This means that, in euovolemic post-operative patient, the target is to allow wise net excretion of excess salt and water until the patient has returned their sodium and fluid balance. So, the fluid volume should be for daily maintenance and replacement of any on-going additional losses, and postoperative fluid regime should be considered in relation to current balance due to previous fluid treatment (pre- and intra-operatively) which really affects post-operative state of the patient \(^{(15)}\). Previous studies reported an early return back to daily activity when fluid intake is restricted post-operatively \(^{(16-18)}\).

In our study we used the simplest formula of post-operative fluid supply in uncomplicated elective cholecystectomy patients, and we found that laparoscopic cholecystectomy patients can resume oral fluid early post operatively with minimum intravenous fluid and discharged on the same day of surgery without ill effects, those within younger age group were more rapidly regained their homeostasis and were ready to start oral fluid early, which reflected that less trauma was induced by laparoscopic cholecystectomy. These data were in agreement with other studies \(^{(16,19)}\). The sex of patients showed no effect on amount of post-operative fluid needed in both types of operations. Regarding open cholecystectomy, patients did not respond well to restrictive intravenous fluid and most of them needed further follow up till they could start their bowel activity, which indicated more trauma induced by open cholecystectomy and more fluid loss in this type of operation.

Our regimen was to use glucose saline in the post-operative period for uncomplicated cholecystectomy as it is devoid from potassium, contains less amount of sodium and can maintain fluid requirements.

The surgical stress causes an impairment in gastrointestinal motility \(^{(26,27)}\), which may theoretically be increased both by decrease of fluid in the body and fluid overload (as decreased motility secondary to fluid accumulation in the bowel wall and surrounding tissue) \(^{(28)}\), which may lead to post-operative nausea and vomiting as well as the effect of anesthetic drugs and type of cholecystectomy procedure \(^{(29)}\). Other studies concluded that post-operative pain, vomiting and nausea have been found to influence post-operative fluid administration \(^{(10)}\) and to potentially predict hospital stay after surgery \(^{(31)}\).

It is proved that post-operative pain is less sever after laparoscopic cholecystectomy, so needs less post-operative pain killers than open cholecystectomy \(^{(32)}\), this was reflected in our patients by early return of bowel activity, cardiovascular stability and early discharge from hospital.

Absence of complications, stable homeostasis, positive bowel movement, mobility and toleration of a general diet are considered criteria for early discharge by most (including us) of surgical opinions \(^{(33)}\).

We recommend further studies about the effect of intra-operative fluid regimen on the amount of post-operative fluid in elective cholecystectomy.

Conclusions

Restrict post-operative intravenous fluid for maintenance therapy in elective and uncomplicated laparoscopic cholecystectomy in fit patients in the aim of early discharge of patients from hospital as a day case surgery.

Ethical Clearance: The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding.

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Estimation of the Efficacy and Safety of Totally Real-Time Ultrasonography-Guided Percutaneous Nephrolithotomy: A Single Center Study

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ABSTRACT

Background: Percutaneous removal of urinary calculi is superior to open surgical removal in terms of morbidity, recovery and expenses. Even for large complex renal stones PCNL now considered the first choice of treatment at most institutes. The aim of current study was to determine the efficacy and safety of percutaneous nephrolithotomy under total ultrasound-guidance.

Methodology: From January 2015 to March 2018, a total of 300 patients, (200 males and 100 females) their age ranged from 20 to 65 years with a Mean ± SD age of 40.75 ± 11.8 years who visited the outpatient urology clinic and presented with stones size ranged (20–50mm) with a mean size of 33.5mm, were included in this study. All calculi were situated in the renal pelvis with different degrees of hydronephrosis ranging from mild to severe hydronephrosis as appreciated by radiological investigations. The patients were positioned in the standard lithotomy position, a double J stent was placed cystoscopically, and urethral catheter was also inserted. Then the position of patient was changed to prone position. The PCS was punctured by using an 18-gauge nephrostomy needle through the lower pole calyx, and all steps of the operation were performed under ultrasonography guidance. Lithotripsy was done by using pneumatic probes.

Results: Data showed that 276 (92%) patients had complete stone clearance in patients with single stone (180 patients). The stone-free rate was 100% and in patients with multiple or staghorn stone (120 patients), the stone-free rate was 80% (120 patients). In addition, 20%(16 patients) had residual stones ;10 patients of them had insignificant residual fragments that passed spontaneously four weeks postoperatively and 6 patients needed SWL for clearance of stone fragments. The complication rate was 30%, the most common complications being mild fever (35%), clinically insignificant hemorrhage (8%), urinary tract infections in 5%, 5% had flank pain and there were no injuries to adjacent organs. The Mean ± SD time of the operation was 70 ± 35.68 minutes (range was 35–160 minutes). The Mean ± SD time of hospitalization was 2.8 ± 1.15 days (2–5 days).

Conclusion: Totally ultrasonography-guided PCNL has excellent results in comparison to the ordinary method of PCNL with no major complications and with the benefit of precluding radiation exposures and injury to the neighboring organs.

Keywords: PCNL, ultrasound, renal stone, nephrostomy, hydronephrosis.

Introduction

The introduction of percutaneous nephrolithotomy (PCNL) as a new method for treatment of large renal stone was in 1976 [1]. By 1995, large number of studies about PCNL had been made for estimation of the efficacy and safety of this minimally invasive technique and its complications [2].
Percutaneous removal of urinary calculi is superior to open surgical removal in terms of morbidity, recovery and expenses \[^3\]. Even for large complex renal stones PCNL now considered the first choice of treatment at most institutes \[^4\].

Now, this operation is done under guidance of fluoroscopy, and this will lead to exposure of the surgical team and patient to radiation \[^5\]. Using ultrasonography as a guidance, PCNL can abolish the side effects of radiation exposure during fluoroscopy-guided PCNL, and eliminate the hazard of radiation \[^1\]. The aim of current study was to determine the efficacy and safety of percutaneous nephrolithotomy under total ultrasound-guidance.

**Patients and Method**

From January 2015 to March 2018, 300 patients (200 males and 100 females) with renal calculi sized (20–50mm) and mean size of 35.5mm situated in the pelvis and with different degrees of hydronephrosis ranging from mild to severe hydronephrosis with a Mean ± SD age of 40.75 ± 11.8 years, were involved in this study at the urology unit in Al-Diwaniyah Teaching Hospital (Table 1).

Complete preoperative assessment was done for all patients. Criteria of stones regarding size, site, number, opacity and the degree of obstruction that caused by the stone were done by radiological investigations. Before the operation, an informed consent was taken.

All of our patients operated under general anesthesia and all patients received single dose (1000mg) of ceftriaxone at the induction of anesthesia. After completion of anesthesia the patient was placed in standard lithotomy position and cystoscopy was done and insertion of the double J stent was done and urethral catheter was inserted, then patient’s position was changed to the prone position, and under ultrasound guidance, the PCS and the calculus were localized.

The PCS was punctured by an 18-gauge nephrostomy needle through the lower pole calix. After achieving puncture to the PCS and with the urine flowing out, a floppy guidewire was passed through the needle into the PCS. After that the dilatation of the tract was done using an Alken (metal) dilator up to 28Fr. After that 30 Fr. an Amplatz sheath, was passed to the PCS. All steps of the operation were done under ultrasound guidance.

A nephroscopy was placed in the PCS. Calculi fragmentation was done by using a pneumatic Swiss lithoclast. Grasping forceps were used for removal of calculus fragments. At the end of the operation a nephrostomy tube was inserted in all patients and this tube was removed 48 hours postoperatively.

Patients received parenteral antibiotics for 3 days postoperatively and discharged with oral antibiotics as well as analgesia for 7 days. The follow-up of our patients was done at outpatient clinic with radiography of the (KUB) and/or ultrasound at 14, and 28 days postoperatively as needed for evaluation of the stone-free rate and removal of DJ stent under local anesthesia by flexible cystoscopy.

**Results**

The characteristics of our patients were shown in Table (1). The Mean ± SD operative time (from the induction of anesthesia to the insertion of the nephrostomy tube) was 70 ± 35.68 minutes (range was 35–160 minutes).

Successful access to the PCS was achieved in all patients. The Mean ± SD time of hospitalization was 2.8 ± 1.15 days (range was 2–5 days).

Results of current study revealed that 85% of patients had complete stone clearance and this was confirmed by ultrasonography 48 hours after surgery. In 180 patients those with single renal stone the stone free rate was 100% while the (120 patients) with staghorn or multiple calculi the stone-free rate was 80%. Sixteen patients had residual fragments; 10 of them had insignificant residual stone fragments that passed spontaneously after a period of 4 weeks and in six patients had residual stone greater than 10mm at the end of the operation. For those patients, extracorporeal shockwave lithotripsy was used to eliminate the residual stone fragments after the primary procedure.

The complication rate was 30%, these complications included mild fever (35%), clinically insignificant hemorrhage (8%), urinary tract infections 5% and flank pain (5%) without injuries to the adjacent organs.
Table 1: Clinical characteristics of patients

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age/yr</td>
<td>40.75 ± 11.8, (20 – 65)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>200</td>
</tr>
<tr>
<td>Women</td>
<td>100</td>
</tr>
<tr>
<td>Stone size/mm</td>
<td>35.5, (20-50)</td>
</tr>
<tr>
<td>Hydronephrosis</td>
<td></td>
</tr>
<tr>
<td>Mild</td>
<td>30</td>
</tr>
<tr>
<td>Moderate</td>
<td>170</td>
</tr>
<tr>
<td>Severe</td>
<td>100</td>
</tr>
<tr>
<td>Type of stone</td>
<td></td>
</tr>
<tr>
<td>Single (pelvic)</td>
<td>180</td>
</tr>
<tr>
<td>Multiple or staghorn</td>
<td>120</td>
</tr>
</tbody>
</table>

Discussion

Nowadays open surgical approach for removal of large renal stone is less applicable because of the availability of other less invasive alternative methods of treatment of renal stone such as SWL, flexible ureteroscopy and PCNL [7].

The most important thing in achieving excellent results of PCNL with minimal or no complication is good selection of the patient and good follow up [8].

By using ultrasound guidance, there was no need for contrast, and there was more accurate access to the collecting system without injury to the neighboring organs [9]. The main advantages of ultrasound over fluoroscopy in PNL are avoidance of radiation, visualization of radiolucent stone and avoidance of injuries to the adjacent organs [10-12].

In our study all steps of the operation were done under ultrasound guidance without need for fluoroscopy while Osman and colleagues [13] used sonography just for the primary access to the pelvicalyceal system, while the dilatation of the tract has been done under the guidance of fluoroscopy [14].

The primary stone-free rate was 45.7% as reported by Osman and colleagues [12] that performed PCNL with ultrasound-guided renal access and the total stone-free rate was 96.5%, which is comparable to the result that achieved by our study.

Osman and colleagues [15] reported that 33% of patients needed an auxiliary measure (a second PCNL, SWL, or a URS) for achievement of complete stone clearance while in our study only 5% of patients needed subsequent SWL for getting a stone free state.

The overall complication rate in our study was 30% which was comparable to that seen in other studies [16].

Conclusion

PCNL under ultrasound guidance is considered as a realistic, consistent, safe, and effective substitute to fluoroscopy in experienced urologist and eliminate radiation hazard to both the urologist and the patient.

Ethical Clearance: The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding.

REFERENCES


The Effect of the Use of Parachutes and Gloves in Some Kinetic Variables and the Completion of a Swimming Pool (50M) Free for the Armenian Club

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¹College of Physical Education and Sports Science for Girls, University of Baghdad, Iraq

ABSTRACT

Background: Scientific research in sports biomechanics is not limited to diagnosis or treatment of the strengths and weaknesses of the training process for young swimmers. The study was aimed to prepare special exercises using the parachute and the gloves as a means of resistance in the training process in accordance with the abilities of the sample and to identify its effects on the kinetic parameters of length of the cloud, velocity of the cloud and rate of speed.

Method: A 50-meter swimming pool was completed for young swimmers. The researcher adopted the experimental method of group design with the design of the three experimental groups with tight control in the pre- and post-tests. The first experimental group was trained using the umbrella resistance, the second experimental group was trained using paw resistance and the third experimental group was trained by combining the two types of resistance (parachute + gloves) on a sample of young swimmers in the club of the Armenian. Nine swimmers were chosen by a vertical (100%) of their community origin. The training curriculum lasted for eight weeks with two training units per week. The number of training units per group was 16 training units in the study experience.

Results and Conclusions: Data of pre- and post-tests were statistically determined by the SPSS system. The researchers concluded that training by combining two types of resistors (parachutes + gloves) improved the rate of speed, length and frequency of the strike and the completion of a 50-meter swimming pool in the young swimmers who trained them. The researchers argue that it is necessary to have resistance training based on the principle of experimentation and not to exaggerate with young swimmers to be appropriate for their age, training level, gender and privacy of swimming distance specified for them.

Keywords: parachutes, kinetic variables, young swimmers, resistance, frequency of strike.

Introduction

Scientific research in sports biomechanics is not limited to diagnosis or treatment of the strengths and weaknesses of the training process for young swimmers. In many fields it extends the training methods used in formation of resistance on swimmer’s body, which has gained considerable space in the training operations of global swimmers to break the routine of the training process. Resistors with and reverse swimmer, which develops some physical characteristics and some biomechanical variables in swimming extending that role to motor performance and helps correct it to reach the optimal motor performance that serves the effectiveness “Biochemistry did not really evolve from mechanics alone, but it is a modern science that has evolved from a range of other sciences: anatomy, organ function, and curriculum”. In this way, Samir Abdullah presented his opinion that “work (training/competition) against very strong resistance, whether slow or rapid, requires muscles to strengthen the three types of fibers. It has be mentioned that “The training, which is derived from the sports biomechanics, what is the main muscle group to be trained, which method of training to use, and what is the energy production system to focus on during work), then the trainer should determine the following”[1].

So the steps can be followed: Determine the position of the joint and its movement in the specific exercise, determine the muscles responsible for the movement required and determination of nature. By adoption of these determinants, it is possible to employ
the mechanical principles in the direction of training process to go into the effects of resistors to provide an explanation of their roles in these. The process is subject to limitations imposed by laws of force that invest as a resistance to the mass that constitutes disability different from normal conditions, thus increasing the ability of the swimmer to improve it to achieve. So that, the productivity of the study is directed towards raising achievement through the adoption of what is built on the language of numbers and avoids personal speculation of some trainers to exaggerate the loads of training in order to raise the achievement. Also, the speed of link with the nervous system as well as type of muscle fiber are genetically determined so the nervous system must be prepared to accept the additional burdens and accept the physical burdens (50 meters) and the training umbrella to induce change in the target muscles for development[2].

Studies that are scientifically proven indicated that there is no increase in the number of neurons because they do not contain the central particle, but it is possible that the work is improved by shortening the period of latency in muscle contraction which showed clear in the speed of performance. In the training of resistors in swimming, muscles are trained to achieve the development of work of muscle fibers when faced with different circumstances. In other words, to develop motor velocity, attention must be paid to a large extent by strengthening the muscle groups on which the motor function is based[7]. Moreover, through the work of the researcher as a trained assistant, I noticed that the need to achieve consistency in the length of the cloud and frequency to serve the achievement in a distance of (50) meters for young swimmers in the Armenian club. Therefore, the study attempted to answer the following question: Is it possible to use the parachute and cabbage as resistors to have an impact in some biomechanical variables and the completion of swim (50) meters in young swimmers?

The aims of current study were:

1. Preparation of special exercises using the parachute and the gloves as resistance means in the training process in accordance with the sample capabilities, and to identify their effects on the kinematical variables represented by length of the cloud, velocity of the cloud and rate of speed.

2. Identify the effects of these exercises in the time of completion of swimming (50) meters in the young swimmers.

To achieve the goals of the study, the researchers assumed that:

1. There are statistically significant differences between the results of the pre and post tests of the kinematical variables of the three research groups represented by (velocity of the cloud, length of the cloud and speed of the speed) and completion of the swimming pool (50) meters.

2. There are statistically significant differences between the three research groups in the results of the tests in the kinematical variables represented by (frequency of drawing, length of the cloud, speed rate) and completion of the swimming (50) meters in the young swimmers.

**Method**

The experimental group followed the empirical research approach by designing the three experimental groups with tight control in the pre and post tests. The first experimental group was trained by using parachute resistance; the second experimental group was trained using paw resistance and the third experimental group was trained by combining the two types of resistance.

**Study sample:** The sample included (9) swimmers, the sample of the study was chosen by (110%) and according to the determinants of experimental design of the study; the sample was divided into three groups of equal numbers.

**Measuring tools, tests and study procedures:** The resistors were in the umbrella (6 and 6), while the instruments in the search experience were (whistle, stopwatch, legal swimmer, Sony high speed camera (100 sec); (15) meters from each distance, (25) meters of the distance and (50) meters after excluding the starting distance and rotation and the distance of the end. After analyzing this imaging, the data of the values (speed, strike length and strike frequency) as well as recording the completion time of 50 meters, were extracted. The training curriculum lasted for eight weeks with two training units per week. The number of training units for each group was 16 units during the field study, after which the post-tests were carried out on 24/9/2018, and results were processed with SPSS (Version 25).
## Results

### Table 1: Results of (f) analysis of single-way variance among the three study groups in the pre tests

<table>
<thead>
<tr>
<th>Test No.</th>
<th>Source of Contrast</th>
<th>Total squares df Average squares (f) calculated Sig.</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Between groups</td>
<td>0.000 2 0.000</td>
<td>0.475 0.000  Non-sig.</td>
</tr>
<tr>
<td></td>
<td>Within groups</td>
<td>0.003 6 0.000</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Between groups</td>
<td>0.002 2 0.001</td>
<td>2.239 0.188  Non-sig.</td>
</tr>
<tr>
<td></td>
<td>Within groups</td>
<td>0.003 6 0.001</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Between groups</td>
<td>0.000 2 0.000</td>
<td>0.500 0.63   Non-sig.</td>
</tr>
<tr>
<td></td>
<td>Within groups</td>
<td>0.002 6 0.000</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Between groups</td>
<td>0.000 2 0.000</td>
<td>0.580 0.589  Non-sig.</td>
</tr>
<tr>
<td></td>
<td>Within groups</td>
<td>0.003 6 0.000</td>
<td></td>
</tr>
</tbody>
</table>

Number of groups is 3. Significant if P≤0.05.

### Table 2: Results of t-test of the interrelated samples of each of the three study groups in the pre and post tests

<table>
<thead>
<tr>
<th>Tests</th>
<th>Group</th>
<th>Pre-test</th>
<th>Post-test</th>
<th>Mean</th>
<th>SD</th>
<th>Mean</th>
<th>SD</th>
<th>Mean diff.</th>
<th>SD diff.</th>
<th>(t) calculated</th>
<th>Sig.</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed rate</td>
<td>Group1</td>
<td>1.28</td>
<td>1.407</td>
<td>0.026</td>
<td>0.06</td>
<td>0.027</td>
<td>0.021</td>
<td>0.127</td>
<td>0.021</td>
<td>10.539</td>
<td>0.009</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Group2</td>
<td>1.63</td>
<td>1.677</td>
<td>0.015</td>
<td>0.01</td>
<td>0.047</td>
<td>0.012</td>
<td>0.057</td>
<td>0.006</td>
<td>17</td>
<td>0.003</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Group3</td>
<td>1.66</td>
<td>1.767</td>
<td>0.02</td>
<td>0.029</td>
<td>0.143</td>
<td>0.025</td>
<td>0.127</td>
<td>0.021</td>
<td>23.02</td>
<td>0.002</td>
<td>Sig.</td>
</tr>
<tr>
<td>Length of strike</td>
<td>Group1</td>
<td>0.93</td>
<td>0.967</td>
<td>0.02</td>
<td>0.06</td>
<td>0.037</td>
<td>0.015</td>
<td>0.037</td>
<td>0.015</td>
<td>4.158</td>
<td>0.053</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Group2</td>
<td>0.927</td>
<td>0.943</td>
<td>0.015</td>
<td>0.012</td>
<td>0.017</td>
<td>0.006</td>
<td>0.017</td>
<td>0.006</td>
<td>5</td>
<td>0.038</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Group3</td>
<td>0.917</td>
<td>1.02</td>
<td>0.015</td>
<td>0.01</td>
<td>0.103</td>
<td>0.012</td>
<td>0.103</td>
<td>0.012</td>
<td>15.5</td>
<td>0.004</td>
<td>Sig.</td>
</tr>
<tr>
<td>Frequency of strike</td>
<td>Group1</td>
<td>3.077</td>
<td>3.013</td>
<td>0.029</td>
<td>0.006</td>
<td>0.063</td>
<td>0.023</td>
<td>0.063</td>
<td>0.023</td>
<td>4.75</td>
<td>0.042</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Group2</td>
<td>3.062</td>
<td>3.047</td>
<td>0.007</td>
<td>0.006</td>
<td>0.015</td>
<td>0.005</td>
<td>0.015</td>
<td>0.005</td>
<td>5.277</td>
<td>0.034</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Group3</td>
<td>3.06</td>
<td>2.947</td>
<td>0.02</td>
<td>0.006</td>
<td>0.113</td>
<td>0.015</td>
<td>0.113</td>
<td>0.015</td>
<td>12.851</td>
<td>0.006</td>
<td>Sig.</td>
</tr>
<tr>
<td>Completion of (50) meters</td>
<td>Group1</td>
<td>3.077</td>
<td>3.013</td>
<td>0.029</td>
<td>0.006</td>
<td>0.063</td>
<td>0.023</td>
<td>0.063</td>
<td>0.023</td>
<td>4.75</td>
<td>0.042</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Group2</td>
<td>3.062</td>
<td>3.047</td>
<td>0.007</td>
<td>0.006</td>
<td>0.015</td>
<td>0.005</td>
<td>0.015</td>
<td>0.005</td>
<td>5.277</td>
<td>0.034</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Group3</td>
<td>3.06</td>
<td>2.947</td>
<td>0.02</td>
<td>0.006</td>
<td>0.113</td>
<td>0.015</td>
<td>0.113</td>
<td>0.015</td>
<td>12.851</td>
<td>0.006</td>
<td>Sig.</td>
</tr>
</tbody>
</table>

### Table 3: Results of (f) analysis of one-way mono-variance among the three study groups in the post-tests

<table>
<thead>
<tr>
<th>Test No.</th>
<th>Source of Contrast</th>
<th>Total squares df Average squares (f) calculated Sig.</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Between groups</td>
<td>0.078 2 0.039</td>
<td>706.4 0.000  Sig.</td>
</tr>
<tr>
<td></td>
<td>Within groups</td>
<td>0.000 6 0.000</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Between groups</td>
<td>0.013 2 0.006</td>
<td>21 0.002  Sig.</td>
</tr>
<tr>
<td></td>
<td>Within groups</td>
<td>0.002 6 0.000</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Between groups</td>
<td>0.009 2 0.005</td>
<td>52.125 0.000  Sig.</td>
</tr>
<tr>
<td></td>
<td>Within groups</td>
<td>0.001 6 0.000</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Between groups</td>
<td>0.016 2 0.008</td>
<td>233.333 0.000  Sig.</td>
</tr>
<tr>
<td></td>
<td>Within groups</td>
<td>0.000 6 0.000</td>
<td></td>
</tr>
</tbody>
</table>
Table 4: Results of the (LSD) test among the three study groups in the post-tests

<table>
<thead>
<tr>
<th>Indicators and groups</th>
<th>Results of mean differences</th>
<th>Sig.</th>
<th>Morality</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>For the first experimental group</td>
</tr>
<tr>
<td>Speed rate</td>
<td>1 - 2</td>
<td>0.087*</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>1 - 3</td>
<td>-0.14*</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>2 - 3</td>
<td>-0.227*</td>
<td>0.000</td>
</tr>
<tr>
<td>Length of strike</td>
<td>1 - 2</td>
<td>0.03</td>
<td>0.008</td>
</tr>
<tr>
<td></td>
<td>1 - 3</td>
<td>-0.06*</td>
<td>0.005</td>
</tr>
<tr>
<td></td>
<td>2 - 3</td>
<td>-0.09*</td>
<td>0.001</td>
</tr>
<tr>
<td>Frequency of strike</td>
<td>1 - 2</td>
<td>0.023*</td>
<td>0.023</td>
</tr>
<tr>
<td></td>
<td>1 - 3</td>
<td>-0.053*</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>2 - 3</td>
<td>-0.077*</td>
<td>0.000</td>
</tr>
<tr>
<td>Completion of (50) meters</td>
<td>1 - 2</td>
<td>-0.033*</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>1 - 3</td>
<td>0.067*</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>2 - 3</td>
<td>0.1*</td>
<td>0.000</td>
</tr>
</tbody>
</table>

* Significant difference at (P≤0.05) level of significance.

Discussion

The researchers attributed the emergence of these results to the role of resistors interpreted by kinematic laws for the practice of training these exercises, as the gloves used in swimming as training aids helped increase the surface area for hand comfort and then increase the amount of water pump to the gloves. The gloves constituted a driving force forward helped improve the values of dependent variables in the trained swimmers. On the other hand, the umbrella is a resistance to reverse the movement of the swimmer and pull back, so the use of gloves makes the player swims quickly above the maximum due to the amount of payment generated [3]. It is a resistance to reverse the movement of the swimmer and then strengthens the muscular capacity of the swimming pool and develop the force, but the use of these means with some puts the swimmer under the influence of two forces opposite in the direction; one forward (gloves) and the other force backward (umbrella), positive along the swimmer’s pull because he will try to overcome the resistance to the back of the hand to extend the most possible point to avoid fatigue and this could improve the length of the draw and the continuity of training and continue it [4].

The addition of the burden means increasing the torque of the inertia of parts of the body or the whole body when swimming, and this requires the swimmer to exert greater strength to overcome the increase in the determination of inertia due to the impact of resistors. The amount of this force is increased by type and how much resistance and it needs to make a greater force to match the increase in the resolve of body inertia and increasing the resistance requires increased strength to maintain the proportion of this force as required by performance, as speed and mass are inversely proportional [5]. Increased resistance will reduce the amount of speed and this, as the training of resistors, increases the strength due to increased resistance. In the process of physiological response and access to the physiological adjustment phase and the lifting of these resistances, the speed will increase by increasing the force that has been developed by the resistance. Salma Toukan provides evidence that “The weight of the body, the age, the sex and the difference in sports. There is an important principle that “the less weight, the less energy is needed to do the same work [6].

This means that mechanical work will be increased (labor = energy) and that this increase will be offset by a dynamic energy exchange commensurate with the work high effort mechanical resistors [7]. After the process of adjustment in the increase of mechanical energy (kinetic ones), these resistors are lifted and maintain the output of mechanical energy with the least resistance (only the inertia of the pool and resistance to water friction and others without resistance). The bio energy will be reduced to fit the resistance in the swimmer’s environment, but the work itself, based on the principle mentioned (because the resistance was said and the work itself). It is possible to obtain a high-level work in bioenergy [8].
According to [8], biomechanics is an associated science, as the content of this science directly benefits from the theories and laws of several different basic sciences [9]. These sciences contributed to the science of biomechanics by determining the motor characteristics associated with the exercise of sports activity, which led to the development of high skill technique and increased the kinetic experiences. Biomechanics contribute to the development and improvement of sports movement and to achieve skill and motor performance to the closest ideal performance, a goal that each coach seeks to eloquence. It is the duty of science related to sport to find the latest methods that can be used to analyze and study sports movements [10].

Conclusions

1. Training by combining two methods of resistance (parachute + gloves) improves the rate of speed, length and frequency of strike and the completion of swimming pool (50) meters free among young swimmers who trained and outperform the swimmers who train one.

2. The parachute training improves the rate of speed, length and frequency of strike and the completion of swimming pool (50) meters free with young swimmers who train them, and excel on swimmers who train with cabbage.

3. It is necessary to train resisters based on the principle of experimentation and not exaggeration with young swimmers, to be appropriate for their age and training level and gender and the specific distance of swimming identified for them.

Ethical Clearance: The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding.

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The Impact of Problem Solving Strategy in Developing the Technical Performance and Accuracy of the Skill of the Serve Facing from the Top (Tennis) Volleyball for Students

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¹College of Physical Education and Sport Sciences, University of Babylon, Iraq; ²College of Physical Education and Sport Sciences, University of Kufa, Iraq

ABSTRACT

Background: The field of education in physical education and sports has undergone significant changes that have shown the interest of specialists and researchers in developing the educational process continuously in order to raise the level of education and learners. The aim of current study was to identify the effect of problem solving strategy in developing the skill of Serve from the top (tennis) to the students’ volleyball.

Method: The research community included 3rd-stage students at Faculty of Physical Education and Science. The total number of students was (71). However, the number of students who were rejected and deferred was (7) students. Therefore, total number of participants was 64 students. The sample was randomly selected by 32 students and divided equally into two groups. After conducting the tests, the experimental group began applying the units prepared by researcher and continued for eight weeks each week in one developmental unit. After the completion of the unit items, the researchers carried out the remote tests. The researchers collected data and were processed statistically to reach the most important conclusions.

Results: The exercises, which were developed in accordance with the strategic steps of problem solving, have greatly helped to develop the pilot skill of the upper plane (tennis) volleyball students’ experimental group.

Conclusions: There was a positive development, of experimental and control groups, of the technical performance and accuracy of the skill and the Serve of the upper (tennis) volleyball for students.

Keywords: volleyball, technical performance, Serve, upper tennis, problem-solving.

Introduction

The field of education in physical education and sports has undergone significant changes that have shown the interest of specialists and researchers in developing the educational process continuously in order to raise the level of education and learners. The task of the teacher is no longer limited to explaining and dumping and following the traditional methods of education. For the strategy of the lesson and developing it according to scientific standards which are compatible with the potential of students’ physical skills, achievement, mental and individual differences and others to achieve the goals of the lesson set in advance [¹].

Scientific development includes the emergence of ideas and strategies that tend to make the learner takes the largest role in the learning process, while teacher’s role is in guidance and giving student the opportunity and time to use a variety of strategies to solve the problems facing them and identify them and find appropriate solutions to them according to his own thinking and opinions. So, the attention of specialists is in teaching various skills in various sports such as volleyball to use unconventional strategies in the unit for educational purposes.

Moreover, volleyball of athletics, which took a distinguished position in terms of practice and spread in
The aims of current study were to identify the impact of problem-solving strategy in the development of the skill of serve from the top (tennis) volleyball as well as the link between practical and theoretical aspects of their impact in helping learners to understand the skills and improve their performance.

Research Hypotheses:

1. There is a positive impact of the strategy of problem solving in the development of the skill of the transfer from the top (tennis) volleyball for students.

2. There is a preference in influencing the problem solving strategy and the method used in the development of the skill of serve from the upper face (tennis) volleyball for students, and the effectiveness of the influence of the strategy of problem solving in the tests of post.

Method

The researchers followed the experimental approach to fit the nature of the research problem. They also chose to design the style of the two study groups (experimental and control) with both the pre and Pre-tests.

Study Sample: The study sample represented 3rd-stage students at Faculty of Physical Education and Sports Sciences/University of Kufa, their number was 71 students. Seven students were excluded because they retarded and deferred, therefore, total number of participants was 64 students. The latter were divided equally into two groups; experimental and control groups.

Sampling Homogeneity: The researchers used the torsion coefficient before applying the main experiment to the two study groups (control and experimental) as shown in Table (1).

Table 1: Homogeneity of the research sample

<table>
<thead>
<tr>
<th>Variable</th>
<th>Units</th>
<th>Mean</th>
<th>Median</th>
<th>SD</th>
<th>Skewness</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>cm</td>
<td>174.75</td>
<td>175</td>
<td>1.879</td>
<td>0.133</td>
<td>Homogeneous</td>
</tr>
<tr>
<td>Body mass</td>
<td>kg</td>
<td>73.812</td>
<td>74</td>
<td>2.286</td>
<td>0.082</td>
<td>Homogeneous</td>
</tr>
<tr>
<td>Age</td>
<td>year</td>
<td>20.5</td>
<td>20.5</td>
<td>0.516</td>
<td>0.968</td>
<td>Homogeneous</td>
</tr>
</tbody>
</table>

Equivalence of study groups: Prior to implementing the problem-solving strategy, researchers sought to verify equivalence of the two groups under study, as shown in Table (2).

Table 2: Equivalence of the two research groups in the tests of the variables under study

<table>
<thead>
<tr>
<th>Variables</th>
<th>Units</th>
<th>Control group</th>
<th>Experimental group</th>
<th>(t) calculated</th>
<th>Sig.</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical performance of the front-facing</td>
<td>Grade</td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>0.36</td>
<td>0.717</td>
</tr>
<tr>
<td>forward (tennis)</td>
<td></td>
<td>4.81</td>
<td>0.51</td>
<td>4.75</td>
<td>0.44</td>
<td></td>
</tr>
<tr>
<td>Serve accuracy from the top (tennis)</td>
<td>Grade</td>
<td>7.75</td>
<td>1.06</td>
<td>7.93</td>
<td>1.34</td>
<td>0.43</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*: Standard Deviation.

Used tools and devices

- Legal volleyball court.
- Legal aircraft balls number (15) type (Mikasa).
- Colored adhesive tape number (4).
- Tape measure (20 meters).
- Sport stopwatch number (2).
- Whistle number (2).
- Office tools (papers and pens).
Field Research Procedures

Specify search variables: The search variables were determined according to the search problem, which is the technical performance and accuracy of the skill of the Serve facing the top (tennis) volleyball.

Identification of Variable Tests: After reviewing several sources, scientific references and similar studies, in addition to the interviews of some experts and specialists in the field of motor learning and volleyball, the tests were determined to measure the research variables which can be measured in terms of motor and skill abilities.

Testing the technical performance of the skill of the Serve facing from the top (tennis): The objective of the test was to evaluate the technical performance of the skill of Serve through its virtual form and its three divisions (preparatory, president and conclusion). The tools used included legal volleyball court, legal plane balls number (3) and performance evaluation form.

Performance specification: The student will perform the skill of sending the tennis from the Serve area specified by (9) meters to the corresponding field on the ball passes the net (without touching) trying to drop in the opposite half of the stadium.

Conditions of performance: The laboratory gets zero points in the case of the performance of the Serve in a manner not agreed.

The registration: Three evaluators evaluated the three attempts of each student laboratory and gave three degrees for each rectifier (the final calendar grade for each attempt is 10 degrees distributed on the three sections of the skill which is (3) grades for the preparatory section, (6) and (1) grades for the final section. Then, they chose the best score for each rectifier and through the extraction of the mean of the best three grades, the final grade for each student laboratory was calculated.

Testing accuracy of skill of the Serve from the top (tennis): Objective of the test was measuring the accuracy of the Serve skill. The tools used included Legal volleyball court, legal plane balls (5) and colored bar to divide the corresponding playground areas.

Performance specifications: The student stood in the middle of final line of the stadium (9) meters from the network, so that the student labored to hold the ball to perform the Serve to cross the ball network to half the planned stadium.

Conditions of performance: In the case of touching the ball to the network and transit to half the planned stadium or out of the boundaries of the stadium, it was counted as an attempt for the student laboratory (of five attempts) and did not calculate their grades.

Registration: The student took the degree of the area where the ball is located for each correct sending and since each student has a laboratory (5) attempts and because grades are distributed on the regions of (1-4) degrees, the maximum score for this test was (20). The fall of ball on the line separates the two regions; it was counted for the student’s upper region score.

Main experiment procedures

Pre-Tests: The researchers conducted the pre-tests on the research community of the two groups (control and experimental) of the study variables; technical performance and accuracy of skill of the Serve facing the top (tennis) on Sunday, 16/12/2018, at ten o’clock in the morning in the indoor closed hall at the Faculty of Physical Education and Science. The researchers used two cameras (Canon) to portray the technical performance of the skill of the Serve from the top (tennis) volleyball and recorded videoconference by (CD) to be presented to the gentlemen for analysis and recording the results of their evaluation of the technical performance through the evaluation form prepared for humiliation as preset.

Application of problem solving strategy: The researcher applied the experiment according to the following steps: After reviewing vocabulary of the curriculum for 3rd-stage students at Faculty of Physical Education and Sports Sciences/University of Kufa, the development of curriculum was carried out in the form of developmental units and began applying the experiment to students of the research group in (23/12/2018) in the closed gymnasium of the Faculty of Physical Education
and Sports Sciences/University of Kufa, at the rate of development unit each week duration (90 days) and continued until the end of the experiment in (17/1/2019). The total number was (8) development units.

Pre-tests: After the completion of the problem-solving strategy, the Pre-tests were carried out on the control and experimental groups. This was on Sunday, 27/1/2019, in the same sequence of pre-tests.

Results

Table 3: Computational circles, standard deviations, calculated values of (t) of interrelated samples, level of significance of the test and significance of the difference to the pre and Pretests of the control group for the variables investigated

<table>
<thead>
<tr>
<th>Variable</th>
<th>Units</th>
<th>Pretest Mean</th>
<th>Pretest SD*</th>
<th>(t) calculated</th>
<th>Sig.</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical performance of the front-facing forward (tennis)</td>
<td>Grade</td>
<td>4.81</td>
<td>0.51</td>
<td>6.56</td>
<td>0.33</td>
<td>10.77</td>
</tr>
<tr>
<td>Serve accuracy from the top (tennis)</td>
<td>Grade</td>
<td>7.75</td>
<td>1.06</td>
<td>10.18</td>
<td>1.60</td>
<td>5.24</td>
</tr>
</tbody>
</table>

*: Standard Deviation.

Table 4: Computational circles, standard deviations, calculated value of (t) of interrelated samples, level of significance of the test and significance of the difference for the pre and Pretests of the experimental group for the variables investigated

<table>
<thead>
<tr>
<th>Variable</th>
<th>Units</th>
<th>Pretest Mean</th>
<th>Pretest SD*</th>
<th>(t) calculated</th>
<th>Sig.</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical performance of the front-facing forward (tennis)</td>
<td>Grade</td>
<td>4.75</td>
<td>0.44</td>
<td>8.06</td>
<td>0.45</td>
<td>21.15</td>
</tr>
<tr>
<td>Serve accuracy from the top (tennis)</td>
<td>Grade</td>
<td>7.93</td>
<td>1.34</td>
<td>13.12</td>
<td>1.31</td>
<td>10.51</td>
</tr>
</tbody>
</table>

*: Standard Deviation.

Table 5: The value of (t) calculated (for independent samples) and the level of significance of the test for the two groups (control and experimental) regarding the variables under study

<table>
<thead>
<tr>
<th>Variable</th>
<th>Units</th>
<th>Control group Mean</th>
<th>Control group SD*</th>
<th>Experimental group Mean</th>
<th>Experimental group SD</th>
<th>(t) calculated</th>
<th>Sig.</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical performance of the front-facing forward (tennis)</td>
<td>Grade</td>
<td>6.56</td>
<td>0.33</td>
<td>8.06</td>
<td>0.45</td>
<td>10.52</td>
<td>0.000</td>
<td>Sig.</td>
</tr>
<tr>
<td>Serve accuracy from the top (tennis)</td>
<td>Grade</td>
<td>10.18</td>
<td>1.60</td>
<td>13.12</td>
<td>1.31</td>
<td>5.68</td>
<td>0.000</td>
<td>Sig.</td>
</tr>
</tbody>
</table>

*: Standard Deviation.

Discussion

Results of current study showed that there were significant differences in the pre and Pretests of the two groups and the Pretests among the experimental and control group members [5]. For members of control group, findings might be attributed to researchers, to the variables and/or effects of several overlapping factors in the process of development that led to emergence of moral differences between the tests pre and Pre including feedback as it has an effective role. Feedback was given in the manner of the teacher directly to the student during
the performance, at the end of the lesson, which was confirmed that “After the end of the application period and preparing for the end of the lesson, the teacher corrects the mistakes of students” (Schmidt, 2000). “The feedback increases the capacity and motivation of individuals, corrects performance and avoids erroneous performance” [6].

The differences shown in the above tables of the experimental group members were attributed to use the strategy of problem solving in terms of planning and implementation of developmental units [7], as the exercises developed by researchers using the problem-solving strategy had transferred learners of the usual pattern that makes them receive information from the teacher to a new style based on question and choice of the appropriate solutions. This motivated learners to respond to this strategy, trying to succeed and to demonstrate their abilities and assert themselves and prove their potentials, which is often seen in palaces and indifference. The latter facilitated the process of understanding and assimilation of skills studied in the three sections (preparatory, president and final). In addition, the reason for these differences may be the new educational attitudes of learners [8] that clarified the target and what was required from learners to achieve and was not recognized in the educational units that led to a clear improvement in their performance. Moreover, [9] said that “The clarity of the goals and their identification in light of certain behaviors or performance levels are meaningful and effective”. Also, [10] said that “The interaction between group members and the discussions around the educational task that they had, affected their understanding of the educational material”.

The presentation of educational material whether written text or static and moving images or videos that enable the student to use more than a sense in the process of learning [11] had contributed significantly to the diversity of sources of knowledge and increased opportunities for good learning, and this improvement in technical performance and accuracy of skills is the result to stay away from the familiar in teaching through the use of problem solving strategy. The latter has a role in making learner’s focus on educational process and its performance organized and arranged according to the steps of the strategy in addition to the use of different positions and the continuous guidance from the supervisors supervising the performance of those exercises. These prepare to minimize the mistakes that the learner may have in performing the exercises during the unit [12].

Conclusions

1. There was a positive development, of experimental and control groups, of the technical performance and accuracy of the skill and the Serve of the upper (tennis) volleyball for students.

2. The exercises that were prepared according to the strategic steps to solve problems, significantly helped develop the skill of Serve from the top (tennis) volleyball students in the experimental group.

3. The problem solving strategy increased enthusiasm of learners, which was reflected positively in the development of motor abilities, which led to learning the skill of transfer from the top (tennis) significantly and effectively.

Ethical Clearance: The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding.

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10. Al-Mashhad RAA. The Impact of the Plan and PDEODE Strategies in Developing Awareness of Cognitive Processes and Reducing Psychological Pollution Among Students of the Faculty of Physical Education and Sports Sciences ????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????
Effect of Battle Ropes Training in Some Components of Health Fitness and Vision of the Body Image of Women Aged (30-35) Years

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ABSTRACT

The training of Battle ropes is one of the forms of modern exercises, which proved to be effective in the West by affecting the components of fitness and weight reduction and burning calories, and based on the interest of women in their bodies as well as its important role in society being more sensitive than men to see her body, Beauty is an objective phenomenon that all women seek to highlight, which requires more attention and use exercise appropriate sports methods. And highlights the importance of research in providing the woman with a healthy body and the vision that aspires to see her body, through the performance of exercises using heavy ropes, The aim of the research is to prepare exercises using heavy ropes and to identify the effect of these exercises on some components of health fitness (muscular endurance, flexibility, weight, BMI) and body vision for women aged 30-35 years, The research community consisted of women trainees at the Black Gym Fitness Center. The sample was deliberately selected from women aged 30-35 years. The researchers used the one-group experimental approach to suit the study. The tests and questionnaire were tools for collecting information, The researchers conducted a number of exercises that were applied to the sample for two months, (3) training units per week. After conducting pre-tests and post-tests (before and after exercise), the data were obtained and then statistically treated using the appropriate statistical methods. The results showed that there were significant differences between The tests, According to the results, the researchers made a number of recommendations.

Keywords: Battle Ropes training, Health Fitness, Vision of the Body Image.

Introduction

Health fitness is essential for every woman, whether it is sports or not. It is part of the general fitness and one of the components of the overall fitness that qualifies the individual to live in a balanced manner in society. The concept of health fitness is not limited to the free the individual from diseases or functional deficiencies, but represents the state of safety and physical, psychological, mental and social Satisfaction. As a result of the increasing awareness that coincides with the great development and scientific progress we are witnessing today and the growing interest in beauty and shape of the body, especially for women, the importance of fitness through its association with daily life and the possibility of women to doing the requirements of life activity which may be professional or sports.

The concept of improving the level of health fitness requires the development of its basic components through the adoption of the best methods of training is the main means to affect the individual functionally to make the adjustments required, so training experts have been constantly searching for the latest forms of physical exercise taking into account the impact of economic and effective. The training of Battle ropes is one of the forms of these modern exercises, which proved to be effective in the West by affecting the components of fitness and weight reduction and burning a lot of calories as it has a number of features as easy to transfer and it

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is not considered expensive and that work on the whole body at the same time without the need to train every part of the body in addition to it gives an atmosphere of enthusiasm and pleasure during the performance, which increases the motivation of the practitioner to continue the exercise.

Vision of the body image: It is the impression of the individual feelings and sensations of the sense of the body has attractive features that reflect the female or male character and what others see it from his point of view.

The study highlights the importance of the woman in giving the healthy and the vision she aspires to see her body by undergoing two-month Battle-duty exercises for women aged 30-35 years and responding in the following question: Does heavy rope exercises affect some in components of fitness and body vision for women aged 30-35 years? And finding out the results.

Method & Participants: The researchers used the experimental approach with a single experimental group design that suit the nature of the problem in order to find the results of the research.

The research sample was chosen in a deliberate manner. The research community consisted of (30) female trainees aged 30-35 years in the fitness court of Black Gym. The sample of the experiment was 9 female trainees, represented (30%) from Community of origin.

Materials:

Medical Balance *

* Laptop (hp)

* Ropes with diameter (1,5) inches and length (25) feet.

Procedures: After reviewing the scientific sources and references, researcher depended on the American Health, Physical Education Recreation and Dance Association (AAHPERD) classification of health fitness components was classified as:

{Muscular endurance, muscle strength, flexibility, efficiency of the circulatory system, physical composition}.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Criterion measures</th>
<th>Unit of measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Muscular endurance</td>
<td>In Numbers</td>
</tr>
<tr>
<td>2.</td>
<td>Flexibility</td>
<td>cm</td>
</tr>
<tr>
<td>3.</td>
<td>Physical composition tests</td>
<td>Total body weight</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Measurement of body mass index (BMI)</td>
</tr>
</tbody>
</table>

Table 1: Criterion measures

Vision of the body image Scale: After studying the sources and references related to the subject of the researchers based on the scale of vision body image.

The scale consists of three axes:

1. The individual’s vision of his body: the feelings and emotional tendencies of the individual by his personal assessment of the attractions and contradictions in the parts of his body.

2. The vision of others for his body: feelings and emotional tendencies that the individual has for himself because of others’ view of him or his thoughts as a personal analysis to see others of the attractions and contradictions in parts of his body.

3. Emotional response: It means the ideas and psychological trends that the individual as a final outcome of the behavioral and emotional aspects of attraction and dissonance of parts of his body.

The scale consists of (24) paragraphs divided into three axes, respectively: (7) paragraphs of the individual’s vision of his body, (8) paragraphs of the vision of others to his body, and (9) paragraphs of the emotional perspective and the answer according to the alternatives (yes, sometimes, no) In accordance with the triple grading criterion (3.2.1) and that all paragraphs of the scale are negative except for paragraphs (1.6,7). The highest degree of the scale (72) and the lowest degree (24) and the Hypothetical mean is (48).

Exercise protocol: Exercises were carried out using heavy ropes (with arms) which were a training method used to influence and improve some of the components of health fitness (muscular endurance, flexibility) and reduction of weight and BMI and know the effect of this improvement in the change or survival of the vision of the image of women to her body.

The number of training units (24) units and the (3) training units per week, distributed on days (Sunday,
Tuesday, Thursday) for a period of (45) minutes and the duration of exercise for two months period from 17/8/2018 until 15/10/2018.

The researchers designed a number of exercises based on the scientific sources and personal experience of the researchers and videos of exercises on the site (You Tube), taking into account the level and age of the sample research.

The main factor behind these exercises is the length and thickness of the rope. The researchers used 25-foot and 1.5-inch (about 4 kg) polyester ropes, which are a good start for novices, and are the best choice for gyms where individuals Of different sizes and physical levels, in addition to the ropes ensure full freedom of movement of all directions, as included exercise uses the entire body and not just the arms to increase the energy and efficiency of the legs which play a crucial role in generating and transferring energy to the arm and then to the rope. Through the combination of exercises of the upper and lower part, the researcher was able to prepare exercises for the body as a whole. The training unit also included some exercises that are performed with the partner with the musical accompaniment to facilitate performance and create an atmosphere of enthusiasm for performance and break the boredom.

The researchers adopted the interval training method in the organization of the load training, taking into account that the trainees beginner did not exercise before and they are not similar in their abilities and characteristics of health and biological, so when the formation of the training load should be taken into account the differences and factors associated with the age of time and health status and the rate of hospitalization as well as keen Seeking to adopt the principle of gradualism in giving intensity.

**Statistical analysis:** To extract the statistical differences between the pre-tests and the post-tests of the research sample, the researcher used the statistical program (spss) version 22.

**Results**

After the completion of the application of the exercises and the tests of pre and post data were obtained and after processing statistically by the appropriate statistical means were reached the final results and as shown in Table (2), which shows the computational and standard deviations and the value of (t) calculated between the pre-test and post-experimental group and then Analyzed and discussed.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Unit of measurement</th>
<th>Pre-test</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>(t) value</th>
<th>sig</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>Std. deviation</td>
<td>Mean</td>
<td>Std. deviation</td>
<td>Mean Differences</td>
<td>Std. deviation Differences</td>
<td></td>
<td></td>
</tr>
<tr>
<td>weight</td>
<td>kg</td>
<td>74.33</td>
<td>3.464</td>
<td>68</td>
<td>3.240</td>
<td>6.333</td>
<td>1.581</td>
<td>12.017</td>
<td>0.000</td>
</tr>
<tr>
<td>BMI</td>
<td>degree</td>
<td>29.53</td>
<td>1.616</td>
<td>27.014</td>
<td>1.358</td>
<td>2.522</td>
<td>0.664</td>
<td>11.393</td>
<td>0.000</td>
</tr>
<tr>
<td>Flexibility</td>
<td>cm</td>
<td>14.56</td>
<td>2.242</td>
<td>10.56</td>
<td>2.007</td>
<td>4</td>
<td>1.871</td>
<td>6.414</td>
<td>0.000</td>
</tr>
<tr>
<td>Muscular endurance</td>
<td>Numbers</td>
<td>9.78</td>
<td>1.787</td>
<td>14.22</td>
<td>1.563</td>
<td>4.444</td>
<td>1.590</td>
<td>8.386</td>
<td>0.000</td>
</tr>
<tr>
<td>Body vision</td>
<td>degree</td>
<td>53.11</td>
<td>8.638</td>
<td>60.22</td>
<td>5.286</td>
<td>7.111</td>
<td>3.887</td>
<td>5.488</td>
<td>0.001</td>
</tr>
</tbody>
</table>

The value (t) calculated for the variables shown in the above table is greater than the value of the significance level between (0.000) and (0.001) indicating a significant difference between the tests and for the post test.

**Discussion**

The results revealed that there is improvement and decrease in weight and body mass index, which is a way to infer the proportion of fat accumulated in the body, and is used as a General for the classification of individuals on the basis of weighting and weight gain and monitoring changes in the proportion of fat and thus determine the dangers resulting from obesity³. The researchers attributed the decrease to the fact that the exercises were designed to target the accumulated fat as sources of energy, leading to a decrease in the lipid
component, where “physical activity ensures weight loss of accumulated fat and not muscle decay” 4 «.

“Regular physical activity helps to reduce body weight and increase energy exchange” 5, and “If the daily calorie requirement (food intake) is balanced with the daily caloric intake rate, The thermal energy balance will be moderate in the sense that the amount of energy consumed equals the energy consumed and thus lose weight and maintain it” 6. Therefore, the regularity of the sample in the exercise led to fat burning resulting in a decrease in weight. In addition, the exercises designed to include various physical movements and different parts of the body with oxygen to complete the metabolism and production of energy for the continuation of muscle work, where “this decrease in weight occurs as a result of targeting aerobic exercise of storage places that do not degrade oxygen only with oxygen” 7.

As a result of the specificity of the exercises, which are designed by using more parts of the body and involving more muscles (such as double-wave exercise instead of single-arm use) and lower body participation, which leads to greater metabolic rate and thus more fat burning 8. and through high-intensity interval training, which is more effective according to the American College of Sports Medicine, whenever the intensity is high with a few rest periods, the impact of cardiovascular and metabolism is a greater 9. According to the site (greatest.com) Using heavy ropes burns (10) calories per minute. As a result of weight loss, health fitness components improved.

The researchers attribute the significance differences that shown between the pre-test and post-tests in the flexibility variable to the use of stretching exercises in the training program, which helps to increase the flexibility of the joints “ The stretching exercises in the training program, which aims to stretch the muscle, ligament, The extent of movement in the joint as these exercises are the most important means of development of flexibility “ 10. As well as” systematic and continuous training can improve the rubber muscles, and then the expansion of the range of motor joints, which improves the flexibility of the body 11 «.

The results showed significant differences between the tests of pre and post and for the benefit of post-test in the variable muscular endurance of the arms in the members of the research sample, and attributed the researcher the reason for this positive impact of exercise, citing the site (Onnit.com) that the benefits of training with heavy ropes increase strength.

A studies conducted in 2013 published in the European Journal of Sports Sciences and in 2017 published in Indian journal of research, that heavy rope training has proved effective in the development of strength and endurance higher than traditional resistance exercises 12,13.

From the definition of (Bool Shelder) to vision of the body image as “the vision of our body that we form in our mind or the way in which the individual (fat, thin, long, short) appears on which the individual is his idea of himself and his behavior, emotions and responses are affected” 14. We can say that this vision may change depending on the change of body shape, and when this change is generated we have a view that may be positive or negative Although there is no scientific link between any type of exercises and change this view, but there is a psychological link that generates a sense of satisfaction. And discomfort about body shape especially for women who are more likely Because of the weight and shape of her body and of course if we work to modify the reason, which is the body shape we have modified this view and in a positive way too, so exercises have an impact on the psychological state of women, which is represented in this study as the vision of the body image, And the post-test in the above scale.

Conclusions

In general, the findings of this study showed that Battle rope training can improve some components health fitness, as well as development in the scale of vision of the body of women.

Ethical Clearance: taken from College of physical education and sport science, University of Baghdad.

Conflict of Interest: The authors declare that there is no conflict of interest.

Source of Funding: Self.

REFERENCES


The Cytotoxic Effect of Zinc Oxide on Colon Cancer Cell Lines in Vitro

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ABSTRACT

Background: The small size and surface properties of Zinc Oxide Nanoparticles enabled them to diffuse easily through, and localize inside, tumor cells. The aim of current study was to evaluate the anticancer effects of Zinc Oxide Nanoparticles on a colonic cancer cell line in vitro with the use of Methyl Thiazolyl Tetrazolium assay.

Method: The cytotoxic effects of of Zinc Oxide Nanoparticles against colon cancer were planned with a serial doubling dilution concentrations (μg/mL). The microscopic features of apoptotic cell were shown and viability was measured by using Methyl Thiazolyl Tetrazolium assay, a reliable and common colorimetric test for evaluation of cell viability.

Results: According to cell viability assays, 15μg/mL and 8μg/mL of Zinc Oxide Nanoparticles were found to be highly toxic with the most potent antitumor activity on colonic cancer cell line. In addition, the obtained results showed a major reduction in cell viability and increased apoptosis comparison with normal cell line by same doubled increase concentrations.

Conclusion: ZnONPs can be used as anti-cancer agents in treatment modalities. They were able to decrease tumor growth in cancer cell lines.

Keywords: MTT Assay, HCT116 colon cancer cell line, Zinc Oxide Nanoparticles, Cytotoxicity, Anticancer.

Introduction

Cancer is unique of the most common illnesses all over the world in which an abnormal growth of cells invades and destroys normal cells. Free radicals, one of the main cause for the transition of normal to cancerous cells, are created as a consequence of a number of endogenous metabolic procedures involving redox enzymes and bioenergetics electron transfer and exposure to an excess of exogenous chemicals or high irradiation dose.

Nanoparticles are microscopic particles which have dimensions less than 100nm; they are widely used in the field of medicine and health sciences although minimal harmful effects on animal cells had been noticed.

The properties of Zinc Oxide Nanoparticles (ZnO NPs) like availability, high stability, high solubility and biocompatibility make their usefulness in biomedical applications [1]. They have a wide range of biomedical applications like drug delivery, anti-cancer, anti-diabetic, anti-bacterial, anti-fungal and agricultural properties [2-4].

Despite the common application of ZnO NPs in biomedicine, their use is still controversial. Nanoparticles were stated to have therapeutic aids. However, they were reported to have toxicological hazards as well, ZnO NPs were shown to induce toxic effects in different body organs and systems. The toxic effects of ZnO NPs depend on their concentration, dose, route of their administration, and time of exposure to those particles. Thus, it is crucial to assess their efficacy and safety to determine their toxicological risks and therapeutic benefits [5].

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ZnO NPs are used in topical applications such as sunscreens and cosmetics. This nano-size was assumed that they would be non-toxic in comparison to the bulk size, but studies have found that this is not necessarily true. ZnO NP, in particular, have been found to demonstrate strikingly different toxicological profiles in vitro than bulk ZnO [6-7].

ZnO NPs showed positive charges in the physiological conditions such as in tissue fluid or in blood, while cancerous cells have negatively charged phospholipids on their outer membranes, therefore, an electrostatic attraction occurs between ZnO NPs and the cancerous cells. Also, their small size and the surface properties enabled them to diffuse easily through tumor cells and localize inside them with 30 times selective cytotoxicity towards cancer cells compared to healthy cells and that could kill cancer cells selectively in vitro. Several studies suggested an increased in vitro cytotoxicity with nano-phase ZnO compared to micron-sized ZnO for several types of cancers [8-9].

The advantages for considering ZnO nanoparticles to be used in treatment of cancer are the inherent preferential cytotoxicity against cancer cells in vitro. It is suggested that their selectivity towards cancer cells may be even further improved by changing their shape in order to decrease their harmful effects on normal body cells, which has been observed to occur at very high concentrations of ZnONPs, particularly those in the size range of 4 – 20nm [10].

We noticed that ZnO NPs have ability to kill both cancerous and normal cells. Although the cytotoxicity of ZnO NPs affects multiple types of cancer cells, it was more obvious on non-adherent cells of hematopoietic lineage, the selectivity of reactive oxygen species towards cancerous cells more than normal cells. The endocytosis of nanoparticles (presence of nanoparticles inside the cell) is required for cytotoxic effect rather than presence of nanoparticles extracellularly. The charge of NP is an important factor in toxicity. Cationic nanoparticles have greater toxicity and selectivity toward cancerous cells than neutral or anionic charged particles. This suggests utilization of ZnONPs as anticanerous agents [11].

The Methyl Thiazolyl Tetrazolium (MTT) assays were used to investigate cell viability after ZnO application of doubled increase concentrations. Solution was used according to MTT was added to cell cultures for 3h and, after incubation, formant crystals were dissolved in Dimethyl Sulfoxide (DMSO) and the plates were analyzed using a plate reader at 630nm wavelength.

The aim of current study was to evaluate the anticancer effects of ZnONPs on a colonic cancer cell line in vitro with the use of MTT assay.

Materials and Method

Zinc Oxide Nanoparticles (ZnONPs): The reference powder of ZnONPs was obtained from SKY Spring Nanomaterial, Inc., (SSNANO) (USA) (10-30)nm, treated with silane coupling agents, and suspended in deionized distilled water (DDW) and sterilization was done by 0.4 Micro align filter subsequently.

Preparation of culture media and cell culture: Liquid medium was prepared from culture media powder, with helps buffer, L-glutamine and phenol red 16.650g was dissolved in approximately 900ml of DDW in volumetric flask and pH of the media was adjusted to 7.4 by using NaOH. Sterilization was done by 0.4 Micro align filter subsequently and the media was incubated in sterile flask for 4 days then stored at 4°C.

Tissue culture flask with a monolayer cells was incubated until cell layer detached, then centrifuged and resuspended with freezing media and transferred to sterile freezing vial which was stored in liquid nitrogen tank. Harvesting is a technique that uses proteolytic enzyme trypsin, to detach and disaggregate the adherent monolayer cells. When cell growth reached a monolayer, the medium was aspirated and discarded. Then the cells were gently pipetted up and down to disrupt cell clumps into single cells. Then the cells were cultured on culture plate.

Survival cell assay: The growth inhibitory effect of ZnONPs can be determined in vitro on cell lines by using MTT colorimetric assay with a concentration of 5×10^3 cells/well were seeded in 96-well flat bottom plates containing 300μl of medium. After 48 hour, serial doubling dilutions of ZnONPs were used to treat cell lines. Afterwards, the medium was aspirated and discarded and cells received 10μl of MTT. All plates were incubated at 37°C for 4h and Formozan blue was dissolved in 200μl of dimethyl Sulfoxide (DMSO).

Statistical Analysis: Our data were expressed as means ± SD. Analysis of variance and significant differences
were obtained by SPSS version 22 software and one-way ANOVA analysis. Values of $P<0.05$ were considered significant.

**Results**

To measure the growth inhibitory effect of ZnONPs, all cell lines HCT116 and normal cells were treated with a serial doubling dilution concentrations (μg/mL) of ZnONPs. (i.e. 30, 15, 8 and 4) with no treatment (control) for 48h and the MTT assay was used to determine the viability and propagation of cells and finally presented as statistical analysis (SPSS) and proliferation rate. The results of MTT assays revealed that ZnONPs had cytotoxic effects on all cell lines in a dose-dependent manner (Figure 1) in comparison with normal cell lines treated with a serial doubling dilution concentrations (μg/mL) of ZnO NPs (i.e. 60, 30, 15, 8, 4 and 0; Figure 3).

---

**Figure 1:** Effects of double-increased concentrations of ZnONPs on cancer cells line compares with controls (0μg/ml).

**Figure 2:** HCT116 cells morphological changes after treatment with ZnO NPs with doubled increase concentrations compares with non-treatment cancer cells (0 μg/ml)
As presented in Figure (1), proliferation rates of HCT116 cells were reduced in a dose-dependent style. The lowest propagation rates of cells were achieved at 30μg/ml concentration of ZnONPs, however, similar effects on normal cells were attained using 15, 30 and 60μg/ml concentrations (Figure 3).

Figure 4: Normal cells morphological changes after treatment with ZnO NPs with doubled increase concentrations compare with non-treatment cancer cells (0 ug/ml)

**Discussion**

In our study, we evaluated the anticancer effects of ZnONPs on a colonic cancer cell line *in vitro* with the use of MTT assay. The results revealed that presence of ZnONPs significantly inhibited the growth of tumors as data from current showed that ZnONPs exhibited growth inhibition and morphological changes on tumor cells in a concentration-dependent manner.

**Conclusion**

As a result of the obvious induction of toxicity and apoptosis on tumor cells in our and other studies, ZnONPs can be used as anti-cancer agents in treatment modalities. They were able to decrease tumor growth in cancer cell lines.

**Ethical Clearance:** The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding.

**REFERENCE**


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Toxicological Hazards”. The Open Nanomedicine Journal 2018; 291(22): 2705–2712.


Comparison between WBCs, RBCs and HGB Levels for Iraqi AML Patients Pre and Post 3- and 7- Treatment within Four Age Groups Segmented Based on Growth Levels

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ABSTRACT

Background: Acute myeloid Leukemia is one of the rapidly progressing leukemia and it is diagnosed in all age groups (pediatrics, teens, adults, and geriatric group). In addition, most of physicians depend on complete blood count to evaluate whether the patients need bone marrow aspiration to be diagnosed for CD markers to determine type of leukemia. The aim of current study was to compare white blood cells, red blood cells and hemoglobin levels among Iraqi patients with acute myeloid leukemia.

Method: So a pool of 60 newly diagnosed patients segmented within 4 growth levels (0-15 years, 16-40 years, 4-65 years and 66-above) with 15 subjects in each segment. Complete blood counts done for them then another 60 samples were collected from the same patients a month after 3- and 7-treatment receiving. The comparison was done between growth levels from one side and treatment effect from another.

Results: The outcomes showed significant difference in white blood cells count within the same growth level between pre and post treatment patients (44.65 ± 8.51, 15.62 ± 2.83) for the 1st age group pre and post treatment, respectively (P<0.05). Also, there were differences between age groups for the pre-treatment patients (44.65 ± 8.51, 29.03 ± 9.16, 8.35 ± 5.96 and 32.02 ± 6.06) for the four age groups, respectively, and the post treatment patients (1.95 ± 0.21, 3.16 ± 0.20, 5.77 ± 0.84, and 2.34 ± 0.23) for the four age groups, respectively. Red blood cells evaluation showed significant differences between pre and post treatment within the same age group (1.95 ± 0.21, 4.10 ± 0.17 for 1st age group) pre and post treatment, respectively, and within the same age group for pre and post treatment alone. Hemoglobin evaluation showed statistical differences between pre and post treatment samples within the same age group, but not between age groups.

Conclusion: White blood cells, red blood cells and hemoglobin evaluation give a primary reflection for AML patient’s status whether they improve or get worse.

Keywords: AML, CBC, growth level, Platelet, MPV.

Introduction

Acute myeloid leukemia: Blood malignancy influences white blood cells (WBCs), platelets (PLTs) and red blood cells (RBCs). An individual with Acute Myeloid Leukemia (AML) creates anomalous quantities of these cells in all respects rapidly, giving the malady the name “intense”. The WBCs tally is either upper or under than ordinary tally, which are all in blast stage. Since WBCs are a significant piece of battling contaminations, patients regularly have different incurable diseases. A few patients develop low RBCs tally and/or PLTs tally, yet that isn’t generally⁴.

Diagnoses Methods: Biopsy from Bone Marrow (BM) to determine the classification of AML, these may include
cytogenetic testing (karyotype and/or FISH testing), immunophenotyping, molecular testing and human leukocyte antigen (HLA) typing for potential future bone marrow transplant. Classification helps guide treatment. There are two classification systems for AML\cite{2}.

World Health Organization order of AML\cite{3} utilizes hereditary variations from the norm to group classes of it. That framework modifies the idea and vision toward AML diagnosis to more than twenty percent of immature cells in BM and gatherings different subtypes of AML dependent on hereditary variations from the norm and forecast.

Acute myeloid leukemia (AML) and related neoplasms: The second classification system for AML is FAB grouping (M0 – M7). The FAB (French American British) (2016) order (Table 1). The FAB framework depend on percentage of more than thirty percent immature cells in BM to allocate an analysis Patients characterized into prognosis hazard gatherings (ideal, moderate and poor) in view of the hereditary variations that may help decide the best proper treatment.

**Complete Blood Count indicators for AML**

**A. Count of white blood cells:** Elevated WBCs check more than one hundred thousand connected to a more regrettable viewpoint \cite{4}.

**B. Other blood components count:** By characterizing the platelet check 50×10^9/L and 120×10^9/L as two cut-off focuses, we ordered the patients into three gatherings: low (<50×10^9/L), medium (50–120×10^9/L) and high (>120×10^9/L).

On univariate examination, patients with medium platelets check had longer OS and DFS than those with low or high platelets tally. In any case, the multivariate examination demonstrated that solitary longer DFS seen in patients with medium platelets check than those with low or high platelets count. So their discoveries showed that pretreatment platelets tally has a prescient incentive for the anticipation of patients with non-M3 AML\cite{5}.

In a separated evaluation included 107 instances of once more AML, patients from ten to sixty years from each gender chosen arbitrarily. Symptoms included elevation in body temperature, shortcoming, weight loss, spewing, draining gingiva, hepatomegaly and splenomegaly. The findings included drop in Hemoglobin (HGB) levels below 8g/dl in 46% near the drop of RBCs and PLTs count. Also, the study showed more common incidence of AML in adults than in children (86% and 4%, respectively) \cite{6}.

The aim of current study was to compare white blood cells, red blood cells and hemoglobin levels among Iraqi patients with acute myeloid leukemia.

**Method**

**Samples collection:** One hundred and twenty peripheral blood samples were collected between 1st, May 20th, September from Baghdad special nursing center (which is the drainage of all Iraq to diagnose the tumor type) and AL-Yarmouk Hematology Center using EDTA tubes. In addition, 60 non-AML samples of healthy patients with similar age groups of patients were collected in EDTA to compare the results with the pre and post treatment groups. he Sysmex® (2019) \cite{7} method accurately counts and sizes cells by detecting and measuring changes in electrical resistance when a particle (such as a cell) in a conductive liquid passes through a small aperture. Each cell suspended in a conductive liquid (diluent) acts as an insulator. As each cell goes through the aperture, it shortly increases the resistance of the electrical path between the submerged electrodes on either side of the aperture. This causes a measurable electronic pulse. For counting, the vacuum used to pull the diluted suspension of cells through the aperture must be at a regulated volume. The number of pulses correlates to the number of particles. The height of the electrical pulse is proportional to the cell volume. Differential Analysis as the sample, prepared for differential analysis, streams through the flow cell these three measurements occurs simultaneously on each individual white cell to classify it: Low-frequency current measures volume, High-frequency current senses cellular internal content through measuring changes in conductivity. Light from the laser bouncing off the individual WBCs characterizes cellular surface, shape and reflectivity. **On the other hand,** the Sysmex HMX Hematology Analyzer is a quantitative, automated hematology analyzers and leukocyte differential cell counters for In Vitro diagnostic use in clinical laboratories. The purpose of the HMX Hematology Analyzer is to separate the normal participant, with all normal system-generated parameters, from the participant who needs additional studies. These studies include further measurements of cell size and cell distribution, biochemical investigation,
The HMX measures the following parameters in whole blood; WBCs, RBCs, HGB, HCT, MCV, MCH, MCHC, Platelets, MPV, Neutrophils, Lymphocytes, Basophils, Eosinophils and Monocytes.

The methods used to derive CBC parameters is based on the Sysmex® method of counting and sizing, in combination with an automatic diluting and mixing device for sample processing, and a single beam photometer for hemoglobinometry. WBCs differential uses VCS technology. Analysis and classification of WBCs used three simultaneous measurements of individual cell volume (V), high frequency conductivity (C), and laser light scatter (S). The scatter gram plots cells based upon measurements of these three parameters.

### Results and Discussion

The statistical difference between pretreatment age groups ed different immunological response to the pathological status among ages which reflected the maturity status of the immune system. WBCs tally test demonstrated noteworthy contrast among pre and post treatment bunches in a similar age gathering and we found high WBCs means within first, second and fourth age bunches with a mean higher than 29.03×10^9/L, while the control gathering stayed in the principle run between 7.88-8.66×10^9/L which offered an emergence to the huge distinction. On the other hand, 3rd age group showed no significant difference when compared with other treatment groups and its mean remained in the normal range of WBCs count (Table 1).

<table>
<thead>
<tr>
<th>Age group/year</th>
<th>Mean ± SE of WBC</th>
<th>LSD value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Treatment</td>
<td>Post-Treatment</td>
<td>Control</td>
</tr>
<tr>
<td>1-15</td>
<td>44.65 ± 8.51</td>
<td>15.62 ± 2.83</td>
</tr>
<tr>
<td>16-40</td>
<td>29.03 ± 9.16</td>
<td>15.42 ± 3.90</td>
</tr>
<tr>
<td>41-65</td>
<td>8.35 ± 5.96</td>
<td>3.66 ± 0.86</td>
</tr>
<tr>
<td>66 and above</td>
<td>32.02 ± 6.06</td>
<td>13.17 ± 3.80</td>
</tr>
<tr>
<td>LSD value</td>
<td>21.422 *</td>
<td>8.785 *</td>
</tr>
</tbody>
</table>

* (P<0.05). NS: Non-significant.

RBCs, the O₂/CO₂ carriers, also included in the overall blood cells disorder as shown in Figure (3.8). Both RBC count and HGB concentrations droped below control values for most of groups. However, some elevation appeared in post treatment groups that reflected the impact of treatment on these two parameters which gave us an image of case prognosis whether it responds to treatment or not (Tables 2 and 3).

<table>
<thead>
<tr>
<th>Age group/year</th>
<th>Mean ± SE of RBC</th>
<th>LSD value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Treatment</td>
<td>Post-Treatment</td>
<td>Control</td>
</tr>
<tr>
<td>1-15</td>
<td>1.95 ± 0.21</td>
<td>4.10 ± 0.17</td>
</tr>
<tr>
<td>16-40</td>
<td>3.16 ± 0.20</td>
<td>3.87 ± 0.20</td>
</tr>
<tr>
<td>41-65</td>
<td>5.77 ± 0.84</td>
<td>3.29 ± 0.17</td>
</tr>
<tr>
<td>66 and above</td>
<td>2.34 ± 0.23</td>
<td>3.23 ± 0.25</td>
</tr>
<tr>
<td>LSD value</td>
<td>0.689 *</td>
<td>0.585 *</td>
</tr>
</tbody>
</table>

* (P<0.05).

<table>
<thead>
<tr>
<th>Age group/year</th>
<th>Mean ± SE of HGB</th>
<th>LSD value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Treatment</td>
<td>Post-Treatment</td>
<td>Control</td>
</tr>
<tr>
<td>1-15</td>
<td>6.59 ± 0.52</td>
<td>9.84 ± 0.38</td>
</tr>
<tr>
<td>16-40</td>
<td>7.03 ± 0.23</td>
<td>10.10 ± 0.40</td>
</tr>
<tr>
<td>41-65</td>
<td>5.77 ± 0.84</td>
<td>9.35 ± 0.39</td>
</tr>
<tr>
<td>66 and above</td>
<td>6.47 ± 0.81</td>
<td>9.27 ± 0.63</td>
</tr>
<tr>
<td>LSD value</td>
<td>1.850 NS</td>
<td>1.319 NS</td>
</tr>
</tbody>
</table>

* (P<0.05).
Numerous signs and side effects of AML are the consequences of a lack of ordinary WBCs which happens when leukemia cells group out the typical blood-production cells in bone marrow. Therefore, individuals don’t have enough ordinary red blood cells, white blood cells and blood platelets. These deficiencies appear on blood tests and they cause additional manifestations[8].

ACA (2018) referenced that contaminations can happen in light of a deficiency of typical WBCs (leukopenia), explicitly a lack of disease battling WBCs called neutrophils (a condition called neutropenia). Individuals with AML can get contaminations that don’t appear to leave or may get one disease after another. Fever frequently obliges the contamination.

Despite the fact that individuals with AML can have high white blood tallies because of abundant quantities of leukemia cells, these cells don’t secure against disease, the manner in which ordinary WBCs do.

Renin expression in an updated research of in 45 AML patients and five controls by using quantitative real-time reverse-transcriptase PCR since renin is the direct responsible for hematopoiesis. Result in renin expression detected in 93.3% of AML patients at diagnosis and 100% at relapse. Relapsed AML patients showed higher renin gene expression levels compared to those detected at complete remission and at diagnosis (P = 0.000 and 0.001), respectively. None of our control subjects was positive for renin gene expression. At diagnosis, HGB below 10 grams per dl showed higher renin levels compared to those with HGB of at least 10g/dl. We used median renin gene expression levels to divide AML patients into high and low groups at diagnosis. At diagnosis, the group with higher renin expression showed higher total leukocyte count (TLC) than did the group with lower renin expression. At relapse, the higher renin expression group showed a higher peripheral blood (PB) blast percentage than did the lower renin expression group. So Renin expression can predict outcomes in AML patients and could be used as a therapeutic target.

Hyperleukocytosis is characterized as a WBCs count more prominent than 100,000/μL in patients influenced by intense or constant leukemias. Hyperleukocytosis is more typical in intense leukemias than in interminable leukemias. Hazard elements incorporate more youthful age, intense myeloid leukemia, the microgranular variation of intense promyelocytic leukemia, intense lymphoblastic leukemia and some cytotenetic irregularities. Despite the fact that it can influence any organ framework, side effects as a rule emerged from association of the cerebral, pneumonic and renal microvasculature. The expression “leukostasis” alludes to ‘symptomatic Hyperleukocytosis’ which is a medicinal crisis that requires brief acknowledgment and inception of treatment to anticipate renal and respiratory disappointment or intracranial discharge. The basic instruments of hyperleukocytosis and leukostasis are inadequately comprehended [11].

With WBCs at determination of under 30×109/L (57.1%) and overall again intense myeloid leukemia (62.2%), survival bends demonstrated that better anticipation was identified with age underneath 60 years (middle: 12.4 months; p-esteem = 0.222; Odds Ratio = 0.676), great prognostic cytogenetic markers (middle: 97.7 months; p-esteem = 0.0037; Odds Ratio = 0.4239) and platelets tally at conclusion of under 30×109/L (middle survival: 23.6 months; P value= 0.0001; Odds Ratio = 0.3651). As to French-American-British subgroups, the middle by and large survival was 23.5 months for M0, M1 and M2; 97.7 months for M3 and 7.4 months for M4, M5, M6, and M7 (p-esteem = 0.0288) [12].

A randomized (2:1) investigation about directed by of prohibitive (LOW) HGB) trigger (7g/dL) contrasted with higher (HIGH) HGB trigger (8g/dL). The essential result was plausibility of directing a bigger preliminary. The four necessities for progress necessitated that beyond what half of the qualified patients could be agreed, over 75% of the patients randomized to the LOW arm endured the transfusion trigger, less than 15% of patients traversed from the LOW arm to the HIGH arm, and no sign for the need to stop the investigation for wellbeing concerns. Auxiliary results included weariness, dying and RBCs as well as platelets transfused. The examination brought about ninety patients were agreed and haphazardly doled out from LOW to HIGH. The four criteria for the essential goal of plausibility were met. At the point when the quantity of units transfused was looked at, modifying for gauge HGB, the LOW arm was transfused all things considered 8.0 (95% certainty interim [CI], 6.9–9.1) units/tolerant, while the HIGH arm got 11.7 (95% CI, 10.1–13.2) units (P= 0.0003). There was no noteworthy distinction in draining episodes or neutropenic fevers between study arms.
**Conclusion**

White blood cells, red blood cells and hemoglobin evaluation give a primary reflection for AML patient’s status whether they improve or get worse.

**Ethical Clearance:** The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding.

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3. FAB; 2016.


7. Sysmex □ Beckman; 2018.


The Relationship between Peak Systolic Velocity of Thyroid Gland Arteries and Thyroid Stimulating Hormone Level in Diffuse Goiter Patients

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¹College of Medicine, University of Baghdad, Iraq

ABSTRACT

Background: Thyroid disease is the second most common type of endocrine pathology after diabetes mellitus, diffuse goiter accounts for more than 80% of all thyroid abnormalities. Sonography and Doppler study permit direct visualization of thyroid gland including its abnormalities with minimum cost and reduced time of diagnosis. In addition, pulse wave Doppler study can confirm increasing and decreasing blood flow within thyroid gland including measuring the peak systolic velocity of thyroid arteries. Patients with diffuse goiter have variable thyroid-stimulating hormone levels in their blood which reflects their clinical status as eu-, hypo- or hyper–thyroidism. The aim of this study was to find the relationship between peak systolic velocity and thyroid-stimulating hormone level in diffuse goiter patients.

Method: One hundred and twenty one patients with diffuse goiter were involved in this research measuring their thyroid-stimulating hormone levels – resembling normal value (0.4-2.5 μu/l) and examined with ultrasound and calculating their thyroid arteries peak systolic velocity – resembling normal value (10-28cm/sec) by Pulse wave Doppler study. No such study was done including these variable data in diffuse goiter patients.

Result: Sixty seven patients with normal thyroid-stimulating hormone level had normal peak systolic velocity, 29 patients with low thyroid-stimulating hormone level had high peak systolic velocity, and 25 patients with high thyroid-stimulating hormone level had low peak systolic velocity.

Conclusion: There was a significantly high negative correlation between peak systolic velocity value and thyroid-stimulating hormone level in diffuse goiter patients (if thyroid-stimulating hormone decreases, then the peak systolic velocity increases) giving indirect information about patients’ clinical status variation from euthyroidism, hypo- and hyperthyroidism.

Keywords: Diffuse goiter, Peak systolic velocity, Thyroid-stimulating hormone, Doppler study, Sonography.

Introduction

Thyroid gland is a butterfly-shaped gland located at midline of neck above the clavicles, it consists of right and left lobes and the isthmus and it surrounds the larynx and trachea covered by perthyroid muscle, subcutaneous fat and skin. According to WHO the normal thyroid gland adult size as (AP diameter of RT & LT lobes is 16-18mm, width 13-18mm, isthmus 2-6mm) in liner based measurements [¹]. Thyroid gland is supplied with blood from two paired superior thyroid arteries (UTA) from external carotid artery and inferior thyroid arteries (ITA) from subclavian artery and inter mediate artery to the isthmus [²]. The normal average of peak systolic velocity (PSV) of UTA is 10-28cm/sec [³]. Diffuse enlargement of thyroid gland or called goiter is observed in 1-5% of the population and accounts for 80-85% of all thyroid abnormalities, including the following pathologies (diffuse hyperplasia, iodine or auto immune –induced goiter, idiopathic goiter, thyroiditis and Graves’ disease) [³].

Ultrasound and Doppler study have 92.9 % accuracy in diagnoses of Graves’ disease with 96.3% specificity and 80.3% sensitivity [⁴].
Thyroid gland produces thyroxin which regulates body weight, temperature, muscle strength and even mood. This hormone release is controlled by the TSH hormone or called thyrotropin which is produced from the pituitary gland. High level thyroid hormone indicates low level TSH and results in a case of hyperthyroidism which gives these symptoms (anxiety, weight loss, tremors, increase heart rate, puffiness, bulging eye and difficulty sleeping). On the other hand, low level thyroid hormone indicates high level TSH and results in a case of hypothyroidism which gives these symptoms (weight gain, tiredness, hair loss, low tolerance for cold temperatures, irregular menstrual cycle and constipation). However, normal TSH level averages (0.4—2.5µU/L). The aim of current study was to find the relationship between peak systolic velocity and thyroid-stimulating hormone level in diffuse goiter patients.

### Patients and Method

Current study involved 121 patients with diffuse goiter, measuring their TSH levels – resembling normal value (0.4-2.5µU/l) and examined with ultrasound and calculating there thyroid arteries PSV— resembling normal value (10-28cm/sec) by PW Doppler study.

These patients were referred from medical and endocrinology clinics with their pervious diagnoses and their lab tests results. The study extended from 2017 to 2019 when all patients with diffuse goiter were examined by senior radiologists, in Sonography department at Al Furat General Hospital, Baghdad and Sonography clinics, collecting their findings, particularly their PSV of thyroid arteries and TSH test results for each of them.

### Ultrasound & Doppler examination procedure:

Patients were positioned supine with head thrown back and examination was performed in 3 plans; longitudinal, transverse and oblique lateral views. Examination was performed with (7.5 – 12MHZ) liner ultrasound probe, but convex (2.5-5MHZ) may be used for larger goiter.

### Statistical Analyses:

Statistical analyses were performed using statistical package for Social Sciences (SPSS version 20.0 for windows, SPSS, Chicago, IL, USA). Data were presented as Mean ± SD, while numbers and percentages for gender, PSV and TSH ordinal groups. Correlation test was used to study the relation between PSV and TSH. Chi-squared test was used to test the relation between PSV and TSH groups. P value of <0.05 was considered statistically significant.

### Results and Discussion

Data from current study showed that Mean ± SD age of participants was 43.19 ± 10.75 years and the range was 22-69 years (in males the age was 46.48 ± 13.03 years with a range of 27-66 years, while in females it was 42.50 ± 10.16 with a range of 22-69 years). There were 21 males (17.4%) and 100 females (82.6%). Male to female ratio was 1:5. In all cases, the Mean ± SD PSV was 21.04 ± 11.77cm/sec (range was 5-58 cm/sec); 26 were below normal range of (10-28 cm/sec) with Mean ± SD PSV of 7.05 ± 1.25cm/sec (range was 5-9cm/sec), 68 cases were with normal PSV level had Mean ± SD PSV 19.37 ± 4.09cm/sec (range was 10-28cm/sec). On the other hand, 27 cases were with above normal range of PSV had Mean ± SD of 38.74 ± 8.12cm/sec (range was 30-58 cm/sec) (Table 1 and Figure 1).

Moreover, data showed that the Mean ± SD level of TSH was 1.52 ± 1.08µU/l (range was 0.05-4.2µU/l). Also, 29 cases were below normal TSH range (0.4-2.5µU/l) with a Mean ± SD level of 0.21 ± 0.09µU/l (0.05-0.30µU/l), 67 cases were with normal range of TSH had a Mean ± SD level of 1.46 ± 0.48µU/l (0.5-2.4µU/l) and 25 cases were with above normal range had a Mean ± SD level of 3.2 ± 0.41µU/l (range was 2.7-4.2µU/l) (Table 1, Figure 1).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Mean</th>
<th>No. of cases</th>
<th>Std. Deviation</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PSV (cm/sec)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;10</td>
<td>7.0538</td>
<td>26</td>
<td>1.25035</td>
<td>5.00</td>
<td>9.00</td>
</tr>
<tr>
<td>10-28</td>
<td>19.3676</td>
<td>68</td>
<td>4.09187</td>
<td>10.00</td>
<td>28.00</td>
</tr>
<tr>
<td>&gt;28</td>
<td>38.7407</td>
<td>27</td>
<td>8.12684</td>
<td>30.00</td>
<td>58.00</td>
</tr>
<tr>
<td>Total</td>
<td>21.0446</td>
<td>121</td>
<td>11.76638</td>
<td>5.00</td>
<td>58.00</td>
</tr>
<tr>
<td><strong>TSH (µU/l)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;0.4</td>
<td>0.2103</td>
<td>29</td>
<td>0.08902</td>
<td>0.05</td>
<td>0.30</td>
</tr>
<tr>
<td>0.4-2.5</td>
<td>1.4567</td>
<td>67</td>
<td>0.48406</td>
<td>0.50</td>
<td>2.40</td>
</tr>
<tr>
<td>&gt;2.5</td>
<td>3.2000</td>
<td>25</td>
<td>0.40620</td>
<td>2.70</td>
<td>4.20</td>
</tr>
<tr>
<td>Total</td>
<td>1.5182</td>
<td>121</td>
<td>1.08095</td>
<td>0.05</td>
<td>4.20</td>
</tr>
</tbody>
</table>
Furthermore, there was significant high negative correlation between PSV and TSH (Pearson correlation \((r) = -0.813, P<0.0005\)) which indicated that when TSH decreases, PSV increases (Table 2 and Figure 2).

On grouping the cases into below, within and above normal ranges for PSV and TSH and studying the relation between them, we found that the majority of cases 66(54.5%) had normal PSV and TSH, while low TSH (<0.4µU/l) was associated with high PSV (>28cm/sec) in 26(21.5%) cases. On the other hand, high TSH (>2.5µU/l) was associated with low PSV (<10cm/sec) in 25(20.7%) cases. There was highly significant relation \((P<0.0005;\ \text{Table}\ 2\ \text{and Figure}\ 2)\).

**Table 2: Correlations between PCV and TSH values of study participants**

<table>
<thead>
<tr>
<th>TSH (µU/l)</th>
<th>PSV (cm/sec)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;10</td>
<td>10-28</td>
</tr>
<tr>
<td>&lt;0.4</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>.8%</td>
<td>1.7%</td>
</tr>
<tr>
<td>0.4-2.5</td>
<td>0</td>
<td>66</td>
</tr>
<tr>
<td></td>
<td>.0%</td>
<td>54.5%</td>
</tr>
<tr>
<td>&gt;2.5</td>
<td>25</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>20.7%</td>
<td>.0%</td>
</tr>
<tr>
<td>Total</td>
<td>26</td>
<td>68</td>
</tr>
<tr>
<td></td>
<td>21.5%</td>
<td>56.2%</td>
</tr>
</tbody>
</table>

Data in the table represent numbers and percentages of cases.

\[\text{Chi-squared} = 215.9, \ P<0.0005.\]

**Figure 1: Distribution of PSV and TSH values of study participants**

**Figure 2: Correlation between TSH and PSV values of study participants**

**Conclusion**

There was highly significant negative correlation between PSV values and TSH levels in diffuse goiter patients (if the TSH decreases, then the PSV increases) giving indirect information about patients’ clinical status variation from euthyroidism, hypo- and hyperthyroidism.

**Ethical Clearance:** The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding.

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The Role of microRNA 122, MCP-1 and TGF-β1 as Diagnostic Biomarkers for Endometriosis

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¹Collage of Health & Medical Technology, Baghdad, Iraq

ABSTRACT

Background: Endometriosis represents a major medical concern in women of reproductive age. A Reliable single biomarker or panel of biomarkers may help diagnose endometriosis earlier and reduce unnecessary operation. Simple blood tests for prediction and diagnosis of endometriosis have a major impact on women’s health. MicroRNAs are small Non-coding RNAs that have been intensively evaluated as biomarkers for several diseases and may hold promise for endometriosis diagnosis. The present study was aimed to explore the possible role of using serum miRNA122 in endometriosis patients to supply a more accurate assessment of the disease and improve the role of other serum biomarkers in endometriosis.

Method: Twenty-five endometriosis patients diagnosed by laparotomy were admitted to the Gynecology Department of Al-Emamain Al-Kademian Medical City, Baghdad, Iraq. A total of twenty-five apparently healthy women were chosen as controls. The miR122 was detected by reverse transcription-quantitative polymerase chain reaction (RT qPCR), while the MCP-1 and TGF-β1 were detected by the ELISA technique.

Results: This study showed that the mean log fold change value of miR122 in plasma of endometriosis patients, which was (19.65), was higher in comparison to controls (3.42) (P= 0.001). The mean concentrations of MCP-1 and TGF-β1 were significantly higher in patients with endometriosis than in controls (P<0.05).

Conclusion: Measurements of serum, miRNA122 may be useful in the evaluation of endometriosis patients in combination with other serum markers.

Keywords: Endometriosis, MicroRNA122, MCP-1, TGF-β1, PCR.

Introduction

Endometriosis refers to the presence of ectopic endometrial glands and stroma outside the uterine cavity with development primarily in the pelvic cavity. Endometriosis affects 5% to 10% of women of reproductive age and is characterized primarily by pelvic pain and infertility (1). The identification of specific biomarkers for the disease which may let earlier detection and may demand less invasive diagnostic measurement would minimize not only the time to diagnosis but also minimize the cost associated with implementing laparoscopy and consequent diagnosis of the disease (2).

A need for simple blood test for endometriosis-specific biomarkers would offer a timelier and precise diagnosis for the disease conferring earlier therapeutic intervention (3). MicroRNAs (miRNAs) have stand out as potential diagnostic markers for endometriosis based upon the premise of identification of endometriosis-specific miRNAs after been suitable for the field of cancer diagnostic biomarkers (4). Cytokines are the main mediators and communicators of the immune system; their dysregulation is acknowledged as an important aspect of the pathogenesis of numerous conditions, including endometriosis (5). Monocyte chemo–attractant phagocytosis (MCP-1) was a chemo-attractant for mononuclear phagocytes. It was one of the products of the mevalonate pathway and secreted by white blood cells, macrophages, endometrial ectopic tissues and endometriotic tissues (6). It promotes monocytes migration from the peripheral blood to the peritoneal cavity where they transform into macrophages and contribute to the

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local peritoneal inflammation commonly observed in endometriosis (7). According to these reasons, MCP-1 may play an important role in the pathogenesis of endometriosis (8). While there have been considerable attempts to identify such biomarkers, a simple blood test for endometriosis-specific biomarkers would exhibit a timelier and accurate diagnosis for the disease allowing earlier therapeutic intervention. The present study was aimed to explore the possible role of using serum miRNA122 in endometriosis patients to supply a more accurate assessment of the disease and improve the role of other serum biomarkers in endometriosis.

Materials and Method

Subjects: Twenty-five endometriosis patients diagnosed by laparotomy and admitted to the Gynecology Department of Al-Emamain Al-Kademian Medical City, Baghdad during the period extended from November 2017 to November 2018. Inclusion criteria were women at reproductive age. Exclusion criteria were women with a malignant tumor, smokers and those with current infection (genital or systemic). Blood and peritoneal fluid were collected from each patient. Twenty-five apparently healthy women were chosen as control group they were age-matched to the study group. The controls were fertile, not pregnant and non-smoker with no current infection (genital or systemic).

Molecular detection of miRNA-122: Molecular detection of miRNA-122 was carried out according to (Taq Man™ MicroRNA Assay, inventoried, SM, Applied Biosystems, USA) which occurred in three steps:

1. RNA extraction.
2. Reverse transcription step.
3. Real-time PCR for the detection of mature miRNA-122.

Measurement of MCP-1 and TGF-β1 by ELISA: The concentrations of the serum MCP-1 and TGF-β1 in an individual patient and healthy controls were managed according to ELISA kit (Ray Bio) for MCP-1, (My Biosource) for TGF- β-1.

Statistical Analysis: Analysis of data was carried out using the available Statistical Packages for Social Sciences (SPSS, version 25). Data are presented as mean ± SD, median and standard error. Qualitative relations were evaluated using Chi-squared test. P-value ≤0.05 was considered statistically significant.

Results

Demographical picture and clinical presentation: The results of this study were based on the investigation of 25 patients with endometriosis, compared with 25 apparently healthy women considered as controls. The mean ± SD age of patients was (32.76±7.82) years with a range of (18-45) years, while the mean ± SD age of the control group was (31.98±7.28) years with a range of (20-45) years. Statistically there was no significant variance in the mean age between both groups, (P>0.05; Table 1).

<table>
<thead>
<tr>
<th>Age interval/yr</th>
<th>Patients group</th>
<th>Control group</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>≤20</td>
<td>1</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>21-30</td>
<td>10</td>
<td>40</td>
<td>5</td>
</tr>
<tr>
<td>31-40</td>
<td>4</td>
<td>16</td>
<td>10</td>
</tr>
<tr>
<td>&gt; 40</td>
<td>10</td>
<td>16</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>25</td>
<td>100.0</td>
<td>25</td>
</tr>
</tbody>
</table>

Mean age ± SD/yr: 32.76 ± 7.82 vs 31.98 ± 7.28 (P-value was 0.001).

Age range/yr: 18-45 year vs 19-44 year

Levels of MiRNA-122 in the studied groups: In the present study, the mean log fold change values of gene expression of miR-122 in plasma of endometriosis patients were higher in contrast to controls and revealed a statistically significant difference between them (P-value was 0.001; Table 2).

<table>
<thead>
<tr>
<th>MiRNA-122</th>
<th>Patients</th>
<th>Controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>19.65</td>
<td>3.42</td>
</tr>
<tr>
<td>Standard Error of Mean</td>
<td>3.96</td>
<td>0.81</td>
</tr>
<tr>
<td>Median</td>
<td>7.24</td>
<td>1.32</td>
</tr>
<tr>
<td>P value (Patients vs Controls)</td>
<td>0.001</td>
<td></td>
</tr>
</tbody>
</table>

Levels of MCP-1 in the studied groups: Current study exhibited a significant elevation in serum levels and peritoneal fluid of MCP-1 in patients group in comparison with healthy controls the P-value was 0.001. In addition, there was a significant increase in peritoneal MCP-1 in comparison with serum levels of endometriosis patients (P-value was 0.003; Table 3)
Levels of TGF-β1 in the studied groups: Serum levels of TGF-β1 are displayed in Table (4). The mean was (6.17pg/ml), while in the control group the mean was (1.53pg/ml). In peritoneal fluid the mean level equals to 6.08pg/ml. Furthermore, the serum concentration of TGF-β1 showed a significant difference in the mean value between patients and control groups \( P=0.004 \). Additionally, there was significant difference in the mean level of TGF-β1 in peritoneal fluid and serum with \( P=0.002 \).

Table 4: Serum levels of TGF-β1 in the studied groups

<table>
<thead>
<tr>
<th>TGF-β1</th>
<th>Plasma</th>
<th>Peritoneal fluid</th>
<th>Healthy control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>6.17</td>
<td>8.65</td>
<td>2.59</td>
</tr>
<tr>
<td>Standard Error of Mean</td>
<td>1.02</td>
<td>2.82</td>
<td>1.76</td>
</tr>
<tr>
<td>Median</td>
<td>4.50</td>
<td>7.96</td>
<td>1.23</td>
</tr>
</tbody>
</table>

\( P \) value

- Patients vs Control: 0.004
- Plasma vs Peritoneal fluid: 0.002

Discussion

Endometriosis describes a major medical interest in women of reproductive age. No single serum biomarker has been found with enough sensitivity and specificity to diagnose endometriosis, but recently researchers focused on studying a panel of serum biomarkers for diagnosing this disease \(^9\). MiRNAs serve as potential biomarkers for early detection of the disease \(^10\). Consequently, studies on the expression of miRNAs in patients with endometriosis will provide unprecedented penetrations for the development of specific miRNAs as diagnostic markers and therapeutic destinations for endometriosis in the future \(^11\). In the current work, there was an increased expression of microRNA-122 in patients as compared with healthy controls. This finding agreed with \(^12\) who was the first to estimate serum microRNA levels in women with endometriosis and healthy women. They obtained increased levels of miR-122 and miR-199a and decreased levels of miR-145, miR-141, miR-542-3p and miR-9 in women with endometriosis and stated that these compounds could be used as possible biomarkers for the disease. Their findings also reported that evaluation of the expression of miR-122 and miR-199a might be of use in evaluating severity of the disease. In agreement with our results, \(^13\) determined that the relative expression levels of miR-199a and miR-122 were raised in endometriosis patients samples than those in controls \(^14\). Interestingly, \(^15\) stated that up-regulation of miR-199a and miR-122 in the serum of endometriosis patients suggested that they might be involved in disease pathogenesis via the organization of SOX4 expression. This hypothesis warrants further investigation. Hence, miR-122 may be helpful for diagnosing EMs although this will need to be proved by other studies and validation in a large cohort of samples \(^16\). Several cytokines such as transforming growth factor-β1 (TGF-β1) and monocyte chemo-attractant protein-1 (MCP-1) have been described to associate with pathogenesis of endometriosis and provoke infiltration of blood monocytes or macrophages into the peritoneal cavity \(^17\). In the current study, there were statistically significant higher levels of MCP-1 and TGF-β1 in serum and peritoneal fluid of patients as compared to healthy controls. Monocytes are delivered to the endometriotic lesion by the chemotactic chemokine MCP-1, and they are then transformed into mature macrophages. Really, some investigators had reported higher concentrations of MCP-1 in the peritoneal fluid in women with endometriosis than in those without endometriosis \(^18,19\). These results agreed with our findings. Prior studies showed an increased quantity and activation of macrophages in the peritoneal fluid of patients with pelvic endometriosis as well as raised levels of macrophage-related cytokines and growth factors \(^20,21\). Moreover, the level of TGF-β1 was significantly higher than in healthy controls. Numerous studies had reported significantly higher levels of TGF-β1
in serum, peritoneal fluid, peritoneum and ectopic endometrial tissue of women with endometriosis when correlated to women without endometriosis, implying that changed TGF-β expression and/or signaling may contribute to the pathophysiology of endometriosis (20-22). Numerous studies in mice and women had reported that increasing levels of TGF-β ligands are associated with decreased immune cell activity within the peritoneum, concomitantly with an increase in ectopic endometrial cells survival, attachment, invasion and proliferation, meanwhile endometriosis lesion development (23-25).

**Conclusion**

Significantly increased levels of miR-122, MCP-1, and TGF-β1 in endometriosis indicated that these biomarkers serve as the diagnostic marker of endometriosis. Increased concentrations of inflammatory cytokines within the peritoneal fluid and serum were thought to contribute to peritoneal lesion formation.

**Ethical Clearance:** The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding.

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Assessment of Health Related Quality of Life in Children with Nephrotic Syndrome in Iraq—A Comparative Study

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¹Department of Pediatrics, College of Medicine, Al-Nahrain University, Iraq; ²Imamain Kadhimain Medical City, Baghdad, Iraq

ABSTRACT

Nephrotic syndrome is a relapsing and remitting disease. Comprehensive care of affected children may benefit from assessments of the impact of disease on physical and psychosocial aspects of health-related quality of life.

The aim is to assess the quality of life (QOL) in a sample of Iraqi children with NS in relation to children with other chronic disease. And To evaluate the relation of functioning at the physical, emotional, social and educational domains of quality of life with phenotype of NS and medication

This case control study was conducted in pediatric consultation clinics at two hospitals in Baghdad. Fifty children with nephrotic syndrome aged 2–12 years, and 50 patients as controls with chronic diseases were evaluated by using a structured questionnaire of Pediatrics Quality Of Live ™ 4.0 Generic Core Scale

Scores in all domains of quality of live were significantly higher in nephrotic syndrome patients compared to those with chronic disease. Frequent relapsing and new diagnosis types showed significantly higher score in physical and emotional domains. Patients treated by prednisolone alone showed significantly higher score in physical and social domains

Quality of live in children with nephrotic syndrome is better than children with other chronic illnesses. Infrequent relapse type, newly diagnosed and steroid treated groups showed better quality of life in certain domains

Keywords: Nephrotic syndrome, Children, Life quality

Introduction

Nephrotic syndrome (NS) is defined as persistent heavy proteinuria mainly albuminuria, hypoalbuminaemia, generalized edema and hyperlipidemia. Males appear to be more affected than females at a ratio of 2:1 in children, but this predominance fails to persist in adolescence⁴.

The main pathogenic abnormality in nephrotic syndrome is an increase in glomerular capillary wall permeability, resulting in pronounced proteinuria, with most common sign being edema which is excess fluid in the body due to the serum hypoalbuminemia (²,³).

Treatments include steroid therapy, diuretics, antihypertensive medications, lipid lowering agents, chemotherapy together with diet and activity (⁴,⁵,⁶).

Nephrotic syndrome may be associated with a series of complications which can affect an individual’s health and quality of life (⁷,⁸).

Behavioral abnormalities are another established complication of steroid therapy. Internalizing and externalizing behavioral disorders, including anxiety, depression and aggression, have been reported (⁹–¹¹).

Frequently, the disease process spans a significant portion of the formative years of a child’s life and can extend into adulthood. As a result, the comprehensive care of children with NS may benefit by the formal assessments of the impact of disease on the physical and psychosocial aspects of health-related quality of life (HRQOL) (¹²,¹³).
There is broad agreement that HRQOL is the functional effect of a medical condition and/or its consequent therapy upon a patient. HRQOL is thus subjective and multidimensional, encompassing physical and occupational function, psychological state, social interaction and somatic sensation\(^{14,15}\). The World Health Organization (WHO) defines quality of life (QOL) as the individuals’ perception of their position in life in the context of culture and value systems in which they live, and in relation to their goals, expectations, standards and concerns\(^a\).\(^{16}\)

This study was conducted to:

1. Assess the quality of life (QOL) in a sample of Iraqi children with NS in relation to children with other chronic disease.
2. Evaluate the relation of functioning at the physical, emotional, social and educational domains of quality of life with phenotype of NS and medication.

**Materials and Method**

This comparative case control study was conducted at pediatric consultation clinics at Imamene Kadhimein Medical City and Central Child Teaching Hospital in Baghdad, Iraq between 1\(^{st}\) of May to 31\(^{st}\) of August 2018.

A convenient sample size of 100 patients was selected. Patients consist of 50 patients with NS. The controls included 50 pediatric patients with the following chronic diseases: asthma, thalassemia, epilepsy, leukemia and diabetic mellitus. Ten patients of each of these chronic conditions were randomly selected.

Data were obtained from the parents with direct interview, after explaining the purpose of the study to them and having their informed consent to participate in the study. Data collected from NS parents included: age, gender, and residence, duration of illness and types of NS., medication used, complications and number of admission to the hospital.

Data collected from controls included: age, gender, residence, duration of illness and disease category.

The data concerning quality of life were collected by a structured questionnaire using PedsQL™ 4.0Generic Core Scale. PedsQL™ 4.0 Generic Core Scale is a well-used instrument that assesses the physical, emotional, social functioning, and school performance, depending on age of child age; (2-4), (5-7) and 8-12 years old.\(^{18}\). It evaluates the QOL in five domains: Physical, emotional, social and School functioning. A 5-point response scale is used from 0 (never a problem) to 4 (almost always a problem). The scores of each item are then reversed and linearly transformed into a 0–100 scale (0 = 100, 1 = 75, 2 = 50, 3 = 25, and 4 = 0) i.e. the interquartile range (IQR), with higher PedsQL scores indicating a better QOL.\(^{19}\)

The parent report form of the tool with formats of ages (2-4),(5-7) and (8-12) years were translated to Arabic language and piloted on ten parents before initiation of the study. It took approximately 15-20 min to gather the required information from the parents. Children with congenital NS and secondary NS were excluded. SPSS version 23 (Statistical Package for the Social Science) software was used data analysis. P <0.05 was considered statistically significant

**Results**

One hundred patients aged 2–12 years were included in the study distributed as 50 patients with NS and 50 patients as control cases. The two groups were homogenous regarding demographic characteristics with no statistically significant difference between them. (Table 1)

The majority of NS patients (60%) have more than (24) months as duration of illness. Majority of patients (38%) were of steroid dependent and frequent relapsing phenotypes. Fifty patients (100%) were treated by prednisolone either alone (62%) or combination with other drug (38%). As complications, peritonitis was present in (36%) and hypertension in (30%) of NS cases. (36%) reported no hospital admission, while frequent admission five and more was detected in (8%) (Table 2).

The median IQR was found to be higher in NS patients compared to controls. There were significantly better scores in physical (P = 0.001), emotional (P = 0.001), and social (P =0.001) functioning, and school performance (P = 0.001). School domain was studied in (28) children with NS out of the (50) patients because (6) of them were below 4 years old and other (16) patients above 4 years but left school. In the control group (13) children did not attend school,(7) of them were below (4) years of age and other (6) of them did not attend school. (table 3)
Patients with Infrequent relapsing NS and newly diagnosis NS showed better and statistically significant score in the physical ($P = 0.046$) and emotional ($P = 0.021$) domains in comparison to other phenotypes, while both social functioning ($P = 0.249$) and school performance ($P = 0.337$) showed nearly similar scores and were not statistically significant different from other phenotypes. (table 4)

NS children treated by prednisolone alone showed better score in both physical ($P = 0.022$) and social functioning ($P = 0.043$) domains and the difference was significant compared to those children on combined drug treatment. (table 5).

### Table 1: Baseline characteristics of patients with NS and control

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Patients No. (%)</th>
<th>Control No. (%)</th>
<th>$P$ value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>33 66%</td>
<td>27 54%</td>
<td>0.307*</td>
</tr>
<tr>
<td>Females</td>
<td>17 34%</td>
<td>23 46%</td>
<td></td>
</tr>
<tr>
<td>Age (yr)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-4</td>
<td>6 12%</td>
<td>7 14%</td>
<td>0.803**</td>
</tr>
<tr>
<td>5-7</td>
<td>17 34%</td>
<td>14 28%</td>
<td></td>
</tr>
<tr>
<td>8-12</td>
<td>27 54%</td>
<td>29 58%</td>
<td></td>
</tr>
<tr>
<td>Duration (months)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;6</td>
<td>7 14%</td>
<td>12 24%</td>
<td>0.312**</td>
</tr>
<tr>
<td>6-12</td>
<td>6 12%</td>
<td>9 18%</td>
<td></td>
</tr>
<tr>
<td>13-24</td>
<td>7 14%</td>
<td>8 16%</td>
<td></td>
</tr>
<tr>
<td>&gt;24</td>
<td>30 60%</td>
<td>21 42%</td>
<td></td>
</tr>
</tbody>
</table>

### Table 2: Clinical characteristics of children with nephrotic syndrome

<table>
<thead>
<tr>
<th>Clinical Variable</th>
<th>Clinical characteristic</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration of illness(months)</td>
<td>&lt;6 M</td>
<td>7</td>
<td>14%</td>
</tr>
<tr>
<td></td>
<td>6-12M</td>
<td>6</td>
<td>12%</td>
</tr>
<tr>
<td></td>
<td>12-24M</td>
<td>7</td>
<td>14%</td>
</tr>
<tr>
<td></td>
<td>&gt;24M</td>
<td>30</td>
<td>60%</td>
</tr>
<tr>
<td>Types of NS</td>
<td>Steroid resistant NS</td>
<td>9</td>
<td>18%</td>
</tr>
<tr>
<td></td>
<td>Steroid dependant NS +Frequent relapsing NS</td>
<td>19</td>
<td>38%</td>
</tr>
<tr>
<td></td>
<td>Infrequent relapsing NS</td>
<td>15</td>
<td>30%</td>
</tr>
<tr>
<td></td>
<td>Newly diagnosis NS</td>
<td>7</td>
<td>14%</td>
</tr>
<tr>
<td>Treatment</td>
<td>Prednisolone</td>
<td>50</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Cyclosporine</td>
<td>10</td>
<td>20%</td>
</tr>
<tr>
<td></td>
<td>Cyclophosphmid</td>
<td>6</td>
<td>12%</td>
</tr>
<tr>
<td></td>
<td>Mycophenolate Mofetil</td>
<td>4</td>
<td>8%</td>
</tr>
<tr>
<td></td>
<td>Levamisole</td>
<td>2</td>
<td>4%</td>
</tr>
<tr>
<td>Complications</td>
<td>None</td>
<td>26</td>
<td>52%</td>
</tr>
<tr>
<td></td>
<td>Persistent Hypertension</td>
<td>15</td>
<td>30%</td>
</tr>
<tr>
<td></td>
<td>Peritonitis</td>
<td>18</td>
<td>36%</td>
</tr>
<tr>
<td></td>
<td>Cushioned faces</td>
<td>4</td>
<td>8%</td>
</tr>
<tr>
<td></td>
<td>Thrombotic episode</td>
<td>3</td>
<td>6%</td>
</tr>
<tr>
<td></td>
<td>Cellulitis</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td></td>
<td>Cataract</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>Number of admission to hospital</td>
<td>None</td>
<td>18</td>
<td>36%</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>12</td>
<td>24%</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>7</td>
<td>14%</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>4</td>
<td>8%</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>5</td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td>&gt;5</td>
<td>4</td>
<td>8%</td>
</tr>
</tbody>
</table>
Table 3: Peds QL Quality of life of NS and patients with chronic disease as control

<table>
<thead>
<tr>
<th>Domains</th>
<th>Cases</th>
<th>Control</th>
<th>P value*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n Median (IQR)</td>
<td>n Median (IQR)</td>
<td></td>
</tr>
<tr>
<td>Physical</td>
<td>50 79.69(46.88-90.63)</td>
<td>50 42.19(35.16-64.84)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Emotional</td>
<td>50 75.0(56.25-85.0)</td>
<td>50 55.0(45.0-65.0)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Social</td>
<td>50 95.0(80.0-100)</td>
<td>50 55.0(50.0-68.75)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>School</td>
<td>28 60.0(55.0-70.0)</td>
<td>37 45.0(35.0-55.0)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Total</td>
<td>28 75.0(60.0-90.16)</td>
<td>37 50.0(40.0-65.0)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Table 4: Quality of life in different clinical phenotype of nephrotic syndrome

<table>
<thead>
<tr>
<th>Domains</th>
<th>Steroid dependent and frequently relapsing</th>
<th>Steroid resistant</th>
<th>Infrequently relapsing and newly diagnosis</th>
<th>P value*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Median (IQR) N = 19</td>
<td>Median (IQR) N = 9</td>
<td>Median (IQR) N = 22</td>
<td></td>
</tr>
<tr>
<td>Physical</td>
<td>75.0 (46.88-84.38)</td>
<td>46.88 (43.75-84.38)</td>
<td>89.06 (76.56-100)</td>
<td>0.046</td>
</tr>
<tr>
<td>Emotional</td>
<td>65.0 (47.5-77.5)</td>
<td>75.0 (45.0-85.0)</td>
<td>80.0 (75.0-90.0)</td>
<td>0.021</td>
</tr>
<tr>
<td>Social</td>
<td>90.0 (77.5-97.5)</td>
<td>100 (60.0-100)</td>
<td>100 (86.25-100)</td>
<td>0.249</td>
</tr>
<tr>
<td>School</td>
<td>60.0 (53.75-65.0) N = 12</td>
<td>65.0 (57.5-70.0)  N = 4</td>
<td>65.0 (55.0-70.0) N = 12</td>
<td>0.337</td>
</tr>
</tbody>
</table>

Table 5: Quality of life according to treatment

<table>
<thead>
<tr>
<th>Domains</th>
<th>Prednisolone only</th>
<th>Combination of drugs</th>
<th>P value*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Median (IQR) N = 31</td>
<td>Median (IQR) N = 19</td>
<td></td>
</tr>
<tr>
<td>Physical</td>
<td>87.5 (73.44-96.88)</td>
<td>46.88 (40.63-85.94)</td>
<td>0.022</td>
</tr>
<tr>
<td>Emotional</td>
<td>80.0 (70.0-90.0)</td>
<td>70.0 (45.0-82.5)</td>
<td>0.082</td>
</tr>
<tr>
<td>Social</td>
<td>100 (90.0-100)</td>
<td>85.0 (70.0-100)</td>
<td>0.043</td>
</tr>
<tr>
<td>School</td>
<td>65.0 (55.0-70.0) N = 17</td>
<td>60.0 (50.0-65.0) N = 11</td>
<td>0.208</td>
</tr>
</tbody>
</table>

P value significant <0.05

Discussion

This study found significantly higher score for physical, emotional, Social domains and school performance indicating better quality of life in NS patients than patients of chronic diseases. Two studies by Sonia Agrawal et al in India, and El-Gamasy M.A. et al in Egypt, both assessed the quality of life (QOL) of 50 children with NS and 50 children with other chronic disease as control both aged between 2-18 years and found that children with NS had significantly higher scores in physical, emotional, and social functioning as compared to controls while found no difference regarding school performance (19,20).

Furthermore Rüth et al in Netherlands evaluated QOL in 45 European pediatric patients with steroid-sensitive NS. Only the QOL subscale “social function” was impaired while other domains were not affected. (12). NS patients are free of symptoms and acquire a normal life style in between relapses especially Infrequent relapse type which constituted 30% of total patients with NS in the current study, in addition most of relapses are mild and without complication and does not necessitate admission to hospital as found in the current study. Thus these children with NS move physically and actively better than children with other illnesses.

For emotional functioning, the nature of disease added to absence of the aggressive treatment used during relapses make the patients with NS better emotionally, while in social aspect the longtime of remission and normal life style during it, help the patients to contact socially and play easily with other children. This
Conclusion

Quality of life in children with nephrotic syndrome is better than children with other chronic illnesses. Infrequent relapse type, newly diagnosed and steroid treated groups showed better quality of life in certain domains.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding

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REFERENCES


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The Use of Erubium Yag (Er:YAG) Laser to Treat Burns and Study Laser Effect on the Environment

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1College of Basic Education, University of Sumer, Iraq; 2College of Medicine, University of Kufa, Iraq; 3Ministry of Health, Iraq

ABSTRACT

Er: YAG laser wavelength (2940nm) was used in burns treatment. The result of treatment acne scar by Er:YAG is better than by using IPL. This process is occurs by absorption laser beam by skin layers. especially superficial treatment. There are different properties related to skin layer such as thermal and thermal relaxation time (TRT) and the target \[TRT=\text{Time required for the heated tissue to lose about half of its heat}\]. When using laser beams incorrectly affect human health and the environment, which leads to the spread of radiation and this leads to the incidence of various cancers.

Keywords: Er:YAG, Laser, Burns, Environment.

Introduction

The laser mean [light amplification by stimulated emission of radiation]. However laser light is different normal light because laser light have (intensity, energy, tip, frequency) is high compare of normal light. The different type of laser such as \(\text{CO}_2\) (10600nm), Nd:YAG (1064nm), Er:YAG (2940nm). The effect laser ray in biological tissue is dependent on (wave length, tip, energy, frequency). The low the absorption coefficient is burns types is simple use Er:YAG fraction in the treatment and the high absorption coefficient is burns type is deep of the skin use Er:YAG fractional and thermal in the treatment \(^{1,2}\). The use laser in treatment burns or acne scar and vascular make temperature on the tissue we need to cool system treatment region. The cooling system express cold air used temperature low on the tissue \(^{3,4}\).

Laser Er:YAG: The Er:YAG laser main crystal of the ytrrium aluminium garnet [YSAG]. The laser Er:YAG emission wavelength (2940nm). The laser gives radiation wavelength (2940nm), which is the absorption by tissue. The laser Er:YAG is two type (fractional and fractional thermal) is used data in treatment burns. The burns type simple use fractional and deep burns is used fractional thermal. The Er:YAG near infrared laser, pumping optical, solid state. The properties laser is monochromatic, coherent, directional but is normal light is not have laser properties. The laser properties used in the treatment burns but is not normal light in the burns and acne scar.

Selective photo- thermolysis:

Selective photo- thermolysis term was introduced by Anderson and Parrish \(^{5}\). That clearly indicates to the objective of the selective destruction of a tissue structure by an increase in temperature induced by a light source. There are three significant parameters to be taken into account in achieving selective photothermolysis.
Wavelength is determines depth of penetration through the epidermis and dermis figure (2).

![Figure 2: Wavelength and absorption coefficient](image)

Pulse duration (3.5mm, 9mm): Determined by the thermal relaxation time (TRT).

**Spot size:** Spot size to have less scattering of the laser beam and deep dermal penetration in figure (3).

![Figure 3: relation between penetration level and size spot](image)

**Cooling system:** The cooling includes air-cooling or cool gels applied to the surface.

**Laser tissue interaction:** Light is an electromagnetic radiation that covers a broad spectrum of wavelength (from x-ray to radio waves). When we irradiate tissue – in this case the skin – with a light source, several significant physical phenomena occur (fig.4). Because of the difference in refraction coefficients between air and the corneal epithelium, some of the radiation is reflected.
Another part of the radiation transmitted or penetrating the tissue become dispersed. Finally, the radiation that reaches the target tissue be absorbed by the structure. Any target tissue or structure must contain a substance or molecule with the appropriate physical and chemical characteristic to absorb this radiation. A molecule that absorbs a given wavelength is known as a chromophore. All of the medical applications of light sources are built upon the basic physical principle of absorption.

Absorption of the radiation by the chromospheres must take place in order for a biological reaction to occur. The energy provided in the radiation absorbed by the target tissue undergoes a transformation with several possible outcomes: photo thermal (increase in temperature), photomechanical (thermal expansion producing sound waves), or fluorescence (emission of photons at another wavelength). In photo depilation, a photo thermal effect is sought in order to raise the temperature of the follicular structure and thus destroy it. Each chromophore has the capacity to absorb certain wavelength. This is a very important fact, as it is the absorption profile of the chromophore that will determine which wavelength must be used to treat it. Therefore, need to know at which wavelength the absorption peaks of each chromophore occur. Melanin is the target chromophore in photodepilation. This intracellular pigment is characterized by high absorption coefficient for all wavelength in the visible spectrum but in an inverse relation to the wavelength, meaning the absorption coefficient decreases as the wavelength increases (Fig.5). The wavelength of the radiation used is important not only because it determines the specificity for a given chromophore, but also because penetration depth is dependent upon this. At wavelength within the low absorption index of water (400 to 1000nm), as the wavelength increase, dispersal within the dermis decreases, increasing the depth of penetration at the wavelength (Fig 6).

![Figure 4: Diagram showing the different physical phenomena that occur when skin is irradiated with a light source](image)

![Figure 5: Diagram showing the relationship between wavelength and the absorption coefficient of melanin](image)
Environmental safety of lasers: There are other than the risk of exposure to laser beam, which is a significant risk of the laser system itself, such as electric shock caused by high exposure to electrical materials used. For the purpose of laser prevention, follow these steps.

1. When handling lasers or entering the lasers laboratory, special glasses must be bounced to reduce the exposure of the laser beam and the glasses must be chosen for each wavelength.

2. If the laser is turned on the laboratory light should be as high as possible to keep the pupil opening as small as possible to minimize the possibility of the laser beam entering the eye.

3. To product skin and skin of the laser rays risk to be reinstated thick white boat to reduce the capacity of laser bases. It also wears gloves to maintain the skin of the radiation.

4. Be sure to check the electrical system of the laser system and inspect it accurately and may not stand on the floors or metal surface when operating the system.

5. In laser laboratories, appropriate wall petitions are required to prevent direct exposure to laser radiation when entering the laboratory.

6. Laser lab workers warn of solitary work and individual survival when running the system.

7. The absorbent radiation barriers should be placed in front of the scattered laser beam.

8. The laser system should be provided with self-control circuits so that the system cannot be operated unless the environment conditions adequate.

9. Periodic medical examinations should be conducted for laser workers to check on their health and to protect the environment from the spread of harmful rays, which cause many diseases.

When using laser beams incorrectly affect human health and the environment, which leads to the spread of radiation and this leads to the incidence of various cancers. When lasers are used by non-specialist, the patients’ health may be affected. these rays may reach the eye, which is the sensitive organ in the human body. Therefore, laboratory safety conditions and necessary guidelines should be used when entering the laser beam to product the person from harmful radiation and also the non-spread of these rays in the environment, which leads to pollution of the environment so it is necessary to use the radiation correctly by specialists, ensuring the safety of people and live in a safety environment.

Conclusion

This middle age female presented with burn scar in right check perioral area and right side of neck. In the (1st) cessation the scar is large and hard in consistency after (7 cases) the scar become smaller in size and softer in consistency and the ugly appearance become better especially in right double chin area and perioral area.
This patient presented with scar in right. Shoulder with hyper and hypopigment of laser the skin after cessation of laser the scar in right. Upper arm disappear and scar in right. Shoulder become smaller and softer in addition the patient feel better movement in the joint.

This young patient presented with burn scar and hypergiment in the face. In (1st) cessation, there is hypertrophic scar in right. nasolobail fold and tip of nose with hypergimen in left. Nasolabail fold after (7 cases) the hypertrophic scar in the tip of nose disappeared and right. Nasolabial scar become smaller and smoother.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding

**REFERENCES**


The Relation between Some Genetic Traits (Ptc Tasting, Tongue Rolling, Earlobe Attachment and Dental Occlusion in Iraqi Adults

Jinan E. Saloom1, Sami K. Al-Joubori1, Sara M. Al-Mashhdany1

1Department of Orthodontics, College of Dentistry, University of Baghdad, Baghdad, Iraq

ABSTRACT

This study aimed to determine the possible relation among three genetic traits named phenylthiocarbamide (PTC) tasting ability, earlobes attachment, and tongue rolling ability together with class I, class II and class III dental malocclusion.

The study was undertaken amongst 81 dental students of college of dentistry of Baghdad university aged (18-25), (52 female & 29 male) with different anteroposterior dental malocclusion to determine their phenylthiocarbamide (PTC) tasting ability, earlobes attachments configurations and tongue rolling ability, for these non-parametric variables, chi-square and percentage tests were used to examine differences among groups.

The prevalence of (PTC) tasting ability was higher in all dental classes and being higher in male group of Cl I, Cl II and female group of Cl III sample, the prevalence of free un-attached earlobes is higher in all dental classes being highest in Cl III sample, the prevalence of tongue rolling ability is higher in all dental classes except for female group of Cl III sample who are mostly non-curler. These variables showed statistically significant gender differences ($P \leq 0.05$), Cl III dental malocclusion showed specific distribution pattern of the studied genetic traits suggesting for a possible genetic link among them.

Keywords: Malocclusion, (PTC) tasting, Earlobes attachments, Tongue rolling.

Introduction

Anthropometric characters have been depended for racial classification for so many years, however the use of genetic characters bring about special advantages of helping to understand the dynamic of human population for understanding the human diversity. many polymorphic genetic markers have been used (1-3). The determination of gene frequencies for ear lobe, tongue rolling and the ability to taste phenylthiocarbamide (PTC) and the variation of dental occlusion is of interest to the human population geneticists. Genetic diversity between human populations can be detected by means of analysis of variation in these characteristic (3).

The ability to taste PTC (Phenylthiocarbamide), an organic compound is also known as phenylthiourea (PTU) is an organosulfuruthioureia containing a phenyl ring, it has an unusual property that either very bitter or is being tasteless, it has been known to be a bimodal autosomal trait inherited in a simple Mendelian recessive gene that codes for a taste receptor on the tongue (2-6), the PTC gene was discovered in 2003 (2). The people who can taste it are having a dominant genetic trait and the test to determine PTC sensitivity is one of the most commonly used genetic tests on humans (6). About 70% of the people can taste PTC (2).

There are two common forms (or alleles) of the PTC gene, one of the common form is a tasting allele, and the other is anon tasting allele each of these allele codes for a bitter taste receptor protein with slightly different parts of their shapes, since all people have two copies of each gene, combination of the bitter gene variants determine whether someone finds PTC intensely bitter, somewhat bitter, or being without taste at all (3,6).
Earlobe attachment is considered as a continuous trait, if the earlobe hangs free, they are detached, if they attached directly to the side of the head, they are attached earlobe. Some scientists have reported that this trait is due to a single gene for which unattached earlobe is dominant trait and attached earlobe is recessive trait, other scientists have reported that this trait is probably due to several genes (7).

Tongue rolling is considered as an inherited trait, described as the ability to turn up the lateral border of the tongue into U-shape, it is also known as tongue curling. The dominant gene is responsible for tongue rolling ability, while the inability to roll the tongue is a result of a recessive gene, In 1940, the famous geneticist Alfred noted that about 70% of the people of European ancestry were able to roll up the lateral edges of the tongue, while the remaining lack this ability (2,8).

The aim of this study is to determine the relationship among the genetic traits of PTC phenylthiocarbamide tasting ability, earlobe attachments configuration, tongue rolling ability and anteroposterior dental malocclusion in Iraqi adult sample.

Materials and Method

A measurement of PTC tasting ability, earlobe attachment configuration, tongue rolling ability and its relation to dental occlusion in a sample of (81) Iraqi dental students from the college of dentistry of Baghdad university, (52 female, 29 male), their age ranged (18-25) years, consist of (31 class I, 30 class II, 20 class III dental occlusion).

The sample of this study was collected from the students of college of dentistry of Baghdad university, they were selected to meet a special criteria, which were:

1. Full set of permanent teeth (excluding the 3rd molar).
2. Normal appearing teeth, no badly carious teeth and no missing or extracted teeth.
3. No large restoration or fixed replacement.
4. No history of previous of orthopedic, orthodontic or facial trauma.
5. No gross asymmetries in the dental arches and face.

Examination and dental tools: Dental mirrors, kidney dish, antiseptic solution (spirit 75%), with the individual was seated on a dental chair, the intraoral examination was done for each person to check the criteria that should be present.

The dental occlusion was examined and classified into (9):

1. Class I or neutocclusion—the mesiobuccal cusp of the upper first molar occludes with the mesiobuccal groove of the lower first molar, discrepancies of up to half a cusp width either way were also included in this category.
2. Class II or distocclusion—the mesiobuccal cusp of the lower first molar occludes distal to the Class I position, which is subdivided into:
   - Class II division 1—the upper central incisors are proclined or of average inclination and there is an increase in overjet.
   - Class II division 2—the upper central incisors are retroclined. The overjet is usually minimal or may be increased.
3. Class III or mesiocclusion—the mesiobuccal cusp of the lower first molar occludes mesial to Class I position.

PTC tasting threshold was determined by using serial dilution method of Harris and Kalmas (1949) (10) a stock solution containing 0.13% phenylthiocarbamide was prepared in distilled water and serial dilutions were made up to the number fourteen, the least diluted solution was numbered as dilution number 1 and the most diluted solution was numbered (14), If an individual could not taste any solution including no.14, then he or she was designed as a non-taster, threshold level for PTC were recorded for both gender.

The shape of earlobe was classified into either free or attached, the ability to roll the tongue was classified into either curlers, so the subject would be able to curl the tongue into a U-shape or non-curler who could not roll his or her tongue.

Results

Table (1) showed the distribution of the genetic traits amongst the sample of class I malocclusion in
Table (1) showed the distribution of the genetic traits amongst the sample of class III malocclusion in which a higher percentage of the sample have the ability to taste a bitter phenylthiocarbamide (PTC), being higher in female with statistically significant difference were found between gender in this respect.

For earlobes attachment, all the studied sample have free un-attached ear lobes, with statistically significant difference between genders; For the ability or inability to roll the tongue, the result showed a higher percentage of male were curler, having the ability to roll the tongue, while a higher percentage of female were non-curler with statistically significant difference between genders in this respect.

Table (2) showed the distribution of the genetic traits amongst the sample of class II malocclusion in which a higher percentage of the sample have the ability to taste a bitter phenylthiocarbamide (PTC), being greater in male than female patients with statistically significant difference between gender in this respect. For the ability or inability to roll the tongue, the result showed a higher percentage of class I malocclusion have the ability to roll the tongue, being greater in male than female with statistically significant difference between genders in this respect.

Table (3) showed the distribution of the genetic traits amongst the sample of class III malocclusion in which a higher percentage of the sample have the ability to taste a bitter phenylthiocarbamide (PTC), being higher in female with statistically significant difference were found between gender in this respect.

For earlobes attachment, all the studied sample have free un-attached ear lobes, with statistically significant difference between genders; For the ability or inability to roll the tongue, the result showed a higher percentage of male were curler, having the ability to roll the tongue, while a higher percentage of female were non-curler with statistically significant difference between genders in this respect.

Table (4) showed the distribution and comparison of the three tested variables in male patients with different anteroposterior dental malocclusion, it was observed that the ability to taste the bitter phenylthiocarbamide (PTC) was higher in class II malocclusion, the prevalence of free un-attached ear lobes was higher in class III malocclusion; while the ability of tongue rolling was higher in class I and class III malocclusion than class II malocclusion with statistically significant differences between them.

Table (5) showed the distribution and comparison of the three tested variables in female patients with different anteroposterior dental malocclusion it was observed that the ability to taste the bitter PTC was higher in class III malocclusion, the prevalence of free un-attached ear lobes was higher in class III malocclusion; while the ability of tongue rolling was higher in class I malocclusion.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Male</th>
<th>Percentage %</th>
<th>Female</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTC taste</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taster</td>
<td>11</td>
<td>73.3%</td>
<td>13</td>
<td>81.3%</td>
</tr>
<tr>
<td>Non taster</td>
<td>4</td>
<td>26.7%</td>
<td>3</td>
<td>18.8%</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>100.0%</td>
<td>16</td>
<td>100.0%</td>
</tr>
<tr>
<td>Pearson Chi-Square</td>
<td>0.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ear lobe</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Free</td>
<td>12</td>
<td>80.0%</td>
<td>12</td>
<td>75.0%</td>
</tr>
<tr>
<td>Attached</td>
<td>3</td>
<td>20.0%</td>
<td>4</td>
<td>25.0%</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>100.0%</td>
<td>16</td>
<td>100.0%</td>
</tr>
<tr>
<td>Pearson Chi-Square</td>
<td>0.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>tongue roll</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Curler</td>
<td>10</td>
<td>66.7%</td>
<td>9</td>
<td>56.3%</td>
</tr>
<tr>
<td>Non curler</td>
<td>5</td>
<td>33.3%</td>
<td>7</td>
<td>43.8%</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>100.0%</td>
<td>16</td>
<td>100.0%</td>
</tr>
<tr>
<td>Pearson Chi-Square</td>
<td>0.000</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 2: Distribution and comparison of PTC taste, ear lobe and tongue roll between gender in class II malocclusion

<table>
<thead>
<tr>
<th>Variable</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Count</td>
<td>Percentage %</td>
</tr>
<tr>
<td>PTC taste</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taster</td>
<td>4</td>
<td>80.0%</td>
</tr>
<tr>
<td>Non taster</td>
<td>1</td>
<td>20.0%</td>
</tr>
<tr>
<td>Total</td>
<td>5</td>
<td>100.0%</td>
</tr>
<tr>
<td>Pearson Chi-Square</td>
<td></td>
<td>.000</td>
</tr>
<tr>
<td>ear lobe</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Free</td>
<td>4</td>
<td>80.0%</td>
</tr>
<tr>
<td>Attached</td>
<td>1</td>
<td>20.0%</td>
</tr>
<tr>
<td>Total</td>
<td>5</td>
<td>100.0%</td>
</tr>
<tr>
<td>Pearson Chi-Square</td>
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</tr>
<tr>
<td>tongue roll</td>
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<td></td>
</tr>
<tr>
<td>Curler</td>
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</tr>
<tr>
<td>Non curler</td>
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<td>40.0%</td>
</tr>
<tr>
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<tr>
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Table 3: Distribution and comparison of PTC taste, ear lobe and tongue roll between gender in class III malocclusion

<table>
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<th>Female</th>
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<td></td>
<td>Count</td>
<td>Percentage %</td>
</tr>
<tr>
<td>PTC taste</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taster</td>
<td>6</td>
<td>64.7%</td>
</tr>
<tr>
<td>Non taster</td>
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<td>35.3%</td>
</tr>
<tr>
<td>Total</td>
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</tr>
<tr>
<td>Pearson Chi-Square</td>
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</tr>
<tr>
<td>ear lobe</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Free</td>
<td>9</td>
<td>100.0%</td>
</tr>
<tr>
<td>Attached</td>
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</tr>
<tr>
<td>Total</td>
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<td>100.0%</td>
</tr>
<tr>
<td>Pearson Chi-Square</td>
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<td>0.000</td>
</tr>
<tr>
<td>tongue roll</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Curler</td>
<td>6</td>
<td>66.7%</td>
</tr>
<tr>
<td>Non curler</td>
<td>3</td>
<td>33.3%</td>
</tr>
<tr>
<td>Total</td>
<td>9</td>
<td>100.0%</td>
</tr>
<tr>
<td>Pearson Chi-Square</td>
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</table>

Table 4: Distribution and comparison of PTC taste, ear lobe and tongue roll among different malocclusions in the male group

<table>
<thead>
<tr>
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<th>Class I</th>
<th>Class II</th>
<th>Class III</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Count</td>
<td>Percentage</td>
<td>Count</td>
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<tr>
<td>PTC taste</td>
<td>Taster</td>
<td>11</td>
<td>73.3%</td>
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<td></td>
<td>Non taster</td>
<td>4</td>
<td>26.7%</td>
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<tr>
<td></td>
<td>Total</td>
<td>15</td>
<td>100.0%</td>
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<tr>
<td>Df</td>
<td></td>
<td>6</td>
<td></td>
</tr>
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</table>
Table 5: Distribution and comparison of PTC taste, ear lobe and tongue roll among different malocclusions in the female group

<table>
<thead>
<tr>
<th>Variable</th>
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<th>Class II</th>
<th>Class III</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Count</td>
<td>Percentage</td>
<td>Count</td>
</tr>
<tr>
<td>PTC taste</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Taster</td>
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<td>19</td>
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<td>Non taster</td>
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<td>Total</td>
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<td>100.0%</td>
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<td>Df</td>
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<td>p-value</td>
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<td></td>
</tr>
<tr>
<td>Ear lobe</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Free</td>
<td>12</td>
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<tr>
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<td>5</td>
</tr>
<tr>
<td>Df</td>
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<td></td>
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</tr>
<tr>
<td>p-value</td>
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<td></td>
</tr>
<tr>
<td>Tongue roll</td>
<td></td>
<td></td>
<td></td>
</tr>
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<td>Curler</td>
<td>10</td>
<td>66.7%</td>
<td>3</td>
</tr>
<tr>
<td>Non curler</td>
<td>5</td>
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<td>2</td>
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<tr>
<td>Total</td>
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<td>100.0%</td>
<td>5</td>
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<tr>
<td>Df</td>
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<td>p-value</td>
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Discussion

The present study was aimed to determine the possible relation among PTC taste ability, tongue rolling ability and the earlobe attachment configuration with different anteroposterior malocclusion class I, II and III.

Phenylthiocarbamide (PTC) tasting ability and anteroposterior dental malocclusion: PTC tasting ability is regarded as a classic and important genetic marker in different genetic investigations, 79% of the studied sample have the ability to taste a bitter phenylthiocarbamide (PTC), as it is revealed as a dominant genetic trait that was conveyed through a single dominant gene responsible for the taste perception on the tongue (11) and this come in agreement with other studies (12); a higher percentage of PTC taster was found among male group of class I, class II malocclusion and among female groups of class III malocclusion; this variation between gender might be due to their different genetic make up coming along with their classic inherited pattern that vary in different gender.

The higher percentage of tasting ability was lie at level 7 dilution for both male and female and this come in agreement with Hussain etal (13).
Earlobes attachment configuration and anteroposterior dental malocclusion: It was observed that the incidence of free earlobe is higher than attached earlobe in all dental malocclusion classes and in all sample and this is agree with other study (14).

As free unattached ear lobe has an autosomal dominant path of inheritance while attached ear lobes have a recessive mode of inheritance (15). However the gender differences in this trait suggesting the effect of genetic variation on earlobe attachment area configuration between them.

Tongue rolling and anteroposterior dental malocclusion: The percentage of the ability to roll up the lateral borders of the tongue into a tube shape is higher in male than female all dental classes than the inability to roll the tongue, except female group of class III dental malocclusion in which higher percentage of them were non curler. Tongue rolling is a result of an autosomal dominant gene with simple Mendelian inheritance, and might be learned or developed (16). Gender differences in the prevalence of this trait suggesting the genetic variation in the overlapping of motor innervation of both extrinsic and intrinsic muscle although this has not been studied.

Conclusion

There is no specific combination pattern among the genetic traits of PTC tasting ability, tongue rolling and earlobes attachment configuration come along with the class I, class II dental malocclusion, while in class III malocclusion there is a possible link among the studied genetic traits of phenylthiocarbamate (PTC) tasting ability, tongue rolling ability, earlobes attachments configuration and class III dental malocclusion.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

REFERENCES


Combination of Gold Nanoparticles Conjugated Lectin and Using it for Development the Antibacterial Activity of Lectin Purified from *Acinetobacter baumannii*

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¹Department of Biology, College of Science, Mustansiryiah University, Iraq

**ABSTRACT**

Lectins are glycoproteins of non-immune source which take a large range of use in medical area. In the present search a new strain, *Acinetobacter baumannii c₁₃* took from chicken carcasses samples gave the top production level of lectin by microscopic glass slide and microtiter plate methods. Lectin was purified to similarity by ammonium sulfate at 35% capacity followed by DEAE -cellulose ion exchange chromatography and sephadex G-150 gel filtration chromatography with 45.3 fold of purification and a harvest of 57.1%. Au nanoparticles was made by laser ablation and conjugated to lectin by method of pulses. The Au nanoparticles conjugated lectin led to development of lectin action versus each tested UTI affecting in contrast with ciprofloxacin antibiotic that used for therapy of UTI inflammation and purified lectin, where Au nanoparticles conjugated lectin look great effectiveness versus *Enterobacter* sp. followed by *Salmonella* sp. and *Streptococcus* sp. in contrast with the more tested bacteria. Thus Au nanoparticles conjugated lectin can be used as a suitable antibacterial agent for the action of growing urinary tract infections.

**Keywords:** *Acinetobacter baumannii*, lectin, Au nanoparticles

**Introduction**

*Acinetobacter* species are common, free-living saprophytic(¹), ubiquitous in nature and can be found in different environmental sources such as hydrocarbon contaminated areas, activated sludge, sewage, dump sites(²), also found on vegetables, animals, humans and in the soil, water, and source foods(³). *Acinetobacter* species have emerged as an important nosocomial pathogen due to its capability for survival in the hospital environment on a wide range of dry and moist surfaces (⁴).

The term of nanoparticles refers to any particle that has three dimensions in nanometer scale and contains small enough a number of constituent atoms or molecules (⁵). The metal nanoparticles such as Ag, Au, Cu and Pt NPs considered a great interest source because of their novel electrical, optical, physical, chemical and magnetic proprieties (⁶). Au nanoparticles have important applications in different fields due to their physical and chemical proprieties that depending on their shape and size. The reduction of HAuCl₄ with different reduction agents and in presence of some stabilizers led to synthesize of Au nanoparticles (⁷). The goal in modern nanotechnology field may to obtain of metal nanoparticles by using environmentally friendly methods. A popular top-down approach by pulsed laser ablation in liquids (PLAL) is an alternative method for conventional chemical reduction methods, it used for making of nanoparticles from a target absorbed in fluid where an intense laser beam lead to break down the bulk materials to smaller particles. Laser ablation technique has many advantages like simplify, leads to safe and stable handling of the colloids without by-products and impurities and needs less time and low cost (⁸).

Lectins in the beginning called hemagglutinins or agglutinins because their abilities to agglutinate of human and animal erythrocytes. Lectins are various group of proteins or glycoproteins of non-immune source. Lectins is a useful tool in several fields such as immunology, cell biology, molecular biology, membrane structure,
Materials and Method

Samples collection and bacterial analysis: Fifty five samples of chicken carcasses (1g) was diluted gradually into 100 ml NaCl 0.85% solution and according to this method (11). Acinetobacter baumannii isolate was set by Vitek 2 system by using Vitek GNI card (bio Mérieux, France) according to the producer’s commands.

Lectin production

Semi-quantitative analysis: This test was done by method that discard by (13).

Quantitative hemagglutination assay: The numerical screening was thru in microtiter plate as discarded by (14).

Estimation of protein content: The protein content of lectin was fixed by using the method of (15) and using bovine serum albumin as a standard.

Extraction and purification of lectin: The special bacterial isolate was grown on (CFA) described by(13) at 37°C for 24 hour, then cells was gathered by centrifugation at 8000rpm for 30 min, washed twice and re-suspended in 0.02M (PBS) pH 7.2. Cells were upset by glass beads for 50 min at 4°C by the vortex. Remaining full cells and cell membrane fragments were detached by centrifugation 8000rpm for 20 min. The causing supernatant was used as the starting point to form the hem agglutination activity of lectin in crude cell extracts.

The supernatant was fractionated with ammonium sulfate at concentrations 20-80% saturation and using the method of (5).

Preparation of Au nanoparticles by laser ablation:
Au nanoparticles was prepared by laser ablation by method in (5).

Characterization of Au nanoparticles: The shaped Au nanoparticles was established by UV-visible spectrophotometer by method (10) and left to wet at room temperature for 30min. The slides were then examined.

Conjugation and Characterization of purified lectin and Au nanoparticles by pulses method: The pellets of Au dropped in 4 ml of purified lectin at 4°C to save away from enzyme damage and vibrated by using laser ablation method at 1 Hz replication rate with 40 pulses, fluence (14.44 J/cm2) and wavelength of 1064 nm then hem agglutination action was premeasured.

The filtered lectin and Au nanoparticles conjugated purified lectin by pulses methods by (5).

Detection of antibacterial activity: The Kirby-Bauer disc diffusion method was worked for discovery of antibacterial action of ciprofloxacin, Au nanoparticles, purified lectin, Au nanoparticles conjugated purified lectin by pulses method in Mueller- Hinton agar plates. Twenty bacterial isolates including Streptococcus sp., Staphylococcus aureus, Klebsella pneumonia, Escherichia coli, Pseudomonas aeruginosa, Enterococcus sp., Serratia marcescens and Salmonella sp. isolated from urinary tract infection were immunized in liquid culture and incubated for 24 hrs at 37 °C, these bacterial isolates were then spreaded on Mueller - Hinton agar plates. Sterile blank paper discs (6mm diameter) immersed in Au nanoparticles and purified lectin, separately, for 1 h besides to ciprofloxacin that used as 30μg antibiotic disc were placed on the surface of the plates then incubated at 37 °C for 24 h. A transparent ring around the paper disc revealed antimicrobial activity and the inhibition zones around discs were measured in millimeters (14).

Kirby-Bauer disc diffusion method was repeated as stated above for discovery the antibacterial activity of Au nanoparticles conjugated purified lectin by pulses method. The same bacterial isolates that isolated from urinary tract infections were used. After the incubation period, the diameter of inhibition zone was calculated with millimeter.

Results and Discussion

Isolation of Acinetobacter baumannii: Twenty (36.3%) Acinetobacter baumannii isolates happened got out of 55 samples of chicken carcasses

Acinetonacters have been frequently isolated from eviscerated chicken carcasses and other poultry meats (3). Acinetonacter constituted 22.7% of the total microflora of chicken carcasses (4).

Lectin production: The results of semi-quantitative analysis revealed that 16 Acinetobacter baumannii isolates gave hemagglutination activities plus the
Acinetobacter baumannii c₁₃ presented upper hemagglutination level. Also in measurable analysis the hemagglutination actions in microtiter plate were revealed in these bacterial isolates and Acinetobacter baumannii c₁₃ showed higher hemagglutination value against O+ blood group equals to 64 U/ml.

In a paper reported by(17,18) discovered that the purified lectin from Acinetobacter baumannii led to agglutinate blood group O⁺ in the first degree followed by B⁺ in the second degree, but lesser levels of hemagglutination exposed for blood groups A⁺ and AB⁺. Acinetobacter baumannii has type1 Pilii that have the capability to hemagglutinate the erythrocytes that have mannose and this type of pilii considered from the the vectors of virulence that facilitate the adhesion of bacteria to epithelial cells(19).

**Purification of lectin:** The crude extract was consumed then crude enzyme solution precipitation process by 20-80% saturation of solid ammonium sulfate and found that 35% saturation led to increase the specific activity to 62.28U/mg. Dialysis step was consumed to delete the impurities and unwanted proteins and loaded on DEAE cellulose that equilibrated and washed with 0.02M (PBS) pH 7.2. The adsorbed enzyme was eluted with a slope of sodium chloride ranging from 0.1 to 0.5M with the same buffer. The elution headed to appear three protein peaks with hem agglutination action in the second peak (figure-1a). After collection of the active fractions these fractions loaded on Sephadex G-150 that was previously washed with 0.02M (PBS) pH 7.2. The elution with the same buffer showed two peaks of protein with hemagglutination activity in the second peak (figure-1b). The lectin was purified with 57.1% a yield, 45.3fold of purification and a specific activity of 616.8U/mg protein as shown in table (1).

Glass beads have different advantages in cells disruption such as easily, inexpensively, multiply samples can be used at the same time with a high attentiveness of protein. vortex beading is similar to sonication in extraction of the periplasmic proteins, since the sample and beads are blended and placed on a vortex to induce mechanical throbbing under cooling conditions (18) reported that the lectin was purified to homogeneity from Acinetobacter baumannii by ammonium sulfate at 35% saturation followed by QAE-Sephadex ion exchange chromatography and sephadex G-200 gel filtration chromatography with a retrieval harvest of 72.72% and 40.76 fold of purification. An ammonium sulfate fractionation, gel filtration and preparative isoelectric focusing were spent for purification of cholera lectin produced by Vibrio cholerae strain CA401 to apparent homogeneity with specific activity of 110 U/mg and a yield of 0.02% (20).

<table>
<thead>
<tr>
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<th>Size (ml)</th>
<th>Hemagglutination activity (U/ml)</th>
<th>Protein conc. (mg/ml)</th>
<th>Specific activity (U/mg)</th>
<th>Total activity</th>
<th>Purification fold</th>
<th>Yield (%)</th>
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</thead>
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<td>(NH₄)₂SO₄ precipitatin</td>
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<td>256</td>
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<td>616.8</td>
<td>5120</td>
<td>45.3</td>
<td>57.1</td>
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</tbody>
</table>

Table 1: Steps of lectin purification from Acinetobacter baumannii c₁₃

Figure 1: Purification of lectin from Acinetobacter baumannii c₁₃ by using (a: ion exchange chromatography on DEAE cellulose column; and b: gel filtration chromatography on Sephadex G-150 column)
TEM technique: The TEM technique was used to see the shape and size of Au nanoparticles Figure(2a) It has a spherical shape with an average size of 25nm compare with TEM technique was used to see the shape and size of the purified lectin and Au nanoparticles. Figure (2b) showed that purified lectin had a good distribution in the size of 75 nm. In contrast, Au nanoparticles conjugated purified lectin by pulses with the size of 92 nm figure (2c).

![TEM images of (a) Au nanoparticles (b) purified lectin, (c) Au nanoparticles conjugated purified lectin by pulses method](image)

Characterization of purified lectin and Au nanoparticles conjugated purified lectin by pulses method: The Au nanoparticle-lectin conjugation can remain observed from maximum absorption spectra with wave length by the red shift from (320.3 nm) to (376.9 nm) (figure- 1b). This indicated When the Au nanoparticle formed by pulses the shell thickness of the lectin protein shell created around the Au nanoparticle increased and led to a red shift in the peak wave length. These results reflect the conjugation of purified lectin with the Au nanoparticle. Compere with The absorption spectrum of the Au nanoparticles was calculated by a UV–visible spectrophotometer in the wavelength range 300 to 900 nm as shown in figure (3a). At wavelength about 312nm.

![Absorbance of Au nanoparticles thin films; b-Absorbance of purified lectin and Au nanoparticles conjugated lectin by pulses method](image)

Detection of antibacterial activity for purified lectin, Au nanoparticles and Au nanoparticles conjugated purified lectin by pulses method: For discovery of antibacterial activity of purified lectin, Au nanoparticles conjugated purified lectin and Au nanoparticles was learnt in Muller Hinton agar against different causing UTI
infection. The effects revealed that ciprofloxacin showed high effectiveness with high diameter of inhibition zone was reached to 16 and 16.3 mm for *Enterobacter* sp. and *K. pneumoniae*, respectively. In contrast, it revealed no effect toward Gram- positive tested bacteria (figure-4).

The calculations demonstrated that Au nanoparticles and purified lectin had antibacterial activity anti UTI causing. The Au nanoparticles had higher effectiveness than the purified lectin with great inhibition zone (21 and 20.5 mm) against *Enterobacter* sp. and *Salmonella* sp., respectively, while the diameter of inhibition zone reached to 18 and 16.5 mm, respectively against the same types of bacteria.

When the purified lectin was conjugated to Au nanoparticles by pulses, the antibacterial activity was increased with high effectiveness (high diameter of inhibition) for all tested Gram-positive and Gram-negative bacteria in comparison with ciprofloxacin antibiotic, Au nanoparticles alone and purified lectin alone(figure-8) and *Enterobacter* sp had higher activity with higher diameter of inhibition zone of 25 mm as shown in figure (5). So that we can conclude that pulses method was the best method for enhancement purified lectin activity to maximum level for treatment of UTI infections.

![Figure 4: The diameter of inhibition zone for UTI causing pathogens](image1)

![Figure 5: The inhibition zones that produced by Au nanoparticles, purified lectin and Au nanoparticles conjugated lectin against Enterobacter sp.](image2)

**Conclusion**

Au nanoparticles conjugated lectin can be worked as a useful antibacterial agent for the action of rising urinary tract infections.

**Acknowledgement**

The Authors would like to thank Mustansiriyah University (http://uomustansiriyah.edu.iq/) Baghdad, Iraq for its support in the present work.
**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding

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Functional Neurological Disorder at Al-Diwaniyah Teaching Hospital

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¹College of Medicine, University of Al-Qadisiyah, Diwaniyah, Iraq

ABSTRACT

Background: Functional neurological disorder (conversion disorder) is defined as a psychiatric illness in which a neurological or general medical condition can not explain symptoms and signs affecting voluntary motor or sensory function. The aim of current study was to study the sociodemographic characteristics of patients with functional neurological disorders, to demonstrate the frequency of symptoms of functional neurological disorders and to study the stressors of life events in such patients.

Method: One hundred patients were diagnosed according to DSM5 diagnostic criteria of FND at Al-Diwaniya Teaching Hospital in the Psychiatry unit and Emergency department between 1st, January 2018 and 1st, October 2018. Then, all patients were assessed with a semi-structured interview to demonstrate their sociodemographic backgrounds and stressor events.

Results: Majority of subjects were females (70%) at an age range of 21-30 years (45%), married (48%), unemployed (70%), educated up to secondary school (70%), urban resident (60%), rent house (65%) and came from extended family (60%). Common presenting symptoms were motor (56%), visceral (22%), mixed (12%) and sensory (10%). Significant stressors were found approximately in all patients and the most common one was social problems (35%) followed by financial problems (26%).

Conclusion: Functional neurological disorder is more common in females, low socioeconomic background and low literacy level and when there are significant stressors. Most common presentations were motor symptoms.

Keywords: functional neurological disorder, stressors, motor symptoms, social problems, financial problems.

Introduction

Conversion disorder, also known as functional neurological symptom disorder (FND) (1,2), is defined as a psychiatric condition in which symptoms and signs affecting voluntary motor or sensory function cannot be explained by a neurological or general medical condition (3). Psychological factors, such as conflicts or stress, are thought to be associated with the disorder. The term conversion disorder was coined by Sigmund Freud, who emphasized the occurrence of certain symptoms that are not better explained by organic diseases and reflect unconscious conflict (4). The term conversion refers to the substitution of a somatic symptom for a repressed idea (5).

FND is relatively rare, with most cases diagnosed after age of 7 years; the incidence increases with age and has a female preponderance (6-8).

Clinical features: The most common FND symptoms are paralysis, visual disturbances and speech problem. FND may be more correlated with passive-aggressive, dependent, antisocial and histrionic personality disorders. Depressive and anxiety symptoms often associated with FND and affected patients are in danger of suicide (9).

Motor Symptoms: These include abnormal movements, gait disturbance, weakness and paralysis. Gross rhythmical tremors, choreiform movements, tics...
and jerks may be present. These movements generally worsen when attention is called to them. One gait disturbance seen in FND is astasia-abasia, which is a wildly ataxic, staggering gait accompanied by gross, irregular, jerky truncal movements and thrashing and waving arm movements. Patients with these symptoms rarely fall; if they do, they are generally not injured. Other common motor disturbances are paralysis and paresis involving one, two or all four limbs, although the distribution of the involved muscles does not conform to neural pathways. Reflexes remain normal; patients have no fasciculation or muscle atrophy, electromyography findings are normal.

**Learning Theory:** Regarding conditioned learning theory, a conversion symptom can be seen as a classically conditioned learned behavior; symptoms of illness learned in childhood, are called forth as a means of coping with an otherwise impossible situation.

**Aims of the study:** The aims of current study were to study the sociodemographic characteristics of patients with functional neurological disorders, to demonstrate the frequency of symptoms of functional neurological disorders and to study the stressors of life events in such patients.

**Patients and Method**

**Setting:** The study was performed in the Emergency Department and Psychiatry Unit at Al-Diwaniyah Teaching Hospital during the period from 1st, January to 1st, October 2018.

**Sample selection:** The total studied sample was 100 patients, who were referred to the Psychiatry Unit. After initial assessment; examination and routine investigations were done in the Emergency Department to exclude any organic causes. Some consulted the Psychiatry Unit directly. All of them achieved the diagnosis of FND according to diagnostic criteria of DSM5. We used a sociodemographic scale to demonstrate the characters of patients and also demonstrate symptoms frequency and stressors and life events in such patients.

**Results**

**Socio-demographic characteristics of participants:**
Table (1) showed Socio-demographic characteristics of the patients.

**Distribution of study sample according to relation of socio-demographic factors and gender:** Table (2) showed that frequencies were higher in married females (38%), educational level was most commonly secondary school in both sexes and accommodation rent house and the urban residency in both sexes with significant differences, while the family structure criterion showed that most patients had extended families, but was statistically non-significant.

**Symptoms of FND:** Table (3) showed that motor symptoms were the most common symptoms (56%) followed by visceral symptoms (22%), mixed (12%) and sensory symptoms (10%).

**Distribution of the symptoms in both sexes:** Table (4) showed that syncopal attack had the highest frequency in females, while in males the motor symptoms including weakness or paralysis and pseudoseizure were most frequent symptoms.

**Distribution of study sample according to stressors frequency:** Table (5) showed that the most common stressors expressed were social problems (35%), financial problems (26%) and the death of a relative (12%).

<table>
<thead>
<tr>
<th>Socio-demographic characteristic</th>
<th>Frequency</th>
<th>Percent</th>
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<tbody>
<tr>
<td><strong>Age/yr</strong></td>
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</tr>
<tr>
<td>41-50</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Female</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td><strong>Marital status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>26</td>
<td>26</td>
</tr>
<tr>
<td>Married</td>
<td>48</td>
<td>48</td>
</tr>
<tr>
<td>Widow/er</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Divorced</td>
<td>17</td>
<td>17</td>
</tr>
<tr>
<td><strong>Occupation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployed</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>Government-Employed</td>
<td>13</td>
<td>15</td>
</tr>
<tr>
<td>Private employed</td>
<td>17</td>
<td>2</td>
</tr>
</tbody>
</table>
Conted…

Table 2: Distribution of study sample according to relation of socio-demographic factors and gender

<table>
<thead>
<tr>
<th>Socio-demographic Characteristic</th>
<th>Sex</th>
<th>Male</th>
<th>Female</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>15(22)</td>
<td>11(37)</td>
<td></td>
<td>0.029</td>
</tr>
<tr>
<td>Married</td>
<td>38(54)</td>
<td>10(33)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Widow/er</td>
<td>7(10)</td>
<td>2(6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Divorced</td>
<td>10(14)</td>
<td>7(24)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>17(24)</td>
<td>3(10)</td>
<td></td>
<td>0.043</td>
</tr>
<tr>
<td>Primary</td>
<td>19(27)</td>
<td>11(36)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary</td>
<td>26(37)</td>
<td>14(47)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Institute/college</td>
<td>8(12)</td>
<td>2(7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family structure</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nuclear</td>
<td>18(26)</td>
<td>22(73)</td>
<td></td>
<td>0.055</td>
</tr>
<tr>
<td>Extended</td>
<td>52(74)</td>
<td>8(27)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accommodation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Own house</td>
<td>25(36%)</td>
<td>10(33)</td>
<td></td>
<td>0.014</td>
</tr>
<tr>
<td>Rent</td>
<td>45(64%)</td>
<td>20(67)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residency</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>41(59)</td>
<td>19(63)</td>
<td></td>
<td>0.001</td>
</tr>
<tr>
<td>Rural</td>
<td>29(41)</td>
<td>11(37)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3: Frequency of symptoms associated with FND

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pseudo seizure</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>Speech problem</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Weakness or paralysis</td>
<td>17</td>
<td>17</td>
</tr>
<tr>
<td>Abnormal body movements</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Swallowing problem</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Syncopal attack</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Visual disturbance</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Mixed features</td>
<td>12</td>
<td>12</td>
</tr>
</tbody>
</table>

Table 4: Distribution of symptoms according to participants’ gender

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Total Percent</th>
<th>Females %</th>
<th>Males %</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pseudo seizure</td>
<td>19</td>
<td>9</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Speech problem</td>
<td>10</td>
<td>9</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Weakness/Paralysis</td>
<td>17</td>
<td>6</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Abnormal movement</td>
<td>10</td>
<td>9</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Swallowing problems</td>
<td>10</td>
<td>8</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Syncopal attack</td>
<td>12</td>
<td>11</td>
<td>1</td>
<td>0.094</td>
</tr>
<tr>
<td>Visual disturbances</td>
<td>10</td>
<td>9</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Mixed symptoms</td>
<td>12</td>
<td>9</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

Table 5: Most common stressors expressed by study participants

<table>
<thead>
<tr>
<th>Stressors</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social problem</td>
<td>35</td>
<td>35</td>
</tr>
<tr>
<td>Financial problem</td>
<td>26</td>
<td>26</td>
</tr>
<tr>
<td>Death of a relative</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Legal problem</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>School problem</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Any physical illness</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Undetermined</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

Discussion

In our study, we found that most of patients consulted either the Emergency Department or the Psychiatry Unit with sudden onset of loss of function or different varieties of physical complaints making patients with FND more likely to present first to the Emergency Department or primary care physician (12). This supports the idea of introducing psychiatric services early in the process of diagnosis (13).

Socio-demographic and clinical characteristics of patients: FND affected different age groups, but the most common age group affected was between 21 and 30 years representing about 45% of total cases. In a study by (14), the most affected age group was between
18 and 29 years representing about 57% of total cases, which was comparable to our study. Another study by (15) reported that the most common age affected was 22-40 years, which was similar to the findings of our study. However, some studies showed even higher incidence in this age group, whereas other studies suggested a higher incidence in late thirties (16).

In this study, FND affected females more commonly than males (70% vs. 30%), respectively, suggesting that women in Iraqi society may be having more social difficulties than men. In a study conducted by (17) reported that females represented (78.4 %) and males (21.6%) which was similar to our study. In a study by (18) they found that 82.12% of affected cases were females and 17.89% were males.

Regarding marital status, the most common group was the married group in both sexes. Published studies gave different percentages of married individuals presented with FND. For example, (19) showed that 32% of affected female patients were married and (12) showed that 78% were married, suggesting that increased responsibility toward family and children with limitations of financial resources.

Regarding education, the majority of cases had just reached to secondary school, this was greatly consistent with the emphasized finding of the lower educational level that is associated with FND in literature and other studies (18,20).

Regarding employment, our study revealed that (70%) were unemployed and (30%) were employed. In a study conducted by (18) they found that 7.9% were employed and 92.05 % were unemployed (18).

In terms of residency, we found that (60%) belonged to urban community, and (40%) to rural community. A previous study (21) found that (81.8%) belonged to urban community, while the remaining (8.7%) lived in the rural community.

The high occurrence of FND in urban areas may be explained by more stressful life events and more responsibilities related to harsh living conditions.

Regarding accommodation and family structure we found that most patients lived in a rented house and came from extended families where there was high tension, inter-related problems and life events in such crowded families.

**Presenting Symptoms and symptom groups:** It is likely that in eastern culture, physical symptoms are more acceptable and patients presenting their distress in the form of FND are more likely to get medical attention. This cultural approval of symptoms is an important factor that determines mode of reactions towards stress (22).

Individual symptoms were motor symptoms (56%) (pseudo seizure (19%), muscle weakness or paralysis (17%), speech problem (10%) and abnormal body movement (10%)), visceral symptoms (22%), syncopal attack (12%), swallowing problems (10%), mixed symptoms (12%) and sensory loss in the form of visual disturbance (10%). This was nearly similar to a study by (17) who found that the most common presentation was with motor type of symptoms (54.1%) followed by visceral (32.3%) and mixed (11.3%), while only (2%) had sensory symptoms. A majority of patients presented with motor symptoms in the form of pseudo seizures followed by paralysis or muscle weakness and aphonias by a study conducted by (23). Other studies conducted by (24) found that classic symptoms such as pseudo seizures, paresis, limb paralysis and aphonias or dysphonia were the commonest presentations. Another study conducted by (12) revealed that motor symptoms were the most common clinical presentations. In another study by (25) found that the most common presentations were pseudo seizures followed by motor symptoms. Moreover, it was suggested that asymbolic representation of emotions when the patient is unable to express in words (26).

Regarding presenting symptoms in both sexes the most common presenting mono symptom in males was motor symptom in the form of weakness and paralysis, they involved being unable to move a limb or a leg. This weakness usually involves whole movements rather than muscle groups (i.e. weakness affects the extremities more often than ocular, facial or cervical movements), but in females it was syncopal attack which was also the most common symptom in females in this study. We observed that their vital signs were normal, no pallor in contrary to vasovagal syncope (in which there is loss of consciousness, pallor and change in the vital signs which was the finding reported by Don Eastmead and edited by (27).

**Significant Stressors:** We observed that approximately most of the cases had obvious stressors. Obtaining the stressor also depends on the presenting problems and chronicity of the condition. This might lead to adaptation to the stressor by developing coping mechanisms (29).
The bodily symptoms of FND may be an adaptive way of expressing the difficulties faced by the person in a stressful situation that is accepted by society. This can be one of the reasons that the manifestation of symptoms in FND differs significantly from west to east worldwide.

In this study, we grouped stressors into seven major groups according to stressful events of the patients. Social problems, financial problem, death of relative, legal problems, school problem, physical illness related to them or their family and undetermined. In comparison with other studies especially those conducted in developing countries e. g in the study by the majority of the patients had in-law’s problems and had love problems, others reported family relationship problems, study-related stress, etc. Also, in the study by social problems were the most common preceding stressors followed by school-related problems, while exam/school-related factors were the major precipitating factors in younger ages. In the study by they found that interpersonal difficulties with family and academic problems were the most importantly identified precipitants.

Conclusion

Functional neurological disorder is more common in females, low socioeconomic background and low literacy level and when there are significant stressors. Most common presentations were motor symptoms.

Ethical Clearance: The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding.

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Immunogenetic Study of *Pediculus humanus capitis* Associated with *Typhus* Fever in Iraqi Patients

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¹Department of Medical Laboratory Techniques, College of Health and Medical Technology; ²Department of Medical Laboratory Techniques, Medical Technical Institute, Medical Technical University, Baghdad, Iraq

**ABSTRACT**

**Background:** *Pediculus humanus capitis* is one of the ectoparasites which lead to transition of Typhus fever. Rickettsial infections which affect the vasculature cause nonspecific signs and symptoms making it difficult to diagnose the disease clinically. This study was performed to investigate the genetic sequence of these external parasites and the possibility of their development that may make them more dangerous to transfer many pathogens to the human body.

**Method:** In this study, 200 patients of school students (65 males and 135 females) with their ages ≥18 years were enrolled. In addition, 8(4%) of them were infected with rickettsiosis. All the patients were tested for detection of IGM and IgG anti- Rickettsia antibodies by ELISA and IFA techniques.

**Results:** The serum titers for Anti- Rickettsia Antibodies (IgG) were 1/128, 1/256 and 1/512 among 8 of them as 2(25%), 4(50%) and 2(25%), respectively. The COI gene was detected with 552bp. The primers used F- AGCTCATTTGTTCAAGGCGG and R TACCAACACCCTCCAGCAAA with sequence size 827.

**Conclusion:** There was a 100 percent similarity between USA strains and Iraqi strains of the Bene Bank, indicating that the lice have not been developed.

**Keywords:** *Pediculus humanus capitis*, Typhus fever, Gene sequence, Antibody titer, ectoparasite.

**Introduction**

Lice are ectoparasites that play the role of a vector that is able to transmit Typhus through their bite [1]. Lice are traditionally assigned into two orders; Anoplura (sucking lice) and Mallophaga (chewing lice) [2,3]. *Pediculus humanus capitis* which is known as head louse is an obligatory hematophagous ectoparasite of human belonging to the Anopluraorder, P. ediculidae family. Its life cycle includes eggs that hatch in 5-10 days. Mediterranean spotted fever (MSF) is caused by *R. conorii* and it is endemic rickettsiosis of southern and eastern Europe as well as parts of Africa and Asia [4]. It is mainly transmitted by the tick *Rhipicephalus sanguineus*. Most clinical cases are therefore noted in rural areas. Our ecological and epidemiological comprehension of MSF has experienced important advances in the last 10 years as the disease has emerged and reemerged in different countries [4,5]. A Thai strain (TT-118) is most closely associated with a rickettsia identified in Amblyomma cajennense tick in southern Texas [6]. Rickettsial infections which affect the vasculature cause nonspecific signs and symptoms making it difficult to diagnose the disease clinically [6]. Development of effective diagnostic methods for targeted early anti-rickettsial treatment was hindered by the spread of *Rickettsia* and *Orientia* dynamics with their early limited bacteremia stage and resulting antibody emergence [7]. This study was performed to investigate the genetic sequence of these external parasites and the possibility of their development that may make them more dangerous to transfer many pathogens to the human body.
Materials and Method

A total of 200 patients aged ≥18 years with recent tick bites were asked through local public media to bring the tick, after detachment, to their primary health care centre (PHC). In this study, 200 participants were included from 1st, September 2018 to 1st, April 2019. A recombinant 56KDa type-specific typhus antigen was used in the wells for IgM and IgG detection by ELISA. According to the instructions of the manufacturer, typhus Detect IgM ELISA kit from InBios International Company (Seattle, WA, USA) was used to test patients’ sera at 1:100 dilutions. The absorbance was read at 450nm and the results were recorded as positive or negative. The OD cut-off value was fixed at 1.0 following the recommendations of determining the endemic cut-off titer in the kit protocol.

Statistical Analysis: The statistical analysis of the results was performed using an t-test and chi-squared test.

Results

Table 1 showed the serological assay of IFA and anti-IgM-IgG antibodies sensitivity and specificity of Rickettsiosis. In addition, serum titers for Anti-Rickettsia Antibodies (IgG) were shown in Table (2).

Table 1: Serological assay of IFA and Anti-IgM-IgG antibodies sensitivity and specificity of Rickettsiosis

<table>
<thead>
<tr>
<th>Infection</th>
<th>Serological assay</th>
<th>Sensitivity (%)</th>
<th>Specificity (%)</th>
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</thead>
<tbody>
<tr>
<td>Rickettsiosis</td>
<td>IFA IgG</td>
<td>85-100</td>
<td>99-100</td>
</tr>
<tr>
<td></td>
<td>IFA IgM</td>
<td>83-85</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>ELISA IgG</td>
<td>83</td>
<td>87</td>
</tr>
<tr>
<td></td>
<td>ELISA IgM</td>
<td>98</td>
<td>96</td>
</tr>
</tbody>
</table>

Table 2: Serum titers for Anti-Rickettsia antibodies (IgG)

<table>
<thead>
<tr>
<th>Groups</th>
<th>Titer 1/64</th>
<th>Titer 1/128</th>
<th>Titer 1/256</th>
<th>Titer 1/512</th>
<th>Titer 1/1024</th>
<th>Titer 1/2048</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients No.(%)</td>
<td>—</td>
<td>2(25%)</td>
<td>4(50%)</td>
<td>2(25%)</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

Figure 1: Detection of (COI) gene DNA. Lane 1: marker corresponds to 100bp ladder (fermintus), lanes: 2, 3, 4, 5 and 6 the COI gene bands with 552bp

Figure 2: Phylogram map of 4 Pediculus humanus capitis strains determined by analysis of the entire sequences of the COI genomic region compared to USA isolation
Table 3: Primer sequences used

<table>
<thead>
<tr>
<th>Name of Gene</th>
<th>Primer sequence 5'-3'</th>
<th>Amplicon size</th>
<th>Tm</th>
</tr>
</thead>
<tbody>
<tr>
<td>COI</td>
<td>F- ATTTGTTCAAGGCGGTGTTG GAGATTGGGAATGTAGATGTTCCTTCAATATTAGG GAGGATTTGGAAATGTAGATGTTCCTTCAATATTAGGGTCTCCAGAT</td>
<td>510</td>
<td>59°C</td>
</tr>
</tbody>
</table>

1. *Pediculus humanus capitis* Iraq
   Reference: GGAGGATTTGGAAATGTAGATGTTCCTTCAATATTAGG GAGGATTTGGAAATGTAGATGTTCCTTCAATATTAGGGTCTCCAGAT

2. *Pediculus humanus capitis* iraq
   Reference: CCTTCAATATTAGGGTCTCCAGATATAGCGTTTCCTCGTATAAATAA

3. *Pediculus humanus capitis* iraq
   Reference: CCTTCAATATTAGGGTCTCCAGATATAGCGTTTCCTCGTATAAATAAATATAAGCTATTGA

4. *Pediculus humanus capitis* iraq
   Reference: TTCCTTCAATATTAGGGTCTCCAGATATAGCGTTTCCTCGTATAAATAAT

Discussion

Lice are external parasites that transport typhus fever to human body. This parasite spreads heavily in rural areas which lack health care as well as densely populated areas with low-income [2]. Samples were taken from school students and 8 of them had typhus fever. In this study, ELISA technique was conducted to determine the IgM and IgG anti-Rickettsial antibodies to identify the chronic and acute infections of the disease [8]. The IFA method was also used, but the titration of IgG was very dull. This study was performed to investigate the genetic sequence of these external parasites and the possibility of their development that may make them more dangerous to transfer many pathogens to the human body [9]. By primers LEFT PRIM AGCTCATTTGTTCAAGGCGG and RIGHT PRIMER TACCAACACACCCCTCCA GCAAA, the mitochondrial gene was identified for the COI gene. The gene in mitochondria of this parasite may be responsible for vital activities of *Pediculus humanus capitis* (COI) Cytochrome Oxidase subunit gene [10]. The Phylogram map of *Pediculus humanus capitis* showed that the Iraqi strains and the USA strains were identical. According to the genetic analysis carried out for the genetic tree, it was confirmed that there was no genetic mutation occurred [11]. However, the pathways that may occur on local strains from these external parasites should be monitored. *Rickettsia* is one of the pathogenic bacteria that cause human’s typhoid fever. The cause of their transmission from infected to healthy people via absorbing blood n by lice and transmitting the disease to other patients [12]. As demonstrated by this study, after genetic analysis of the lice themselves, which are harmful to humans, it was found that there was no genetic transformation occurred to this parasite to be more dangerous to transport other species of bacteria, viruses or even malaria [13].

Conclusion

There was a 100 percent similarity between USA strains and Iraqi strains of the Bene Bank, indicating that the lice have not been developed.

Ethical Clearance: The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding.

REFERENCES


Impact of Dental Caries on Quality of Life of Primary School Children aged 8-10 Years in Al-Najaf City, Iraq

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ABSTRACT

Background: Dental caries is the most common oral diseases affecting human beings throughout the world particularly in childhood. It has been recognized that children’s quality of life is related to their oral health status. The aim of current study was to investigate the impact of dental caries on quality of life of primary school children. Methods: The total sample composed of 1200 children aged (8-10) years selected randomly from different primary schools in Al-Najaf governorate. WHO 2013 index was used for assessment of dental caries experience and OHRQoL questionnaire was distributed among children.

Results: Data from current study showed that the prevalence of dental caries was 98.00% for total sample, no significant differences were seen between OHRQoL questionnaires and dental caries experience DMFT of permanent teeth except questions concerning Children’s school were significant, while a significant relation was seen in primary teeth.

Conclusion: Primary schools children in Al-Najaf were found to have a high prevalence of dental caries and this disease was found to have an effect on quality of children’s life. Hence, this survey highlighted the need of children for dental health education programs and public as well as school preventive measures among those children.

Keywords: Quality of life, Dental caries, School children, DMFT, OHRQoL.

Introduction

Dental caries most commonly affects children, the impact of oral conditions on children’s life includes difficulty with chewing, oral pain, missed school days due to their cumulative dental caries experience and changes in emotion e.g. being upset and worrying about being different as well as anxiety or distress about their mouth (1).

It is essential to evaluate the impact of dental caries on quality of life on those children, taking their own perceptions into account. Given that, at the age of eight years, children consider health to be set of emotional and somatic symptoms, they have the ability to report all health aspects using same criteria as attractive as using with adults (2). Iraq is one of the developing countries that exhibited an increase of dental caries prevalence and severity. Some previous studies found that dental caries prevalence is low, while other studies reported high prevalence (3,4). Some studies showed that dental caries had negative impact on quality of life for children and for their families including nutrition aspects, educational alterations and behavioral oral symptoms (5).

As a consequence, assessment of oral diseases impact on daily life of children is very important because oral diseases not only limit their current functioning and psychosocial well-being but may also compromise their future achievements and development as well as difficulty in chewing process, resulting from dental caries severity in children (6).

Oral health-related quality of life (OHRQoL) indicated the impact of oral health on individual’s daily functioning, wellbeing and quality of life (QoL). During

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childhood oral diseases can have a negative impact on the child’s life (7).

Therefore, this study was conducted on group of primary school children 8-10 years old living in Al-Najaf governorate to find out the impact of dental caries on the quality of their life.

**Method**

A sample of 1200 primary school children (600 boys and 600 girls) 8-10 years old were selected randomly from urban areas in Al-Najaf city, from different schools distributed in the city. The study received approval from the Research Ethics Committee of the College of Dentistry/University of Baghdad, Iraq.

Oral health related-quality of life was recorded by 20 questions (OHRQoL questionnaire) (8) which are sub-grouped into four domains: the first part included questions about the mouth and teeth (Q1. Pain in the teeth or mouth in the past 4 weeks? Q2. Sore spots in the mouth in the past 4 weeks? Q3. Pain in the teeth when drinking cold drinks or eating foods in the past 4 weeks? Q4. Bad breath in the past 4 weeks? Q5. Needed longer time than others to eat the meal because of the teeth or mouth? Q6. Had a hard time biting or chewing food like apples, corn on the cob or steak because of the teeth or mouth? Q7. Had a problem sleeping at night because of the teeth or mouth? The second part included questions about the feelings (Q8. Been upset because of the teeth or mouth? Q9. Felt frustrated because of the teeth or mouth? Q10. Been shy because of the teeth or mouth? Q11. Been concerned what other people think about the teeth or mouth? Q12. Worried that is not as good-looking as others because of the teeth or mouth? The third part included questions about school (Q13. Missed school because of the teeth or mouth? Q14. Had a hard time paying attention in school because of the teeth or mouth? Q15. Not wanted to speak or read out loud in class because of the teeth or mouth? The fourth part included questions about child being with other people (Q16. Tried not to smile or laugh when with other children because of the teeth or mouth? Q17. Not wanted to talk to other children because of the teeth or mouth? Q18. Not wanted to be with other children because of the teeth or mouth? Q19. Stayed away from playing with children because of the teeth or mouth? Q20. Other children teased or called names because of the teeth or mouth?

Intra oral examination of dental caries status was recorded according to WHO 2013 (9) using CPI probe. Dental caries was measured by DMFT/S for deciduous teeth and DMFT/S for permanent teeth.

The statistical data analysis was approached by using statistical package (SPSS) version 23.0 in order to analyze and assess the results of this study through application of descriptive data analysis (frequencies and percentages). Inferential data analysis were used to test hypotheses by accept or reject it, which included Spearman Rank Correlation test, analysis of variance and significance at $P \geq 0.05$.

**Results**

Results showed that the prevalence of dental caries was 98.00% for the total sample. The (mean ± SE) dmft for deciduous teeth was equal to (5.479 ± 0.084) and for dmfs, it was (12.954 ± 0.273), while concerning permanent teeth, the (mean ± SE) DMFT was (1.86 ± 0.047) and for DMFS, it was (2.16 ± 0.063).

Significance of the relation between dmfs and educational levels of father and mother revealed $P$ values of 0.423 and 0.407, respectively. In addition, the relation of DMFS with the educational levels of father and mother revealed $P$ values of 0.076 and 0.837, respectively.

Significant differences were seen between OHRQoL questionnaire and dental caries experience dmfs of primary teeth. Some pain questions were highly significant, the question about sore spots in the mouth (the dmfs $P$ value was 0.004) and the question about child had a hard time chewing food (the dmfs $P$ value was 0.009). Also, the question about child had trouble eating foods (the dmfs $P$ value was 0.007).

No significant differences were seen between OHRQoL questionnaire and dental caries experience. DMFS of permanent teeth except the question about finding the child in the school (Not wanted to speak or read out loud in class because of your teeth or mouth) had significant difference (DMFS $P$ value was 0.168; Tables 1, 2, 3 and 4).
Table 1: Caries experience (Mean ± SE) of primary and permanent teeth dmfs and DMFS in relation to OHRQoL (Pain) questionnaire

<table>
<thead>
<tr>
<th>Pain Questions</th>
<th>Dental caries</th>
<th>Doesn’t know</th>
<th>Yes</th>
<th>No</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SE</td>
<td>Mean</td>
<td>SE</td>
<td>Mean</td>
<td>SE</td>
</tr>
<tr>
<td>Pain in teeth</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>dmfs</td>
<td>11.90</td>
<td>1.04</td>
<td>14.39</td>
<td>0.36</td>
<td>10.98</td>
<td>0.43</td>
</tr>
<tr>
<td>DMFS</td>
<td>2.16</td>
<td>0.23</td>
<td>2.25</td>
<td>0.09</td>
<td>2.04</td>
<td>0.10</td>
</tr>
<tr>
<td>Sore spots in mouth</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>dmfs</td>
<td>11.76</td>
<td>0.89</td>
<td>15.02</td>
<td>0.47</td>
<td>11.71</td>
<td>0.35</td>
</tr>
<tr>
<td>DMFS</td>
<td>1.88</td>
<td>0.20</td>
<td>2.32</td>
<td>0.11</td>
<td>2.10</td>
<td>0.08</td>
</tr>
<tr>
<td>Pain during drinking or eating</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>dmfs</td>
<td>12.83</td>
<td>1.56</td>
<td>14.34</td>
<td>0.37</td>
<td>11.11</td>
<td>0.40</td>
</tr>
<tr>
<td>DMFS</td>
<td>1.54</td>
<td>0.25</td>
<td>2.25</td>
<td>0.08</td>
<td>2.10</td>
<td>0.10</td>
</tr>
<tr>
<td>Bad breath</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>dmfs</td>
<td>13.42</td>
<td>1.03</td>
<td>14.03</td>
<td>0.41</td>
<td>11.78</td>
<td>0.38</td>
</tr>
<tr>
<td>DMFS</td>
<td>1.96</td>
<td>0.21</td>
<td>2.18</td>
<td>0.09</td>
<td>2.17</td>
<td>0.09</td>
</tr>
<tr>
<td>Had a hard time chewing food</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>dmfs</td>
<td>12.89</td>
<td>1.12</td>
<td>15.08</td>
<td>0.43</td>
<td>11.12</td>
<td>0.35</td>
</tr>
<tr>
<td>DMFS</td>
<td>1.68</td>
<td>0.28</td>
<td>2.21</td>
<td>0.10</td>
<td>2.17</td>
<td>0.09</td>
</tr>
<tr>
<td>Had trouble eating foods</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>dmfs</td>
<td>12.47</td>
<td>0.99</td>
<td>15.15</td>
<td>0.46</td>
<td>11.44</td>
<td>0.34</td>
</tr>
<tr>
<td>DMFS</td>
<td>2.19</td>
<td>0.24</td>
<td>2.19</td>
<td>0.10</td>
<td>2.14</td>
<td>0.08</td>
</tr>
<tr>
<td>Problem during sleeping at night</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>dmfs</td>
<td>12.84</td>
<td>1.49</td>
<td>14.86</td>
<td>0.49</td>
<td>12.06</td>
<td>0.33</td>
</tr>
<tr>
<td>DMFS</td>
<td>2.20</td>
<td>0.32</td>
<td>2.43</td>
<td>0.12</td>
<td>2.04</td>
<td>0.08</td>
</tr>
</tbody>
</table>

Not significant at P≥0.05. *: Significant at P<0.05.

Table 2: Caries experience (Mean ± SE) of primary and permanent teeth dmfs and DMFS in relation to OHRQoL (Feelings) questionnaire

<table>
<thead>
<tr>
<th>Feelings Questions</th>
<th>Dental caries</th>
<th>Doesn’t know</th>
<th>Yes</th>
<th>No</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SE</td>
<td>Mean</td>
<td>SE</td>
<td>Mean</td>
<td>SE</td>
</tr>
<tr>
<td>Been upset</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>dmfs</td>
<td>12.15</td>
<td>1.03</td>
<td>15.13</td>
<td>0.50</td>
<td>11.91</td>
<td>0.33</td>
</tr>
<tr>
<td>DMFS</td>
<td>2.15</td>
<td>0.272</td>
<td>2.27</td>
<td>0.114</td>
<td>2.11</td>
<td>0.080</td>
</tr>
<tr>
<td>Felt frustrated</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>dmfs</td>
<td>14.34</td>
<td>1.30</td>
<td>15.07</td>
<td>0.55</td>
<td>12.04</td>
<td>0.32</td>
</tr>
<tr>
<td>DMFS</td>
<td>2.21</td>
<td>0.260</td>
<td>2.36</td>
<td>0.125</td>
<td>2.08</td>
<td>0.077</td>
</tr>
<tr>
<td>Been shy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>dmfs</td>
<td>14.20</td>
<td>1.56</td>
<td>15.47</td>
<td>0.58</td>
<td>12.00</td>
<td>0.31</td>
</tr>
<tr>
<td>DMFS</td>
<td>2.58</td>
<td>0.367</td>
<td>2.30</td>
<td>0.120</td>
<td>2.09</td>
<td>0.076</td>
</tr>
<tr>
<td>Been concerned what other people think about the teeth</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>dmfs</td>
<td>13.05</td>
<td>1.10</td>
<td>15.79</td>
<td>0.63</td>
<td>12.09</td>
<td>0.31</td>
</tr>
<tr>
<td>DMFS</td>
<td>2.14</td>
<td>0.211</td>
<td>2.35</td>
<td>0.134</td>
<td>2.11</td>
<td>0.076</td>
</tr>
<tr>
<td>Worried about appearance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>dmfs</td>
<td>13.16</td>
<td>1.34</td>
<td>15.84</td>
<td>0.69</td>
<td>12.17</td>
<td>0.30</td>
</tr>
<tr>
<td>DMFS</td>
<td>2.08</td>
<td>0.328</td>
<td>2.38</td>
<td>0.138</td>
<td>2.11</td>
<td>0.073</td>
</tr>
</tbody>
</table>

Not significant at P≥0.05. *: Significant at P<0.05.

Table 3: Caries experience (Mean ± SE) of primary and permanent teeth dmfs and DMFS in relation to OHRQoL (About child school) questionnaire

<table>
<thead>
<tr>
<th>Questions about school</th>
<th>Dental caries</th>
<th>Doesn’t know</th>
<th>Yes</th>
<th>No</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SE</td>
<td>Mean</td>
<td>SE</td>
<td>Mean</td>
<td>SE</td>
</tr>
<tr>
<td>Missed the school</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>dmfs</td>
<td>11.88</td>
<td>1.61</td>
<td>16.04</td>
<td>0.69</td>
<td>12.29</td>
<td>0.30</td>
</tr>
<tr>
<td>DMFS</td>
<td>2.54</td>
<td>0.441</td>
<td>2.40</td>
<td>0.148</td>
<td>2.10</td>
<td>0.071</td>
</tr>
<tr>
<td>Had a hard time paying attention</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>dmfs</td>
<td>12.46</td>
<td>1.55</td>
<td>16.13</td>
<td>0.75</td>
<td>12.40</td>
<td>0.29</td>
</tr>
<tr>
<td>DMFS</td>
<td>2.23</td>
<td>0.321</td>
<td>2.61</td>
<td>0.162</td>
<td>2.08</td>
<td>0.070</td>
</tr>
<tr>
<td>Not speak out loud in class</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>dmfs</td>
<td>12.89</td>
<td>1.34</td>
<td>15.90</td>
<td>0.73</td>
<td>12.40</td>
<td>0.30</td>
</tr>
<tr>
<td>DMFS</td>
<td>2.04</td>
<td>0.312</td>
<td>2.44</td>
<td>0.152</td>
<td>2.12</td>
<td>0.071</td>
</tr>
</tbody>
</table>

Not significant at P≥0.05. *: Significant at P<0.05.
Table 4: Caries experience (Mean ± SE) of primary and permanent teeth dmfs and DMFS in relation to OHRQoL (About child being with other people) questionnaire

<table>
<thead>
<tr>
<th>Questions about being with other people</th>
<th>Dental caries</th>
<th>Doesn’t know</th>
<th>Yes</th>
<th>No</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avoid smiling</td>
<td>dmfs</td>
<td>12.408</td>
<td>1.393</td>
<td>16.142</td>
<td>0.742</td>
<td>12.296</td>
</tr>
<tr>
<td></td>
<td>DMFS</td>
<td>1.959</td>
<td>0.359</td>
<td>2.397</td>
<td>0.151</td>
<td>2.124</td>
</tr>
<tr>
<td>Not talk to other children</td>
<td>dmfs</td>
<td>14.462</td>
<td>1.376</td>
<td>16.074</td>
<td>0.812</td>
<td>12.358</td>
</tr>
<tr>
<td></td>
<td>DMFS</td>
<td>2.308</td>
<td>0.315</td>
<td>2.344</td>
<td>0.169</td>
<td>2.126</td>
</tr>
<tr>
<td>Not be with other children</td>
<td>dmfs</td>
<td>14.183</td>
<td>1.218</td>
<td>16.467</td>
<td>0.844</td>
<td>12.347</td>
</tr>
<tr>
<td></td>
<td>DMFS</td>
<td>2.367</td>
<td>0.303</td>
<td>2.367</td>
<td>0.176</td>
<td>2.120</td>
</tr>
<tr>
<td>Not playing with children</td>
<td>dmfs</td>
<td>11.818</td>
<td>1.166</td>
<td>17.180</td>
<td>0.844</td>
<td>12.460</td>
</tr>
<tr>
<td></td>
<td>DMFS</td>
<td>1.855</td>
<td>0.285</td>
<td>2.511</td>
<td>0.188</td>
<td>2.134</td>
</tr>
<tr>
<td>Other children teased you</td>
<td>dmfs</td>
<td>12.902</td>
<td>1.486</td>
<td>16.257</td>
<td>0.774</td>
<td>12.369</td>
</tr>
<tr>
<td></td>
<td>DMFS</td>
<td>2.122</td>
<td>0.355</td>
<td>2.503</td>
<td>0.171</td>
<td>2.105</td>
</tr>
</tbody>
</table>

Not significant at P≥0.05. *: Significant at P<0.05.

Discussion

In this study, the prevalence of dental caries was found to be (98%) for primary school (8-10) years old children. This percentage was more than that reported in a study done in Brazil (10) and more than some Iraqi studies (3,11,12,13). The high prevalence of caries recorded in this study may partly be attributed to lower fluoride level in drinking water in Iraq that was ranging between 0.12-0.22 (14) and may also be related to other factors related to socioeconomic condition and living style of families (15). For the diagnosis and recording of caries-experience, DMFS/dmfs indices were used in present study. These indices allow measurement of past caries-experience, indicated by missing and filled fraction, and present caries, by the decayed fraction. In addition, DMFS and dmfs indices allow measurement of dental caries by severity. The (mean ± SE) DMFS value was (2.16 ± 0.063) and that for dmfs was (12.954 ± 0.273) compared with other Iraqi studies (17,18).

This study also showed that the mean of DS fraction (2.11) was higher than MS and FS components of DMFS index and the mean of ds fraction (8.752) was higher than ms and fs components of dmfs index, which was an indication of a poor dental treatment. MS fraction (0.02) was higher than FS fraction (0.04) and ms fraction (4.2%) was higher than fs fraction (0.7%), which indicated that even if treatment is present, it is directed toward extraction rather than restoration. This result was in agreement with other studies (11,16,12). No statistically significant differences were found between genders regarding impact on OHRQoL, unlike other studies on children from different age groups. There may be several reasons for that, including the fact that most children in this study were in the mixed dentition phase. The recently erupted anterior permanent teeth did not have enough time to exhibit signs of the disease and the anterior primary teeth most affected by early childhood caries and more related to facial appearance had already exfoliated. Perhaps, the results could be different if esthetic had been affected by dental caries in the anterior region of the mouth, as shown by other studies with older children (19,20).

In this study, the OHRQoL has no significant difference with caries experience of permanent teeth except the question about finding the child in the school (Not wanted to speak or read out loud in class because of your teeth or mouth) had significant difference. Also, the study showed that there was significant difference in the relation of OHRQoL questionnaire to dental caries experience of primary teeth.

Conclusion

This study highlighted the need of children for preventive measures and dental health education as well as improvement of dental knowledge and attitude towards good oral hygiene.
Acknowledgment

The authors would like to thank all participants in the study and Dr. M. Galib for helping in data analysis and statistical work.

Ethical Clearance: The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding.

REFERENCES


Purification of Protease from *Aspergillus fumigatus*

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¹College of Medicine, ²College of Dentistry, Tikrit University, Iraq

**ABSTRACT**

**Background:** Protease enzymes are considered one of the virulence factors for many types of microorganisms, including *Aspergillus spp*. The aim of current study was to evaluate proteases enzymes in clinical isolates of *Aspergillus fumigatus*.

**Method:** Isolates of *Aspergillus fumigatus* were inoculated at bromocresol purple agar and then colonies that gave clear zones were further evaluated for protease enzyme production. Then purification of protease was done by using more than one step via different purification techniques.

**Results:** We found that 39 isolates out of 41 isolates of *Aspergillus fumigatus* were able to produce protease enzyme, while 2(4.9%) isolates were unable to produce protease.

**Conclusion:** *Aspergillus fumigatus* species that were isolated from human are more efficient in protease production than *Aspergillus* that are isolated from other source.

**Keywords:** *Aspergillus fumigatus*, protease enzyme, bromocresol purple agar chromatography.

**Introduction**

*Aspergillus. fumigatus* secretes a variety of enzymes, such as proteases, that help invasion of host tissue. Proteases assist establishment inside the host by degrading protein barriers at the lung epithelium (¹). Protease has been identified as a potential virulence factor since strains producing more protease are more virulent (²). An additional large group of putative virulence factors are enzymes.

Proteases are able to hydrolyze ester bonds present in phospholipids, which are the major component of host cell membranes. Moreover, secretion of proteases was elevated in clinical isolates of *A. fumigatus* (³). *Aspergillus fumigatus* isolates need to obtain nutrients by degradation of collagen and elastin, which constitute the main compounds of the lung (⁴). The major protease under neutral conditions is the rine alkaline protease ALP with the ability to proteolyses elastin. Nevertheless, strains without ALP cause the same mortality rate in a mouse model compared to those with ALP. Other enzymes without proteolytic activity are also important for *A. fumigatus* in causing disease (⁵-⁸), catalases and peroxidases are needed by the organism to counter attack reactive oxidative species like H₂O₂. Deletion of four enzymes involved in peroxide breakdown leads to strains that are more sensitive to this reactive oxidative molecule but not to phagocytosis (¹⁰). In general, it has to be stated that pathogenicity of *A. fumigatus* appears to be multifactorial and cannot be assigned to one single trait (¹¹). The aim of current study was to evaluate proteases enzymes in clinical isolates of *Aspergillus fumigatus*.

**Materials and Method**

Screening the ability of *A. fumigatus* for protease production: One drop of spore suspension of *A. fumigatus* isolates was inoculated on bromocresol purple agar. The plates were incubated at 25°C for 4 days (triplicate of each isolate). Colonies that displayed clear zone around growth were selected for further experiments and transferred to fresh plates. The ability of protease production was calculated according to (¹¹).

**Secondary screening for protease production:** Secondary screening was carried out for the five isolates which gave high diameter zone on protease production

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medium. So that, $5 \times 10^6$ inoculums were transferred to 25mL of sterile casein production medium and incubated at 30°C under shaking conditions for three days. Cells were harvested by filtering the broth with cellulose filter; subsequently, 1ml of this culture was transferred to 100ml of casein broth and incubated under the same conditions for 12 hours. The culture was centrifuged at 12000rpm for 25min at 4°C and the supernatant was collected in fresh flask (12). The filtrate was used as the crude enzyme and protease activity was determined according to the method described by (13).

Protease activity of filtrate was determined by adding 0.1ml of crude enzyme to 3ml of casein prepared and incubated at 37°C for 20 minutes. After incubation, 2ml of 1.5M trichloroacetic acid was added to the reaction mixture to stop the reaction, then the mixture was centrifuged at 4000rpm for 15-20 minutes, the enzyme activity was measured in the supernatant. One protease unit (IU) is defined as the enzyme amount that causes 0.01 per minute increase of absorbance at 280nm under experimental conditions.

**Determination of protein concentration:** The protein concentration in the standard filtrate was assayed after following the same steps of the known protein concentration and depending on the standard curve of bovine serum albuminas as follows:

Stock solution of bovine serum albumin was used to prepare gradual concentrations of bovine serum albumin (0, 20, 40, 60, 80, 100mg/ml). Specific activity of crude protease was calculated according to the equation mentioned by (12).

A volume of 10µl from each concentration of BSA was added to sterile test tubes, then 250µl of 1N NaOH and 5ml of coomassie blue G-250 were added to each tube and mixed gently, and then it was left to stand at room temperature for 5 minutes followed by reading absorbance at 595nm.

Standard curve of bovine serum albumin was drawn by plotting the relationship between bovine serum albumin concentrations and absorbance at 595nm (14) as shown in Figure (1).

![Figure 1: Standard curve of bovine serum albumin for determination of protein concentration](image)

**Purification of Protease:** Protease produced by the selected *A. fumigatus* isolate, that gave high enzymatic activity, was purified by more than one step using different purification techniques as mentioned below:

**Ion exchange chromatography DEAE-Cellulose Preparation:** DEAE-Cellulose column (2×23cm) was prepared according to (15) by dissolving 20 grams from DEAE-Cellulose resin in 1 liter of distilled water. Then, beads were left to settle down washed several times with distilled water until clear appearance. The suspension was filtered through Whitman No.1 Buchner funnel. The resin was then re-suspended in 0.25M sodium, filtered again and washed several times with 0.25M hydrochloric acid solution by distilled water before it was equilibrated with potassium phosphate buffer (, pH=8, 0.05M).

**Dialysis of enzyme:** Crude enzymes were dialyzed against potassium phosphate buffer (pH=7, 0.05M) using dialysis tube for 24 hours with three increments of substitutions. Enzyme activity and protein concentration were determined.
Sample loading: After column equilibration, concentrated enzyme was transferred and poured gently onto surface of the column, then washed by potassium phosphate buffer to displace unbinding proteins (wash). Fractions were eluted at a flow rate of 3ml/fraction and the optical density for each fraction was measured at 280nm. Enzyme activity for each fraction was determined according to \[^{16}\]. Other proteins bound to the column were eluted by gradient concentrations of NaCl (0.1-0.5M) dissolved in 0.05M potassium phosphate buffer solution (pH= 8.0). The relationships between eluted fractions, optical density at 280nm and protease activity were blotted. The fractions with high protease activity were pooled together and kept frozen for the last step of purification by gel filtration chromatography.

Gel filtration chromatography

Preparation of Sepharose 4-B column: Sepharose 4-B column was prepared according to instruction of the Pharmacia Fine Chemical Company. Five grams of the gel (Sepharose 4-B) were suspended in 1 liter of 0.1M potassium phosphate buffer, then suspension was left in a water bath at 90°C for 5 hours to ensure the swelling of gel beads with gentle agitation from time to time. Then, the gel was degassed, packaged gently in a glass column (1.6x43cm). The column was equilibrated using the same buffer at a flow rate of 20ml/hour for 24hrs.

Sample loading: After column preparation, 5ml of the enzyme solution obtained from the elution fractions of ion exchange chromatograph was added gently to column surface and eluted using 0.1M potassium phosphate buffer (pH= 8.0) with flow rate of 20ml/hour (5ml for each fraction). Optical density (at 280nm), and enzyme activity (U/ml) were determined in each fraction. Fractions represented protease activity were pooled and kept at 4°C for further experiments.

Screening for *A. fumigatus* hemolysin producers: One drop of spore suspension (5*10^6) *A.fumigatus* of each isolate was inoculated on sheep blood agar (SBA). The plates were incubated at 37°C for 7 days (triplicate of each isolate). The evidence of hemolysis in the medium indicated by the presence of clear hemolysis in the medium and considered as a positive result. Mean of hemolytic diameter were calculated in each plate \[^{16}\].

Results and Discussion

Screening of *A. fumigatus* isolates for protease production: In order to select the efficient isolate for protease production, screening of *A. fumigatus* isolates had been achieved on bromocresol purple medium contained casein as sole source of nitrogen.

Thirty nine isolates (95.1%) out of 41 *A. fumigatus* isolates were able to produce protease on bromocresol purple medium (Figure 1), whereas 2(4.9%) isolates were unable to produce protease (Figure 2). All protease-producer isolates of *A. fumigatus* included in this study gave a clear zone but at different ratios.

The five selected isolates with high protease production were secondary screened for protease production using casein liquid medium.

![Figure 2: Protease production from *A. fumigatus* on bromocresol medium incubated at 25°C for 4 days. A: Protease-producing *A. fumigatus* produce protease and B: Non-protease-producing *A. fumigatus*](image)

Significant differences were shown \((P<0.001)\) between specific activities of the five protease-producing isolates. A previous study \[^{17}\] demonstrated that a strain of *A. fumigatus* isolated from a case of human Aspergillosis produced more protease activity than other strains from non-clinical sources.
Fungal isolates in present study were also capable of growing on bromocresol medium and produced visible clear zones around and beneath colonies. The ability of *A. fumigatus* isolates to produce protease may due to proteolytic activity of these isolates (18). Another study (18) suggested that casein is a useful substrate for the assay of crude protease. However, other studies have reported that there was variability in detecting the ability of clinical isolates to produce protease as a virulence factor.

**Protease purification using ion exchange chromatography:** Protease extracted from *A. fumigatus* was purified by ion Exchange chromatography using DEAE-Cellulose, an anionic exchanger. This matrix was used for purification because it has high capacity for bioseparation, easy to prepare, multiple uses in addition to simplicity to separate different biomolecules (19).

According to these findings, anionic exchanger DEAE-Cellulose was used for purification of protease from *A. fumigatus*. A portion of 3ml of partially purified protease concentrated with sucrose was applied onto surface of column gel matrix (DEAE-Cellulose). Then column was washed and equilibrated with equal volume of 0.05M potassium phosphate buffer solution (pH= 8.0) to wash unbound proteins (uncharged and positively charged proteins) in protease crude extract. The bound proteins (negatively charged) were then eluted using linear gradient concentrations of sodium chloride ranged between 0.1-0.5M. Results in Figure (3) showed that no protein peak appeared in the washing step, while there were four protein peaks appeared after elution with gradient concentrations of sodium chloride. All these protein peaks in washing step were detected by measuring the absorbance at 280nm for each eluted fraction.

![Figure 3: Ion exchange chromatography for purification of protease produced from *Aspergillus fumigatus* using DEAE-Cellulose column (2x23cm) with a flow rate of 20ml/hour](image)

Results also showed that the third peak eluted in fraction numbers 80 to 84 had protease activity that reached 558.0U/ml. Fractions represented protease were collected and pooled, then protein concentration, protease activity and specific activity were estimated. Results in Table (1) showed that the maximum protease activity and specific activity in the protease concentrate were 554.8U/ml and 154.1 U/mg, respectively, with 13.7% yield 2.03 fold. Partially purified protease obtained from ion exchange chromatography step was further purified by gel filtration chromatography technique. Due to the dependence of ion exchange chromatography basically on charge difference principle, the presence of enzyme in the elution step confirmed that protease, produced by *A. fumigatus*, was negatively charged.
Gel filtration chromatography: Gel filtration chromatography technique was the next step used in the purification of protease produced by *A. fumigatus*, after purification by ion exchange chromatography technique. A volume of 5ml of partially purified protease was applied on Sepharose 4-B column (1.6×43cm) which was previously equilibrated with 0.1M potassium phosphate buffer (pH= 8.0). Sepharose 4-B column has separation limits ranged between (5000-600000 Dalton) which allow ability of separation with high degree of purification (18). Furthermore, gel filtration is the simplest and mildest of all chromatography techniques and separates molecules on basis of differences in molecular size (19). Proteases were eluted thought the column matrix in a flow rate of 20ml/hour. Protein peaks were detected by measuring the optical density at 280nm using UV-VIS spectrophotometer. Results in Figure (4) showed that only one peak represented protease activity appeared after elution with potassium phosphate buffer. Fractions representing protease activity were pooled, and then protein concentration, protease activity and specific activity were measured in 20ml of enzyme concentrate.

Results in Table (1) showed that there was an increase in both activity of purified enzyme (732.4U/ml) and specific activity (228.8U/mg) with a purification fold 3.02 with an increase in the yield of protease (24.2%).

![Figure 4: Gel filtration chromatography for purification of protease extracted from A. fumigatus using Sepharose 4-B column (1.6×43cm) equilibrated with potassium phosphate buffer (pH=8.0), fraction volume was 5ml at flow rate of 20ml/hour](image)

<table>
<thead>
<tr>
<th>Step</th>
<th>Volume (ml)</th>
<th>Activity (U/ml)</th>
<th>Protein conc. (mg/ml)</th>
<th>Specific activity (U/mg)</th>
<th>Total activity (U)</th>
<th>Purification fold</th>
<th>Yield (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crude enzyme</td>
<td>100</td>
<td>605.0</td>
<td>8.0</td>
<td>75.6</td>
<td>60500</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>Ion exchange DEAE-Cellulose</td>
<td>15</td>
<td>554.8</td>
<td>3.6</td>
<td>154.1</td>
<td>8322</td>
<td>2.03</td>
<td>13.7</td>
</tr>
<tr>
<td>Gel filtration Sepharose 4-B</td>
<td>20</td>
<td>732.4</td>
<td>3.2</td>
<td>228.8</td>
<td>14648</td>
<td>3.02</td>
<td>24.2</td>
</tr>
</tbody>
</table>

In another study, (26) found that purification of protease from *Aspergillus terrus*, using Sephadex G-100 and Sephadex G-200 as a second step (after ammonium sulfate precipitation), gave the highest specific activity of 158.11U/mg protein and 128 fold of purification with 17% yield.

Purification of protease produced by *Streptomyces spPDK 2*, using dialysis, precipitation with ammonium sulfate 45-85%, Sephadex G-50 gel filtration and Sephadex G-200 gel filtration, gave a maximum specific activity of 63.0U/mg.

On the other hand, protease from *Enterobacter aerogenes*, purified by a simple method involving sonication of the crude cell mass, then by gel filtration with Sephacryl S-100 as the separating material followed by ultrafiltration.

This procedure gave 10-fold of purification with a specific activity of 55U/mg protein and recovery of 54% (17).

**Conclusion**

*Aspergillus fumigatus* species isolated from human are more efficient in protease production than *Aspergillus* isolated from other source.

**Ethical Clearance:** The research Ethical Committee at scientific research by ethical approval of both
environmental and health and higher education and scientific research ministries in Iraq.

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding.

**REFERENCES**


ABSTRACT

Background: There is no doubt that childhood is one of the most important stages of human life and the most dangerous because it is a formative stage in which the personality traits and behavior of the individual are determined, and that attention to this stage is a comprehensive concern not framed by immediate needs. The aim of current study was to develop a proposed curriculum to develop some physical and dynamic characteristics of the slow learners, and to know its impact as an appropriate attempt to contribute to raising the level of our children and achieve balanced growth of physical, psychological, social and mental abilities.

Method: The research sample was selected from students intentionally slow learners aged 7-9 years from the School of Mercy civil, Anbar province. The number of the selected sample was 27 students of both sexes make up the selected percentage (51.92%) of the original community of 52 students.

Results: The results of pre- and post-tests indicated that there were statistically significant differences between pre- and post-tests and in favor of the post-test in all variables identified in current study.

Conclusions: The sports activities of student in general have a great positive relationship with student’s mental abilities.

Keywords: proposed program, physical ability, motor abilities, slow learners.

Introduction

There is no doubt that childhood is one of the most important stages of human life and the most dangerous because it is a formative stage in which the personality traits and behavior of the individual are determined, and that attention to this stage is a comprehensive concern not framed by immediate needs. However, through the objective thinking derived from deep studies to prepare them as well as their efforts to reach children’s abilities and talents, in order to help them make their way through life. The curricula and their methods of preparation are still a minor concept in some countries of the world.

The physical and motor abilities are one of the important pillars that we should care about in childhood to accompany the child in most of his life time as well as children in middle childhood of high mobility and ability to learn new sports skills, and their great love for the activities and sporting events that this development leads to “directing and linking the motor with the flow in movements of sports and reach the flow to the top in the third row and be lower in the first and second rows” 1.

Some children suffer from poor or slow learning ability for one reason or another such as educational, psychological, social or health reasons. It is educational that every child has the right to have a good education without any difference between people. In addition, the emphasis of modern education of attention to all children, including private, based on the principle of equal opportunities in the provision of educational services to them to reach the maximum to enable their preparations and their capabilities 2.

Moreover, for the purpose of achieving an integrated understanding of the nature of their work in order to serve the educational process of special education classes for
this group of our children, mental processes are of great impact in the result of participation in motor skills.

Therefore, to the aim of current study was to prepare a proposed program for the development of some physical and dynamic characteristics of the slow learners, and to know its impact as an appropriate attempt to contribute to raise the level of our children and achieve balanced growth of their physical, psychological, social and mental abilities.

Method

The study sample was randomly selected from students of slow learning at the age of 7-9 years from Al-Rahma private School in Anbar Governorate, Iraq. They were 27 students of both sexes representing 51.92% of the original society (52 students). In order to know the nature of sample spread around its arithmetic mean, the researcher used the coefficient of variation in some variables of the study sample (length, weight and age) to find out the homogeneity of sample members. The results showed that the sample was normally distributed.

Table 1: Some variables of study sample

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>Skewness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length/cm</td>
<td>123.037</td>
<td>7.781</td>
<td>6.324</td>
</tr>
<tr>
<td>Weight/kg</td>
<td>24.629</td>
<td>2.720</td>
<td>11.044</td>
</tr>
<tr>
<td>Age/yr</td>
<td>7.962</td>
<td>0.636</td>
<td>7.988</td>
</tr>
</tbody>
</table>

Field research procedures

Determination of physical and motor characteristics: In order to determine the most important physical and motor characteristics in the motor performance, which are required to be developed for the students of slow learning within the age group in question, the researcher surveyed the sources related to the above characteristics. The researcher prepared a questionnaire for the opinion of experts and specialists. In the fields of (science of training and learning locomotives) and the number of experts and specialists were 8. Through the presentation of qualities on them and in light of results generated by the questionnaire, the qualities that were less than (60%) were excluded because the researcher has the right to choose the suitable proportion when selecting indicators.

Tests used

First test: jogging (20m) from the high start: The objective of this test was to to measure the transition speed. The tools used to carry out it were straight path for testing, two lines for start and end for 20m, and stopwatch. participant stood behind the starting line from the high start position. When the start signal is heard, it starts at full speed from the starting line and the end line is crossed straight and the participant was given two attempts and the best one was registered. The time at which the specified distance cut was recorded.

Second test: Bend the trunk in front of the bottom of the stand*: The objective of this test was to measure the elasticity of the spine. In this test, a graduated ruler (0-20 cm) vertically placed at the edge of the table, with the middle of the scale above the edge of the table and the other half under the top edge of the table or seat. From standing on the bench or table, and the feet to the two sides of the scale, the participant bends the trunk in front of the bottom so that the hand fingers become in front of the meter and from this situation the participant tries to bend the trunk to the maximum extent possible while noting that the fingers are at one level and the participant maintains his final status between (2-3) seconds without bending the knees to record the distance and give the participant two attempts to register the best. In this test, the maximum point recorded on the scale was that reached by participant with his fingertips.

Third test: Running the winding between the barriers*: The objective of this test was to measure agility. Tools used for test were chairs or low chairs and stopwatch. During this test the participant stood behind the starting line, which is located between the first block distance (3m) and its width (1m). The distance between one block and another of the four meters distance was one meter. When the start signal is heard, participant runs between one block and another. The time taken for two continuous sessions was calculated.

Fourth test: Throw and receive balls*: The objective of this test was to measure the ability of eye-hand compatibility. Tools used were tennis ball and a wall. During this test, the participant stood behind a drawn line on the ground, 4 meters away from the wall. The test was carried out as follows:

1. Throw the ball five times in a row with the right hand and that participant receives the ball after rebounding from the wall with the same hand.

2. Throw the ball five consecutive times with the left hand and that the participant receives the ball after rebounding from the wall with the same hand.
3. Throwing the ball five times in a row with the right hand. The ball should be received by the participant after it has been removed from the wall with the left hand. For every correct attempt, the participant was rated a score, the final grade is (15) grade.

**Pretests:** The tests and measurements are one of the assessment, diagnosis and guidance methods that are part of scientific work parameters based on the correct scientific basis. Tests are a means of evaluation in different curricula and plans for all levels and age groups. Tests serve as a positive indicator that contributes to achieving the goals and objectives set.

In light of this, the pretests of physical and motor characteristics of study sample were conducted on 13-14/1/2018 at 9:00 am as shown:

1. Testing physical qualities on Sunday, 13/1/2018.

On the other hand, pre technical tests for the same sample were conducted on 9/3/2002 at 9am for both groups and two days for each group as shown:


In order to create the same conditions as possible in the post-tests, it was taken account the establishment of the conditions related to tests of space and time as well as tools used and methods of implementation of the tests.

**Educational program:** The researcher prepared the educational program which was aimed to develop the variables under consideration for students with slow learning, taking into consideration the intensity of the educational units, depending on length of the distance, difficulty of jumping, complexity of the exercise and increasing the repetitions and rest between performances of the games used. The reason was specificity of the sample, on the one hand, and lack of achievement to break a record, on the other hand. The new thing in our current approach was that the researchers adopted games that are characterized by the nature of compatibility of muscular and nervous systems because of its positive impact on the nervous system, which will reflect the increased efficiency of students in the cognitive aspects.

Regarding validity of scientific bases used in the development of the program, the researcher drew opinions of experts and specialists and through the presentation to them to ascertain suitability of the program for students who were slow to learn in the first primary stage. The program was finalized within (10) weeks, 3 units per week and for 3 days (Sunday, Tuesday and Thursday) and (20-26) minutes of the time for each unit, specifically the main sections; the preparatory section and the final sections, however, the increase in time was made at the expense of the education side. The minimum and upper limits of these sections corresponded to variables of the atmosphere and what is required for the preparation of the exercises through the physical education teacher to implement the preparatory section and the educational aspect of the main section and the closing section.

In spite of the efforts of the researcher to control the variables that may affect the main experiment and what is required by the scientific secretariat of the department to give a real image when the implementing the program, the researcher created the elements of excitement and thrill in order to achieve the self-interest of participants to ensure the achievement of good results.

**Post-tests:** After completion of the program, the researcher conducted the tests, taking into account the same conditions in which the tests were conducted in terms of place, time and method of tests as much as possible, where physical and motor tests were carried out over two days according to the dates indicated below.

- Physical qualities test (Monday 4/2018).
- Testing of motor abilities on Tuesday.

### Results

**Table 2: Mean, standard deviation, arithmetic mean difference, calculated (t) values and significance of the differences between the pre- and post-test results**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Units</th>
<th>Pre-test Mean</th>
<th>Pre-test SD</th>
<th>Post-test Mean</th>
<th>Post-test SD</th>
<th>Mean diff.</th>
<th>SD diff.</th>
<th>(t) Calculated</th>
<th>Indication of differences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transition speed</td>
<td>Time</td>
<td>6.53</td>
<td>0.76</td>
<td>4.44</td>
<td>0.39</td>
<td>2.09</td>
<td>2.05</td>
<td>5.35</td>
<td>Significant</td>
</tr>
<tr>
<td>Flexibility</td>
<td>cm</td>
<td>2.47</td>
<td>1.73</td>
<td>4.20</td>
<td>1.10</td>
<td>1.73</td>
<td>1.75</td>
<td>5.24</td>
<td>Significant</td>
</tr>
</tbody>
</table>
Conted…

<table>
<thead>
<tr>
<th>Fitness</th>
<th>Time</th>
<th>21.12</th>
<th>3.62</th>
<th>15.04</th>
<th>0.88</th>
<th>6.18</th>
<th>3.66</th>
<th>8.82</th>
<th>Significant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compatibility between eye and hand</td>
<td>Grade</td>
<td>3.80</td>
<td>1.08</td>
<td>8.07</td>
<td>3.95</td>
<td>4.27</td>
<td>2.73</td>
<td>8.21</td>
<td>Significant</td>
</tr>
</tbody>
</table>

The value of tabulated (t) was (2.201) at degree of freedom (26) and the level of significance (0.05).

The results of pre- and post-tests in Table (2) indicated that there were statistically significant differences between pre- and post-tests and in favor of the post-test in all variables identified in current study. The researcher attributed the reason for this development to the effect of the program prepared and its contribution to raising abilities of students with slow learning by giving them sufficient mobility. The studies confirmed that depriving student of movement will lead to development of physical conditions that limit his mobility compared to ordinary students [5]. Speed rapidly develops in newly-arrived children and the rate of growth stands at approximately (10) years and gradually decreases thereafter. Also, some studies indicated that speed-management requires the efficiency of the nervous system in performing muscle function as it controls functions of the body [6].

In the test of elasticity, the results showed that there were statistically significant differences between pre- and post-tests. These differences showed the extent of influence of vocabulary of the prepared program and its suitability to student’s slow learning abilities. However, availability of the principles of excitement and creation of competition and instilling the spirit of enthusiasm in the students were very influential in overcoming these difficulties. Also, studies indicated that child’s new entry into school constantly needs to increase the purpose of exercises.

Exercise increases flexibility in new-school children and gives a much better result when the child ages in addition to development of the motor flexibility of joints [7].

As for the test (fitness), there were statistically significant differences between results of pre- and post-tests. These moral differences confirmed the impact and contribution of educational program in the development of this trait. The studies indicated that fitness is the character of the child at this stage, and this is what we see in balancing exercises and soft toys as well as tools to help the child earn experience by putting him/her in different situations [8].

The results showed statistically significant differences between results of pre-test and post-tests. These differences were a clear indication of the effect of the program on the development of this function as well as the efficiency of some mental processes consensus that depend on integrity and accuracy of nerve functions and their associations together, because neurotransmitters have to be sent out to more than one place at the time as well as the compatibility of hand-eye and foot-eye compatibility are developing with age. So that, boys perform better than girls throughout childhood [1].

Conclusions
1. The emergence of significant differences between results of pre- and post-tests and in favor of the post-test of physical and motor characteristics.
2. The sports activities of student in general have a great positive relationship with the abilities of student’s mental abilities.
3. The training program had a positive effect on development of research variables through the inclusion of small games and various motor activities contributed to the release of the potential of the student slow learning, because of its impact on the improvement of mental processes.

Ethical Clearance: The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding.

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The Effect of Learning Exercises Through Flexible Circles on Learning Some of the Composite Skills of Futsal Football for Students

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ABSTRACT

Background: Playing fast and quick moving of the ball from the backyard to the front yard drives learners to invest the basic skills effectively together so that they can start an attack larger in number than that of the opposing team which will help them score a goal. Thus, researchers (experts) give great attention to the acquisition and mastering of these basic skills. The objective of this research was to define the effects of learning exercises within the scope of flexible circles on learning of some composite skills of Futsal football for students.

Method: The researcher used the experimental method of equal groups. The fifth grade preparatory students (147 students), in the 2018/2019 academic year, at Mohammad Baqir Al-Sadr School for boys represented the study community. A sample of 30 students was randomly chosen from both classes (B&C). Participants were divided into two groups; one was experimental (15 students from Class B) using the learning exercise with the flexible circles model, while the second (15 student from Class C) was a control group using their teacher’s method (model).

Results: The results indicated that there were statistically significant differences between the pre- and post-tests in favor of the post-tests according to the second hypothesis of the research which was attributed to validity of the learning curriculum of both groups (experimental and control).

Conclusion: It was concluded that learning exercises prepared by the researcher had increased the efficiency of learners and the skillful and planetary side of the Futsal football.

Keywords: learning, exercises, flexible Circles, Futsal, composite skills.

Introduction

Teachers of physical education have long been interested in how to reach the highest levels of learning activities and sports games for their students. Therefore, there have been many attempts to find educational alternatives to the kinetic skills as represented in different educational ways and methods based on active role and actual participation in all stages of the class in a way that suits students’ capabilities and potentialities. Among these methods is the style of flexible groups, which makes student focuses on learning process and provides him with educational alternatives to choose the most appropriate for him(1).

Futsal football is one of these sports games. It is a multi and diverse skill game besides its relation with the psychological, cognitive, physical, mental and procedural skills which led researchers to pay attention to those skills to acquire and master them effectively.

The researcher noted that most teachers follow the traditional methods when teaching the skills of Futsal football. It is to be noted that these old methods depend on the repetition of these skills one by one not collectively together with assigning little value to teaching how to practice this game. Thus, the researcher studied this real problem through the use of learning exercises according to the flexible circles and linking the learning of basic
skills to plans of playing directly and knowing the extent of their contributions in teaching of some of the complex skills. Thus, we have taught students the procedural and planetary performance in a simplified manner at the same time [2]. Therefore, the objective of current study was to identify the effect of learning exercises according to the flexible circles in learning some of the complex skills of Futsal football for students.

Research hypotheses

1. There are significant statistical differences between the pre- and post-tests of the control and experimental groups in learning some of the composite skills in the Futsal football in favor of the post-test.

2. There are significant statistical differences in the post-tests between the control and experimental groups in the learning of some of the composite skills of the Futsal football and in favor of the experimental group.

**Method**

The researcher used the experimental method of the two equal groups (control and experimental) for being suitable for the research problem.

**Research Community and Sample:** The research community was represented by the fifth grade preparatory students at Mohammad Baqir Al-Sadr School for Boys in the 2018/2019 academic year. The total number of students was (147) representing four classes (A, B, C and D). Thirty students from the classes (B & C) were chosen randomly to be the sample of the research. Thus, the percentage of the sample of the research was (20.40%), divided by lotto into two groups; experimental group, 15 students using learning exercises according to flexible circles, and control group, 15 student using the teacher’s method.

**Sample Homogeneity:** The researcher used the torsion coefficient to find homogeneity in the variables of the search as shown in Tables (1 and 2).

**Table 1: Homogeneity of control group members in terms of age, height and mass**

<table>
<thead>
<tr>
<th>No.</th>
<th>Statistical Approaches/variables</th>
<th>Measurement Unit</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>Torsion coefficient</th>
<th>Sample size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Age</td>
<td>Month</td>
<td>195.466</td>
<td>2.099</td>
<td>-0.4</td>
<td>15</td>
</tr>
<tr>
<td>2.</td>
<td>Height</td>
<td>cm</td>
<td>177.533</td>
<td>3.961</td>
<td>-0.411</td>
<td>15</td>
</tr>
<tr>
<td>3.</td>
<td>Mass</td>
<td>Kg</td>
<td>62.733</td>
<td>3.104</td>
<td>0.849</td>
<td>15</td>
</tr>
</tbody>
</table>

**Table 2: Homogeneity of members of the experimental group in terms of age, height and mass**

<table>
<thead>
<tr>
<th>No.</th>
<th>Statistical Approaches/variables</th>
<th>Measurement Unit</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>Torsion coefficient</th>
<th>Sample size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Age</td>
<td>Month</td>
<td>195.333</td>
<td>1.838</td>
<td>-0.012</td>
<td>15</td>
</tr>
<tr>
<td>2.</td>
<td>Height</td>
<td>cm</td>
<td>175.8</td>
<td>3.967</td>
<td>-0.692</td>
<td>15</td>
</tr>
<tr>
<td>3.</td>
<td>Mass</td>
<td>Kg</td>
<td>61.2</td>
<td>2.077</td>
<td>0.3</td>
<td>15</td>
</tr>
</tbody>
</table>

All values of the torsion coefficient were (1+) indicating homogeneity of the members of the sample in term of the abovementioned variables.

**Samples equivalence:** The researcher made the equivalence to ensure a single starting line in the work of both groups (experimental and control) so used the t-test for independent samples to extract the parity.

**Table 3: Equivalence of members of the control and experimental groups in the cognitive obtainment and the composite skills of the Futsal football**

<table>
<thead>
<tr>
<th>No.</th>
<th>Statistical Approaches/Variables</th>
<th>Unit</th>
<th>Control Group</th>
<th>Experimental Group</th>
<th>(t) Value</th>
<th>*significamce</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Receiving the ball, running and passing</td>
<td>m/s</td>
<td>0.199 0.019</td>
<td>0.195 0.022</td>
<td>0.532</td>
<td>0.599</td>
<td>Not significant</td>
</tr>
</tbody>
</table>
Methods of data collection and the devices used in the study

- Arabic and Foreign references- school records, extraction of students’ age for the nearest month.
- Forms of questionnaires for the selection of technical tests.
- Scientific observation tests and measurement.

Identification of complex attacking skills: After having reviewed sources, references and scientific studies, identification and selection of complex skills suitable for Futsal ball players were accomplished.

Determination of tests used in the research: The researcher presented a set of tests concerning complex attacking skills in a questionnaire form to a group of experts to identify the appropriate test.

Complex Skills Tests: Receiving from the movement then running and then targeting. The objective of this test was to measure receiving, then running, then targeting towards the square-divided goal: The objective of the test was to measure receiving, then running, then targeting. The tools used in the test were Futsal balls, Stopwatch, Measuring tape, and Stakes.

Test Method: The student stood 3m behind the starting line, and when he hears the whistle, he quickly sets out to take the ball being passed to him by the teacher from a movement in a half circle of 1m radius, then runs with the ball as quickly as possible in a straight line for 10 meters then shoots towards the goal which is 10m away from the place of targeting, from within the drawn rectangle of 2m width, and 1m length, with his preferred foot, the student must repeat his attempt three times.

The method of scoring: The performance time of each targeting attempt was calculated from the moment the ball received until it crosses the goal line.

Accuracy of the targeting was marked as follows:

Three marks were given for the ball going into square, Two marks were given for the ball going into square and One mark was given for the ball that goes into square. The final mark was given to the best attempt regarding time and accuracy of performance.

Pilot study: The researcher conducted a pilot study on a sample of (10) students of the research community without the main experiment on Wednesday (24/10/2018). The exploratory experiment for the researcher was considered a practical training for identifying obstacles to the main experiment, identifying the time allotted for tests and extraction of scientific bases for tests.

The scientific foundations of the tests

Test validity: The researcher presented these tests to the experts and specialists who examined the test forms to verify validity of the content.

Test Reliability: To determine the reliability of the test, the researcher tested a group of (10) students from outside the sample and, after (7) days, the researcher

| Receiving the ball, running and targeting | m/s  | 0.180 | 0.015 | 0.181 | 0.014 | 0.12 | 0.905 | Not significant |
| Blood acidity before tension | m/s  | 0.183 | 0.015 | 0.184 | 0.018 | 0.109 | 0.914 | Not significant |

*significance value is 0.05 at df = 28.
again tested the students themselves. The researcher used the simple correlation coefficient.

Objectivity of the test: The researcher extracted the coefficient of objectivity through the results of two arbitrators using the correlation coefficient (Pearson).

Main experiment procedures

Pre-Test: The experimental tests were conducted on control and experimental groups with the help of the auxiliary team.

Educational Curriculum: The two groups were subjected to a curriculum for composite skills over period of (8) weeks with two educational units per week and as follows:

The control group: Members of this group applied educational units for teaching of composite skills according to the method followed by the teacher. The units were conducted on Monday and Wednesday of each week.

The experimental group: The researcher prepared a learning curriculum which was applied to members of the experimental group. The curriculum included (32) exercises to teach composite skills in the practice of flexible circles, which was initiated on Sunday (11/11/2018)(6/1/2019) and ended on Sunday 16/1/2019. It lasted for 8 weeks, two learning units per week. It included (16) units and each unit contained (2) exercises. The unit time was (45) minutes, and the components of the learning unit were divided into three main sections: 10 minutes preparatory section, 30 minutes time for the main section and (5) minutes for the final section. The teacher played the role of a guide and director and feedback provider. The teacher and the student used the element of suspense and encouragement.

Post-Test: After completion of the curriculum, the tests were carried out for both groups during two days (Tuesday and Wednesday) corresponding to (8-9/1/2019), adopting the same conditions of the pretests.

Results

Table 4: Mean and standard deviations, (t) value and the level of significance for pre-tests results of control group

<table>
<thead>
<tr>
<th>No.</th>
<th>Statistical Variable</th>
<th>Unit</th>
<th>Pre test</th>
<th>Post test</th>
<th>(t) Value</th>
<th>*Significance</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Receiving the ball, running and passing</td>
<td>m/s</td>
<td>0.199</td>
<td>0.019</td>
<td>0.208</td>
<td>0.019</td>
<td>5.137</td>
</tr>
<tr>
<td>2.</td>
<td>Receiving the ball, running and targeting</td>
<td>m/s</td>
<td>0.180</td>
<td>0.015</td>
<td>0.198</td>
<td>0.015</td>
<td>6.081</td>
</tr>
<tr>
<td>3.</td>
<td>Receiving, dribbling and targeting</td>
<td>m/s</td>
<td>0.183</td>
<td>0.015</td>
<td>0.200</td>
<td>0.015</td>
<td>9.539</td>
</tr>
</tbody>
</table>

Table 5: Mean and standard deviations, (t) value and the significance level of pre-tests results for the experimental group

<table>
<thead>
<tr>
<th>No.</th>
<th>Statistical Variable</th>
<th>Unit</th>
<th>Pre test</th>
<th>Post test</th>
<th>(t) Value</th>
<th>*Significance</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Receiving the ball, running and passing</td>
<td>m/s</td>
<td>0.195</td>
<td>0.022</td>
<td>0.238</td>
<td>0.018</td>
<td>10.774</td>
</tr>
<tr>
<td>2.</td>
<td>Receiving the ball, running and targeting</td>
<td>m/s</td>
<td>0.181</td>
<td>0.014</td>
<td>0.238</td>
<td>0.016</td>
<td>18.686</td>
</tr>
<tr>
<td>3.</td>
<td>Blood acidity before tension</td>
<td>m/s</td>
<td>0.184</td>
<td>0.018</td>
<td>0.248</td>
<td>0.018</td>
<td>15.256</td>
</tr>
</tbody>
</table>
Discussion

The results shown in Tables (4 and 5) indicated that there were statistically significant differences between pre- and post-tests for the benefit of the post-tests according to the second hypothesis of the research, which was attributed by researcher to validity of the learning curriculum of both groups (experimental and control) specifically the main section, which contained scientifically-selected exercises with correct and consistent repetitions. “It is of a natural phenomenon that the process of education will be evolved if the coach or teacher follows the sound basic steps in learning and exercising to attain the correct Performance” [5]. The careful and organized selection of exercises contributed directly to the development of level of performance of students of both groups, as well.

The results presented in Table (6) showed that there were significant differences between the post-tests in favor of the experimental group according to the second hypothesis of the research. The researcher attributed the progress to students’ positive receptiveness of information and its implementation which was revealed through development of skills level and planning of composite skills of Futsal balls [6]. In addition, this was in line with results reported by [7].

The researcher also attributes the superiority of the experimental group to the exercises they practiced according to the flexible circles, which were practiced systematically within the graduation of difficulties as per the prepared curriculum. This gave learners greater and important role in solving the tasks and kinetic duties, whereas the control group practiced the adopted normal learning [8].

<table>
<thead>
<tr>
<th>No.</th>
<th>Statistical Variable</th>
<th>Unit</th>
<th>Control group</th>
<th>Experimental group</th>
<th>(t) Value</th>
<th>*significance</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Receiving the ball, running and passing</td>
<td>m/s</td>
<td>0.208</td>
<td>0.019</td>
<td>0.238</td>
<td>0.018</td>
<td>40.206</td>
</tr>
<tr>
<td>2.</td>
<td>Receiving the ball, running and targeting</td>
<td>m/s</td>
<td>0.198</td>
<td>0.015</td>
<td>0.238</td>
<td>0.016</td>
<td>6.62</td>
</tr>
<tr>
<td>3.</td>
<td>Receiving, then dribbling and targeting</td>
<td>m/s</td>
<td>0.200</td>
<td>0.015</td>
<td>0.248</td>
<td>0.014</td>
<td>8.65</td>
</tr>
</tbody>
</table>

* Significance level at $P\leq0.05$. Degree of freedom was 28.

Conclusions

The methods of the adopted learning composite skills and learning through exercises according to the flexible circles have had a positive impact on learning some of these skills of Futsal ball for students.

Ethical Clearance: The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding.

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1. Stone BB. Flip your classroom to increase active learning and student engagement. In Proceedings from 28th Annual Conference on Distance Teaching & Learning, Madison, Wisconsin, USA; 2012.


Effects of Special Exercises on the Sand on Some Blood Cells, Heart Measurements and Physical Abilities of Advanced Futsal Players

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1Faculty of Physical Education and Sports Sciences, University of Dhi Qar, Iraq

ABSTRACT

Background: Among methods of training of power and explosive ability are to exercise on sandy land where this technique has multiple physical and physiological benefits as it promotes the development of cardio-respiratory endurance. This study was aimed at checking up the effect of exercising on the sand, in training of futsal, on some blood cell variables, heart rate and physical abilities.

Method: Sixteen male players were chosen as a study sample from Al-Nasiriyah City Club. Their age ranged between 21 and 23 years. This study sample was divided into two eight-player groups; the experimental group who performed exercises on sandy field and the control group who exercised inside a closed hall. Exercises and training were conducted for two months, 3 days a week. Red blood cells, heart rate and physical capabilities were analyzed and assessed as per appropriate methods. Data were statistically analyzed by using SPSS and t-test.

Results: The study showed changes in the variables of the study and demonstrated that exercises on the sand field produced better effects as compared to those conducted on the closed hall.

Conclusion: Exercising on the sand is a good factor to reduce the breakage of red blood cells caused by solid surfaces and it is one of successful methods in the development of heart measurements and prepares it for the sport effort it faces.

Keywords: special exercises, red blood cells, physical abilities, sandy field, closed hall.

Introduction

The game of Futsal requires that a player has to attain a high level of all different aspects of training, particularly in the physical side, and in order to achieve the required level, exercises should be well chosen so that the aim is accomplished. Among methods of training of power and explosive ability are to use these exercises on sandy land where this technique has multiple physical and physiological benefits as it promotes the development of cardio-respiratory endurance as well as the foresaid physical qualities. Previous studies showed that there was a decrease in the fatigue index of trainees who exercise on the sand as compared to their counterparts who exercise on solid ground, which gives better endurance, through training in the sand and the result of the resistance occurs either during running and jumping or while performing exercises using the body weight (where we noticed the resistance to double) the temperature of the body as a whole as well as the temperature of the heart which leads the local blood flow within the muscle by expanding its blood circulation until it reaches the small blood circulation. The latter will improve functional conditions of heart muscle by increasing oxygen supply, which ultimately helps achieve the achievement of the athlete [1].

In addition, bare-footed exercising and walking on the sand helps to connect with the ground. There are many studies that confirmed the benefits of this connection on the cardiovascular system, immunity and blood and rid the body of free radicals. Physiological studies have shown that sand exercises have very important
physiological effects such as reduction of damage in the muscular tissue caused by playing on solid surfaces. Other studies have shown that futsal training causes a decrease in red blood cells and this will have a negative impact on oxygen transport.

The importance of current study is to search for the most important benefits that can be achieved by exercising on sand, whether on blood cells, the heart rate or the physical side of futsal players.

One of the physiological problems faced by the athlete who plays inside futsal court is the hard ground, as it has been scientifically proven that this type has negative effects through increasing the damage and rupture of muscle tissue. This is evident by increasing the protein components in the bloodstream as well as increasing the fraction of red blood cells in the blood which also adversely affects the transport of oxygen with consequent effects on the level of overall functional performance [2].

Research Objectives

1. To design special set of exercises on the sand to develop special endurance during the “ad hoc” preparation course.

2. To identify the effect of exercises on the sand on some blood cells, heart muscle measurements and physical abilities between the pre- and post-tests, and the post- post - test for the preparation period (Ad hoc).

Method

The researcher used the experimental methodology by designing the two equivalent groups; control and experimental.

Research community and its sample: The sample of the study was deliberately chosen. It was represented by the players of Baladiyat Al-Nasiriyah Sports Club of futsal for the season (2018-2019). The number of players was 95, divided into (5) clubs (Al-Baladiyat, Al-Furat, Al-Gharaf, Al-Nasir, and Al-Nasiriyah). The total number of the research sample was (16) players from Baladiyat Al-Nasiriyah Sport Club divided into two groups; (8) players for the experimental group and (8) players for the control group. They were divided by lottery. Thus, the total sample number (16), representing 16.84% of the total community.

Table 1: Homogeneity of the study sample

<table>
<thead>
<tr>
<th>No.</th>
<th>Statistical assessment/variable</th>
<th>Unit</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>Median</th>
<th>Torsion coefficient</th>
<th>Sample size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>height</td>
<td>cm</td>
<td>178.43</td>
<td>3.36</td>
<td>179</td>
<td>0.50</td>
<td>16</td>
</tr>
<tr>
<td>2.</td>
<td>Body mass</td>
<td>kg</td>
<td>78</td>
<td>8.69</td>
<td>79.34</td>
<td>0.46</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Training Age</td>
<td>year</td>
<td>3.4</td>
<td>1.26</td>
<td>3.2</td>
<td>0.47</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Chronological Age</td>
<td>year</td>
<td>21.9</td>
<td>2.14</td>
<td>21.5</td>
<td>0.56</td>
<td></td>
</tr>
</tbody>
</table>

Tests used in research

A. Red blood cells (RBCs) calculation [3]: Method of measuring: After the player sat and making sure of the appropriate analysis, the special tubes were prepared for each analysis without containing anticoagulant (4ml). The player’s hand was tightened with tourniquet to make sure of appropriate vein of which the blood was drawn and of the needed amount of blood after the area is sterilized. When the blood was drawn with appropriate syringe, the tourniquet was removed and the blood was emptied in a tube on which the name of the player was written. The sample was then transferred to the working room at a temperature of 30°C to be analyzed.

B. Heart Measurements [4]: The researcher designed a questionnaire form for surveying the opinions of a group of specialists and experts in physiological sports of training. The researcher conducted some personal interviews with some experts and specialists to be acquainted with their opinions in this context as shown in the annexes to determine some measurements that fit the sample and serve the research. The researcher chose the highly agreed upon measurements, which included measurements of the variables of the heart by use of Eco-M (M-mode), which is used to measure the different dimensions of the components of the heart such as heart cavities and muscle thickness as well as the use of the method (D2), which is used to determine the movements of contraction
and expansion. The frequency level used in the measurement was 3.5MHz.

Heart measurements included

1. Left Ventricular Dimension in systole.
2. The percentage of blood pump Ejection Fraction.

The special measurements of the heart muscle were extracted by means of the echo con, measured directly by the echo instrument.

Field research procedures

Pre-Tests: The pre-tests were carried out with the assistance of assistant staff and the team of study sample, which included the RBC, heart measurements and physical tests for the period from 2-3/9/2018.

Main experience: Based on the physiological sports training references and sources, besides experts’ views in this respect, the researcher designed special exercises concerned with training on the sand to determine their impact on study sample and to know the results of this effect on some physical and physiological variables of the futsal players. The implementation of the experiment began on 6/9/2018 and ended on 6/11/2018.

Post-tests: The RBCs and heart muscle measurements in question for the two groups were conducted on Saturday, 10/11/2018, and all requirements for the tests were prepared taking into account the temporal and spatial conditions in which the pre-test was conducted.

Results

Table 2: Some ad hoc statistical parameters of both pre- and post-tests of some of blood cells and heart measurements

<table>
<thead>
<tr>
<th>No.</th>
<th>Variable</th>
<th>Unit</th>
<th>Experimental group</th>
<th>Control group</th>
<th>*t value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td>Calculated</td>
<td>Tabulated</td>
</tr>
<tr>
<td>1.</td>
<td>RBCs</td>
<td>Cell/cm 10’12L</td>
<td>5.76 (0.09)</td>
<td>5.79 (0.07)</td>
<td>1.96</td>
<td>Significant</td>
</tr>
<tr>
<td>2.</td>
<td>LVIDs</td>
<td>ML</td>
<td>31.96 (2.23)</td>
<td>32.27 (2.03)</td>
<td>2.18</td>
<td>Non-significant</td>
</tr>
<tr>
<td>3.</td>
<td>EF</td>
<td>%</td>
<td>69.25 (0.96)</td>
<td>72.21 (2.93)</td>
<td>2.44</td>
<td>Significant</td>
</tr>
<tr>
<td>4.</td>
<td>SV</td>
<td>MI</td>
<td>100.87 (3.11)</td>
<td>105.01 (2.61)</td>
<td>2.41</td>
<td>Significant</td>
</tr>
</tbody>
</table>

* The value of the tabulated (t) at the level of significance (0.05) and degree of freedom (7) reached to (2.36).

Table 3: The ad hoc statistical parameters of both pre- and post-tests of some blood cells and heart measurements of experimental group at rest conditions

<table>
<thead>
<tr>
<th>No.</th>
<th>Variable</th>
<th>Unit</th>
<th>Experimental group</th>
<th>Control group</th>
<th>*t value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td>Calculated</td>
<td>Tabulated</td>
</tr>
<tr>
<td>1.</td>
<td>RBC</td>
<td>Cell/cm 10’12L</td>
<td>5.74 (0.07)</td>
<td>5.85 (0.04)</td>
<td>3.98</td>
<td>Significant</td>
</tr>
<tr>
<td>2.</td>
<td>LVIDs</td>
<td>ML</td>
<td>31.93 (2.37)</td>
<td>33.08 (1.66)</td>
<td>2.28</td>
<td>Non-significant</td>
</tr>
<tr>
<td>3.</td>
<td>EF</td>
<td>%</td>
<td>70.84 (2.82)</td>
<td>75.12 (1.007)</td>
<td>5.59</td>
<td>Significant</td>
</tr>
<tr>
<td>4.</td>
<td>SV</td>
<td>MI</td>
<td>101.69 (6.25)</td>
<td>109.24 (1.92)</td>
<td>3.92</td>
<td>Significant</td>
</tr>
</tbody>
</table>

*The tabulated (t) value at the significance level of (0.05) and degree of freedom (7) reached (2.36).

The results shown in Tables (2 and 3), indicated that there was a difference between the pre- and post-tests in measuring the proportion of red blood cells, but it was not significant in the control group, which was attributed by the researcher to the fact that training inside the gymnasium causes lack of red blood cells and this negatively affects the process of oxygen transport, as was confirmed by the study “The training within the gymnasium causes a decrease in red blood cells and this has a negative role in affecting the transfer of oxygen.
because it leads to iron deficiency and this leads to early stress of the player”.

As for the experimental group, significant differences were noticed in the pre-test in favor of the post-test. The researcher attributed this to the continuation of training on sand, as sand does not cause any breakage of red blood cells. So the trainers resort in the transitional period to render their players to recover.

The researcher believes that the period in which the experimental group exercised on sand was sufficient to give indications for physiological changes, as was confirmed after 6-9 weeks of practice, and training was enough for the players to adapt or reduce damage in the muscle tissue [5].

A very little evolution was also noticed in the variable (LVIDs) between the results of the pre- and post-tests of control and experimental groups and this development was in the value of arithmetic mean, which was insignificant as it was smaller than the tabulated value of the scale, whereas the arithmetic mean value of the experimental group was better than that of control group and this was attributed by the researcher to the effect of exercises on sand, of the experimental group, on the heart for the training on the sand is one of the most successful methods to protect the heart and prepares to endure the sports effort to which it is to be exposed. Therefore, most of the training methods tended to protect the heart and prepare it to bear the burden of effort as indicated by [6].

Through training on the sand and due to resistance encountered, whether through running or different jumps (as sand resistance appears to double), the temperature of the body rises as a whole, so does that of heart, and this causes blood to flow within heart muscle through the expansion of its blood circulation until it reaches the small blood circulation. In other words, training on the sand leads more effectively to an increase in the blood circulation and prepares the player to exert effort and to the sudden exercise [7].

The researcher also attributed this slight development to the variable of sand training on the special preparation stage. In other words, if sand training was applied in the general preparation stage, the differences might be significant. As for the variables, the percentage of blood and the volume of the beat (EF, SV) showed a significant difference in favor of post-tests of both groups.

Table 4: Statistical parameters of the two post-tests of some blood cells and heart measurements of experimental and control groups in the case of rest

<table>
<thead>
<tr>
<th>No.</th>
<th>Statistical parameter/Variable</th>
<th>Unit</th>
<th>Post-test of Experimental group</th>
<th>Post-test of Control group</th>
<th>*t value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>1.</td>
<td>RBC</td>
<td>Cell/cm 10^12L</td>
<td>5.85</td>
<td>0.04</td>
<td>5.79</td>
<td>0.07</td>
</tr>
<tr>
<td>2.</td>
<td>LVIDs</td>
<td>ML</td>
<td>33.08</td>
<td>1.66</td>
<td>32.27</td>
<td>2.03</td>
</tr>
<tr>
<td>3.</td>
<td>EF</td>
<td>%</td>
<td>75.12</td>
<td>1.007</td>
<td>72.21</td>
<td>2.93</td>
</tr>
<tr>
<td>4.</td>
<td>SV</td>
<td>MI</td>
<td>109.24</td>
<td>1.92</td>
<td>105.01</td>
<td>2.61</td>
</tr>
</tbody>
</table>

*The tabulated *t value of (t) at the level of significance (0.05) and degree of freedom (14) reached (2.14).

The researcher attributed the evolution of the experimental group to exercises on the sand as the group that was trained inside the solid pitch was exposed to a lack of RBCs as was indicated by the study of [8] who concluded that” Intensive training and exercising inside futsal leads to iron deficiency and lack of iron has harmful effects on the physical performance of players and at the cellular level and reduces the possibility of oxygen transport training”. These differences were also attributed to the increase in the amount of blood in the heart chambers when extinction due to adapting of the left ventricle of the endurance of training through the functional burdens resulting from pumping the amount of blood output to all parts of the body, which increased because of sand resistance, as indicated by the study of [9] who concluded that “The volume of blood pumped increases due to the effect of the increase in the volume of blood filling the ventricle during the extinction and increase in the
size of blood leads to an effect pressing on the muscle fibers in the heart, which is reflected on the strength of contraction of the heart muscle and, as a result, the heart pumps a large amount of blood during stroke”.

**Conclusions**

- Exercising on the sand is a good factor to reduce the breakage of red blood cells caused by solid surfaces and it is one of successful methods in the development of heart measurements and prepare it for the sport effort it faces.

- Composite sand-resistance exercises have a positive effect on the development of some of the physical abilities of the futsal ball for advanced players and this is reflected in the development of athletic abilities.

- Sand training helps the trainer to give resistance exercises that may not be available in the futsal halls at the lowest cost with interaction of training.

- Training on the sandy environment, whether of futsal teams or open courts, has a psychological impact on the recreational aspects of the players and to thrill them with fitness exercises and delayed fatigue.

**Ethical Clearance:** The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding.

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The Impact of an Educational Program According to the Model 4MAT to Learn the Skill of Attack in Numerical Epee for Students Fencing

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ABSTRACT

Background: By observing the majority of educational curricula in the game of fencing and by studying previous studies, there is lack of use of educational models to address the two hemispheres of the brain. Also, by follow-up and watching most of 3rd-year students at Faculty of Physical Education and Sports Sciences/Karbala University for the 2018/2019 academic year, current study was aimed to find educational solutions using an educational programs designed according to an educational model (Format), which aimed to increase the ability of thinking meditation movement of the player and competitor in addition to learning the skills of numerical attack.

Method: The researchers used the experimental approach in the design of one group with pre- and post-testing. The study sample represented by (10) female students. This means that researchers used the method of comprehensive inventory of all members of society.

Results: The researchers attributed the difference between pre-and post-tests results of the study group to the positive effect of educational programs that has been applied and worked with all learners.

Conclusions: The educational programs prepared had a clear and effective impact on learning the skills of numerical attack in fencing. In addition, students acquired the ability to find appropriate solutions for educational situations, because the model had developed their abilities of connection, integration, thinking and perception which helped them keep more information.

Keywords: Educational programs, model 4MAT, fencing, numerical attack.

Introduction

Any development in areas of life a person seeks access to it must invest all the capabilities that are specialized in this area to reach that development. The ambitions adopted by teachers and specialists in the field of sports to reach the highest levels must be coupled with adoption of modern strategies based on effective methods which provide help and practical thinking that lead to increased interaction between learners and the skills to be learned. The educational goal of learners in the various sports is mastering technical performance of those games and when the teacher of a particular method must be appropriate to summarize and to focus on the learner in the light of his activity [1].

The concept of learning is very comprehensive and extensive, which is the basis of the educational process. Almost no pattern of human behavior that lacks some kind of learning has been addressed by many researchers and in line with the scientific trends and fields in which they deal with the definition of concepts based on the principles of psychology.

The idea of the McCarthy learning cycle originated in 1979 when he decided to develop an educational system that works with all learners. As a result of the intensive efforts in researching the Format model, this model works on the natural learning cycle that each

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learner receives. It describes the process that each learner gets when he tries to understand himself and the world around him. He interprets meanings, creates relationships, identifies problems, develops solutions, provides alternatives, evaluates and makes decisions. Awareness of the experience and information processing experience represent a learning process that includes awareness of new experience and then being processed.

The game of fencing, like any other sport, requires appropriate teaching methods to teach its movements, especially the defensive and offensive ones, because they are the basic structure of this game. It is not possible to stand on these methods unless they are tried and the best ones are chosen depending on the results reached in order to teach students so that they attain higher levels and become better in the skillful performance of these movements [2].

Hence, the aim of current study was to prepare an educational program according to the educational model is the format system which is through the use of all energies of the brain.

Objectives of the study were:

1. Preparation of an educational programs based on format model in learning the skills of numerical attack in fencing sport.
2. To identify the impact of the educational method according to format model in learning the skills of numerical attack in fencing sport.

Hypothesis: The educational method according to the Format model has a positive effect on learning the skills of numerical attack by students in fencing in pre- and post-tests.

Information gathering methods included:

1. Observation.
2. Personal interviews.
3. A questionnaire to survey the opinions of experts and specialists to identify the most important tests of the attacks (complex and simple).
4. A form for measuring and evaluating the technical performance of the complex and simple attack movements.
5. Thinking measurement form.

Instruments and tools used in research:

1. A laptop computer type (hp) number (1).
2. A video camera type Sony number (2).
5. German duel mask made of (10).
7. Colored adhesive tapes number 4 Role.
8. Different explanatory posters with different measurements.
9. Laser tablets number (10).
10. Data show No. 1 Chinese-made.
11. Screen display type Samsung number (2).

Characterization of technical performance of the skills of numerical attack [3]: According to the legal conditions of the game each student was given three attempts to try the skill of numerical attack. The objective of the test was to know the level of technical performance. The tools used were the weapon of the legal Shish, camera video number (2), whistle and drawing scale. The test was performed as follows: The student takes the laboratory to take the status (standby) carrying the weapon and at an appropriate distance from the teacher, and when the whistle is heard the student performs the required skill.

In order to evaluate the performance, the participant was given three attempts. The experts evaluate the performance of each attempt. Each expert gives a specific score for each attempt, and then we collect these scores and the mathematical mean was obtained for their grades.
Pre-Tests: After implementation of two modules within the educational programs, which included explanation of the movements of the composite attack (numerical) and the live presentation by the school and the performance of students, the pre technical performance tests were conducted on Tuesday, 26/2/2019 in the closed hall of the Faculty of Education Physical and Mathematical Sciences/University of Karbala at 12 noon. The researchers have proven the conditions related to the test in terms of time and space, tools used and the method of implementation and the working team to help provide them in the post-test.

Educational programs: Through the study of scientific sources and previous studies and ongoing discussions with supervisors, experts and researchers in the field of fencing, an educational program was developed according to the tendencies and desires of learners and within the privacy of Format model methods. The educational program included a set of learning exercises for learning the skills studied.

Feedback was adopted during performance of the skills. Brainstorming questions were used during the application of educational programs. The number of educational units of the educational program was 8 units. The implementation of the educational programs had taken 10 weeks at a rate of one educational unit in the week. The researchers used a series of skillful exercises that were aimed at learning and mastering skills through diversity. The educational program has been applied to the experimental group in a practical way in which learning was done through experimentation and work versus learning, by thinking and creating a clear picture of the strategy of play through explanation, clarification and video presentation.

Post-Test: After completion of the application of the educational programs to the experimental group and the approach adopted by the teacher of the control group, the researchers carried out tests of the dimension of full thought on (2/5/2019), and all members of the sample of the basic experience of experimental and control groups within the same conditions and specifications, Moreover, data were obtained and recorded in the forms for preparation to be processed statistically. The technical performance of the experimental and control groups was assessed in the same way as in the pre-tests.

Results

Table 1: Mean and the standard deviation values of the pre- and post-tests of one group

<table>
<thead>
<tr>
<th>Type of skill</th>
<th>Pre-test</th>
<th>Post-test</th>
<th>(t) value</th>
<th>Level of significance</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td></td>
</tr>
<tr>
<td>The skill of numerical attack</td>
<td>1.6111</td>
<td>1.036</td>
<td>7.166</td>
<td>0.985</td>
<td>22.628</td>
</tr>
</tbody>
</table>

Discussion of the pre- and post-tests' results of study group: The researchers attributed the difference between pre-and post-tests results of the study group to the positive effect of educational programs that has been applied and worked with all learners. As a result of extensive research efforts [4], the format model has been developed. It got to every learner when he tries to understand himself and the world around him, interprets meanings, makes relationships, identifies problems, develops solutions, provides alternatives, evaluates and makes decisions [5].

Figure 1: Mean and standard deviations values of the experimental group with the experimental design of one sample
The explanation, presentation, guidance, instructions and nourishment have had a profound impact on the evolution of the experimental group in the post-test \[6\]. The researchers attributed that to the use of the format model that provides freedom of thought in performance and implementation through the use of this model \[7\] where the learner activated to produce new ideas and creativity in performance. It is learning through connecting and merging the orientation towards facts and concepts in return abstract thinking and orientation towards facts and theories and beyond the meaning so that the learner is able to overcome greater difficulties faced and to make appropriate decisions \[8\].

**Conclusions**

1. The educational programs prepared had a clear and effective impact on learning the skills of numerical attack in fencing.

2. Students acquired the ability to find appropriate solutions for educational situations, because the model had developed their abilities of connection, integration, thinking and perception which helped them keep more information.

**Ethical Clearance:** The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

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**Source of Funding:** Self-funding.

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Efficacy of Nano-Hydroxyapatite on Enamel Surface of Primary Teeth Following Exposure to Liquid Medications in Comparison with Sodium Fluoride: An in Vitro Study

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ABSTRACT

Background: Demineralization initiated by acids is occasionally resulting from the intake of liquid medicines used to treat children on regular basis. Fluoride and nano-Hydroxyapatite has been broadly utilized in remineralization of erosive lesions.

Aim: To compare the efficacy of nano-Hydroxyapatite with sodium fluoride on enamel surface of primary teeth after exposure to pediatric liquid medications by investigating the topographical and weight changes.

Materials and Method: Thirty posterior primary teeth were extracted from (3-6) years old children. They were assigned to three groups: (A) nano-Hydroxyapatite, (B) sodium fluoride, and (C) artificial saliva (control). Groups A and B were exposed to pediatric liquid medications including: (Cephalexin and ParAzar). Afterwards, they were treated with 1% nano-Hydroxyapatite suspension and 2% sodium fluoride solution. The samples were examined for changes in surface roughness and weight using Atomic Force Microscope and an electronic balance respectively; at three periods: baseline, after 7 days of exposure to liquid medications, and 1 day of exposure to treatment agents.

Results: Group A showed a highly-significant difference in roughness for subgroups treated with nano-Hydroxyapatite. A highly-significant increase in roughness was noticed for Cephalexin between baseline and treatment periods and a highly-significant reduction between baseline and ParAzar exposure periods. Regarding weight, a highly-significant difference was found for Cephalexin, and a significant difference for ParAzar after nano-Hydroxyapatite treatment.

Conclusion: 1% nano-hydroxyapatite suspension had the greatest remineralization efficacy when compared with 2% sodium fluoride solution.

Keywords: Nano-Hydroxyapatite, Sodium Fluoride, Cephalexin, ParAzar, Atomic Force Microscope.

Introduction

Saliva plays an important role in promoting enamel remineralization. However, acidic conditions contribute to demineralization[1].

Antibiotics and analgesics are routinely used by children. But, different factors such as acidic formulations, recurrent ingestion and between meals utilization might increase the chance of medication-prompted dental erosion [2, 3]. Primary teeth subjected to various medicinal liquids could have enamel weight loss due to lost minerals [4]. Diagnostic approaches like Atomic Force Microscopy (AFM) can offer a topographic image and surface texture analysis [5].

Sodium fluoride (NaF) was recognized to be an efficient remineralizing agent as it promotes fluorapatite development [6]. Hydroxyapatite (HAP) [Ca10(PO4)6(OH)2] is a natural mineral component, constituting 30% to 70% of the mass of bones and teeth respectively [7]. It is bio-active, biocompatible, osteoconductive, non-toxic and non-inflammatory [8].

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Nano-hydroxyapatite (n-HAP) in dental field is applied as a filler, repairing little holes in tooth structure owing to the minute particles that form it\(^9\). It has higher bioactivity, solubility and surface energy than hydroxyapatite\(^{10}\).

So, the purpose of this study was to compare the effect of nano-hydroxyapatite with sodium fluoride on primary enamel surface after exposure to pediatric liquid medications (PLMs). It was hypothesized that there is no difference between the effects of the two treatment agents.

**Materials and Method**

This experimental in vitro study was conducted using 30 posterior primary teeth extracted for different reasons from (3-6) years old children at the Department of Pediatric and Preventive Dentistry/College of Dentistry/University of Baghdad, having at least one surface free of caries, fillings and cracks. The samples were prepared using micro motor handpiece at 4*4 mm width and 2 mm thickness.

All the sample surfaces were coated with an adhesive tape except for the surface that was tested. Then, they were divided into three groups (2 experimental groups and a control group) and each experimental group was divided into 2 subgroups with 6 teeth each: one was exposed to Cephalexin (as monohydrate -250 mg/5 ml) and the other was exposed ParAzar (Paracetamol 120 mg/5 ml).

Experimental samples were agitated in PLMs every 8 hours 3 times a day for 1 minute up to 7 days\(^2\). Artificial saliva was used to store the samples to imitate the nature of the oral cavity. It was changed every day to protect ionic balance and preserve pH\(^{11,12}\).

Finally, study groups were exposed to the following:

**Group A**: 12 teeth were treated with 1% n-HAP suspension once for 5 sec.

**Group B**: 12 teeth were treated with 2% NaF solution once for 1 min.

**Group C (control)**: 6 teeth were stored in artificial saliva for the whole study.

The samples were attached to a double sided tape and tested individually by Atomic Force Microscope (AFM, NT-MDT, Ntegra/Russian Federation).

The AFM used the tapping mode to display topographic images of surfaces and register average roughness (Ra) changes in nanometers (nm)\(^{13}\).

The weight (W) changes were measured in gram (0.0000 g) by using an electronic balance (A&D HR-200 Balance, Japan). Prior to weighing, the adhesive tape was removed and the teeth were dried by an air syringe.

Ra and W values were calculated at baseline, after 7-days of exposure to PLMs and after 1-day of treatment.

Statistical analysis was performed using SPSS software (version 21, Chicago, USA). Shapiro-Wilk test was used to test the data distribution normality. Average roughness and weight data were compared using 2-way repeated measurements analysis of variance (RM-ANOVA), Post Hoc Bonferroni test, and Paired T-test statistics. The level of significance was set at probability value of 0.05.

**Results**

Shapiro-Wilk test confirmed that the data were normally distributed. On comparing Ra values using 2-way RM-ANOVA, there was a highly-significant difference (P=0.004) in group A. While there were non-significant differences in group B (Figure 1).

Post Hoc Bonferroni test for group A revealed that there was a highly-significant difference (P=0.003) in mean Ra value for Cephalexin subgroup between baseline period and treatment period; denoting increased surface roughness after using n-HAP, and a highly-significant difference (P=0.002) between baseline period and after 7 days of exposure to ParAzar denoting decreased surface roughness after drug usage, as noticed in (table 1).

There was a highly-significant difference (P=0.001) in weight values of group A for subgroup exposed to Cephalexin, and a significant difference (P= 0.047) in ParAzar subgroup. The lowest mean values were recorded in 7-days exposure period denoting decreased weight from baseline; which increased again to be near the baseline values after treatment with n-HAP. There were non-significant differences in group B (Table 2).

Using Bonferroni test as a Post Hoc for group A showed that there was a highly-significant difference (P=0.001) and significant difference (P=0.037) in mean weight values between 1-day n-HAP treatment period and after 7 days of exposure to Cephalexin and ParAzar respectively (table 3).
Paired t-test showed that there were no significant differences in group C regarding weight and average roughness (table 4).

![Figure 1: Average roughness of group A and B compared among subgroups at different periods](image)

Ra- Average roughness, Ra0- Baseline Ra, Ra7- Ra after 7 days of exposure to PLMs, Ra1t- Ra after 1 day of treatment with n-HAP and NaF.

### Table 1: Pairwise Comparison of roughness average for group A between subgroups at different periods

<table>
<thead>
<tr>
<th>Measure: Ra</th>
<th>Groups</th>
<th>Subgroups</th>
<th>(I) time</th>
<th>(J) time</th>
<th>Mean Difference (I-J)</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>Cephalexin</td>
<td>Ra0</td>
<td>Ra1t</td>
<td>-31.793</td>
<td>0.003 **</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ra0</td>
<td>Ra7</td>
<td>-3.828</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ra1t</td>
<td>Ra7</td>
<td>27.965</td>
<td>0.068</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ParAzar</td>
<td>Ra0</td>
<td>Ra1t</td>
<td>1.178</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ra0</td>
<td>Ra7</td>
<td>29.094</td>
<td>0.002 **</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ra1t</td>
<td>Ra7</td>
<td>27.916</td>
<td>0.068</td>
</tr>
</tbody>
</table>

Ra- Average roughness, Ra0- Baseline Ra, Ra7- Ra after 7 days of exposure to PLMs, Ra1t- Ra after 1 day of treatment with n-HAP, ** Highly-Significant.

### Table 2: Comparison of weight changes for group A & B among subgroups

<table>
<thead>
<tr>
<th>Groups</th>
<th>Subgroups</th>
<th>W0 Mean</th>
<th>W0 SD</th>
<th>W7 Mean</th>
<th>W7 SD</th>
<th>W1t Mean</th>
<th>W1t SD</th>
<th>F</th>
<th>P- value</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Cephalexin</td>
<td>.07632</td>
<td>.00882</td>
<td>.07617</td>
<td>.00873</td>
<td>.07630</td>
<td>.00876</td>
<td>9.932</td>
<td>0.001 **</td>
</tr>
<tr>
<td></td>
<td>ParAzar</td>
<td>.08042</td>
<td>.00983</td>
<td>.08027</td>
<td>.00973</td>
<td>.08035</td>
<td>.00979</td>
<td>3.616</td>
<td>0.047 *</td>
</tr>
</tbody>
</table>
Con This research revealed that n-HAP treated group has showed a highly-significant and a significant increase in average roughness (Ra) and weight (W) values of demineralized samples in comparison to NaF treated group; denoting remineralization success. Therefore, the null hypothesis was rejected. Moreover, the highly-significant and the significant decrease in Ra and W values respectively following exposure ParAzar can be explained by enamel degradation in which rough areas forming surface peaks are removed by demineralization caused by PLMs; leading to dissolution, in addition to the remineralization potential of artificial saliva which contains various ions that fill up enamel valleys; thus, creating a smoother surface.

The n-HAP has biocompatible and bioactive properties that offer a defensive effect against enamel erosion. It gives a large amount of calcium and
phosphate ions, and can drive existing crystals to grow leaving a rougher surface, which can be translated by the way that n-HAP crystals caused the deposition of a new apatitic mineral coating; that increasingly fills enamel surface defects [20, 21]. Moreover, n-HAP group formed uniform cluster shaped crystals overlying enamel pores [10], which is consistent with the AFM images of this study.

Another study conducted by Malik and Ghaib in 2017 postulated that enamel remineralization with 10% n-HAP solution was able to increase the mineral content of enamel in order to resist the destructive forces subjected to enamel while removing the orthodontic adhesive [22]; which provide a confirmation of the efficacy of n-HAP suspension in supplying enamel surface with sufficient minerals to form a layer of protection against the demineralization assaults.

Nevertheless; the results of De Freitas et al. in 2011 disagreed with the results of the current study, they reported that polishing with a n-HAP tooth paste after dental bleaching have decreased the roughness of enamel surface. This outcome might be due to the ability of n-HAP to be deposited in the defects and cavities of enamel, promoting smoothness [23]. This might be due to difference in demineralization method which is bleaching by strong acids, also the application time, and consistencies used for treatment agents.

The results of this study also stated that there were non-significant differences in group B. Surface roughness was decreased and weight was slightly increased to near baseline values. These results came in agreement with other study that found a decrease in Ra value following the use of a fluoridated mouthwash and this might be attributed to the reaction of calcium and phosphate ions with calcium fluoride (CaF2) formed after its use. Thus, fluorapatite was formed; which prevents demineralization and enhances remineralization [11]. Fluoride prevents mineral loss as it leads to the establishment of a fluoride reservoir on enamel surface owing to CaF2 deposition. This layer affords extra minerals to be disintegrated throughout acid attack, thus obstructing demineralization [24]. The benefits of 2% sodium fluoride on reducing surface roughness following bleaching have been also investigated by other researchers [23].

On the other hand, these results disagreed with other study that found a little impact of NaF on decreasing roughness and mineral loss, since it has a high pH and can diminish the concentration of fluoride on enamel and the deposition of CaF2 layer. Accordingly, the higher the fluoride concentration and the lower the pH, the bigger its efficacy in inhibiting erosion [25].

The non-significant differences in (Ra) and (W) values for the control group is in accordance with a study reported that no surface protective layer was noticed in the control group other than trivial crystals [10]; which was caused by the remineralization effect of artificial saliva that was selected to store the samples.

Conclusion

Depending on the findings of this in vitro study, one can conclude that nano-hydroxyapatite suspension has the highest remineralization capability of primary enamel surface following exposure to PLMs, and might be recommended as a professional treatment agent when compared with sodium fluoride solution.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

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REFERENCES


Effect of Orthodontic Force on Salivary Levels of Lactate Dehydrogenase Enzyme

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ABSTRACT

Orthodontic tooth movement is characterized by tissue reactions, which consist of an inflammatory response in periodontal ligament and followed by bone remodeling in the periodontium depending on the forces applied. These processes trigger the secretion of various proteins and enzymes into the saliva. The purpose of this study was to evaluate the activity of the lactate dehydrogenase (LDH) in saliva during orthodontic tooth movement using different magnitude of continuous orthodontic forces.

Thirty orthodontic patients (12 males and 18 females) with ages 17-23 years with class II division I malocclusion all requiring bilateral maxillary first premolar extractions. Those patients were randomly divided into 3 groups according to the magnitude of the force application (40, 60 and 80gm). A sectional fixed appliance was bonded and designed to give labial force to the maxillary first premolar for 3 weeks. Unstimulated saliva was collected from the patients before force application, then 1 hour after force application, followed by 1, 7, 14 and 21 days. Salivary levels of LDH were measured using spectrophotometer and compared with the baseline level.

The results revealed that LDH enzyme level increased with increasing magnitude of orthodontic force (from 40 to 80gm). This was statistically significant after 1 hour, 1, 7, 14 and 21 days of force application. The LDH significantly increased from baseline after 1 hour and peaked at 21 days for all the 3 force levels.

The LDH level reflect the biological activity that takes place in the periodontium during orthodontic tooth movement, and therefore it can be used as a diagnostic tool for monitoring of correct orthodontic tooth movement in clinical practice.

Keywords: Lactate dehydrogenase, orthodontics tooth movement, orthodontic forces.

Introduction

Orthodontic tooth movement constitutes a highly complex process defined as an adaptive biological response to interference in the physiological equilibrium in the dentofacial structures by an externally applied force (¹). The host response to orthodontic force has been described as an aseptically and transitory inflammation that mainly alters the vascularity and blood flow of periodontal ligament, resulting in local synthesis and release of different mediators involved in alveolar bone remodeling (²,³).

Progress of tooth movement can be classified into four stages, that is, activation, resorption, reversal, and restructuring of new bones (⁴). An early response to orthodontic force is acute inflammation followed by bone resorption and formation. The resorption and formation of bone are due to increments of activities of osteoclast and osteoblast cells (⁵). In order to monitor orthodontic tooth movement non-invasively in human beings, changes have been examined in the profile and levels of various enzymes, cytokines, growth factors, biomarkers and proteoglycans in gingival crevicular fluid and saliva.

Among those components that change and response to orthodontic force are alkaline phosphatase (ALP), tartrate resistance acid phosphatase (TRAP), lactate dehydrogenase (LDH) and aspartate amino transferase.
(AST) (6,7). Application of continuous force produces bone resorption and formation at pressure area with increased activities of both ALP and LDH (8,9).

Although the clinical and radiographic follow-up examination remains the basis for patient’s evaluation, analysis of saliva, a fluid that contains local and systemically derived markers, may offer the basis for a phase-specific screening of orthodontic tooth movement (10). The increase in osteoblastic activity during bone formation will be accompanied by an increased expression of ALP (11). To investigate the bone remodeling pattern based on ALP activity during an orthodontic treatment, body fluids such as saliva can be used (5).

The identification of salivary biomarkers and its use as a diagnostic tool has many advantages. It is much easier to collect, sufficient quantities can easily obtained for analysis and no specific laboratory devices are necessary. The collection of saliva is also far less invasive compared to other body fluids such as gingival crevicular fluid and serum (12).

Materials and Method

Subject selection: Thirty patients (12 males and 18 females) were included in this study. They were attending the postgraduate clinic of the Orthodontic Department in the College of Dentistry/University of Baghdad. All patients had Angle’s Class II division 1 malocclusion with no or mild crowding (about 2-3mm). They all required bilateral extraction of maxillary first premolar teeth as part of their orthodontic treatment. Inclusion criteria was age of 17-23 years, good general health with no history of any systemic disease, no use of anti-inflammatory drugs before and during the study, no history of any oral habit, good oral hygiene, good periodontal health (probing depth values not exceeding 3 mm in the whole dentition and no radiographic evidence of periodontal bone loss seen in dental panoramic tomography. Subjects were examined clinically, 2 weeks before appliance placement where they underwent a session of accurate ultrasonic scaling and polishing and received oral hygiene instructions. They were randomly divided into 3 groups according to magnitude of force application (40, 60 and 80gm).

Placement of Orthodontic appliance: The length of sectional arch wire used was about 50 mm which consist of two parts: The first part was 0.018 inch round stainless steel arch wire with 35mm length, 30mm horizontal end with included non-traumatic coil, the remaining 5mm vertical apically directed. The second part was 0.021x0.025 inch rectangular stainless steel straight wire with length 15mm, 10mm horizontal and 5mm vertical apically directed. The two vertical ends of both wires were welded by welding device in the lab, and act as stopper in front of molar tube to avoid unwanted movements. The first part (round) was inserted in the premolar bracket while the second part (rectangular) was inserted into the molar tube.

Orthodontic brackets and molar tubes were bonded to enamel surface of right and left maxillary first premolars and first molar respectively, using after acid-etching the enamel of teeth. When the bonding material was completely set, the sectional arch wire was checked inside the patient mouth with the vertical arm in touch with the mesial aspect of the molar tube. The arch wire was marked mesial to the first premolar bracket. Then it was removed and a non-traumatic end was made mesially to the first premolar. After reinsertion, cinch back was made distal to the first molar. The arch wire was bent just mesial to the molar tube in a labial direction so that when ligated to the premolar bracket it will apply labial force on the tooth. This force was measured by a strain gauge. The arch wire was ligated to the premolar bracket by a stainless steel ligature.

Saliva Collection: The patient was instructed not to eat or drink for at least 1 hour before collection of the sample. The patient was asked to sit in a comfortable position and spit or drool out unstimulated saliva into sterile plane plastic test tube for 10 minutes giving about 5 ml of unstimulated whole saliva and put in a cooling box to stop the growth of bacteria.

The samples were taken from each patient immediately prior to fitting the orthodontic appliance at baseline, then after 1 hour, 1 day, 7 days, 14 days and 21 days after force application to the teeth.

Biochemical Assay: After collection, the whole saliva was clarified by centrifugation for 20 minutes at 3000 RPM to remove insoluble material by using centrifuge machine. The supernatants saliva were collected by pipette into eppendorf tubes and frozen at -20° C until biochemical analysis.

The analyses of samples were done in the laboratories of the Poison Center of the Specialized
Surgeries Hospital to measure the concentrate of LDH in saliva by Colorimetric method (spectrophotometrically) at constant temperature of 37°C, with less than 0.05°C fluctuation. The test for serum LDH enzyme was done by the use of commercial kit manufactured by Linear Chemicals, Spain.

**Results**

The LDH level under different continuous orthodontic force levels in the 3 groups at the 6 time intervals from baseline to 21 days are shown in table 1.

**Effect of force magnitude:** At baseline, where there was no orthodontic force applied to the teeth, the LDH level showed a non-significant difference (p˃0.05) between the groups (Table 2). While, after 1 hour and 1, 7, 14 and 21 days of force application, the level of LDH varied among the groups with highly significant difference (p≤0.01) in which group III readings were the highest followed by group II reading, while group I showed the least LDH levels (Fig. 1).

LSD test also showed a highly significant difference (p≤0.01) between groups I and II, and groups I and III and groups II and III for the five time intervals (Table 3).

**Effect of time duration of force:** In each group, with time the LDH level continued to increase and peaked at 21 days (Table 1 and Fig. 1). These differences were shown to be highly significant for the 3 groups (p≤0.01) (Table 3-4).

In each group, LSD test showed a highly significant difference (p≤0.01) between the LDH levels at baseline, 1 hour, 1 day, 7 days, 14 days and 21 days after force application (Table 5).

**Table 1: Descriptive statistics of the salivary enzyme LDH level IU/L**

<table>
<thead>
<tr>
<th>Duration</th>
<th>Group I (40gm)</th>
<th>Group II (60gm)</th>
<th>Group III (80gm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>S.D.</td>
<td>Mean</td>
</tr>
<tr>
<td>Baseline</td>
<td>20.24</td>
<td>3.30</td>
<td>21.86</td>
</tr>
<tr>
<td>1 hr</td>
<td>28.33</td>
<td>3.30</td>
<td>34.00</td>
</tr>
<tr>
<td>1 day</td>
<td>32.78</td>
<td>2.99</td>
<td>38.06</td>
</tr>
<tr>
<td>7 days</td>
<td>39.29</td>
<td>2.60</td>
<td>46.15</td>
</tr>
<tr>
<td>14 days</td>
<td>47.86</td>
<td>3.03</td>
<td>53.78</td>
</tr>
<tr>
<td>21 days</td>
<td>51.45</td>
<td>1.70</td>
<td>62.39</td>
</tr>
</tbody>
</table>

**Table 2: Difference between the groups for LDH levels (IU/L) at the 6 time intervals using ANOVA test**

<table>
<thead>
<tr>
<th>Duration</th>
<th>F test</th>
<th>d.f.</th>
<th>P value</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>1.11</td>
<td>29</td>
<td>0.343</td>
<td>NS</td>
</tr>
<tr>
<td>1 hr</td>
<td>32.89</td>
<td>29</td>
<td>0.000</td>
<td>HS</td>
</tr>
<tr>
<td>1 day</td>
<td>132.52</td>
<td>29</td>
<td>0.000</td>
<td>HS</td>
</tr>
<tr>
<td>7 days</td>
<td>65.23</td>
<td>29</td>
<td>0.000</td>
<td>HS</td>
</tr>
<tr>
<td>14 days</td>
<td>111.20</td>
<td>29</td>
<td>0.000</td>
<td>HS</td>
</tr>
<tr>
<td>21 days</td>
<td>181.25</td>
<td>29</td>
<td>0.000</td>
<td>HS</td>
</tr>
</tbody>
</table>

NS: Non-significant (p˃0.05); HS: Highly significant (p≤0.01)

**Table 3: Difference between the groups for LDH levels (IU/L) at the five time intervals using LSD test**

<table>
<thead>
<tr>
<th>Duration</th>
<th>Groups</th>
<th>Mean Difference</th>
<th>S.E.</th>
<th>P-value</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 hour</td>
<td>I</td>
<td>II</td>
<td>-5.67</td>
<td>1.10</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>III</td>
<td>-8.84</td>
<td>1.10</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>II</td>
<td>III</td>
<td>-3.17</td>
<td>1.10</td>
<td>0.008</td>
</tr>
<tr>
<td>1 days</td>
<td>I</td>
<td>II</td>
<td>-5.28</td>
<td>1.04</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>III</td>
<td>-16.59</td>
<td>1.04</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>II</td>
<td>III</td>
<td>-11.32</td>
<td>1.04</td>
<td>0.000</td>
</tr>
</tbody>
</table>
Table 4: Difference between the 6 time intervals (IU/L) for LDH levels for the three groups using ANOVA test

<table>
<thead>
<tr>
<th>Groups</th>
<th>F-test</th>
<th>d.f.</th>
<th>p-value</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group I (40 mg)</td>
<td>170.69</td>
<td>59</td>
<td>0.000</td>
<td>HS</td>
</tr>
<tr>
<td>Group II (60 mg)</td>
<td>447.35</td>
<td>59</td>
<td>0.000</td>
<td>HS</td>
</tr>
<tr>
<td>Group III (80 mg)</td>
<td>355.17</td>
<td>59</td>
<td>0.000</td>
<td>HS</td>
</tr>
</tbody>
</table>

HS: Highly significant (p≤0.01)

Table 5: Difference between the LDH levels (IU/L) between consecutive time intervals using LSD test

<table>
<thead>
<tr>
<th>Duration</th>
<th>Group I P value</th>
<th>Sig.</th>
<th>Group II P value</th>
<th>Sig.</th>
<th>Group III P value</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>0.000</td>
<td>HS</td>
<td>0.000</td>
<td>HS</td>
<td>0.000</td>
<td>HS</td>
</tr>
<tr>
<td>1 hr</td>
<td>0.001</td>
<td>HS</td>
<td>0.000</td>
<td>HS</td>
<td>0.000</td>
<td>HS</td>
</tr>
<tr>
<td>1 day</td>
<td>0.000</td>
<td>HS</td>
<td>0.000</td>
<td>HS</td>
<td>0.000</td>
<td>HS</td>
</tr>
<tr>
<td>7 days</td>
<td>0.000</td>
<td>HS</td>
<td>0.000</td>
<td>HS</td>
<td>0.000</td>
<td>HS</td>
</tr>
<tr>
<td>14 days</td>
<td>0.007</td>
<td>HS</td>
<td>0.000</td>
<td>HS</td>
<td>0.000</td>
<td>HS</td>
</tr>
</tbody>
</table>

HS: Highly significant (p≤0.01)

Discussion

Orthodontics is based on the application of prolonged forces on teeth. Various degrees of force magnitude, frequency, and duration of orthodontic treatment exert a great influence on the surrounding tissue reaction and bone modeling. Interaction between bone formation and resorption during tooth movement results in the release of various biochemical or cellular mediators that can be identified as potential biomarkers (13).

Effect of time: The findings of this study revealed that the level of LDH in the 3 groups of different force levels significantly increased after 1 hour to 21 days of orthodontic force application. This can be attributed to periodontal changes such as tissue resorption or destruction and is in agreement with the results of previous studies (14-21).

Effect of force: LDH, an enzyme normally limited to the cytoplasm of cells, which is released extracellularly only after cell death, thus it is related to cell necrosis and tissue breakdown. In the periodontal ligament, hyalinization of the most compressed area induced by compressive forces. This hyaline zone is described as an area of focal aseptic necrosis persisting in the pressure zone that resists degradation, depending on the magnitude of the force that resists degradation, persists in the pressure zone, and depends on the magnitude of the force.

The findings of the present study revealed that the level of LDH in the saliva increased with magnitude
of the force, therefore, LDH could be recognized as a potential marker for monitoring periodontal metabolism and it is significantly related to tissue destruction. This is confirmed by the findings of previous studies\textsuperscript{14,17,22-24}.

**Conclusion**

The salivary LDH can be proposed as a sensitive marker of the periodontal metabolism changes during orthodontic tooth movement. The enzyme LDH has the potential to be used as molecular markers to monitor the progression of orthodontic treatment and its activities can be successfully measured in saliva with orthodontic therapy.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding

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Effect of Staining and Brushing on the Surface Roughness of White Spot Lesions Treated with Resin Infiltration Technique

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ABSTRACT

The aim of this study was to investigate the surface roughness of resin infiltration (RI) on the artificial white spot lesions (WSLs) after being stained with discoloring agents and after brushing.

WSLs were produced on the buccal surface of 48 tooth samples. Each WSL received ICON treatment (RI). The samples were randomly divided into three main groups (n=16): group A, distilled water; group B, tea; group C, coffee. Each group was sub-grouped (n=8) to non-brushing (1) and brushing (2). The specimens were subjected to a discoloring material for one week, then mechanical brushing for subgroups 2 was carried out. The surface roughness was measured at the baseline, after production of WSLs, after resin treatment, after discoloration, and after the brushing stage. Results were analyzed with repeated measure two-way ANOVA and Bonferroni test.

The surface roughness of WSLs decreased with highly significant value after treatment with RI, the roughness of RI was acceptable and there is no statistical difference with baseline stage.

The surface roughness of infiltrated WSLs was acceptable but higher than that at the baseline. Resin infiltration had a highly staining ability that affect the surface roughness but can be significantly reduced by brushing.

Keywords: white spot lesions, resin infiltration, surface roughness.

Introduction

Early enamel decalcification, demonstrates itself as white spot lesions (WSLs), particularly when detected in the esthetic area that interfere with aesthetic.. Demineralization of enamel resulted in evident change in the appearance of tooth enamel, it begins to lose its gloss and shine and take an opaque and chalky-white appearance (¹).

A WSL shows an apparently intact surface layer, followed beneath by the more porous lesion body, which give a chalky opaque appearance, as light is scattered mainly within the lesion body. Scattering is caused at interfaces between materials with different refractive indices as enamel, water, and air (²).

Sometimes WSLs naturally remineralize; otherwise several ways of remineralization have been recommended such as using saliva, mouth rinses, and toothpastes contains increased fluoride concentrations. Casein phosphopeptide amorphous calcium phosphate, and calcium sodium phosphosilicate glass, micro-abrasion and resin infiltration have also been suggested to increase remineralization (³).

Caries infiltration is a novel treatment option for WSLs and might link the gap between non-operative and operative modalities It is a technology that infiltrates, reinforces and stabilizes decalcified enamel, without drilling or sacrificing sound tooth structure It has also been shown to hinder caries progression in lesions that are too advanced for fluoride therapy (⁴), hence ICON ® resin infiltration is selected as the main material in the present study.

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Email: silvercanines@gmail.com
Surface roughness is one reason for exterior discoloration, and it is closely associated to the type of the resinous material, polishing and finishing systems used, type of discoloring beverages and the pH of the media, hence ICON not required finishing and polishing steps, this may be led to expect to see some roughness in the surface of infiltrated lesions (5, 6).

The aim of infiltrating WSLs with Icon is to have highly esthetic results, not just directly after treatment but for long-term effect. However, no study conducts the effect of staining agents for long period of time and the effect of brushing after discoloring agent with beverages, such as coffee or tea on surface roughness.

The aim of this study was to investigate the surface roughness of resin infiltration (RI) on the artificial white spot lesions (WSLs) after treatment with discoloring agents and after mechanical brushing simulation.

**Materials and Method**

Forty eight sound permanent premolar teeth were collected after surgical extraction for orthodontic purposes then cleaned and stored in 0.1% thymol solution until use to prevent microorganism growth and dehydration (7). Sample grouping is described in figure (1). The WSL created at the buccal surface of tooth sample. All tooth surfaces of were coated by acid resistant nail varnish gel (essence, UK) except a round shaped area (made by a special sticker) that is larger about (1mm) in diameter than the head of the portable spectrophotometer (5 mm) VITA Easyshade (Zahnfabrik, Switzerland). The adhesive tape sticker is removed when nail varnish coating completed in order to form the required shape that exposed to the demineralization solution. Then the teeth were immersed in the demineralization solution 100ml Methylcellulose gel and covered with filter paper covered by lactic acid 0.1m about 100ml (8).

![Figure 1: Schematic view of the method in multiple stages](image-url)
After seven days of demineralization period WSLs formation obtained and inspected using magnification lens, the demineralization solution placed at room temperature in closed plastic container to prevent dehydration for 7 days; the pH of the demineralization solution monitored by pen-type pH meter (SD Fujian, China) and the solution not changed during the 7 days (9).

ICON application was performed according to the manufacturer’s instructions, samples of groups B and C subjected to tea and coffee respectively for one week and the discoloring material was changed every day (10).

Brushing was accomplished with a special device (figure 2). The machine was set to run with a horizontal path of 3.8 cm, applying a 200g load at 356 stroke per minute for 100 minutes, corresponding to 2 years of standard tooth brushing. A suspension prepared with 70 ml of distilled water and 70 g of dentifrice of medium abrasiveness (Signal, Spain) were poured into each tray (200 ml) and drain the dentifrice suspension in a regulated means (11).

![Sample Brushing Simulation Device](image)

**Figure 2: Mechanical brushing simulation Device**

At each stage (the baseline, demineralization, resin infiltration, discoloration and brushing simulation) teeth samples were tested for surface roughness using profilometer.

**Surface roughness tester Profilometer device:** Measurement of the surface roughness of the sample teeth by using a calibrated, mechanical 2-D profilometer Surface Roughness Tester, leeb 432A (testcoat, USA) was used to measure the Ra, according to ISO-DIN 4768 for surface roughness measurement, a three measurements in the center of each sample (12).

**Statistical Analysis:** All statistical analyses were performed using SPSS (IBM SPSS Statistics v.22.0; IBM Co, USA), with a significance level of p=0.05. Differences in surface roughness (Ra) were compared among the five stages using repeated measure Two way-ANOVA test and Bonferroni test Dunnett’s post-hoc tests were performed.

**Results**

Profilometer measurement; as in Table (1) shows the mean and standard deviation of the surface roughness of each subgroup at different stages.

**Table 1: RM Two-way ANOVA of the surface roughness of each subgroup at different stages**

<table>
<thead>
<tr>
<th>Subgroup</th>
<th>R0</th>
<th></th>
<th></th>
<th>R2</th>
<th></th>
<th></th>
<th>R3</th>
<th></th>
<th></th>
<th>R4</th>
<th></th>
<th></th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean ± SD</td>
<td>Mean ± SD</td>
<td>Mean ± SD</td>
<td>Mean ± SD</td>
<td>Mean ± SD</td>
<td>Mean ± SD</td>
<td>F</td>
<td>Sig.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A1</td>
<td>.666 ± .126</td>
<td>3.057 ± .314</td>
<td>.916 ± .233</td>
<td>.916 ± .233</td>
<td>.817 ± .235</td>
<td>148.381</td>
<td>.000 HS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B1</td>
<td>.805 ± .149</td>
<td>2.846 ± .355</td>
<td>.973 ± .238</td>
<td>1.860 ± .340</td>
<td>1.854 ± .34</td>
<td>55.640</td>
<td>.000 HS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C1</td>
<td>.684 ± .155</td>
<td>2.746 ± .209</td>
<td>.981 ± .196</td>
<td>1.810 ± .198</td>
<td>1.798 ± .185</td>
<td>55.588</td>
<td>.000 HS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Values are presented as mean, ± standard deviation. Groups: A, distilled water; B, Tea; C, Coffee; non-brushing, 1; brushing, 2, R0, Baseline; R1, after white spot lesion formation; R2, resin infiltration; R3, discoloration; R4, brushing simulation stage.

Bonferroni test for the surface roughness at different stages for each subgroup are performed to show the multiple comparison. WSLs at (R1) increases the surface roughness with a highly significant level when compared to baseline stage (R0) for all subgroups. The effect of ICON at (R2) was a highly significant decrease in the surface roughness of WSLs (R1) for all subgroups. The effect of discoloration materials at (R3) was non-significant for (A) and highly significant for (B) and (C), which means that tea and coffee have a highly significant effect on increasing the surface roughness while DW has no effect on the roughness.

Table 2: Two-way ANOVA RM to determine the effect of discoloration materials in each subgroup on the surface roughness

<table>
<thead>
<tr>
<th>Stages</th>
<th>Subgroups</th>
<th>Groups</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>B</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R0</td>
<td>1</td>
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<td>.126</td>
<td>.805</td>
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<tr>
<td></td>
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<td>.751</td>
</tr>
<tr>
<td>R1</td>
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<td>.314</td>
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<td></td>
<td>2</td>
<td>3.143</td>
<td>.445</td>
<td>2.960</td>
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<tr>
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<td>.233</td>
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<td></td>
<td>2</td>
<td>1.190</td>
<td>.199</td>
<td>1.140</td>
</tr>
<tr>
<td>R3</td>
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<tr>
<td></td>
<td>2</td>
<td>1.190</td>
<td>.199</td>
<td>1.947</td>
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<tr>
<td>R4</td>
<td>1</td>
<td>.905</td>
<td>.235</td>
<td>1.854</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>1.068</td>
<td>.232</td>
<td>1.214</td>
</tr>
</tbody>
</table>

Bonferroni test was made for the roughness at (R3) and (R4) stages to see the source of highly significance change in surface roughness. at (R3) stage, coffee and tea groups increased the surface roughness with a highly significant magnitude in comparison with DW, but it is not significant between coffee and tea. This mean that coffee and tea are responsible for increasing the roughness. For (R4) stage, the same result as mentioned before in (R3). The effect of brushing on the surface roughness at (R4) compared to (R2). For all subgroups it was non-significant, this mean the brushing of tea and coffee subgroups capable of restoring the roughness to comparable values at (R2). To see the difference of surface roughness for the brushing and non-brushing subgroups in the same group RM two-way ANOVA was performed as it prescribed in table (3).

Table 3: RM two-way ANOVA test to determine the effect of brushing on the surface roughness of ICON resin infiltration for each subgroup

<table>
<thead>
<tr>
<th>Groups</th>
<th>Stages</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>R0</td>
<td>.155</td>
<td>.696</td>
</tr>
<tr>
<td></td>
<td>R1</td>
<td>.201</td>
<td>.657</td>
</tr>
<tr>
<td></td>
<td>R2</td>
<td>5.944</td>
<td>.191</td>
</tr>
<tr>
<td></td>
<td>R3</td>
<td>2.914</td>
<td>.095</td>
</tr>
<tr>
<td></td>
<td>R4</td>
<td>1.836</td>
<td>.183</td>
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<tr>
<td></td>
<td>B</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>R0</td>
<td>.429</td>
<td>.516</td>
</tr>
<tr>
<td></td>
<td>R1</td>
<td>.343</td>
<td>.561</td>
</tr>
<tr>
<td></td>
<td>R2</td>
<td>2.223</td>
<td>.143</td>
</tr>
<tr>
<td></td>
<td>R3</td>
<td>.294</td>
<td>.591</td>
</tr>
<tr>
<td></td>
<td>R4</td>
<td>28.298</td>
<td>.000 HS</td>
</tr>
</tbody>
</table>
This mean brushing of tea and coffee. Also, the roughness restored for coffee group with a higher value after brushing than the tea group Table (1).

### Discussion

The surface roughness of the resin-based composite is important in determining the performance of the material as a result of brushing and the relation of dentifrice abrasiveness can interfere in this property and the loss of shine and esthetic is the possible consequence. This occurs due to the increase in surface porosity and loss of material mass, in addition to water sorption, causing color change, an effective technique to check the action of these factors is the simulated brushing method. Infiltration of early lesions with resin infiltrant resulted in a high significantly lower Ra values when compared to the surface roughness after demineralization. However, the roughness of infiltrated lesions was still increased if compared to the roughness of sound enamel at baseline, this finding agreed with the and . The mean roughness of all subgroups at ≤ 1 µm and this range considers an acceptable value.

In recent studies, the effect of resin infiltration on Ra surface roughness of subsurface lesions has been found to be minimal, and improvement of baseline surface roughness by resin infiltration has not been reached. Although stylus profilometry has been reported for the precise determination and reliability of the surface roughness profile. The results revealed the discolored groups (Coffee, tea) have a highly significant increase in the surface roughness when compared to the control group (DW) also when compared to resin infiltration stage. After brushing, the surface roughness of the discolored ICON resin was decreased with highly significant value than that at the discoloration stage but not as at the resin-infiltrated stage (Tables 1), the average surface roughness (Ra) of the resin infiltrated surface decreased for coffee from 1.994µm to 1.182 and for tea from 1.947 to 1.214 µm, also it is a highly significant change but it is still not acceptable range.

### Conclusions

Resin infiltration technique can reduce the surface roughness of WSLs to an acceptable range but not as the sound enamel, ICON resin staining is high, especially when prolong exposure to tea and coffee, these beverages increase the surface roughness of resin, but brushing can significantly reduce it to a reasonable level.

### Suggestions

ICON resin infiltration technique have an acceptable surface roughness, it is recommended to the patients who have infiltrated WSLs not to drink much tea and coffee, also a good oral hygiene measures should be maintained to minimize further discoloration and deterioration.

### Ethical Clearance: The Research Ethical Committee

at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

### Conflict of Interest: The authors declare that they have no conflict of interest.

### Source of Funding: Self-funding

### REFERENCES


Evaluation of Salivary Melatonin and Periodontal Parameters in Type II Diabetic Patients with Chronic Periodontitis: A Comparative Study

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ABSTRACT

Background: Diabetes mellitus and periodontitis are complicated chronic disorders with an established bidirectional relationship. Melatonin (MT) is a neuroendocrine hormone, synthetized by the pineal gland. Melatonin acts as anti-inflammatory and anti-oxidant, thus plays significant role in chronic periodontitis and diabetic mellitus.

Aims of study: to measure and compare salivary melatonin level and periodontal health status among study groups of the chronic periodontitis with and without type II diabetes mellitus and contrast their level with control group.

Materials and Method: Eighty males were selected for the examination, with an age range of (35-55) years. The participants were divided into four groups (each group 20 patients): two diabetic groups (type II): moderately and well controlled both of them with chronic periodontitis and two non-diabetic groups: one of them with chronic periodontitis and the other with healthy periodontium and systemically healthy. Unstimulated salivary samples were collected from all of subjects to measure salivary melatonin (pg/ml) by Enzyme-linked immunosorbent-assay technique. Clinical periodontal parameters included: plaque index, gingival index, probing pocket depth and clinical attachment level had been recorded for all subjects.

Results: The chronic periodontitis with moderately controlled type 2 diabetes mellitus group had worst periodontal health status. The lowest level of salivary melatonin was found in the non-diabetic patients with chronic periodontitis group (25.17) pg/ml. There was a weak connection between clinical periodontal parameters and salivary melatonin.

Conclusion: Patients with moderately controlled type 2 diabetic have more destruction of periodontal tissue than other groups. Salivary melatonin may be helpful biochemical marker for destruction of periodontal tissues and this will provide better chances in early diagnosis and management of diabetes and periodontal diseases.

Keywords: melatonin, diabetes mellitus, chronic periodontitis, clinical periodontal parameters.

Introduction

Diabetes mellitus is a group of metabolic disorders in which hyperglycemia happen because of deformities in insulin activity and/or emission. The most common type of diabetes mellitus is type II DM (1). Periodontitis is a chronic inflammatory disorder, that can lead, if untreated to irreversible damage of supportive tissues (cementum, alveolar bone and periodontal ligament) surrounding the teeth with consequent tooth loss (2,3). There is a close relationship between T2DM and PD that been well recognized in several clinical and epidemiological studies (4,5). Melatonin is a neurohormone that is basically discharged by pineal gland, salivary melatonin represents the percentage of circulating melatonin that

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is not albumin-bound (free melatonin)\(^6\). A recent report demonstrate that there is a correlation between melatonin and PD, the amount of salivary MT may vary based on the extension and seriousness of periodontal disease, the level of salivary MT was lower in the patients with gingivitis compared to healthy persons and patients with severe chronic periodontitis had the least salivary MT level \(^7\). This finding proposes that MT may possess the capacity to fight against infection and inflammation, probably because of its immune-enhancing activity and anti oxidant of free radicals that burst originating from phagocytic cells, like neutrophils and macrophages that migrate to the place of inflammation and cause damage to gingival tissue \(^8\). There is prospect that there may be connection between melatonin and T2DM based on findings that insulin discharge is inversely proportional to plasma melatonin concentration. Melatonin inhibits glucose mediated release of insulin from the pancreatic cells emphasizing its activity in the function of insulin\(^9\).

Because there is no previous investigation on the levels of salivary melatonin in T2DM patients with CP and it is importance in the assessment of periodontal tissue destruction, for these reasons this study was conducted.

**Material and Method**

**The sample and Design of study:** The sample comprises of 80 males with age range of (35-55) years and BMI between 18.50-24.99 Kg/m\(^2\). Subjects collection was begun on November 2018 till February 2019. The T2DM patients were analyzed at specialized center for Endocrinology and Diabetes in Najaf while the control and chronic periodontitis patients were examined at the department of Periodontology, at teaching hospital, in the College of Dentistry, University of Kufa. Every patient in this examination was educated about the aim of investigation and he was free to agree or refuse. Samples of unstimulated saliva were collected from the subjects for biochemical analysis of melatonin level. Then, full investigations of clinical periodontal parameters were done.

**Grouping of the subjects:** The subjects were divided into four groups:

**A. Group 1 (G1)** CP with moderately controlled T2DM: included 20 males with CP and HbA1c (≥7% to 8.9%).

**B. Group 2 (G2)** CP with well controlled T2DM: included 20 males with CP and HbA1c < 7%.

**C. Group 3 (G3)** Systemically healthy with chronic periodontitis: included 20 males. CP in patients was characterized as the presence of minimally four sites with PPD ≥ 4 mm and clinical attachment loss of (1-2) mm or greater \(^10\).

**D. Group 4 (G4)** Systemically healthy with healthy periodontium (Control): included 20 males apparently systemically healthy and with clinically healthy periodontium. This group represents a base line data to salivary melatonin level.

**Inclusion Criteria:** Incorporate just males with T2DM (diabetic for 5 years) on oral hypoglycemic therapy only, at least 20 teeth present and body mass index between 18.5-24.9 Kg/m\(^2\). While, the exclusion criteria included: T1DM and T2DM administering insulin, females, smoking and alcohol consumption, presence of systemic diseases other than T2DM, patients who’ve undergone periodontal treatment or administrated medications in the 3 months before the examination.

**Method**

**Saliva collection:** Unstimulated salivary samples were collected from all the groups at 7:30 am to 9:30 am., then the samples were centrifuged at 4000 rpm for 15 min to isolate the clear supernatant by utilizing a micropipette into Eppendorf tube to be stored at (-20 °C) in a deep freeze until being assessed. All samples were permitted to defreeze and stay at room temperature before being analyzed.

**Clinical periodontal parameters examination:** The periodontal parameters examination was performed after collecting the samples by utilizing the Michigan O-periodontal probe on four surfaces (buccal/labial, mesial, lingual/palatal and distal) of all teeth except 3rd molar. These included: 1. Assessment of Soft Deposits by Plaque Index System (PLI) \(^11\). 2. Assessment of Gingival Inflammation by Gingival Index System (GI) \(^12\). 3. Assessment of Probing Pocket Depth (PPD). 4. Assessment of clinical attachment level (CAL).

**Biochemical analysis:** For the purpose of biochemical investigation of salivary melatonin hormone we utilized salivary melatonin ELISA kit (Elabscience, china).
Descriptive statistics: Include mean and median values and inferential statistics which include Kruskal-Wallis H test, Mann-Whitney U test, T test and Pearson Correlation were used in this study. The level of significance (S) was accepted at P-value < 0.05 and non-significant (NS) at P-value > 0.05.

Results

Clinical Periodontal Parameters: Analysis Persons with G1 demonstrated the highest mean values of clinical periodontal parameters, then persons with G2, after that G3 persons. Inter study groups comparisons regarding all clinical periodontal parameters revealed, highly significant (HS) differences between G1 with both G2 and G3 groups and between G2 with G3 groups (table 1).

Biochemical Parameters Analysis: The biochemical analysis (table 2) of the salivary melatonin revealed that the highest concentration was in G4 (103.93) pg/ml, followed by G2(27.23 ) pg/ml then, G1(27.22 ) pg/ml and finally the G3 (25.17) pg/ml. The outcomes of the comparisons for all pairs of the study and control groups in (table 3) about salivary melatonin levels revealed a highly significant differences between the G4 and all of the study groups. While, a non-significant differences between between G3 group with both G1 and G2, as well as between G1 and G2.

Correlations of Salivary melatonin with Clinical Parameters: As can be seen in (table 4) , melatonin hormone generally, demonstrated non-significant weak correlations with all of the clinical parameters at all groups except for a non-significant moderate positive correlation with probing pocket depth in non-diabetics with chronic periodontitis group.

Discussion

Clinical Periodontal Parameters Analysis: The altered salivary discharge, altered oral flora and increased viscosity of the saliva in diabetic patients (13), moreover, the raised glucose level in the gingival crevicular fluid(GCF) and saliva all contribute to the higher plaque accumulation in the diabetic patients(14). The DM causes and exacerbates gingival inflammatory response to the bacterial plaque which implies that there is change in periodontal tissue response to local factors in diabetic patients. The inflammatory reactions are intensified during bad metabolic control, as the same amount of plaque causes more gingival bleeding in uncontrolled diabetic patients compared to controlled, therefore more plaque accumulation in G1 leads to more gingival inflammation than G2 group (15). The DM alters periodontitis by dys regulating the immune and inflammatory responses in periodontium, thus more cytokines are collected in the gingival tissues. Also, DM causes diminished function of the neutrophils and hyperactivity of monocytes and macrophages which will result in further periodontal destruction (16).

Biochemical Parameters Analysis: In the present study the melatonin level in chronic periodontitis patients were found to be significantly lower when contrasted with the healthy controls, this study was in agreement with several studies(17,18). Additionally, the level of melatonin in type II diabetic patients were observed to be significantly lower when contrasted with the healthy controls, this study was in agreement with numerous investigations (19). The explanation of this decrease that the periodontal disease related with production of free radicals and some of these free radicals originate from phagocytic cells and from periodontopathic bacteria. It has been proposed that
an elevate in both reactive oxygen and nitrogen during periodontal disease is responsible for oxidative damage to periodontal tissues (20). Melatonin may diminish this oxidative stress and thus, participate in the tissue protection. It has been observed that high levels of free radicals can advance raises in the melatonin utilization (19), thus, the reduce of melatonin levels in periodontitis might be the result of by products or mediators that could interfere with melatonin levels (21).

Cutando et al (22) found that salivary melatonin levels change depend on the degree of periodontal disease. As the level of periodontal disease increased, the salivary melatonin level diminished, demonstrating that melatonin may act to protect the body from external bacterial insults. Thus, melatonin could be potentially significant in the treatment of the periodontal diseases. Earlier investigations represented that the pineal glands of diabetic animal model contain less noradrenaline and produce less melatonin in response to noradrenaline. The melatonin synthesis begins with tryptophan and tryptophan deficiency can prompt decreased pineal and plasma melatonin concentrations. Other explanation to diminish melatonin in diabetes that the expression of the melatonin synthesizing enzymes are altered under diabetic conditions and the concentrations of all precursors are diminished in the pineal gland of the diabetic animals (23).

**Correlations of Salivary melatonin with Clinical Parameters:** Salivary melatonin exhibited non-significant weak correlations with all of the clinical parameters except for PPD in chronic periodontitis group where there has been a non-significant moderate positive correlation. These outcomes disagreed with Lodhi et al (24) who demonstrated positively significant connection between salivary melatonin and both GI and PPD in chronic periodontitis group. In periodontitis, polymorphonuclear neutrophils infiltration is a key finding, which delivers high amounts of ROS. In addition, a considerable migration of neutrophil to the gingiva and gingival fluid during periodontitis prompts excessive generation of ROS (24), and elevated amounts of free radicals can advance increases in the utilization of melatonin which lead to diminish in the melatonin concentration because of its free radical scavenging and anti oxidant properties (19).

**Conclusion**

Moderate glycemic control of T2DM introduce further destruction to the periodontium or may be the poor oral hygiene worsens the glycemic control. Both diabetic and chronic periodontitis influence salivary melatonin, thus the concentrations of melatonin could be utilized as indicators for periodontal disease progression in diabetic with chronic periodontitis.

**Table 1: Mean Values of the Clinical Periodontal Parameters and the Intergroup Comparisons between all Pairs of the Study Groups**

<table>
<thead>
<tr>
<th>Periodontal Parameters</th>
<th>Groups</th>
<th>Descriptive statistic</th>
<th>G1 &amp; G2</th>
<th>G1 &amp; G3</th>
<th>G2 &amp; G3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>T-test</td>
<td>P- value Sig</td>
<td>T-test</td>
</tr>
<tr>
<td>PLI</td>
<td>G1</td>
<td>2.16</td>
<td>-13.71</td>
<td>&lt;0.001 HS</td>
<td>-13.50</td>
</tr>
<tr>
<td></td>
<td>G2</td>
<td>1.46</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>G3</td>
<td>1.32</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>G4</td>
<td>0.51</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GI</td>
<td>G1</td>
<td>2.06</td>
<td>-13.64</td>
<td>&lt;0.001 HS</td>
<td>-17.00</td>
</tr>
<tr>
<td></td>
<td>G2</td>
<td>1.41</td>
<td></td>
<td></td>
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<td></td>
<td>G3</td>
<td>1.23</td>
<td></td>
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<td></td>
<td>G4</td>
<td>0.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PPD</td>
<td>G1</td>
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<td>6.47</td>
<td>&lt;0.001 HS</td>
<td>11.85</td>
</tr>
<tr>
<td></td>
<td>G2</td>
<td>5.44</td>
<td></td>
<td></td>
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<td></td>
<td>G3</td>
<td>4.8</td>
<td></td>
<td></td>
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<tr>
<td>CAL</td>
<td>G1</td>
<td>2.58</td>
<td>-5.88</td>
<td>&lt;0.001 HS</td>
<td>-7.66</td>
</tr>
<tr>
<td></td>
<td>G2</td>
<td>1.99</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>G3</td>
<td>1.70</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
Table 2: Median Values of Salivary Melatonin and the Significance of Difference among the Study and Control Groups

| Parameter   | G1 Median | G2 Median | G3 Median | G4 Median | Kruskal-Wallis H test
|-------------|----------|----------|----------|----------|--------------------------
| Melatonin pg/ml | 27.22    | 27.23    | 25.17    | 103.93   | 14.28                    |

Table 3: Intergroup Comparisons of the Median Values of Salivary Melatonin between all Pairs of the Study and Control Groups

<table>
<thead>
<tr>
<th>Parameter</th>
<th>G1&amp;G2</th>
<th>G1&amp;G3</th>
<th>G1 &amp;G4</th>
<th>G2 &amp; G3</th>
<th>G2 &amp; G4</th>
<th>G3 &amp; G4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Melatonin pg/ml</td>
<td>190</td>
<td>0.787</td>
<td>NS</td>
<td>194</td>
<td>0.871</td>
<td>NS</td>
</tr>
</tbody>
</table>

Table 4: Correlations between the levels of Salivary Melatonin (pg/ml) with the clinical parameters at each study and control groups

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Statistical analysis</th>
<th>G1</th>
<th>G2</th>
<th>G3</th>
<th>G4</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLI</td>
<td>r</td>
<td>-0.291</td>
<td>-0.103</td>
<td>0.059</td>
<td>-0.077</td>
</tr>
<tr>
<td></td>
<td>p</td>
<td>0.214</td>
<td>0.666</td>
<td>0.806</td>
<td>0.746</td>
</tr>
<tr>
<td></td>
<td>sig</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>GI</td>
<td>r</td>
<td>0.140</td>
<td>0.128</td>
<td>0.111</td>
<td>0.088</td>
</tr>
<tr>
<td></td>
<td>p</td>
<td>0.556</td>
<td>0.590</td>
<td>0.641</td>
<td>0.711</td>
</tr>
<tr>
<td></td>
<td>sig</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>PPD</td>
<td>r</td>
<td>-0.122</td>
<td>0.240</td>
<td>0.425</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>p</td>
<td>0.609</td>
<td>0.308</td>
<td>0.062</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>sig</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td>X</td>
</tr>
<tr>
<td>CAL</td>
<td>r</td>
<td>0.125</td>
<td>0.036</td>
<td>0.120</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>p</td>
<td>0.599</td>
<td>0.880</td>
<td>0.615</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>sig</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td>X</td>
</tr>
</tbody>
</table>

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding

**REFERENCES**


The Role of Extracellular Superoxide Dismutase (Ec-SOD) Gene Polymorphism in Motor Neuron Damage of Type 2 Diabetic Peripheral Neuropathy Patients of Babylon Province-Iraq

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ABSTRACT

Background: Extracellular superoxide dismutase (EC-SOD) gene polymorphism play an essential role in the progression of diabetic complications. Reactive oxygen species (ROS) were known to damage neurons by enhancing nerve lipid peroxidation, the damaging mitochondrial DNA, break-down the respiratory chain, and the cross-linking of neuron proteins.

Aim: the aim of this study was to investigate the relationship between (Ec-SOD) gene polymorphism and the pathogenesis of diabetic peripheral neuropathy in type2 diabetic patients. Arg(213)Gly polymorphism of Ec-SOD gene polymorphism were studied in type2 diabetic patients with (n=30) and without DPN (n=30).

Results: Polymerase chain reaction (PCR) technique were used for detection Ec-SOD polymorphisms. This technique included the use of PCR primers (Forward and Reverse) to produce a restriction site in the amplified EC-SOD gene product just with the polymorphic base. Then, the product of (PCR) was digested with Eco52I restriction enzyme to detect Arg(-213)Gly polymorphic position. The results of Arg(-213)Gly polymorphism showed that the frequency of Arg/Arg, Arg/Gly, and Gly/Gly were 70%, 13.3%, and 16.6% in healthy control subject and 53.3%, 16.6%, and 30% in diabetic without neuropathy countered by 23.3%, 26.6%, and 50% in diabetic with neuropathy. This proposed that the Arg (-213)Gly polymorphism in the Ec-SOD gene is significantly associated with a risk for progression of diabetic peripheral neuropathy.

Conclusions: Arg(-213)Gly polymorphism of Ec-SOD gene was associated with diabetic peripheral neuropathy in type2 diabetic patients of Babylon Province.

Keywords: Diabetes complication, Superoxide dismutase 2, Arg(-213)Gly substitution.

Introduction

Macrovascular complications is a chronic diseases in which diabetes mellitus considered to be an independent risk factor that increase the probability that an individual will develop cardiovascular disease (CVD)(1), such as coronary artery disease (CAD), peripheral vascular disease (PVD), and cerebrovascular Accidents (CVA), these cardiovascular disease thought to be the primary cause of death in patients with either type 1 or type 2 diabetes(2), and are responsible for more than 50% of all deaths in patients with type 2 diabetes. The pathological of macrovascular disease is the process of atherosclerosis that are caused by chronic inflammation and injury to the arterial wall in the peripheral or coronary vascular system leading to narrowing of the arterial walls throughout the body(3).

The another strong causes associated with macrovascular complications in diabetic patients, is the increased platelet adhesion and hypercoagulability as a result of impaired nitric oxide generation and increased free radical formation in vascular endothelial cells, altered

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calcium regulation increasing platelet aggregation, the high levels of plasminogen activator inhibitor-1 causes reduction of fibrinolysis, the combination of increased coagulability and impaired fibrinolysis will increase the risk of vascular occlusion and cardiovascular mechanisms in type 2 diabetes(4).

The long term microvascular complications of diabetes include retinopathy, nephropathy, and neuropathy, and are characterized by damage to vision, kidney failure disease, and neurological lesions respectively(5).

EC-SOD is structurally identical to intracellular SOD, but its located in the extracellular matrix of different tissues including pancreas, skeletal muscle, and blood vessels, is a tetrameric protein containing Cu and Zn atoms and has a high affinity for heparin sulphate allowing its existence in high concentrations in particular regions of extracellular space or on the cell surface(6). EC-SOD expression is regulated mainly by cytokines like IFNγ which stimulates enzyme secretion by the cytokine TNFα and TGFβ inhibit its expression(7) resulting in reduction of mitochondrial glutathione and increasing oxidative stress(8). Sandstrom et al. (2002) have been demonstrated that the superoxide radicals secreted to the extracellular spaces dose not contribute to the β-cell destruction because the high levels of EC-SOD resulted in 6-fold elevation in the total superoxide dismutase activity of the islets(9-13).

The EC-SOD (SOD3) play as a major scavenger of reactive oxygen species in cells and tissues, it is anchored to the extracellular matrix and cell surfaces through binds with heparasulfate proteoglycan and collagen(14)(15). EC-SOD is a homotetrameric copper-zinc glycoprotein, it is reported that the EC-SOD gene has a vital role in protecting various tissues from oxidative stress by catalysis of dismutation of two superoxide radicals to hydrogenperoxide and oxygen(16). Human EC-SOD gene is located on chromosome 4p15.3 and composed of three axons and two introns, the sequence of this gene entirely located within exon 3 and has missense polymorphism(17). The most important SNP that are associated with this gene is Arg213Gly polymorphism in heparin-binding domain affects the function of the carboxy terminus causes several diseases(18)(19). Yamada et al. have been demonstrated that the glycine variant of the enzyme is responsible for elevated EC-SOD levels in serum that are associated with reduction in nitric oxide production in epithelial cells and different other metabolic cardiovascular risk factors(20)(21).

**Materials and Method**

**Study Subjects:** The study samples were collected in Marjan teaching hospital in AL-Hilla City/Babylon province-Iraq. Subjects in this study comprised from (30) patients suffer from type 2 diabetes with peripheral neuropathy, (30) patients without peripheral neuropathy as a positive control group with duration of disease (1-5, >5-10, >10 years) and with average age between (35-65 year). In contrast, the study included (30) apparently healthy people aged between (35-65) as control matched with disease group. The presence of type 2 diabetic peripheral neuropathy or not were diagnosed for all patients by a specialized doctor.

Venous blood samples were collected from fasting patients and control subjects after a period of fasting 8-10 by vein puncture using 5ml disposable syringes, 2 ml was placed into EDTA tubes mixed gently for 3 minutes and then being divided into two parts: the first part used in hematological tests and especially for HbA1c assay and the second part was stored in −20 °C for using later for genetic analysis.

DNA extraction and genotyping of Ec-SOD: The manufacturer protocol (Geneaid/Korea) was followed for extraction the DNA from frozen blood samples by using some components of the extraction kit. The purity of extracted DNA were determined by using Nano-droop apparatus.

Sequences of primers used for PCR amplification this study were shown in table (1).

<table>
<thead>
<tr>
<th>Primer gene name</th>
<th>Sequences 5’ 3’</th>
<th>Band size</th>
</tr>
</thead>
<tbody>
<tr>
<td>EC-SOD</td>
<td>F: -GGCTGGCCTGCTGCGTGGTGG- 104bp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>R: -CCTTGCACTGCTCTCGCGCG-</td>
<td></td>
</tr>
</tbody>
</table>
Polymorphic sites were amplified by using polymerase chain reaction technique (PCR). The PCR reaction mixture considered of < 250ng/μl template DNA, 400μM of each dNTP, 12.5 μl buffer of 1U Go Taq DNA polymerase (Promega), 10 μM of each primer and 3 mM MgCl₂ in 25 μl of total reaction volume.

Amplification reactions were carried out by using GTC Series thermocycler (Cleaver Scientific/UK) apparatus, with 37 cycles of denaturation for 45 second, at 94ºC, annealing for 38 second at 65ºC, the detection of Arg(-213)Gly gene polymorphism were detected by digestion of PCR product with the restriction enzymes Eco 52I (1μl of restriction enzymes were added to the mixture of PCR product and enzymes buffer for 24 h at 37ºC)

**Statistical Analysis:** SPSS version 23 was used for analysis the clinical variables whereas, Chi-square test used for comparison genetic frequencies of Mn-SOD between patients and control group. Odds ratios (ORs) with confidence intervals (95% CL) and their associated P-Values were used to calculate the results. A P-Value of ≤ 0.05 considered statistically significance.

**Results**

1. **DNA extraction:** The results of present genetic study showed that the genomic (DNA) extracted from blood samples has molecular weight (50-200) ng/μl and purity (1.7-2.2) as shown in figure (1).

![Figure 1: The electrophoresis pattern of DNA extracted from blood for patients with type2 diabetes and control, 1% agarose, 75V, 20Am for 1h. (5μl in each well). Lane 1-8 DNA from control, lane 9-16 DNA from patients](image1)

2. **Ec-SOD genotyping:** The results of Ec-SOD gene genotyping show that the PCR product had one band about (104bp) for both type2 diabetic patients and control group as shown in figure (2).

![Figure 2: The electrophoresis pattern of PCR product for Ec-SOD gene, 1% agarose, 75V, 20mA for 1h. Lane L: DNA ladder (100bp), lane 1-8 from control, lane 9-19 PCR products from patients](image2)

3. **PCR-RFLP**

![Figure 3: The electrophoresis pattern of PCR-RFLP for PCR product (104bp) with restriction enzyme Eco-52I, 3% agarose, 75V, 20mA for 2h. (10 μl in each well). AA: Wild type, AG heterozygous mutant type, GG Homozygous mutant type](image3)
4. The genotype and allele frequency of EC-SOD gene polymorphism in type2 patients with and without DPN and control subjects: The homozygote pattern (AA) were more frequent in control group (70%) than type2 patients with DPN (23.3%) with odd ratio (0.1191), while the homozygote pattern (GG) were more frequent in type2 patients with DPN (50%) than control group (16.6%) with odd ratio (5.0000).

On the other hand, the homozygote pattern (AA) were more frequent in type2 patients without DPN (53.3%) than type2 patients with DPN (23.3%) with odd ratio (0.2663), but the homozygote (GG) were more frequent in type2 patients with DPN (50%) than type2 patients without DPN (30%) with odd ratio (2.3333) as shown in table (2).

Table 2: The genotype distribution of EC-SOD gene polymorphism in type2 patients with and without DPN and control subjects

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Genotype Frequency (%)</th>
<th>Allele Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>AA</td>
<td>23.3 Patients with DPN</td>
<td></td>
</tr>
<tr>
<td>AG</td>
<td>26.6 A (0.16)</td>
<td></td>
</tr>
<tr>
<td>GG</td>
<td>50 G (0.84)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Genotype Frequency (%)</th>
<th>Odd Ratio CI 95% P-Value</th>
<th>Allele Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>AA</td>
<td>70</td>
<td>0.1191, 0.0379-0.3740</td>
<td>Control Subjects</td>
</tr>
<tr>
<td>AG</td>
<td>13.3</td>
<td>2.3636, 0.6265-8.9171</td>
<td>A (0.70)</td>
</tr>
<tr>
<td>GG</td>
<td>16.6</td>
<td>5.0000, 1.5096-16.5605</td>
<td>G (0.30)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Genotype Frequency (%)</th>
<th>Odd Ratio CI 95% P-Value</th>
<th>Allele Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>AA</td>
<td>53.3</td>
<td>0.2663, 0.0878-0.8074</td>
<td>Patients without DPN</td>
</tr>
<tr>
<td>AG</td>
<td>16.6</td>
<td>1.8182, 0.5180-6.3824</td>
<td>A (0.53)</td>
</tr>
<tr>
<td>GG</td>
<td>30</td>
<td>2.3333, 0.8090-6.7298</td>
<td>G (0.47)</td>
</tr>
</tbody>
</table>

*P≤0.05  **P≤0.01

Discussion

This study were showed that the DNA has (50-200) ng and purity (1.7-2.2) as show in figure (1).

The results of Arg(213)Gly polymorphism of EC-SOD gene amplification by PCR showed 104bp as shown in figure (2). The findings of this study showed that the (A) allele (Arg) of EC-SOD gene was more frequent in control group than (G) allele (Gly), while the (AG) genotype (Arg/Gly) and (GG) genotype (Gly/Gly) were the most frequent in type2 diabetic patients and also in type2 patients with diabetic peripheral neuropathy as shown in table (3), this findings agreed with(21)(24).

The Arg(213)Gly polymorphism of the EC-SOD occurs in the center of the carboxyl-terminal cluster of positively charged amino acid residues defining the heparin-binding domain(25)(26). This substitution of these amino acid results in increased the enzyme dissociation from the cell surface into serum, so that the lower EC-SOD levels on vascular walls were positively correlated with a higher risk of progression of oxidative stress in influenced patients with the (GG) genotype, and also these association have been found only in Japanese populations without diabetic form of neuropathy resulting from tremendous amyloid deposition in nervous tissues(27), but this don’t agreed with Dimitry et al. were they found lack of association of the polymorphic marker.
with diabetic neuropathy indicating that the Arg(213) Gly polymorphism doesn’t affect the enzyme activity but dose affect the amount of the enzyme on the external endothelial cell surface(22).

Several researches gives an evidence suggested that SOD genes play a crucial role in metabolic disorders and insulin resistance participating in the development of type2 diabetes and its complications(28). Oxidative stress is a major linkage between hyperglycemia and the progression of diabetic polyneuropathy where the axons are susceptible to hyperglycemia impairment because of both their direct access to nerve blood supply and nerve supply leading to accumulation the metabolic capacity of the mitochondrial producing oxidative stress(29).

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding

**REFERENCES**


The Value of Metformin in the Treatment of Hidradenitis Suppurativa in a Cohort of Iraqi Patients

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ABSTRACT

Aim of the study: the current cohort study was planned and carried out in order to evaluate the role of newly introduced therapeutic approach, low dose metformin, for hidradenitis suppurativa. This cohort study included 20 patients with hidradenitis suppurativa, 5 males and 15 females. The study was conducted at the dermatology unit, Al-Diwaniyah Teaching Hospital, Al-Diwaniyah Province, Mid-Euphrates Region of Iraq. The study started on November the 2nd 2018 and extended to June the 3rd 2019. Variables included in the current study were age, gender, residency, body mass index (BMI) and other associated illnesses. Outcome in the end of the study included clinical response and main side effects. Following one year of follow up the clinical response was recorded for all patients. Complete response was seen in 8 (40.0 %), while, partial response was seen in 12 (60.0 %). The only reported sided effect was gastrointestinal upset and was seen in 8 (40.0 %). There was no significant association between clinical response and any of the demographic characteristics (P > 0.05). Metformin is a safe an efficient oral therapy for the treatment of hidradenitis suppurativa with negligible side effects.

Keywords: Metformin, hidradenitis suppurativa, Iraq

Introduction

Hidradenitis suppurativa is a chronic dermatological disorder which affects regions of skin rich with apocrine sweat glands ¹. Clinically the disorder is characterized by remitting and relapsing skin abscesses and nodules that are painful ². These lesions often rupture resulting in the formation of sinuses ³. The disease is usually encountered after puberty so that the mean age at time of diagnosis is around some point within the third decade of life ⁴. The disease is more common in females than in males with an estimated male to female ratio of approximately 1:3 ⁶. The etiology of the disease remains enigmatic; however, an interaction between genetic susceptibility and some mysterious environmental factors has been suggested ⁶. Obesity is nearly a consistent feature in patients with hidradenitis suppurativa ⁷. The increased sweat production resulted from increased intertriginous skin surface area in obese individuals ⁸ and hormonal changes that are in favor of excess androgen production have been suggested to increase the risk of hidradenitis suppurativa in obese individuals ⁹. The pathogenic scenario that has been hypothesized starts with occlusion of an abnormal hair follicle followed by rupture and spread of its bacterial and keratin to surrounding tissue leading to an inflammatory response with neutrophils and lymphocytes being the main players ¹⁰,¹¹. It has been shown that microbial agents have no role as a causative agent, since aspirate from virgin unruptured lesions has failed to demonstrate any infectious micro-organism and that bacterial contamination is responsible for secondary exaggeration of the primary sterile lesion ⁶. The principal aims of treatment are drainage of suppurrative lesions, prevention of disease progression, reduction rate of recurrence and pain relief ¹². Treatment modalities and agents are multiple. Topical antibiotics and intralesional steroids may be used in early stages; however, systemic agents such as systemic steroids and antibiotics have been advised in resistant cases in addition to surgical intervention ¹³-¹⁸. Nevertheless, the outcome may be unsatisfactory and the need for another mode of therapy has been proved to be mandatory. For that reason, the current cohort study was planned and carried out in order to evaluate the role of newly introduced therapeutic approach, low dose metformin, for hidradenitis suppurativa.
Methodology

This cohort study included 20 patients with hidradenitis suppurativa, 5 males and 15 females. The study was conducted at the dermatology unit, Al-Diwaniyah Teaching Hospital, Al-Diwaniyah Province, Mid-Euphrates Region of Iraq. The study started on November the 2nd 2018 and extended to June the 3rd 2019. The study was approved by the institutional ethical approval committee and included a verbal consent was obtained from each participant following full demonstration of the aim and procedures of the study. Every patient has received a daily dose of metformin 500 mg for one year. Variables included in the current study were age, gender, residency, body mass index (BMI) and other associated illnesses. Outcome in the end of the study included clinical response and main side effects. Data were transferred into an SPSS (version 23) spreadsheet and presented as mean, standard deviation, range, number and percentage. Mann Whitney U test was used to study difference in mean between two groups, while, Yates correction was carried out to assess association between any two categorical variables. The level of significance was considered at $P \leq 0.05$.

Results and Discussion

The present study included 20 patients with hidradenitis suppurativa, 5 males and 15 females, 25.0 % and 75.0 %, respectively. The mean age of enrolled patients was 29.75 ± 9.99 years and the age range was from 15 to 46 years; most of the cases (80%) were below 40. The mean body mass index was 33.08 ± 4.52 kg/m$^2$ and the range was from 24.20 to 41.00 kg/m$^2$. Patients were categorized according to BMI into 1 (5.0%), 3 (15.0 %), 9 (45.0 %) and 7 (35.0 %) as normal weight, overweight, class I obese and class II obesity, respectively. According to residency, the study included 14 (70.0 %) and 6 (30.0 %) from urban and rural areas, respectively. These demographic data are shown in table 1. Eight (40.0 %) patients had no other associated disease, whereas, 5 (25.0 %), 5 (25.0%) and 2 (10.0 %) patients had polycystic ovary syndrome (PCOS), diabetes mellitus and hypertension, respectively, as shown in table 2. Following one year of follow up the clinical response was recorded for all patients and summarized in table 3. Complete response was seen in 8 (40.0 %), while, partial response was seen in 12 (60.0 %). The only reported side effect was gastrointestinal upset and was seen in 8 (40.0 %), table 3. There was no significant association between clinical response and any of the demographic characteristics ($P > 0.05$), as shown in table 4.

Table 1: Demographic characteristics of patients enrolled in the present study

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of cases</td>
<td>20</td>
</tr>
<tr>
<td>Age (years)</td>
<td></td>
</tr>
<tr>
<td>Mean ± SD</td>
<td>29.75 ± 9.99</td>
</tr>
<tr>
<td>Range</td>
<td>15 - 46</td>
</tr>
<tr>
<td>&lt; 40, n (%)</td>
<td>16 (80.0 %)</td>
</tr>
<tr>
<td>≥ 40, n (%)</td>
<td>4 (20.0 %)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Male, n (%)</td>
<td>5 (25.0 %)</td>
</tr>
<tr>
<td>Female, n (%)</td>
<td>15 (75.0 %)</td>
</tr>
<tr>
<td>BMI (kg/m$^2$)</td>
<td></td>
</tr>
<tr>
<td>Mean ± SD</td>
<td>33.08 ± 4.52</td>
</tr>
<tr>
<td>Range</td>
<td>24.20 - 41.00</td>
</tr>
<tr>
<td>Normal, n (%)</td>
<td>1 (5.0%)</td>
</tr>
<tr>
<td>Over weight, n (%)</td>
<td>3 (15.0 %)</td>
</tr>
<tr>
<td>Class I obesity, n (%)</td>
<td>9 (45.0 %)</td>
</tr>
<tr>
<td>Class II obesity, n (%)</td>
<td>7 (35.0 %)</td>
</tr>
<tr>
<td>Residency</td>
<td></td>
</tr>
<tr>
<td>Urban, n (%)</td>
<td>14 (70.0 %)</td>
</tr>
<tr>
<td>Rural, n (%)</td>
<td>6 (30.0 %)</td>
</tr>
</tbody>
</table>

Table 2: Associated diseases

<table>
<thead>
<tr>
<th>Associated disease</th>
<th>n</th>
<th>%</th>
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</thead>
<tbody>
<tr>
<td>No associated disease</td>
<td>8</td>
<td>40.0</td>
</tr>
<tr>
<td>PCOS</td>
<td>5</td>
<td>25.0</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>5</td>
<td>25.0</td>
</tr>
<tr>
<td>Hypertension</td>
<td>2</td>
<td>10.0</td>
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</table>

Table 3: Outcome including clinical response and side effects

<table>
<thead>
<tr>
<th>Outcome</th>
<th>n</th>
<th>%</th>
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</thead>
<tbody>
<tr>
<td>Clinical response</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Complete</td>
<td>8</td>
<td>40.0</td>
</tr>
<tr>
<td>Partial</td>
<td>12</td>
<td>60.0</td>
</tr>
<tr>
<td>Side effects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>12</td>
<td>60.0</td>
</tr>
<tr>
<td>GIT upset</td>
<td>8</td>
<td>40.0</td>
</tr>
</tbody>
</table>
Table 4: Association between clinical response and demographic characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Clinical response</th>
<th></th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Complete</td>
<td>Partial</td>
<td></td>
</tr>
<tr>
<td><strong>Age (years)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 40, n (%)</td>
<td>7</td>
<td>43.8</td>
<td>9</td>
</tr>
<tr>
<td>&gt; 40, n (%)</td>
<td>1</td>
<td>25.0</td>
<td>3</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male, n (%)</td>
<td>3</td>
<td>60.0</td>
<td>2</td>
</tr>
<tr>
<td>Female, n (%)</td>
<td>5</td>
<td>33.3</td>
<td>10</td>
</tr>
<tr>
<td><strong>BMI (kg/m²)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean ± SD</td>
<td>32.76</td>
<td>3.81</td>
<td>33.29</td>
</tr>
<tr>
<td><strong>Residency</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban, n (%)</td>
<td>5</td>
<td>35.7</td>
<td>9</td>
</tr>
<tr>
<td>Rural, n (%)</td>
<td>3</td>
<td>50.0</td>
<td>3</td>
</tr>
<tr>
<td><strong>Associated disease</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, n (%)</td>
<td>4</td>
<td>33.3</td>
<td>8</td>
</tr>
<tr>
<td>No, n (%)</td>
<td>4</td>
<td>50.0</td>
<td>4</td>
</tr>
</tbody>
</table>

n: number of cases; SD: standard deviation; ¥: Yates correction; †: Mann Whitney U test; NS: not significant at $P \leq 0.05$

The mean age of patients enrolled in the current study was 29.75 years and this is in agreement with most of studies that reviewed hidradenitis suppurativa. In the current study, most of cases with hidradenitis suppurativa were females with a male to female ratio of 1:3. This finding is similar to the majority of published articles. Obesity and overweight was a predominant feature by nearly all participants in the present study. Obesity is nearly a consistent feature in patients with hidradenitis suppurativa. The increased sweat production resulted from increased intertriginous skin surface area in obese individuals and hormonal changes that are in favor of excess androgen production have been suggested to increase the risk of hidradenitis suppurativa in obese individuals. Polycystic ovary syndrome (PCOS), diabetes mellitus and hypertension were the main associated disorders seen in our patients. The association between PCOS and hidradenitis suppurativa has been proven by a number of authors and a common hormonal mechanism has been suggested to be shared by the two illnesses. Diabetes mellitus in association with hidradenitis suppurativa has been also a frequent issue in published dermatological articles and the risk of hidradenitis suppurativa in diabetic patients is higher than the general population suggesting some role for insulin resistance in the pathogenesis. Metformin is a well known oral hypoglycemic agent. During the last 10 years it has been evaluated in the treatment of hidradenitis suppurativa. Complete response following one year follow up was the rule in 40 % and partial response was seen in 60 % of our patients. In one study, subjective clinical response was seen in 61 % of cases and complete response was seen in 19 % of them. In another study, 18 out of 25 patients had acceptable clinical response. Indeed the mechanism by which metformin act to reduce inflammatory response in patients with hidradenitis suppurativa with accompanied clinical improvement is till now poorly understood. However, it has been hypothesized that metformin acts by its anti-androgenic mechanism in addition to reduction in insulin resistance. The principal side effect seen in our patients was gastrointestinal upset which was recorded by 40 % of cases. These side effects are clinically negligible and well tolerates by patients, thus, Metformin is a safe an efficient oral therapy for the treatment of hidradenitis suppurativa with negligible side effects.

**Conclusion**

The only reported side effect was gastrointestinal upset and was seen in 8 (40.0%). There was no significant association between clinical response and any of the demographic characteristics ($P > 0.05$). Metformin is a safe an efficient oral therapy for the treatment of hidradenitis suppurativa with negligible side effects.

**Source of Funding:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the department of Pharmacology/College of Medicine/University of Al-Qadisiyah and all experiments were carried out in accordance with approved guidelines.
REFERENCES


Design and Implementation of Physiology Lab Management Blood Analysis System

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ABSTRACT

The objective of this work is to build a database that provides a records of blood disease and accurate statistics as an important source of medical information and to provide assistance to the laboratory worker by conducting electronic blood tests, serial and fast steps and printing the results of the analysis electronically to facilitate the work and make communication between the official of the laboratory and the patient easier and faster and more accurate by using electronic blood analysis system. Where this system to conduct basic screening tests for determining certain blood disorders (anemia's, abnormal bleeding and clotting, inflammation, infection and inherited disorders of red blood cells, white blood cells, platelets, hemoglobin (HBC), and cell production (hematopoiesis)). In this work we propose a system which can manage the user for each action performed and justifying the authorization used to create a secure and easy log in. The Physiology lab Management System is tested through verification and validation (V&V) that was one of testing elements to uncover errors that were made inadvertently as it was designed and constructed.

Keywords: electronic blood tests, blood analysis experiments, session, SQL, ASP.NET, verification and validation (V&V), alpha test, beta test.

Introduction

A blood test is a laboratory analysis performed on a blood sample that is usually drawn from capillary skin punctures (finger, toe, heel), dried blood samples, arterial or venous sampling using a subcutaneous needle. Blood samples are obtained from the patient by the biologist lap staff in laboratory to perform tests on blood for the purpose of diagnosing diseases of blood disorders 1. Blood samples may be tested by automated or manual hematology instrumentation and evaluation for the purpose of building a database that provides a record of blood disease and accurate statistics as an important source of medical information. This site is specialized in blood analysis experiments, which consist of eight experiments:

1. The experience of blood groups (ABO): The benefit of this experiment is to know the type of platoon (A+, A-, B+, B-, O+, O-, AB+, AB-) 2.

2. The experience of the white blood cell count (WBC): The benefit of this experience is the knowledge of the severity of bacterial and viral infections in the infected person, except in cases where the WBC grows a large number of more than 50 thousand 3.

3. Red blood cell count (RBC): The benefit of this experience is the detection of anemia and anemia.

4. The experience of platelet count: The benefit of this experience is to know the lack of the number of platelets causing the lack of manufacture of blood clot in the event of any injury, it can lead to bleeding for a long time.

5. Experience of measuring the time of red blood cell deposition (ESR): The benefit of this test is used to detect rheumatic diseases and arthritis 4.

6. Hemoglobin Hormone Estimation Test (HBC): This test is used to detect anemia or increase blood (Polycythemia).
7. Test of Blood Stimulation (PCV): The Benefit of this Examination The identification of abnormally low levels of blood accumulation may indicate anemia, as well as unusually high levels may indicate polycythemia.

8. Experience of Blooding Time estimation: The purpose of this experiment is to know the time of normal and abnormal bleeding, hereditary hemorrhage (hemorrhagic diseases) ³.

The language used in this site is (C# with ASP.net) therefore to provide some of the characteristics that distinguish it from the rest of the programming languages:

- It is fast compared to others because it translates, not interpretation.
- Security, where there are mechanisms to reduce the penetration of sites that have been programmed through them.
- A large and large code library is a dot net library.
- Frequent tools.
- Advanced integrated environment is the Visual Studio.

In this work we used SQL with ASP.NET. Where the database is a collection of information or organized data which is easy to retrieve, manage and update, Therefore, databases allow us to create interactive sites contain a lot of information, which consists of a table or more ⁶.

The need for a system to assist the laboratory officer. The program has the last steps and accurate results and a report of this work, through which the results of these tests and their natural and non-natural conditions, which are used in the case of statistics.

This system includes several people for each individual work according to its specific privacy

- The admin has the privacy and absolute management of the site.
- The laboratory officer is able to manage the report.
- The patient is able to see the results of his blood tests.

There are many projects in this Field, but I did not find a project that serves the biological laboratory, so this project was designed and implemented to serve the medical field and improve the biologist lab performance. The main features are:

- Administration.
- Employee Information.
- Patient Information.
- Experience.
- Reports.

This is the first electronic system for the biologist lap, this software was done from scratch and based on the paper style system that the office was using, this software will speed up the work and make it more flexible and accurate with better database and it reduces the employee’s effort. The following will discuss the paper system.

For an analysis of the patient is the official of the lab by filling in a report (paper form) with personal information about the patient.

An official of the laboratory takes a sample of the patient and then performs an analysis manually Then writes the test result of the report of the patient and are printed manually.

**Requirement and Analysis**

In this work we design the UML diagrams like Use case, a use case can be described as a specific way of using the system from a user’s (actor’s) perspective ⁷. Use cases are best discovered by examining the actors and defining what the actor will be able to do with the system ⁸.

**Identification of Use Cases**

- Use case “is a set of scenarios that describe the interaction between the user and the system. The usage case diagram “Use Case Diagram” shows the relationship between “actors” and “use cases”. The two main components of the “Use Case Diagram” are “use cases” and “actors”.
- The “actor” represents the user or another system that will interact with the system you modeled.

The use of “use case” is an external view of the system to review some of the actions a user can take to complete the task.
1. **Account management:** Site Manager has the privacy and absolute management of the site can create a new account for the lab or the patient and the deletion of any account.

2. **Receiving feedback:** The user sends comments and observations about the site and about the services provided in the laboratory. These comments are received by the webmaster and are able to delete the unintentional comments.

3. **Receive appointment receipt:** Appointment booking shall be within the patient’s account until it is more reliable. Send a reservation to the manager of the website. If the date is already booked, the reservation will be deleted.

**Patient:**

1. **Send an appointment:** The patient is registered with an account and is booked for a specific date the booking are then sent to the site manager because he has absolute authority over the site if the reservation is canceled, the reservation will be canceled and the patient will be sent to another date.

2. **Send feedback:** The user may send a comment and comments about the site and the services provided in the laboratory and also reach these comments to the director of the site to see them for the purpose of taking advantage of these views in order to upgrade the level of service and accurate results.

3. **View and print the report:** After testing the patient and showing the results of the test, he can log in to his account and see the report and can print it.

**Laboratory Officer:**

1. **Introducing new patient information:** The laboratory employee dictates a special form called the report with general information about the patient (patient’s name, age, address) It identifies the name of the test performed by the patient and saves this information.

2. **Conduct tests:** After filling the patient’s report with information, the laboratory employee begins the experiment and saves the results.

3. **View and print the report:** The laboratory staff shall inform the patient of the report and search for the patient through his or her triple name or through the address and print the result.
System Design

In order the design and implementation of a physiology lab management system designed to access as we are shown in figure 1 by the Admin/Patient/Laboratory Officer to provide assistance to the laboratory worker. In this work the flowchart used to clarify the processes that take place in this system starting from the start of the program to the end and each person on this site special operations, according to the authority specified to him using the site as shown in figure 2.

![Flowchart](image1)

**Figure 2: Admin login flowchart**

In this project we used SQL with ASP.NET. The report table used to enter new patient information, including the patient’s name, patient’s age, email, address, name of the experiment to build a database that provides important information on the patient’s condition.

The programming interfaces are designed using ASP.NET Language is an open-source server-side web application framework designed for web development to produce dynamic web pages as shown in figure 3.

![Homepage](image2)

**Figure 3: homepage**
This page contains several choices when clicking on the homepage shows the interface of the program where the program starts, and when you click on the tips and guidance goes to the page contains general information about the laboratories and tests. When you click on the test report, the user will receive a full report of all test results and when clicking on the site containing general information about the program designer. The login page records the user’s name and password to move to his own account which consists of three accounts (Site manager account, laboratory staff and patient). Each account transfers the user to his page according to the user’s specified powers (session).

In ASP.NET Session user can store and retrieve values while the user navigates ASP.NET pages in a Web application. The session can therefore be used to create a secure and easy login by setting a session variable to contain this user account information and allowing the user to browse secure parts of a Web site as long as the session variable is not null. These variables, which are accessed by using the session, are unique to each session instance. A complete security session state of patient information and laboratory information security is provided after a specified period of time. This is because these variables can be adjusted so that they are automatically ended after a specified time and impose the system to log out and return back to main page of inactivity even if the session is not over.

The laboratory employee presents the patient’s report by entering his triple name or place of residence in the search and print report.

The patient is able to send an appointment for the test date through this page and send the booking, if the reservation is canceled, the reservation will be canceled and, a new appointment date will be sent to the patient.

**Experiment**

A questionnaire form was designed and sent to the sample of workers in blood analysis laboratories inside and outside the University of Babylon. The sample consisted of 66 persons divided according to the following age groups (22-30, 31-35, Greater than 36) years old.

The questionnaire asked them the following questions: Is the system useful? Are the reports issued by the system in addition to your area of work? Is the system easy to use? Has the system helped save time and effort? Does the system meet the laboratory requirements? Is the program a real guide to be adopted in the Blood Analysis Laboratory?

**Results and Discussion**

The Physiology lab Management System is tested to uncover errors that were made inadvertently as it was designed and constructed. Verification and validation (V&V) are one of testing elements. Verification refers to set of activities that ensure that system correctly implements a specific function. Validation refers to different set of activities that ensure that system that has been built is traceable to user requirements. In this system we used a process called alpha and beta testing to uncover errors that only the end-user seems able to find.

Alpha test is conducted at developer site by end-users, in this process, we are recording errors and usage problems. The beta test is conducted at end-users site, end user records all problems and reports these to the developer to find and recover errors and make modification in orderly and effective manner.

The questionnaire form in this work was designed to process the (v&v) testing and alpha & beta testing, the result statistics from questionnaire to the sample consisted of 66 persons was the biologist lap divided according to the following age groups (22-30, 31-35 and Greater than 36) years old, we found the following as we are shown in figure (4). From this figure we found that 6% Greater than 36 from workers in biologist lap 9% for (31-35) and 85% for 22-30.

![Figure 4: The percentage of responses by questionnaire according to age group](image-url)
Table 1: A questionnaire’s Questions & responses

<table>
<thead>
<tr>
<th>A questionnaire’s Question</th>
<th>Yes</th>
<th>Medium</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Is the system useful?</td>
<td>52</td>
<td>13</td>
<td>1</td>
</tr>
<tr>
<td>2. Are the reports issued by the system in addition to your area of work?</td>
<td>27</td>
<td>29</td>
<td>10</td>
</tr>
<tr>
<td>3. Is the system easy to use?</td>
<td>36</td>
<td>23</td>
<td>7</td>
</tr>
<tr>
<td>4. Has the system helped save time and effort?</td>
<td>40</td>
<td>25</td>
<td>1</td>
</tr>
<tr>
<td>5. Does the system meet the laboratory requirements?</td>
<td>40</td>
<td>21</td>
<td>5</td>
</tr>
<tr>
<td>6. Is the program a real guide to be adopted in the Blood Analysis Laboratory?</td>
<td>34</td>
<td>25</td>
<td>5</td>
</tr>
</tbody>
</table>

Figure 5: The percentage of A questionnaire’s Question & responses

Conclusion

This work was carried out in a laboratory and was worked out by the laboratory employee and found good results in the ease of use and navigation between the pages of the site and the experiments were conducted and the results were withdrawn and the accuracy and high speed, which provided the laboratory staff of the easy to enumerate normal and abnormal diseases. In this work (session) used to create a secure and easy login to provide a complete security session state of patient information and laboratory information security after a specified period of time because the session can be adjusted so that it is automatically destroyed after a specified a specified time and impose the system to log out and return back to main page. The purpose of this system is to provide the registry with satisfactory cases and accurate statistics, which are an important information source for health organizations and the Ministry of Health, through which the database can be built. It provides important information on the patient’s condition, which helps to extrapolate the future and identify blood disorders, diseases for the most prevalent based on the current database.

Source of Funding: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the University of Babylon, Collage of Information Technology, Iraq and all experiments were carried out in accordance with approved guidelines.

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The Effectiveness of the Model of Active Thinking in the Collection of History and Creative Thinking among Students of the Fifth Grade Literary

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ABSTRACT

The study aims to identify the effectiveness of the active thinking model in the collection of history and creative thinking among fifth grade students. The experimental approach was adopted as the appropriate approach to research procedures. The research community consisted of secondary and middle schools in Babil governorate (The Shatt al-Arab Preparatory School for Girls) to be a sample of the research. The experiment was applied in two groups: the experimental group studied (the active thinking model) and the second the control group studied in the traditional way. The achievement of parents and the grades of female students in the history subject at the end of the first course, the IQ test scores (Dunliz) and the test of tribal creative thinking. The results showed that the two groups were statistically equivalent, and the researcher used the appropriate statistical means to conduct the research. The results showed the superiority of the experimental group students on the control group students in the achievement test. The test of creative thinking, ie, there is a difference of statistical significance at the level of significance (0.05) for the benefit of the experimental group.

Keywords: Active Thinking Model, Achievement, History, Creative Thinking, Fifth Grade Students

Introduction

Education is a comprehensive social process that aims at preparing the individual who lives in a developed world and gains its meaning from the goals that it seeks to achieve because it is the means of society to ensure its continuity and development, and not only in preparing the individual but also in society. In addition to the spiritual and philosophical values that he lives. This is what he pointed out has become a modern view of education as a dynamic process developed in keeping with modern scientific and technological developments as the use of modern strategies in teaching was not a coincidence, but came as a response to the needs of the educational system in order to achieve its objectives, And lasting not limited by a period of time it includes the entire person from the cradle to the grave and shared by many institutions including family, society and school, it is therefore the result of the interaction of the individual and positive activities and the result of this interaction grows individual personality and is used logical reasoning pray. The method of successful teaching is not limited to providing methodological information only, but helps to develop the tendencies of students and push them to work and fruitful participation and the teacher has the largest role in determining the appropriate way to use in the lesson teaching teaching activity in order to lead students to participate actively in the lesson, As a learning assistant, meaning that preparing students for educational content requires the teacher to develop learning methods and methods.

Methodology

The research methodology and procedures: This chapter will include an explanation of the research methodology and procedures, including the choice of experimental design and the selection of the research community and its model, as well as the procedures of parity between the two research groups (experimental and control), consideration and control of the variables.

The experimental design of the research: includes an independent variable (the active thinking model), the usual method, and two dependent variables (achievement and creative thinking).
The research community and its sample: The current research community represents the fifth grade students in the public schools (preparatory and secondary) of the General Directorate of Education in the province of Babylon (center) for the academic year (2018 - 2019), which has at least two divisions of two divisions, The researcher chose the Shatt al-Arab Preparatory School for Girls in the center of Babil Governorate in order to conduct her research, and found that it includes two divisions (A and B). The researcher chose (B) the method of random drawing to represent the experimental group and the number of its applications (40) According to (active thinking model), and in the same way chose Division A to represent For the control group and the number of female students (36) students, which will be studied according to (the normal method) Thus, the total number of the research sample was (76) students before the exclusion and after the identification of the students’ information from the official records of the school. The previous cases were found in the fifth grade in the two research groups.

Table 1: Distribution of female students in the sample before and after exclusion on the experimental and control groups

<table>
<thead>
<tr>
<th>The group</th>
<th>Number of female students before exclusion</th>
<th>Number of female students</th>
<th>Number of female students after exclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>40</td>
<td>2</td>
<td>38</td>
</tr>
<tr>
<td>Control</td>
<td>36</td>
<td>1</td>
<td>35</td>
</tr>
<tr>
<td>Total</td>
<td>76</td>
<td>3</td>
<td>73</td>
</tr>
</tbody>
</table>

Parity of the two sets of research: Before the beginning of the actual teaching in the experiment, the researcher made sure to achieve equivalence in some variables, which can affect the two dependent variables. To ensure this, the students of the two groups were rewarded in a number of variables., The academic achievement of the parents, the grades of the students in the history subject for the first semester (the first course) for the academic year (2018 - 2019), the Dunliz Intelligence test and the tribal creative thinking test scores (Table 2)

Table 2: The arithmetic mean, the standard deviation, and the two values of the variables (The chronological age calculated in months, First semester grades, IQ test, Creative Tribal Thinking Test) for the two research groups

<table>
<thead>
<tr>
<th>Variable</th>
<th>The group</th>
<th>Sample size</th>
<th>Average arithmetic</th>
<th>Standard deviation</th>
<th>The degree of freedom</th>
<th>The value of substrate</th>
<th>The calculated Table</th>
<th>Statistical significance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age calculated in months</td>
<td>Experimental</td>
<td>38</td>
<td>201.95</td>
<td>7.14</td>
<td>71</td>
<td>1.055</td>
<td>2.000</td>
<td>Not statistically significant</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>35</td>
<td>200.29</td>
<td>6.25</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First semester grades</td>
<td>Experimental</td>
<td>38</td>
<td>62.37</td>
<td>14.71</td>
<td></td>
<td>1.150</td>
<td>2.000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>35</td>
<td>61.86</td>
<td>14.4</td>
<td></td>
<td>0.747</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test for intelligence (Danlys)</td>
<td>Experimental</td>
<td>38</td>
<td>28.18</td>
<td>5.04</td>
<td>71</td>
<td>0.397</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>35</td>
<td>29.03</td>
<td>4.57</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Creative Tribal Thinking Test</td>
<td>Experimental</td>
<td>38</td>
<td>63.55</td>
<td>12.96</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>35</td>
<td>64.77</td>
<td>13.24</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Adjust some internal variables: In addition to the above measures of statistical equivalence between experimental and control groups, the researcher attempted to avoid the effect of some extraneous variables in the experimental process, which increases confidence in the internal validity of the experiment and then in the results. These variables (differences in sample selection,, Experimental extinction, Effect of experimental procedures, Measurement tools.

Search Materials: Determination of Scientific Material (Content): The researcher identified the scientific material that will be taught to the students of the two research groups before starting the experiment. The last three chapters (fifth, sixth and seventh) are from
the history book of Europe and modern and contemporary America, which is to be taught for the fifth grade, the ninth edition of the academic year 2018-2019.

Table 3: Behavioral objectives according to Bloom’s classification are distributed over the last three chapters of the history book

<table>
<thead>
<tr>
<th>Scientific Article</th>
<th>Knowledge Level Levels (Behavioral Goals)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Knowledge</td>
<td>Understanding</td>
</tr>
<tr>
<td>Chapter 5</td>
<td>16</td>
<td>12</td>
</tr>
<tr>
<td>Chapter 6</td>
<td>16</td>
<td>12</td>
</tr>
<tr>
<td>Chapter 7</td>
<td>13</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>45</td>
<td>24</td>
</tr>
</tbody>
</table>

Preparation of teaching plans: The researcher prepared a set of teaching plans for the students of the research groups (experimental and control) in light of the behavioral objectives and the contents of the last three chapters (fifth, sixth and seventh) for the date material for the fifth grade students (the research sample) for 2018-2019.) For the experimental group and (18) for the control group and was presented to a group of arbitrators and specialists in education and teaching methods to benefit from their views and observations for the purpose of modifying and improving the formulation of the plans and make them sound to the extent acceptable.

Research tools (cognitive test, creative thinking test)

First: The achievement test: The test is an organized method that includes asking a variety of objectives to measure what the student learned in a subject she studied for a certain period of time in order to determine the level of her performance.

The survey application for the achievement test: It includes the following:

1. The first survey application (the sample of the clarity of the instructions and the paragraphs)
   The first survey sample (the sample of the clarity of the instructions and the paragraphs) In order to ensure that the test paragraphs and the instructions for the answer and the calculation of the time required to answer the paragraphs in full, the researcher applied the test on a survey sample (30) student of the fifth grade literary in (Residential Bent Al Hussein) for the purpose of knowledge of cases of ambiguity in the instructions or test paragraphs and the extent of understanding and clarity of the paragraphs of the students and the calculation of the time required for the test as the researcher recorded the exit time for each student, and calculating the arithmetic mean of time I found that the time needed to answer all the test paragraphs was approximately (43) minutes.

2. The second survey application (sample of statistical analysis): The test was applied to a second sample of (100) fifth grade students in the two schools (Khadijah Al-Kubra Preparatory School and Bint Al-Huda). The purpose of the test is to analyze the test paragraphs statistically The difficulty of paragraph, paragraph discrimination, the effectiveness of wrong alternatives.

A. Difficulty of the paragraph: By conducting statistical analysis of the collection test paragraphs found that the coefficient of difficulty of paragraphs ranged from (0.5 - 0.69) for the substantive paragraphs and (0.36 - 0.56) for the paragraphs of the collection and so the test paragraphs are all good and difficult appropriate.

B. The coefficient of discrimination of the paragraph: Of the important qualities and must be provided in the paragraphs of the test is the characteristic of discrimination means the possibility of paragraphs to identify the individual differences of students and the test paragraphs are valid as the coefficient of discrimination of the paragraph is (20,0) and above, Between (0.33 - 0.59) and (0.35 - 0.43) for the glossary sections and thus the test paragraphs are considered to have a good and appropriate discrimination coefficient.
Results and Discussion

Test application for testing: The researcher applied the test to a sample of (100) female students in the sample. Revolution School It turned out that the test instructions, and its paragraphs were clear, understandable. The average time taken to respond to test paragraphs was between (5-6) minutes per paragraph.

Fixed correction: The researcher randomly selected the responses of (10) female students in order to ascertain the stability of the correction of the test. The researcher used the Pearson correlation coefficient as a statistical method to calculate the stability of the correction of the creative thinking test.

1. Stability over time: After two weeks of the first correction, the researcher re-corrected the books without putting a sign or sign indicating the correction, and the coefficient of correlation between the researcher and herself over time (0.99).

2. Stability with another corrector: The same books were corrected again by another corrector with experience in correcting the test. It was agreed with them not to place signs or marks on the response papers to reduce the effect of the corrector. The correlation coefficient between the researcher and the other corrector was (0.95).

Application of the final test: The test was applied by the researcher after completing the teaching of a particular subject, but after the flags of experimental groups and control, the application test date. The researcher supervised the application of the test and after correcting the answers of the students who obtained their grades.

Application of the test of post-creative thinking: The researcher applied the test of creative thinking to the two groups of research after the completion of the application of the experiment and supervised the researcher herself on the process of applying the test, and after the correction process was obtained degrees

Statistical means: To obtain the results and validate the data, the researcher used the t-test equation for two independent samples to make the parity between the experimental and control groups in the following variables (Students’ age is calculated according to months, academic achievement of parents and grades of students in the history subject for the first semester (first cycle) of the academic year (2018 - 2019), The Danlys test for intelligence and the test of tribal creative thinking) And the Kai box And the equation of difficulty and discrimination of paragraphs and the equation of the effectiveness of alternatives and correlation coefficient Pearson and Spur man Brown and the equation of the magnitude of the effect).

Results of the scholastic achievement variable: The students of the experimental group, who studied according to the active thinking model, exceeded the control group students who studied according to the usual method of the achievement test. This indicates that there are statistically significant differences at (0.05) between the mean of the experimental group and the average of the control group in the date collection test.

From the observation of the above table, we observe that the active thinking model has had an impact on raising students’ achievement in history. The effect of the test on the collection test is 0.90, which is large, which explains the superiority of the experimental group over the control group.

Results of the creative thinking variable: The students of the experimental group who studied according to (active thinking model) exceeded the students of the control group who studied according to the usual method in the creative thinking test. This indicates a significant difference at (0.05) The experimental group and the average scores of the students of the control group in the post-creative thinking experiment Table (8) shows that:

Conclusion

The use of an active thinking model in teaching history has helped to raise the level of student achievement and activate their memory by retrieving the previous information and giving the correct answer. The application of the steps of the active thinking model inspires the enthusiasm and vitality of the students and enhances the spirit of cooperation among them and likes to participate in the lesson and appreciation of the students themselves.

Source of Funding: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the University of Babylon/Faculty of Basic Education and all experiments were carried out in accordance with approved guidelines.
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Effectiveness of an Educational Program on Nurses Knowledge about Chemotherapy Hazards at Al-Habbobi Teaching Hospital in Al-Nasiriyah City

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ABSTRACT

A quasi experimental study design (One-group Pretest-Posttest) study has been carried out at Oncology Center at Al-Habbobi Teaching Hospital in Al-Nasiriyah City from the 26th of Des. 2018 to 14th of March 2019 to implement the Effectiveness of an Educational Program on Nurse’s Knowledge about Chemotherapy Hazards, who are working in Oncology Center and to find out the relationship between the nurses’ knowledge towards chemotherapy hazards and their demographic characteristics. To achieve the objectives of the present study, non-random (purposive) sample consists of 47 nurses working in Oncology Center have participated in this study. The data are collected through using constructed questionnaire designed for the purpose of the study, which consists of three parts: The first part is related to the demographic characteristics like nurses’ age, level of education, marital status, years of experience in oncology ward, and years of employment. The questionnaire is used in pretest before conduction of the program, after the application of the program post-test which is done after one month and half from first post-test repeated doing of participants of this study.

Keywords: Nurses Knowledge, Chemotherapy Hazards, Educational Program

Introduction

Cancer is a cause death or cases many complication for patients with it, which can attack adjoining parts of the body and invade to other organs. This process is called to as metastasis. Metastases are the main cause of death from cancer, leading it to of death worldwide. Cancer Chemotherapy refers to the wide range of therapeutic options used in the treatment of malignant diseases, including categories such as cytotoxic drugs, biologics, immunotherapy’s, targeted drug therapies, hormonal treatments, and high dose chemotherapy regimens supported with hematopoietic stem cell transplant. Cancer chemotherapy encompasses cytotoxic, cytostatic and biologic agents used to modify the body’s response to malignant disorders. These agents can be highly toxic and present specific risks for patients, health care providers and care-givers. As such, the care of patients receiving these drugs requires specific knowledge, skill and judgment within an environment that supports quality practice. Recommendations for the safe handling of hazardous drugs have been available for more than twenty years. Evidence for continued risk of occupational exposure is abundant; however, nurses’ use of the recommended precautions is not universal. This may be related to a lack of information or to a lack of serious concern for the potential hazards. Over ten and one half million healthcare workers are potentially exposed to hazardous drugs in the workplace. While most drugs defined as hazardous are cytotoxic agents used in the treatment of cancer, many drugs used for other indications and in other patient populations are equally unsafe World Health Organization, 2014. According to the National Institute for Occupational Safety and Health, there is documented evidence of contamination of the work environment with hazardous drug HDs, which increases the potential for exposure by nurses, pharmacists and other healthcare workers when these agents are handled inappropriately. A study shows that especially nurses are exposed while preparing
and administering the CDs (chemotherapy drugs). The level of knowledge of the nurses about antineoplastic drugs is not satisfactory. The awareness of the nurses handling the CDs (chemotherapy drugs) is of concern because it is important in raising standards of safety. In service training is a very effective tool to increase the level of knowledge. This study revealed also the necessity of the improvement of the work environment and the availability of the protective equipment. As the primary prevention measures involve the least possible exposure to CDs (chemotherapy drugs), information regarding the updated guidelines should be disseminated both at the practice and administration levels. For that reason nurses’ information about the possible toxicities and the protection measures used while preparing and administering these drugs is gaining more and more importance.

Results and Discussion

There are highly significant differences between two periods (Post 1 and post-2 tests) for all items of the Nurse’s Knowledge about Chemotherapy Hazards at Oncology Wards of the Study Sample, which reflects that the nurses’ knowledge was affected by educational program when analyzed by (t-test). There are highly significant differences among the three period (pre, post-1 and post-2 tests) for of the Nurse’s Knowledge about Chemotherapy Hazards at Oncology Wards of the study sample in all Items and this reflects that the nurses’ knowledge was affected by educational program when analyzed by ANOVA. There is no statistically significance at pretest period at p. value 0.05. At posttest-1 period statistically significance differences at p. value 0.05 and highly statistically significance differences at posttest-2 period at p. value 0.001. Relative to the table (1) the majority of the study sample at the middle age ranged (25 - 29) years. And they are accounted for (19) nurses with percent (40.4%) with age mean (27) years. This result agree with Wafaa, (2015), that show the majority of study sample with mean age (42.4). This may be because the Department of Oncology wishes to bring middle-aged nurses to be more effective and tolerant to treat and care for patients. In regarding to gender it is noticed that (61.7%) of the study sample are female and the remaining are male. This result is similar to study done by Najma, (2012), they reported that the study population consisted of (35) nurses more than half (80%) of them were female and (20%) male. This may be because of the desire of the Department of Oncology to bring large numbers of graduates of the Faculty of Nursing and medical institutes as they are more knowledgeable and scientific in the treatment of patients, and it is known that most graduates of the college of Nursing and medical institutes from women, this results is supported by Nezar A., (2014), Who shows that the female rate is higher than the male rate. Table (3) shows that there are highly significant differences between two periods (Post 1 and post-2 tests) for all items of the Nurse’s Knowledge about Chemotherapy Hazards at Oncology Wards of the Study Sample, which reflects that the nurses’ knowledge was affected by educational program. The health education was effective on study group in present study (Table 3), through the high percent of the nurses responses for knowledge concerning chemotherapy hazards between pre and post health education and majority of nurses responses for the posttest were have been passed compared with pretest.

Conclusion

During the course of the present study data analysis and logical discussion and interpretation of result, the effectiveness of the Education Program was determined. However, the study concluded that: A poor level pretest reflects of knowledge and practice. After posttest 1 the nurses’ knowledge level reflects very well and nurses’ practice level shows a very good level of practice. Nurses’ knowledge and practice become very good after posttest.

Source of Funding: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Department of Community Nursing College of Nursing-University of Baghdad, Iraq and all experiments were carried out in accordance with approved guidelines.

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4. American Cancer Society medical information is copyrighted material. For reprint requests, please see our Content Usage Policy. Last Medical Review: 2016; 21:12-15.


In Vitro Assessment of Some Properties of Biocompatible Polymer Dental Implant Consisting from Poly Ether Ketone (Peek) and Silicon Carbide Nanofiller

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ABSTRACT

Polyetheretherketone (PEEK) is growing in popularity due to its elastic modulus close to that of bone, biocompatibility, and its radiolucent properties. PEEK with high chemical resistance, radiolucency, mechanical characteristics compared to those of human bones. Aim of this study this study was done to evaluate the PEEK and PEEK composite dental implant through mechanical and morphological evaluation. PEEK composites (PEEK and SiC with selected weight percentage ratios of (0, 1.5%, 3%, 4.5%, 6%) were fabricated using a compounding by melt blending by (Internal Mixer) at 365°C, 5min. technique. The study involved Samples preparation (sheets) cutting and machining into desire shapes according to ASTM standards, for mechanical tests which includes tensile strength, elastic modulus and flexural strength, physical tests which include DSC, TGA, FTIR. Morphological test that include SEM, and EDX mapping. The results obtained from the experiments showed that the tensile strength, elastic modulus and flexural strength polymer composite consisting from polyetheretherketone and Silicone Carbide nanofiller implant increased comparing with pure PEEK with better distribution of nano filler particles in PEEK composite (concentration 1.5%, 3%, 4.5%) in the scanning electron microscope examination and EDX mapping.

Keywords: PEEK, PEEK composite, SiC nanofiller.

Introduction

There is an increased interest in the use of polyether ether ketone (PEEK) for orthopedic and dental implant applications due to its elastic modulus close to that of bone, biocompatibility, and its radiolucent properties. PEEK with high chemical resistance, radiolucency, mechanical characteristics compared to those of human bones. In addition, it can be repeatedly sterilized and shaped by machining and heat contouring to fit the contour of bones. PEEK has been used for load bearing orthopedic applications such as spinal cage, dental implant, and screws. Despite these excellent properties, PEEK is still categorized as bioinert due to its very low reaction with the surrounding tissue, which limits its potential applications. Impregnating bioactive materials into PEEK has become an attractive approach for improving its mechanical properties. Silicon carbide (SiC) ceramics have a great potential for a number of industrial applications due to their high mechanical strength, low thermal expansion coefficient, low value of relative density, high chemical inertness, oxidation and corrosion resistance. Recently, bulk porous silicon carbide ceramics have attracted increasing interest in medical applications as materials with high biocompatibility, for the production of orthopedic and dental implants. Silica-based ceramics are another group of bioactive products, which exhibit better biodegradability in comparison to HA ceramics, Silicon carbide (SiC) ceramic is one of the members of this group which is light weight and has excellent mechanical properties. It has been used in the manufacture of composite bone scaffolds, for example with a coating of bioactive glass, PEEK composites were produced for different applications. The most important application is load bearing implant application.

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Email: mostafammjnnjnmj@yahoo.com
Methodology

Preparation of Polymer: The specimens were prepared in five groups, the preparation method included preparing the polymer composite of PEEK and SiC with selected weight percentage ratios of (0, 1.5%, 3%, 4.5%, 6%).

Mixing procedure: The polymer composite was made by mixing of PEEK polymer with SiC nano filler with the following proportions (0, 1.5%, 3%, 4.5%, and 6%). The polymer composite was fabricated via a series of processes as follow: Mixing, compounding and compression molding.

1. Mixing between nanoparticles and polymer granule was achieved by sonication instrument firstly, the mixing was carried out manually by adding the selected percentage of SiC with alcohols then sonication for 15 minutes for better distribution of the nano particles the mixing time continued for (15min) followed by put in an oven for drying at (150 °C) for 15 minutes (6).

2. Mixing and compounding was achieved in an internal mixer (Haake) figure(2-8), the temperature set at 365°C and mixing speed at 70 rpm., the polymer granules added gradually through special opening about 60gm for each mix, The time needed for compounding was about (5) min. after each mix the melted polymer were taken out of the internal mixer and allowed to cool down to room temperature without any further temperature control.

Specimen Preparation:

a. Tensile test: Tensile test was performed with an Intron 5567 tester(Universal test machine), carried out at room temperature, at a cross head speed of (5 mm/min), and gauge-length, 50 mm. The prepared sheets were cutted with CNC machine to the required shape of tensile test specimen, samples were cut according to ASTM D 638-Type3 (ASTM Standard 2011), as shown in Figure (2), the final result represents the average value for the eight tested specimens. Figure (1) shows the standard specimen for tensile test.

b. Flexural tests: Flexural test was performed according to ASTM D790-03 at room temperature by using a three-point test instrument, using the Universal testing machine with velocity (1.28 mm/min). The sample will be cut at length of at least 65 mm, width was about 10 mm and thickness will be not less than 2.5 mm. Flexural modulus and strength were calculated from the load displacement diagrams. Eight specimens were used for most tests, and the final results represent the average values for Eight specimens, as it was reported.

Physical tests and Structural Characterization

a. Differential Scanning Calorimeter (DSC): In this test some characteristic were evaluated, such as melting temperature, crystallization temperature, glass transition temperature, and heat of fusion, etc. The procedure of this test was carried out using samples, weigh about (10.96 mg) heated first from room temperature to 400°C; with 45°C/min. heating rate in order to erase the thermal history of the sample, thereafter cooled from 400°C to room temperature with a rate of 100°C/min, and then heated second in a cycle to 400°C at 10°C/min, all in N2 atmosphere. Each sample was subjected to double heating and cooling cycles under a dry nitrogen purge, and data were recorded during the heating and cooling cycle (7).
b. Thermo gravimetric analysis (TGA): In this test, thermal stability has been discussed, including the resistances of thermal degradation and flammability of SiC nanoparticles. By heating from room temperature to 700°C, at heating rate of 20°C/min in N2 atmosphere. This test was done on a small samples weigh 12.6 mg put in a small crucible of alumina and the weight loss as a function of temperature was measured, the test was performed by using DSC/TGA (STA System) METTLER –TOLLEDO.

c. Scanning Electron Microscopy (SEM): SEM was used to reveal the microstructure of nanoparticles powders samples, neat PEEK, nanocomposites samples. It was used to diagnose the phases and nanoparticles distribution of samples, SEM (LEO, model 1455VP, UK), with an accelerating voltage of 10–20 kV, the uniformity of distribution and the particle size of the nanoparticle in nanocomposites were also inspected. Before observation, in order to avoid charging during electron irradiation, the composite samples were fractured in liquid nitrogen and covered with (Au) using a gold sputter coating.

d. Fourier Transform Infrared (attenuated total reflection) analysis (ATR/FTIR): Thin films (100 microns) shown of the neat PEEK, selected sample from nanocomposite samples. These films were used for crystalline structure characterization on a Brucker ATR/FTIR spectrophotometer (model IFS48, Germany) (spectral range 4000–300 cm-1 and resolution 2 cm-1).

e. Elemental Analysis with EDX: SEM supported by EDX (energy dispersive X-ray analysis) technique was performed to determine the composition polymer composite the main principle of spectroscopy is that each element has a unique atomic structure allowing a unique set of peaks on its electromagnetic emission spectrum, it depends on the interaction of some source of X-ray excitation and a specimen for the emission is the characteristic X-ray of the elements contained in sample which was detected by the detector. The received signal from the detector was analyzed.

Results

Mechanical Tests

Tensile strength: Table (1-1) shows descriptive statistics Mean values, standard deviation, Standard error, maximum and minimum of tensile strength test result of pure PEEK, G1 (peek +1.5%Sic), G2 (peek+3%Sic), G3(peek +4.5%SiC), G4 (peek+6%Sic) respectively as a function of nanoparticle weight percentage, it show increase the tensile strength values of the PEEK polymer composite comparing with pure PEEK with increase the percentage or volume fraction of the SiC nano composite reach to maximum value at G3 group which represent the PEEK with 4.5% SiC nano filler.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Descriptive statistics</th>
<th>Comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>S.D.</td>
<td>Min.</td>
</tr>
<tr>
<td>Pure peek</td>
<td>1444.625</td>
<td>93.399</td>
</tr>
<tr>
<td>G1</td>
<td>1662.625</td>
<td>69.953</td>
</tr>
<tr>
<td>G2</td>
<td>1716.000</td>
<td>16.878</td>
</tr>
<tr>
<td>G3</td>
<td>1927.500</td>
<td>111.024</td>
</tr>
<tr>
<td>G4</td>
<td>1766.250</td>
<td>50.933</td>
</tr>
</tbody>
</table>

The average data of the tensile test results modulus table 1-2 showed that elastic modulus are increased with increasing the weight percentage of nano powders PEEK polymer composite comparing with pure PEEK reaching to its maximum value in G3 group, the inclusion of nanoparticles in first group has raised the tensile strength by 15% and for the composite sample, G3(peek +4.5%SiC) group which its tensile strength value raised by 33% comparing with pure PEEK.
Table 2: The elastic modulus of PEEK, G1, G2, G3, G4 groups nanocomposites as a function of SiC nanoparticles content in the composite

<table>
<thead>
<tr>
<th></th>
<th>Pure peek</th>
<th>G1 peek +1.5%Sic</th>
<th>G2 peek +3%Sic</th>
<th>G3 peek +4.5%Sic</th>
<th>G4 peek +6%Sic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elastic modulus</td>
<td>4.1791</td>
<td>5.5904</td>
<td>6.2507</td>
<td>7.4771</td>
<td>6.2373</td>
</tr>
</tbody>
</table>

Flexural strength: The highest mean value is recorded by the G3 group, while the lower value was in PEEK control group, it is observed that increased of SiC nanofiller content in polymers (PEEK: X% SiC), lead to increase the values of flexural strength for polymer composite except group G4 which show decrease in the flexural strength value. Statistically F-test show a highly significance difference in the transverse strength among the groups.

Physical tests and Structural Characterization

a. Differential Scanning Calorimeter (DSC): (DSC) was used to analyze crystallization and melting temperatures of polymer nanocomposites which can be determined from the curves accordingly. The percentage of crystallinity can be determined by dividing crystallization enthalpy ($\Delta H_c$) (integrating the area under exotherm peak) and dividing it with $\Delta H_{co}$, (the theoretical crystallization enthalpy of 100% of PEEK). That shown in equation

$$X_c\% = \frac{\Delta H_c}{\Delta H_{co}} \times 100 \quad (3 - 1)$$

Where, $\Delta H_c$ refers to heat of crystallization of the specimen, $\Delta H_{co}$ fusion heat for pure crystalline PEEK which is 130 Jg⁻¹ [Tg 2011] and $W$ for the weight composition of the polymer, DSC the crystallization temperature (Tc) of PEEK has been raised slightly when SiC nano filler was added, this indicate non significant changes in the properties of material

b. Thermo gravimetric Analysis (TGA): TGA characterization has been carried out in nitrogen atmospheres to analyze the thermal stability of the composites and the effect of time and heat on the stability of the nano filler which show that it can withstand the time of processing especially during mixing up to 20 minutes. The degradation curves of pure PEEK, and Sic are illustrated in figure (1-3)

c. Fourier Transformation infrared FTIR analyses. IR mode: The FTIR analysis confirms the structure of Poly ether+ ether ketone with the same absorption bands for the polymer composite in the other groups.

d. Scanning Electron Microscopy SEM: The scanning microscopy image of SiC nano-particles. The nanoparticles form some agglomerates, the particles are irregular in shape and the distribution of the particles is such that they are loosely packed and are approximately at the range between 500 nm to 1-3 μm long, the cryo-fractured surface morphology of neat PEEK was homogenous accompanied by smooth surfaces and no voids or defects, the surface morphology of G1, G2, G3 group with 1.5, 3, 4.5 % of SiC nanoparticle content in composites which exhibited a homogenous morphology with uniform dispersion of the nanoparticle, it can be observed that different sizes of spherical shaped of nanoparticle material were dispersed randomly in PEEK matrix with very few of micro-cavities structure, this indicates
a fairly interaction between the components, morphology of G4 group with 6% of SiC nanoparticle content in composites, the dispersion of the SiC nanoparticle in PEEK was much less than the previous groups, with more aggregation behaviors of SiC nanoparticle figure (4).

![Figure 5: SEM of a. pure PEEK, b. G3 polymer composite,c.G4 polymer composite](image)

e-Scanning Electron Microscopy (SEM) with Energy Dispersive X-Ray Analysis (EDX): EDX mapping for the PEEK composite group G1 group and G3 group figure (1-5a,b) with magnification of 25000 x show uniform distribution of the nano silicon carbide filler that indicate good mixing procedure while in G4 group PEEK composite figure (1-5c)) show the presence of agglomerates in concentration of 6% SiC

![Figure 6: SEM with EDX mapping of PEEK composite a.G1,b.G3,c.G4material 25000 x where the red spots represent the SiC Nano filler](image)

**Discussion**

There is an increased interest in the use of polyether ether ketone (PEEK) for orthopedic and dental implant applications one of the major reasons to gain interest into PEEK was its closely matched stiffness to bone. This mismatch in stiffness may cause a stress shielding and may lead to bone resorption (8,9). SiC nanostructures are promising candidates in the field of biomedical device, Moreover, the unusual properties of nanoparticles affect the various interactions take place between nanoparticles and the polymer matrix designing to reinforced the polymers to attain desirable macroscopic material properties by combining materials at a microscopic level (10). For the tensile strength mean tensile strength at break show increase in its values of the PEEK polymer composite (G1, G2 G3) with increase the percentage or volume fraction of the SiC nanofiller reach its maximum value at G3 group that represent the PEEK with 4.5% SiC nano filler, the incorporation of the hard nanoparticles powders into the polymer matrix which leads to restricted the movement of polymer chains and, accordingly, increases the tensile strength and elastic modulus for nanocomposite material (11). Group G4 with 6% content of nano SiC show decrease in the value of tensile strength and elastic modulus this may be due to incorporation of nano filler may lead to agglomeration of the filler in some parts of the polymer matrix that proved in the electron (12-17).
Conclusion

Polymer composite consisting from polyetheretherketone and Silicone Carbide nanofiller sow improved in its mechanical properties (tensile strength, elastic modulus and flexural strength) comparing with pure PEEK, with the concentration of (1.5, 3, 4.5%) of nano filler with good distribution the filler confirmed by SEM,EDX examinations.

Source of Funding: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Dentistry, University of Baghdad, Baghdad, Iraq and all experiments were carried out in accordance with approved guidelines.

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2. Han E, Lee, H. The electron beam deposition of titanium mon polyetheretherketone (PEEK) and the resulting enhanced biological properties. Biomaterials. 2010; 31: 3465–3470.


Occurrence of Asymptomatic Bacterial Urinary Tract Infection and Susceptibility Profile among Students of Medical Technical Institute-Baghdad

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ABSTRACT

Collect the mid-stream of the urine from 350 students (300 female and 50 male). A general urine exam was conducted to determine the presence of bacteria in urine (bacteriuria). The isolated bacteria were identified and diagnosed according to reference manual and standard methods, culture character and VIdex2. The bacterial isolates were subjected to in vitro susceptibility tests against some antibiotic and was performed by Kirby-Bauer’s disc diffusion method done on Mullar- Huntyn aga. The overall prevalence of asymptomatic urinary tract infection was (50.57%) in females were 93.78% higher than males 6.21%. Gram Negative bacteria was the predominant bacterial pathogens, and the highest occurring pathogenic bacteria in both sex. The prevalence of bacterial strains, out of the total 177 strains isolated, 166 (93.78%) and 11 (6.21%) strains were isolated from female and male students respectively. Escherichia coli (58.43%), Staphylococcus aureus (27.71%), female students, while the pathogenic isolate from male students were Staphylococcus aureus (45.45), and Escherichia coli (9.09%). Gram-negative isolates showed a high level of sensitivity to GEN and SXT (96%), followed NIT (93%). Gram-positive isolates were highly susceptible to GNE (96.6), SXT (94.9).

Keywords: urinary tract infection, antibiotic susceptibility profile.

Introduction

The lower part of the urinary system is the most affected compared to the upper parts like the bladder and the urethra. E.coli which found naturally in the digestive system are the main cause of urinary tract infections as well as other Gram negative colonic bacteria. Ninety percent of uti infections are caused by bacteria, mainly colonic bacteria, where 80% of infection occur and E.coli the main cause of cystitis and pyelonephritis followed by Klebsiella pneumoniae, Proteus mirabilis and by Gram-positive pathogens, such as Staphylococcus aureus, Enterococcus faecalis and Staphylococcus saprophyticus. Asymptomatic Urinary tract infection are widespread in healthy populations. And it can be diagnosed as ‘significant bacteriuria’. when a person has no symptoms but there is a number of bacteria in urinary tract, the condition is called asymptomatic urinary tract infection (UTI), and this condition is harmless. In most cases urinary tract infection occurs in women more than men, and by. Show that 55-65% almost every woman has UTI even once in their lives, and the incidence of at least three cases of UTI and at a satisfactory offer at the age of 24 and was necessary treatment with antibiotic. Among the diagnostic tests, urine analysis mainly important, especially for excluding bacteriuria. In cases of asymptomatic uti the culture method is not important for evaluation especially when the patients with uncomplicated UTI, but its important for patients with recurrent UTI. The two, Acute and chronic form occur in asymptomatic uti, E.coli is the common cause of UTI but in sexually active women 10-20% of cases of UTI caused by micrococcal and by the ascending route the infection reaches the bladder. The faecal micro flora is the mainly source of E. coli uti in female. in male the E.coli originate from the sub peptic sac. Because of short female urethra the prevalence of E.coli uti is higher comparable to that of men due to bacterial infection, urination with chronic flora that resides in the perineal skin. it also include the effect of turables occur in urinary stream.

Material and Method

Samples collection: This study is, therefore, designed to determine the prevalence of bacterial UTI and their
antibiotic susceptibility among Students of Medical Technical Institute- Baghdad. Thirty hundred and fifty students of Medical Technical Institute- Baghdad were recruited for this study 300(85.71) female and 50 male(14.29) with asymptomatic UTI and excluded who take antibiotics. All non-repetitive midstream urine (MSU) samples obtained during the study period (September 2016 to August 2019) were included in the study.

**Bacterial count of urine:** All urine samples were examined for "significant bacteriuria by use a modified technique described" by Mbata TI,(2007). A loopful of each urine sample (0.01ml) was spread over the surface of Cystine Lactose Electrolyte Deficient (CLED) agar plates (LabM, UK, and incubated at 370C for 18 – 24 hours. “The number of bacterial colonies were counted and multiplied by 100 to give an estimate of the number of bacteria per milliliter of urine”. A significant bacterial count was taken as any count equal to or in excess of 10^-5/ml.

**General urine examination:** All samples that recorded significant bacterial counts were subjected to ‘urine microscopy test to detect presence of (5PC/HPF) or 10 white blood cells (pus cells)/mm3 in urine sediments or deposits’ (Smith G.2004). The samples that were positive for bacterial count were conducted it for microbiological analysis.

**Microbiological analysis:** All the specimens that were positive for bacterial count and GUE were cultured on routine culture media where 1 ml of urine was cultured on both MacConkey and Blood agar plate (HiMedia, India) by streaking, incubated overnight at 37°C under aerobic condition. Growth of 100 colonies or more, ‘(10^4) colony forming units (CFU)/mL urine, was considered as culture positive’.

Isolated bacteria identified by Gram stain, cultural characters and biochemical tests as per the Manual of Clinical Microbiology, and confirmed by using Vitek2 system (bioMerieux-France)

**Antibacterial susceptibility:** The sensitivity test carried out on Muller Hinton agar The bacterial isolates were subjected to *in vitro* susceptibility tests against some antibiotic and was performed by Kirby-Bauer's disc diffusion method and interpretation of the results was done as described in CLSI 2013. Antibiotic discs (MAST, UK) used were, Ciprofloxacin (CIP:5mg), Nalidixic acid (NA: 30 mg), Gentimycin (GEN: 10 mg), Ofloxacin (OFL:5mg), Nitrofurantoin (NIT:300 mg), Cefixcin (CEF:10 mg), Amoxicillin (AMX:30mg), Sulphamethoxazole-trimethoprim (SXT:25mg), and Augmentin (AU:30 mg).

**Statistical Analysis:** The data were analyzed using Chi-square (χ^2^) test, and student’s t-test. All statistical tests were performed by Statistical Package for Social Sciences (SPSS) software.

**Results and Discussion**

Table (1) showed the distribution of urinary tract infection according to gender. It was found that the rate of females with UTI were 55.3% higher than males 22%. Table1: Shown the urine deposits content, urine deposits were microscopically observed in the samples of 300 (94.2%) and 50(55%) female and male students respectively. Pus cells, bacteria, RBC, yeast cells, and spermatozoa were observed in 177(50.57%), 120(34.9%), 22 (2.55%), 6(1.71%) and 25 (7.14%) urine samples respectively. Whereas pus cells were the most observed urine deposits, yeast cells and RBC were the least observed in male. No spermatozoa were seen in the female urine samples. There were more pus cells, RBC and yeast cells in female urine samples than in male samples. Table (3) shown the prevalence of isolated pathogens in the study group, out of the total 177 strains isolated, 166 (94.2%) and 11 (55%) strains were isolated from female and male students respectively. In a decreasing order, the highest occurring pathogenic bacteria in female students were *Escherichia coli* (58.43%), *Staphylococcus aureus* (27.71%), *Proteus species* (3.01%), *Pseudomonas aeruginosa* (3.61%) *Klebsiella species* (1.8%), *Coliform organisms* (1.2%), *Enterobacter species* (3.01%), *Citrobacter species* (0.60%) and *Staphylococcus saprophyticus* 0.60%. In decreasing order, the pathogenic isolate from male students were *Escherichia coli* (9.09%), *Staphylococcus aureus* (45.45%), *Proteus spp* (18.1%), and each of *Pseudomonas aeruginosa*, *Enterococcus species*, and *Staphylococcus saprophyticus* (9.09%) no isolates of *Klebsiella spp Coliform organisms and Citrobacter species*. This study showed that the GNB are the predominated isolates, and the highest was *E. coli* 98(83%), and the *Citrobacter spp. was* the last with 1(1. 8%).Gram-negative isolates showed a high level of sensitivity to GEN and SXT (96%), followed NIT (93%). While the high-level resistance showed against OFL45 (38%), and CEF 44(37.3%) as showed in table (4).
Table 1: Distribution of UTI according to gender

<table>
<thead>
<tr>
<th>Gender of students</th>
<th>Students with urinary tract infection</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NO.</td>
</tr>
<tr>
<td>Male (50)</td>
<td>11</td>
</tr>
<tr>
<td>Female (300)</td>
<td>166</td>
</tr>
<tr>
<td>Total (350)</td>
<td>177</td>
</tr>
</tbody>
</table>

Table 2: The microscopic examination of urine samples

<table>
<thead>
<tr>
<th>Deposits content of urine</th>
<th>Female NO. (%)</th>
<th>Male NO. (%)</th>
<th>Total NO. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pus cells</td>
<td>166 (55.33)</td>
<td>11 (22)</td>
<td>177 (50.57)</td>
</tr>
<tr>
<td>Bacteria</td>
<td>109 (36.33)*</td>
<td>11 (22)</td>
<td>120 (34.9)</td>
</tr>
<tr>
<td>Yeast cells</td>
<td>5 (1.66)</td>
<td>01 (2)</td>
<td>6 (1.71)</td>
</tr>
<tr>
<td>RBC</td>
<td>20 (0.7)</td>
<td>02 (4)</td>
<td>22 (2.55)</td>
</tr>
<tr>
<td>Spermatozoa</td>
<td>0 0</td>
<td>25 (5)</td>
<td>25 (7.14)</td>
</tr>
<tr>
<td>Total</td>
<td>300 (94.2)</td>
<td>50 (55)</td>
<td>350 (100)</td>
</tr>
</tbody>
</table>

Table 3: Prevalence of isolated pathogens among students

<table>
<thead>
<tr>
<th>Isolated Pathogen</th>
<th>Female (positive)</th>
<th>Male (positive)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NO.</td>
<td>%</td>
<td>NO.</td>
</tr>
<tr>
<td>Escherichia coli</td>
<td>97</td>
<td>58.43</td>
<td>1</td>
</tr>
<tr>
<td>Staphylococcus aureus</td>
<td>46</td>
<td>27.71</td>
<td>5</td>
</tr>
<tr>
<td>Proteus species</td>
<td>5</td>
<td>3.01</td>
<td>2</td>
</tr>
<tr>
<td>Pseudomonas aeruginosa</td>
<td>6</td>
<td>3.61</td>
<td>1</td>
</tr>
<tr>
<td>Klebsiella species</td>
<td>3</td>
<td>1.8</td>
<td>0</td>
</tr>
<tr>
<td>Coliform organisms</td>
<td>2</td>
<td>1.2</td>
<td>0</td>
</tr>
<tr>
<td>Enterococcus species</td>
<td>5</td>
<td>3.01</td>
<td>1</td>
</tr>
<tr>
<td>Citrobacter species</td>
<td>1</td>
<td>0.60</td>
<td>0</td>
</tr>
<tr>
<td>Staphylococcus saprophyticus</td>
<td>1</td>
<td>0.60</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>166</td>
<td>100</td>
<td>11</td>
</tr>
</tbody>
</table>

Table 4: Antimicrobial susceptibility pattern of Gram-negative bacteria

<table>
<thead>
<tr>
<th>Pathogen</th>
<th>S, I, R</th>
<th>CIP 5</th>
<th>NA 30</th>
<th>GEN 10</th>
<th>OFL 5</th>
<th>NIT 300</th>
<th>CEF 10</th>
<th>AMX 30</th>
<th>SXT 25</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>E. coli</em></td>
<td>S</td>
<td>66(67.34)</td>
<td>88(99,)</td>
<td>96(98)</td>
<td>50(51)</td>
<td>96(98)</td>
<td>18(18.6)</td>
<td>49(50)</td>
<td>97(99)</td>
</tr>
<tr>
<td></td>
<td>I</td>
<td>22(22.44)</td>
<td>2(2.04)</td>
<td>2(2.04)</td>
<td>18(18.3)</td>
<td>0(0)</td>
<td>50(51)</td>
<td>31(31.6)</td>
<td>1(1.0)</td>
</tr>
<tr>
<td></td>
<td>R</td>
<td>10(10.2)</td>
<td>8(8.1)</td>
<td>0(0)</td>
<td>30(30.6)</td>
<td>0(0)</td>
<td>30(30.6)</td>
<td>18(18.3)</td>
<td>0(0)</td>
</tr>
<tr>
<td><em>Proteus spp.</em></td>
<td>S</td>
<td>1(14.9)</td>
<td>6(85.7)</td>
<td>7(100)</td>
<td>2(28.57)</td>
<td>2(28.57)</td>
<td>4(57.14)</td>
<td>6(85.7)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I</td>
<td>0(0)</td>
<td>1(14.9)</td>
<td>0(0)</td>
<td>1(14.9)</td>
<td>4(57.2)</td>
<td>1(14.9)</td>
<td>0(0)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>R</td>
<td>6(85.71)</td>
<td>0(0)</td>
<td>4(57.14)</td>
<td>3(42.9)</td>
<td>3(42.9)</td>
<td>1(14.9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>P. aeruginosa</em></td>
<td>S</td>
<td>1(14.9)</td>
<td>5(71.4)</td>
<td>5(71.42)</td>
<td>0(0)</td>
<td>6(85.7)</td>
<td>0(0)</td>
<td>1(14.9)</td>
<td>5(71.4)</td>
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<td></td>
<td>I</td>
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<td>1(14.9)</td>
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</tr>
<tr>
<td></td>
<td>R</td>
<td>5(71.4)</td>
<td>2(28.6)</td>
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<td>1(14.9)</td>
<td>7(100)</td>
<td>6(85.7)</td>
<td>1(14.9)</td>
</tr>
</tbody>
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Conted…

<table>
<thead>
<tr>
<th>Pathogen</th>
<th>S,I,R</th>
<th>CIP 5</th>
<th>NA 30</th>
<th>GEN 10</th>
<th>OFL 30</th>
<th>NIT 300</th>
<th>CEF 10</th>
<th>AMX 30</th>
<th>SXT 25</th>
<th>AU 30</th>
</tr>
</thead>
<tbody>
<tr>
<td>S. aureus</td>
<td>S</td>
<td>5(9.8)</td>
<td>30(58.8)</td>
<td>49(96)</td>
<td>25(2.5)</td>
<td>36(70.9)</td>
<td>6(12)</td>
<td>27(54)</td>
<td>49(96)</td>
<td>4(7.8)</td>
</tr>
<tr>
<td></td>
<td>I</td>
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<td>16(31.4)</td>
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<td>7(13.7)</td>
<td>2(3.9)</td>
<td>12(23.5)</td>
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<tr>
<td></td>
<td>R</td>
<td>36(70.9)</td>
<td>5(9.8)</td>
<td>1(1.96)</td>
<td>7(13.7)</td>
<td>10(19.6)</td>
<td>36(70.9)</td>
<td>17(33.3)</td>
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<td>35(68.6)</td>
</tr>
<tr>
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<td>4(66.6)</td>
<td>6(100)</td>
<td>3(50)</td>
<td>5(83.8)</td>
<td>1(16.6)</td>
<td>4(66.6)</td>
<td>5(83.8)</td>
<td>1(16.6)</td>
</tr>
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<td>1(16.6)</td>
<td>2(33.3)</td>
<td>2(33.3)</td>
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<td>1(16.6)</td>
</tr>
<tr>
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<td>3(50)</td>
<td>0</td>
<td>0</td>
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<tr>
<td>S. saprophyticus</td>
<td>S</td>
<td>0</td>
<td>2(100)</td>
<td>2(100)</td>
<td>2(100)</td>
<td>2(100)</td>
<td>0</td>
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<td>2(100)</td>
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<tr>
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<td>0</td>
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<td>0</td>
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</tr>
<tr>
<td></td>
<td>R</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2(100)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>TOTAL</td>
<td>S</td>
<td>10(16.9)</td>
<td>36(61)</td>
<td>57(96.6)</td>
<td>30(50.8)</td>
<td>43(7.3)</td>
<td>7(24.13)</td>
<td>32(54.23)</td>
<td>56(94.9)</td>
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<td>11(18.6)</td>
<td>18(30.5)</td>
<td>1(1.7)</td>
<td>21(35.6)</td>
<td>6(10.16)</td>
<td>11(18.6)</td>
<td>10(34.5)</td>
<td>3(5.1)</td>
<td>13(22.03)</td>
</tr>
<tr>
<td></td>
<td>R</td>
<td>38(64.4)</td>
<td>5(8.5)</td>
<td>1(1.7)</td>
<td>8(13.55)</td>
<td>10(16.9)</td>
<td>41(69.5)</td>
<td>17(28.8)</td>
<td>0</td>
<td>41(69.5)</td>
</tr>
</tbody>
</table>


Gram-positive isolates were highly susceptible to GNE 57(96.6%), SXT 56(94.9%). S. aureus was susceptible to GEN, SXT both with 49(96%), and NIT 36(70.9%), and resistant to CIP and CEF with 36(70.9%), AU35 (68.6%), and AMX 17(33.3), while the low level of resistance was observed in the remainder of the antimicrobials tested (GEN, NA, and OFL). (Table 5). The results showed that the overall prevalence of UTI was 50.57%. In comparison with that was 50%, but less than. The study found that the rate of females with UTI were 55.3% higher than males 22%. This might be due to the anatomical differences of urogenital organs between the two sexes. The presence of bacteria in fresh urine sample indicates an infection. In current study the highest occurring pathogenic bacteria in female students were E. coli (58.43%), this agrees with many other previous research. And was in agreement with others finding too. This means that infection are more frequent among females because of female urinary tract is more colonized by intestinal bacteria resulting from shortness of their urethra as in addition to shortening the distance between the urethral opening and rectum which makes females more susceptible to UTI 20. Improper cleaning of the perineum with sanitary towel is another additional factors for bladder contamination and UTI. The most common cause of urinary tract infection are secreted out of urine to the environment. Therefore students need to pay more attention to personal hygiene in their homes as well as their surroundings21-25. We reported the second isolates was Staphylococcus species and this agreement with others study findings. In males, the longer length of urethra and the prostate secretions are considered to be excellent immune agents against bacterial infection.

Table 5: Antimicrobial susceptibility pattern of Gram-positive bacteria

<table>
<thead>
<tr>
<th>Pathogen</th>
<th>S,I,R</th>
<th>CIP 5</th>
<th>NA 30</th>
<th>GEN 10</th>
<th>OFL 30</th>
<th>NIT 300</th>
<th>CEF 10</th>
<th>AMX 30</th>
<th>SXT 25</th>
<th>AU 30</th>
</tr>
</thead>
<tbody>
<tr>
<td>S. aureus</td>
<td>S</td>
<td>5(9.8)</td>
<td>30(58.8)</td>
<td>49(96)</td>
<td>25(2.5)</td>
<td>36(70.9)</td>
<td>6(12)</td>
<td>27(54)</td>
<td>49(96)</td>
<td>4(7.8)</td>
</tr>
<tr>
<td></td>
<td>I</td>
<td>10(19.6)</td>
<td>16(31.4)</td>
<td>1(1.96)</td>
<td>19(37.2)</td>
<td>5(9.8)</td>
<td>9(17.6)</td>
<td>7(13.7)</td>
<td>2(3.9)</td>
<td>12(23.5)</td>
</tr>
<tr>
<td></td>
<td>R</td>
<td>36(70.9)</td>
<td>5(9.8)</td>
<td>1(1.96)</td>
<td>7(13.7)</td>
<td>10(19.6)</td>
<td>36(70.9)</td>
<td>17(33.3)</td>
<td>0</td>
<td>35(68.6)</td>
</tr>
<tr>
<td>Enterococcus spp.</td>
<td>S</td>
<td>5(83.8)</td>
<td>4(66.6)</td>
<td>6(100)</td>
<td>3(50)</td>
<td>5(83.8)</td>
<td>1(16.6)</td>
<td>4(66.6)</td>
<td>5(83.8)</td>
<td>1(16.6)</td>
</tr>
<tr>
<td></td>
<td>I</td>
<td>0</td>
<td>2(33.3)</td>
<td>0</td>
<td>2(33.3)</td>
<td>1(16.6)</td>
<td>2(33.3)</td>
<td>2(33.3)</td>
<td>1(16.6)</td>
<td>1(16.6)</td>
</tr>
<tr>
<td></td>
<td>R</td>
<td>1(16.6)</td>
<td>0</td>
<td>0</td>
<td>1(16.6)</td>
<td>0</td>
<td>3(50)</td>
<td>0</td>
<td>0</td>
<td>4(66.6)</td>
</tr>
<tr>
<td>S. saprophyticus</td>
<td>S</td>
<td>0</td>
<td>2(100)</td>
<td>2(100)</td>
<td>2(100)</td>
<td>2(100)</td>
<td>0</td>
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<tr>
<td></td>
<td>I</td>
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<td>1(50)</td>
<td>0</td>
<td>0</td>
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<tr>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2(100)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>TOTAL</td>
<td>S</td>
<td>10(16.9)</td>
<td>36(61)</td>
<td>57(96.6)</td>
<td>30(50.8)</td>
<td>43(7.3)</td>
<td>7(24.13)</td>
<td>32(54.23)</td>
<td>56(94.9)</td>
<td>5(8.5)</td>
</tr>
<tr>
<td></td>
<td>I</td>
<td>11(18.6)</td>
<td>18(30.5)</td>
<td>1(1.7)</td>
<td>21(35.6)</td>
<td>6(10.16)</td>
<td>11(18.6)</td>
<td>10(34.5)</td>
<td>3(5.1)</td>
<td>13(22.03)</td>
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<tr>
<td></td>
<td>R</td>
<td>38(64.4)</td>
<td>5(8.5)</td>
<td>1(1.7)</td>
<td>8(13.55)</td>
<td>10(16.9)</td>
<td>41(69.5)</td>
<td>17(28.8)</td>
<td>0</td>
<td>41(69.5)</td>
</tr>
</tbody>
</table>

Conclusion

Gram-negative isolates showed a high level of sensitivity to Gentimycin, and Sulphamethoxazole-trimethoprim, followed by Nitrofurantion. While the high-level resistance showed against Ofloxacin and Cefixcin. this is disagreement with the results study of (Otajevwo FD and Eriagbor C.2014) which found high sensitivity to Ofloxacin.

Source of Funding: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Middle Technical University, Iraq and all experiments were carried out in accordance with approved guidelines.

REFERENCES


Prevalence of Levels of Examination Anxiety among
Undergraduate Students of the Colleges of University of
Thi-Qar, Iraq

Rasha Dakhel Abdullah¹, Maan Hameed Ibrahim Al-Ameri²
¹Academic Nurse, ²Assist. Professor, College of Nursing, University of Baghdad, Iraq

ABSTRACT

Objective: To assess the prevalence of examination anxiety among undergraduate Students of the Colleges of the University of Dhi-Qar. A descriptive and analytical study was conducted on a sample of the undergraduate students of the University of Dhi-Qar. Which consist of 400 students. The study was conducted during the period from November 2018 to June 2019 to assess levels of examination anxiety and finding a relationship between levels of examination Anxiety and academic Achievement among undergraduate Students of the Colleges of the University of Dhi-Qar. A set of paragraphs of questionnaire were used for the purpose of assessing examination anxiety to Students. The scale is a used as a screening measure of Levels of Examination Anxiety of Students. The findings reveals that the levels of severe anxiety and extremely severe anxiety for 400 undergraduate student both (male & female) are 47.3% and mild level of examination anxiety 18.2% and moderate level of examination anxiety 34.5%, and that (28.0%) of female students have severe and extremely severe levels of examination anxiety more than (19.2%) of male students.

Keywords: Examination Anxiety, Academic Achievement, Undergraduate Students

Introduction

Excessive fear can make it difficult to concentrate and persons might struggle to recall things that they have studied. In addition, they might feel like all the information they spent some much time reviewing suddenly seems inaccessible in their mind. They might blank out the answers to questions to which they know the answers. This inability to concentrate and recall information then contributes to even more anxiety and stress, which only makes it that much harder to focus their attention on the test (²). Researchers suggest that between 25 and 40 percent of students experience test anxiety (³). Examination anxiety can also be labeled as anticipatory anxiety, situational anxiety or evaluation anxiety. Some anxiety is normal and often helpful to stay mentally and physically alert(⁴). Test anxiety can have broader consequences, negatively affecting a student’s social, emotional and behavioral development, as well as their feelings about themselves and school(⁵). Researches suggest that high levels of emotional distress have a direct correlation to reduced academic performance and higher overall student drop-out rates (⁶).

Methodology

Design of the study: A correlational study design in which association and assessment approaches are applied to achieve the objectives of the study. It was conducted to determine the prevalence of levels of examination anxiety among undergraduate students of the colleges of the University of Dhi-Qar during the period of the study from October 17th 2018 to July 1st 2019.

Sample of the Study: The study was conducted upon non-probability/systematic random sample of 400 students from five colleges of University of Dhi-Qar, which located in Al-Nasiriya city/Iraq.

Data collection: Data was collected by using the questionnaire for the purpose for data collection after the researcher interviewed the students to provide overview and explain purpose of the study in simple way. The data were collected through the period from November
1st 2018 to January 2nd, 2019. The estimated time to complete the questionnaire is 10-15 minute.

**Instrument of the Study:** The questionnaire consists of two parts: demographic characteristics and scale that supposed to measure the levels of examination anxiety and academic Achievement and as following:

**Part I:** This part contains demographic characteristics of the students participated in the study and which include age, gender, college name, Stage and marital status.

**Part II:** Part (2) consists of the Test Anxiety Scale (TAS) of Sarason (1987) which measures levels of examination anxiety. This scale has (38) items. Reliability and validity of this tool is determined through application of a pilot study and panel of 15 experts.

**Statistical Methods:** Data were analyzed through the application of descriptive statistical (Frequencies and percentages) and inferential analysis (chi square).

**Results and Discussion**

**Table 1: Distribution of the study sample according to the levels of Examination Anxiety**

<table>
<thead>
<tr>
<th>Examination Anxiety</th>
<th>No.</th>
<th>Levels of Examination Anxiety</th>
<th>Mild</th>
<th>f</th>
<th>%</th>
<th>Moderate</th>
<th>f</th>
<th>%</th>
<th>Severe</th>
<th>f</th>
<th>%</th>
<th>Ext. Severe</th>
<th>f</th>
<th>%</th>
<th>Total</th>
<th>f</th>
<th>%</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>400</td>
<td></td>
<td></td>
<td>73</td>
<td>18.2%</td>
<td>138</td>
<td>34.5%</td>
<td>111</td>
<td>27.8%</td>
<td>78</td>
<td>19.5%</td>
<td>400</td>
<td>100.0%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

f→ frequency %→ percentage Ext. → extremely

Table (1) reveals that 18.2%, 34.5%, 27.8% and 19.5% of the students have mild, moderate, severe and extremely severe respectively.

Distribution in levels of Examination Anxiety according to demographic characteristics: age (table 2); gender (table 3) and stage (table 4).

**Table 2: Distribution in levels of Examination Anxiety according to the Age of the students**

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Levels of Examination Anxiety</th>
<th>Mild</th>
<th>f</th>
<th>%</th>
<th>Moderate</th>
<th>f</th>
<th>%</th>
<th>Severe</th>
<th>f</th>
<th>%</th>
<th>Ext. Severe</th>
<th>f</th>
<th>%</th>
<th>Total</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤20</td>
<td></td>
<td>32</td>
<td>8.0%</td>
<td>60</td>
<td>15.0%</td>
<td>51</td>
<td>12.8%</td>
<td>26</td>
<td>6.5%</td>
<td>169</td>
<td>42.2%</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>41</td>
<td>10.2%</td>
<td>78</td>
<td>19.5%</td>
<td>60</td>
<td>15.0%</td>
<td>52</td>
<td>13.0%</td>
<td>231</td>
<td>57.8%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>73</td>
<td>18.2%</td>
<td>138</td>
<td>34.5%</td>
<td>111</td>
<td>27.8%</td>
<td>78</td>
<td>19.5%</td>
<td>400</td>
<td>100.0%</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

f→ frequency %→ percentage Ext. → extremely

Table (2) indicates that 28.0% of the students within age group 21 years old and more have severe and extremely severe levels of examination anxiety.

**Table 3: Distribution in levels of Examination Anxiety according to the Gender of the students**

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Levels of Examination Anxiety</th>
<th>Mild</th>
<th>f</th>
<th>%</th>
<th>Moderate</th>
<th>f</th>
<th>%</th>
<th>Severe</th>
<th>f</th>
<th>%</th>
<th>Ext. Severe</th>
<th>f</th>
<th>%</th>
<th>Total</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td></td>
<td>35</td>
<td>8.8%</td>
<td>69</td>
<td>17.2%</td>
<td>44</td>
<td>11.0%</td>
<td>33</td>
<td>8.2%</td>
<td>181</td>
<td>45.2%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td></td>
<td>38</td>
<td>9.5%</td>
<td>69</td>
<td>17.2%</td>
<td>67</td>
<td>16.8%</td>
<td>45</td>
<td>11.2%</td>
<td>219</td>
<td>54.8%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>73</td>
<td>18.2%</td>
<td>138</td>
<td>34.5%</td>
<td>111</td>
<td>27.8%</td>
<td>78</td>
<td>19.5%</td>
<td>400</td>
<td>100.0%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

f→ frequency %→ percentage Ext. → extremely
Table (3) shows that 28.0% of the female students have severe and extremely severe levels of examination anxiety.

Table 4: Distribution in levels of Examination Anxiety according to the Stage of the students

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Levels of Examination Anxiety</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mild</td>
<td>Moderate</td>
</tr>
<tr>
<td></td>
<td>f</td>
<td>%</td>
</tr>
<tr>
<td>Stage</td>
<td>f</td>
<td>%</td>
</tr>
<tr>
<td>1st</td>
<td>17</td>
<td>4.2%</td>
</tr>
<tr>
<td>2nd</td>
<td>18</td>
<td>4.5%</td>
</tr>
<tr>
<td>3rd</td>
<td>16</td>
<td>4.0%</td>
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<tr>
<td>4th</td>
<td>16</td>
<td>4.0%</td>
</tr>
<tr>
<td>5th</td>
<td>6</td>
<td>1.5%</td>
</tr>
<tr>
<td>Total</td>
<td>73</td>
<td>18.2%</td>
</tr>
</tbody>
</table>

f→ frequency %→ percentage Ext. → extremely

Table (4) reveals that 13.7% of the total students who have severe and extremely severe levels of examination anxiety are within the 4th stage.

Findings show that the levels of severe anxiety and extremely severe anxiety for 400 undergraduate student both (male & female) are 47.3% and mild level of examination anxiety 18.2% and moderate level of examination anxiety 34.5%. These findings agree with study of Dawood and his team (2016) (7) who studied the relationship between test anxiety and academic achievement among undergraduate nursing students and found that 14.4% of the students had severe levels of examination anxiety; 28.2% mild level of examination anxiety and 50.9% moderate level of examination anxiety. Findings reveals that 28.0% of the students within age group 21 years old and more have severe and extremely severe levels of examination anxiety higher than 19.3% of the students within age group 20 years old and less with regard to severe and extremely severe levels of examination anxiety. Also 19.5% of the students within age group 21 years old and more have moderate levels of examination anxiety; more than 15.0% of the students within age group 20 years old and less are with moderate levels of examination Anxiety. The reason for the high rates of examination anxiety for the age group of 21 and above could be attributed to that many students repeat the last school year intentionally to obtain a rate that qualifies them to enter to the desired university during the secondary stage. In addition, due to the presence of five stages in two of the colleges studied, which include the age above 21 and who occupy the stage Third, fourth and fifth. It is also possible that the reason for the increasing concern is that the fourth and third stages occupy a larger percentage for the university rate and is necessary for future employment or for the master degree. This study disagrees with a study of Suarez and Quimbo (2016) (8) who studied test anxiety and selected personal factors as determinants of academic performance of undergraduate online learners. In addition, found that the majority of those who belonged to the youngest age group of 16 to 25 years were within the high test anxiety level (13.3%) followed by those falling within the moderately high test anxiety level (10.0%). Meanwhile, most of the next older group of students of 26 to 35 years was also observed to have high-test anxiety level (4.8%) and moderately high-test anxiety level (9.5%). Regard to gender findings indicates that (28.0%) of female students and (19.2%) of male students have severe and extremely severe levels of examination anxiety. However, the study revealed moderate test anxiety equal among both male and female university students (17.2%), but it appears that female students have slightly higher severe and extremely severe anxiety levels compared to their male counterparts. The general reasons for this finding could be numerous; lack of preparation is well-known to cause examination anxiety, the other possible reasons might be the students indulge in last minute cramming, poor time management and/or poor study habits. In addition, inadequate time to prepare, lack of advance notice, lack of clarity in the content of the examination and too much content could all contribute to test anxiety. Perhaps these reasons are applicable more to female rather than male university students for the latter sex generally go by don’t care attitude towards their subjects and exams at university level. However, the findings of present study agree with the study of Rezazadeh and Tavakoli (2009) (9) who studied investigating the relationship among test anxiety,
gender, academic achievement and years of study. A case of Iranian EFL (English Foreign Language) university students and found that there is a meaningful difference between males and females considering the rate of examination anxiety. The mean of test anxiety score for female students ($X^2= 123.72$, $SD= 35$) was higher than the mean of examination anxiety score for male students ($X^2= 113.27$, $SD= 32.14$). According to stages of colleges, findings show that (13.7%) of the total students who have severe and extremely severe levels of examination anxiety are within the 4th stage more than other stages, that could be because it is the university’s final stage for most colleges and has a large proportion of the total university student rate. This study conflicts with a study of Rezzazadeh and Tavakoli (2009) (9) show that juniors have the highest test anxiety level; 25 were freshmen, 35 were sophomores, 19 were juniors, and 31 were senior students. Seniors have the lowest level of test anxiety ($X^2= 114.35$) and juniors have the highest ($X^2= 132$).

**Conclusion**

High percentage of university students (males and females) experience levels of extreme anxiety and extremely severe anxiety before their examinations.

**Source of Funding:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the College of Nursing/University of Baghdad, Iraq and all experiments were carried out in accordance with approved guidelines.

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Influence of the Cross Linking Agent “Proanthocyanidins” on the Push-Out Bond Strength of Fiber Posts Cemented with a Self-Adhesive Resin Cement

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ABSTRACT

Grape seed extract is rich of Proanthocyanidin as a collagen crosslink which enhances the mechanical properties of dentin. This in vitro study aimed to evaluate the influence of Proanthocyanidin on push-out bond strength of prefabricated fiber post cemented with self-adhesive resin cement in different root canal areas. Method: twenty-four roots were instrumented with hand universal ProTaper System and randomly divided into three groups (n=8), according to final irrigant protocol: group 1: distilled water, group 2: 5.25% NaOCl/17% EDTA, group 3: 7% PA. Samples then obturated and coronal 8mm of the obturating materials were removed and space re-rinsed with the proposed irrigating protocol respective to the groups. Fiber posts were luted using self-adhesive resin cement. Two slices from coronal and middle thirds were prepared from each root (2 mm thickness). Push-out test was performed in a universal testing machine. Bond strength data were expressed in megapascal and analyzed by one-way ANOVA and LSD test. Results revealed that, coronally, group 3 showed significantly higher BS. In the middle levels, group 3 showed significantly higher BS than group 1, while no significantly different with group 2. Conclusions: Irrigation with 7% PA showed increased BS of fiber post to root dentin.

Keywords: Proanthocyanidin, Push-out, fiber post, self-adhesive cement.

Introduction

After the finishing of root canal therapy and throughout post space preparation, once again, a heavy smear layer is formed on root dentin. This layer is full of endodontic sealer and gutta-percha remnants plasticized by the generated heat 1-2. If resin cements are used for luting fiber posts, elimination of the sealer-filled dentin is highly suggested to reach clean dentin and make a hybrid layer 3. Chemical solutions can remove the heavy smear layer from post spaces. Consequent dentinal tubules will be opened, thus enhances the intertubular penetration of adhesive materials and increases bond strength 4. Sodium hypochlorite (NaOCl) and Ethylene diamine tetra-acetic acid (EDTA) have wide acceptance and recommended as an efficient irrigation protocol to eliminate the remnants of smear layer 4. NaOCl acts selectively to dissolve the organic part of the smear layer, whereas EDTA can remove inorganic particles 6. Nevertheless the synergistic effect of NaOCl and EDTA may cause deleterious alterations of the biomechanical characteristics of the dentin, such as the fracture resistance, hardness, flexure strength and fatigue strength, consequently render these endodontically treated tooth more prone to vertical root fracture 7. Grape seed extract (GSE) mainly composed of Proanthocyanidin (PA) as a natural crosslinking agent 8. Several studies reported that PA enhanced the mechanical properties and bond strength of dentin 9-12. To the best of the authors’ knowledge, the collagen cross-linking agents have not been so widely investigated and no study has evaluated the effect of these agents as final irrigation protocol. Hence, the rationale of the current in vitro study was to assess the effects of naturally occurring collagen cross linking agent “Proanthocyanidin” as a final root canal irrigant on the bond strength of glass-fiber post using self-adhesive resin cement, according to root thirds.

Materials and Method

Samples selection: twenty-four human palatal roots of maxillary first molars were selected and stored in 0.2% thymol solution until they were used.
**Samples preparation:** Stainless steel K-File 10# was inserted into root canal until the tip was seen just exiting at the apical foramen (observed under magnifying lens). All roots were standardized at 12mm. WL was determined by subtracting 1mm from this length. The apical foramen was sealed with sticky wax (GC, chemical Co, Japan). To prevent extrusion of irrigant out of the apex. All samples were prepared using hand universal ProTaper system (Dentsply, Maillefer, Swiss), till F4 (0.4/0.06) according to the manufacturer’s instructions. During preparation, the canals were irrigated with 2 ml of DW; this was repeated each time the instrument was removed.

**Samples grouping:** The roots were randomly divided into 3 groups (n=8) relative to the final irrigation protocol. The concentrations of NaOCl, EDTA and PA were 5.25 %, 17% and 7% respectively.

**Group 1:** Irrigation process was performed with DW only.

**Group 2:** The sequence of final irrigation was as follows:

1. 1ml of NaOCl (Wojciech Pawlowski, Poland), Endoactivator for 30s.
2. 5ml of DW and dried with absorbent paper point (#40).
3. 1ml of EDTA (Siauliai, Lithuania), Endoactivator for 30s.
4. 1ml of EDTA, Endoactivator for 30s.
5. 5ml of DW and dried with absorbent paper point (#40).
6. 1ml of NaOCl, Endoactivator for 30s.
7. Canals were finally flushed with 5ml of DW and dried with absorbent paper points (#40).

**Group 3:** The same protocol used in group 2 followed by these subsequent steps:

1. 1ml of PA (HerbStore,USA). Endoactivator for 30s.
2. Fresh 1ml of PA, Endoactivator for 30s, and then the canals were dried with absorbent paper point (#40).

**Root canal obturation:** After final irrigation, the experimentally root canals dried with absorbent paper points and filled with ProTaper F4 gutta-percha (Dentsply, Maillefer, Switzerland), and an epoxy-resin sealer (AH Plus; Dentsply, Konstanz, Germany) using single cone technique. Radiographs were taken to confirm the absence of voids in the fillings. The canal access was restored with a temporary restorative material. The roots were stored in an incubator at 37 °C and 100% humidity for 1 week to allow the sealer to get fully set.

**Post Space Preparation:** Gutta-percha was removed with Peeso reamers from size 1 to 4 at 1500 rpm with water cooling, then the custom drill of the fiber post system was used with the coincide post size. Gutta-percha was removed up to 8mm, leaving 3mm long apical obturation materials (13). The post space was filled with dual-cure self-adhesive resin cement (U-Cem, Vericom, Korea). Photoactivation was performed using LED light unit (GUILIN WOODPECKER, China) with 850 mW/cm2 intensity in such a way that the tip of the light unit was directly in contact with the coronal end of the post.

**Mold construction:** A chemically cured acrylic resin was mixed according to the manufacturer’s instructions and poured into a specially designed plastic mold (12mm height and 12mm diameter). Before the acrylic resin reached the dough stage, the root with coronal part of cemented post in situ was dipped into the acrylic resin up to the coronal end of the specimen.

A protractor was used during the mounting procedure to ensure that the long axis of the root was vertically aligned 14,15.

![Fig. 1: The plunger precisely over the fiber post](image)

**Root sectioning:** After complete polymerization of acrylic, the coronal section of the post outside the
specimen was cut and the root was removed from the plastic mold. Two horizontal sections (2mm thick), were taken from coronal and middle thirds of each root using a precision cutting machine with a water-cooled, resulted in 16 horizontal sections of each group with a total of 48 horizontal sections for the three groups.

**Push-Out Bond Strength Test:** The thickness of each slice was confirming with a digital caliper. The push out test was applied with a universal testing machine (Laryee, China) at a speed of 0.5 mm/min. Stainless steel cylindrical plunger (1mm diameter) with a flat tip was placed at the center of the post to maintain the contact with the post only without touching the canal wall (fig.1). A plastic plate with a hole 2mm in diameter was used to provide support for the specimens during the push-out test and to allow the free motion of the plunger.

**Bond strength calculation:** Measurements were made by the device at the time that the post had left the post space. The bond strength, measured in Newton (N), was converted to megapascal (MPa) using the following formula: (16).

\[
\text{Push out bond strength (Mpa)} = \frac{F(N)}{A(mm^2)}
\]

Where,
- \(F\) = the force needed to dislodge the post,
- \(A\) = adhesion surface area.

To determine the adhesion surface area, the following formula was used:

\[
\text{Adhesion surface area (mm}^2) = 2\pi RH
\]

Where,
- \(\pi\) = the constant 3.14,
- \(R\) = the post radius (0.6mm) and
- \(H\) = the thickness of the slice in millimeters (2mm).

Since the post was cylindrical-shaped so, the diameter was the same for all specimens (1.2mm) at either the apical or the coronal side.

**Results and Discussion**

Bond strength values in MPa (mean, standard deviation, minimum and maximum) of the three groups are illustrated in Table 1.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Levels</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1</td>
<td>Coronal</td>
<td>13.94</td>
<td>1.36</td>
</tr>
<tr>
<td></td>
<td>Middle</td>
<td>12.24</td>
<td>2.00</td>
</tr>
<tr>
<td>G2</td>
<td>Coronal</td>
<td>17.63</td>
<td>1.29</td>
</tr>
<tr>
<td></td>
<td>Middle</td>
<td>16.03</td>
<td>1.47</td>
</tr>
<tr>
<td>G3</td>
<td>Coronal</td>
<td>19.38</td>
<td>1.64</td>
</tr>
<tr>
<td></td>
<td>Middle</td>
<td>17.34</td>
<td>1.55</td>
</tr>
</tbody>
</table>

Coronally, the results showed that the highest bond strength was observed in G3 (19.38 ± 1.64). The second highest bond strength was of G2 (17.63 ± 1.29) While, the least bond strength was recorded for G1 (13.94 ± 1.36). Rendering the middle third, the highest bond strength was observed in G3 (17.34 ± 1.55). The second highest bond strength was of G2 (16.03 ± 1.47) While, the lowest bond strength was recorded for G1 (12.94 ± 2.00).

To compare the results of the three groups at the coronal and middle thirds, a statistical analysis of bond strength study was performed with one-way ANOVA test (Table2). ANOVA test revealed that there were statistically significant differences among the three groups at both levels.

<table>
<thead>
<tr>
<th>Levels</th>
<th>F</th>
<th>P-value</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coronal</td>
<td>29.698</td>
<td>.000</td>
<td>HS</td>
</tr>
<tr>
<td>Middle</td>
<td>19.575</td>
<td>.000</td>
<td>HS</td>
</tr>
</tbody>
</table>

Intergroup multiple comparisons were done by LSD test (table3) which show significant differences among the three groups considering coronal thirds. At middle areas G1 differ significantly with other groups, while G2 and G3 were not differ significantly.
Table 3: LSD test among the three groups at the coronal thirds

<table>
<thead>
<tr>
<th>Area</th>
<th>Groups</th>
<th>Mean Difference</th>
<th>SE.</th>
<th>P-value</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coronal</td>
<td>G1 G2</td>
<td>-3.68238-*</td>
<td>.72049</td>
<td>.000</td>
<td>HS</td>
</tr>
<tr>
<td></td>
<td>G1 G3</td>
<td>-5.44050-*</td>
<td>.72049</td>
<td>.000</td>
<td>HS</td>
</tr>
<tr>
<td></td>
<td>G2 G3</td>
<td>-1.75812-*</td>
<td>.72049</td>
<td>.024</td>
<td>S</td>
</tr>
<tr>
<td>Middle</td>
<td>G1 G2</td>
<td>-3.79837-*</td>
<td>.84812</td>
<td>.000</td>
<td>HS</td>
</tr>
<tr>
<td></td>
<td>G1 G3</td>
<td>-5.10863-*</td>
<td>.84812</td>
<td>.000</td>
<td>HS</td>
</tr>
<tr>
<td></td>
<td>G2 G3</td>
<td>-1.31025</td>
<td>.84812</td>
<td>.137</td>
<td>NS</td>
</tr>
</tbody>
</table>

Table 4: t-test between middle and coronal thirds of the three groups

<table>
<thead>
<tr>
<th>Groups</th>
<th>T</th>
<th>P-value</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1</td>
<td>1.817</td>
<td>.112</td>
<td>NS</td>
</tr>
<tr>
<td>G2</td>
<td>2.777</td>
<td>.027</td>
<td>S</td>
</tr>
<tr>
<td>G3</td>
<td>3.124</td>
<td>.017</td>
<td>S</td>
</tr>
</tbody>
</table>

It has been reported that, irrigants used during root canal therapy are able to affect the composition of radicular dentin. As a result, the capability of the adhesive system in making a strong bond is affected as well20. Regarding the results of this test, the lowest bond strength values were found in G1, in which, the canals were irrigated with distilled water only. Followed by G2 where the canals irrigated with NaOCl/EDTA. Removal of the smear layer seems to be the most probable explanation for the positive effect of the chemical agents on the bond strength. NaOCl the most commonly used irrigant is considered an excellent proteolytic agent 21. EDTA cleaned smear layer and debris and most of the dentinal tubules were open, which may facilitate the penetration of adhesive resin. This might clarify the improved push-out bond strengths in G2. These results were in accordance with several researches 22-25 who concluded that, NaOCl in combination with EDTA could be advantageous for post space irrigation when fiber posts are bonded with self-adhesive resin cement. The reasons behind this contradictory data could be due to they did not obturate the canals in their study, while in the present study; the canals were filled with gutta-percha and AH Plus sealer. Accordingly, the composition of the smear layer in the two studies was different.

Additionally, Garcia et al. 17 revealed that, 17% EDTA and 5% NaOCl provided bond strength statistically similar to distilled water. It was noted that, in their study they applied the irrigation about 3min for each solution, while in the present study the application time was 1min for each. According to Jalali et al. 18, 25, the longtime of application and a high concentration of NaOCl could affect the mechanical properties of human dentin.

Conclusion

Within the limitations of this study, Irrigation with 7% PA showed higher push-out bond strength of fiber post cemented with self-adhesive resin cement compared with conventional irrigating solutions (NaOCl/EDTA). Based on the methodology used, it can be concluded that: the coronal third, regardless the irrigant employed, presented better adhesive performance than middle area.

Source of Funding: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Dentistry, University of Baghdad/Iraq and all experiments were carried out in accordance with approved guidelines.

REFERENCES


Effectiveness of Instruction Program on Pregnant Women’s Practices regarding Anemia at Primary Health Care Centers in Baquba City

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ABSTRACT

Objective: To identify the effect of the Instruction program on the Practices of pregnant women who suffering anemia. A quasi-experimental design was carried out with the application of pre- post test for the study and the control group. Purposive sample, consists of (60) pregnant women diagnosed with anemia attending four health care centers in Baquba city. The highest percentage of pregnant women (30%) (33.3%), respectively, at age group (25-29) years for study and control, with regard to the educational level (30%) (36.7) respectively intermediate and primary school graduate. (96.7%) (100%) in both groups were housewives. The two groups (36.7%) were within (low socioeconomic status), (43.7%) (56.7%) having (1-2) pregnancies, in which (46.7%) of women are reveal a level of (8.1-9) g/dl that is less than normal pre instructional program and the level is increased to normal level post instructional program (10.1-11) g/dl in (53.3%), and to (> 11) g/dl in (30%) of pregnant women. The results also present that the pregnant women in study group showing fair level of Practices about anemia in pre-instructional program and their level increased to (100%) in post-instructional program. While the level of control group did not changed.

Keywords: Anemia, Pregnant women, Primary Health Care Center, Practices

Introduction

Anemia is public health problem that effects countries with low, middle, or high income (¹). Anemia during pregnancy is defined by the World Health Organization (WHO) as a hemoglobin concentration less than 11 g/dL. Also anemia is considered as a condition in which the number and size of red blood cells, or the hemoglobin concentration, falls below an established cut-off value, as a result lead to impairment of the capacity of the blood to transport oxygen around the body (²). It occurs at all age groups, but is more prevalent in pregnant women and children (³). Anemia impairs health and well-being in women and increases the risk of maternal and neonatal adverse outcomes. During pregnancy anemia is responsible for a lot of complications in women. Some of those associated problems are less exercise tolerability, puerperal infection, thromboembolic problems, postpartum hemorrhage, pregnancy induced hypertension, placenta praevia, cardiac failure, low birth weight, preterm delivery, and prenatal death, therefore, children have low hemoglobin are at high risk of long term impairment in mental and motor development, lack of concentration, short attention span, easy distractibility, increased susceptibility to infection and abnormal appetite (⁴-⁵). The diet through pregnancy should contain protein, iron, vitamin B12, folic acid and mineral which are required for the hemoglobin production and Iron deficiency anemia (IDA) was considered to be one of the most vital factors of anemia (⁶).

Materials and Method

A quasi-experimental design was carried out throughout the present study with the application of a pre-test and post –test for the study and the control group for the effectiveness of instruction program on the
Practices of pregnant women with anemia. The study was conducted at primary health care centers in Baquba city that include: Altakia health care center, Alsarraay health care center, Althaher health care center, Almustapha ideal health care center. The Study implemented for the period of (23th October 2018 through 15th April 2018). Non-probability (purposive) sample, consists of (60) pregnant women diagnosed with anemia attending four health care centers in Baquba city. Thirty (30) women considered as (study group) and another (30) women were considered as (control group). The study sample group was exposed to pretest, instructional program, and posttest, while the control sample group just exposed to pretest and posttest. The steps of the Study carried by assessment of pregnant women’s needs for Practices to manage anemia and by using questionnaire format to fulfill with objective of the study and consisted of demographic, and reproductive characteristics previous and current health history, Hb levels, and pregnant practices concerning anemia. An instrument was constructed through the use of (3) levels of Likert scale for the assessment of anemic pregnant women’s practices. The rating score of the instrument was (2) for I know, (1) for uncertain and (0) for I don’t know, with cut-off point=1.5. A pilot study was carried out between December 13th, 2018 to December 20th, 2018, on (10) anemic pregnant women, attending alsarai health care center, to determine the reliability of the questionnaire and content validity was carried out through 17 experts. Descriptive and inferential statistical analyses were used to analyze the data.

Results and Discussion

The analysis of demographic variable in table (1) reveals that relative to age groups, the highest percentages (30%) (33.3%) respectively for both study and control groups are (25-29) years old. The finding of the study agree with study done by Al-Muktar, (2009) about “anemia among pregnant attending labor units in two maternity hospitals in Mosul”, the study reported that the age range is (15-43) years, with mean ± SD were (28.17 ± 5.57) (7). Regarding to women’s level of education, the highest percentages (30%) for study group are intermediate school graduate, and (36.7%) for control group are primary schools graduates. With respect to women’s occupation, the highest percentage (96.7%)(100%) in both study and control groups were housewives. The study results agree with Asrie, (2017) study about “Prevalence of anemia and its associated factors among pregnant women receiving antenatal care at Aymiba Health Center, northwest Ethiopia” Most of the study participants were educated up to the level of primary school (59.7%), also found about (38.8%) of participants were housewives (8). Additionally with the results of Egryani & colleagues (2017) “about the effect of one-to-one counseling to pregnant women’s knowledge about anemia in Semarang” that found about (52,1%) of women were housewives (9). Concerning Socio-economic status the highest percentages (66.7%) (80%) respectively for both study and control groups within low category (low socio economic status). The finding agree with Prakash & colleagues, (2015) about “Incidence of Anemia and its Socio-demographic determinants among pregnant women attending for antenatal care in Nepal”; also shows that pregnant have low socioeconomic (10). Table (2) showed the distribution of the pregnant women according to reproductive history. Relative to age at marriage, results indicate that the highest percentage (56.7%) of pregnant women for both groups, their age at marriage (15-19) years old. This finding agree with Abu-Hasira, (2007) findings who has reported that the highest percentage (75.7%), is at age group of (14-16) years (11). Concerning gravid, the highest percentage (43.3%) (56.7%) respectively for study and control groups having (1-2) pregnancies. Regarding to Parity, the highest percentage (36.7%) for study group have (1-2), and (46.7%) in control group were primipara. The results agree with Obse & colleagues (2013) study who that the majority reported that average number of pregnancy about (45.2%) of the mother are in their second pregnancy (12). Additionally, A Prospective study done by Suryanarayana, (2017) on the prevalence of anemia of pregnant women and its outcome; the study reported that (45.9%) of the mother are in their primi pregnancy in study sample, and (30.4%) in control sample (13). Regarding to no. of abortions (43.3%) (23.3%) respectively in both groups confirm that they got (1-2) abortions. The study of Ahmed & others (2015) at GMC Hospital, Ajman, UAE”, found that the highest percentage (41.8%) of their findings of one abortion (14). Regarding period between pregnancies, the highest percentages are distributed between less than year and three years and more (26.7%) in the study group, but in the control group, (43.3%) were primipara, and (33.3%) of them have less than one year period between pregnancies. The finding agree with that done by Urvashi, (2018) who has reported that most
(55.38%) of those with pregnancy; having birth interval ≤ 2 years (15). Regarding to prenatal visits, the women in both group reveal that they are on regular visits to prenatal health care centers (73.3%) (80%) respectively. Table (3) show level of hemoglobin in pregnant women pre instruction program and post instruction program (before delivery), the findings indicate that the level of hemoglobin is increasing post instruction program among women in the study group, in which (46.7%) of women are reveal a level of (8.1-9) g/dl that is less than normal pre instructional program and the level is increased to normal level post instruction program that is (10.1-11) g/dl in (53.3%), and to (> 11) g/dl in (30%) of pregnant women. The level of hemoglobin was (9.1-10)g/dl among women in the control group (53.3%) pre-test and post-test is 10.1-11 g/dl (60%) that show moderate increasing also. The number of women having various grades of anemia reduced and the number of women with normal HB increased during the follow-up at 10.3-10.72 g% in control group (13). Table (4) shows that pregnant women practices in the study group having fair level of practice toward anemia during pre-instructional program (86.7%), those practices getting better after application of instructional program in which they show good level of practice (100%). While the control group showing fair level of practice toward anemia during pre and post test periods (pre=70%and post=66.7%) respectively. Table (5) reveals that women in the study group showing fair level of practice in all items related to pattern of drug intake, in pre test, and they are showing good level in all item post application of the program, while the control group showing fair level in all item related to pattern of drug intake pre-test except the item “taking iron tablet immediately after eating” which show good practice and they showing fair level of practice post-test in all items. This finding agree with a study done by Jayanthigopal & Demisie, (2018) that showed good practices, about (62.9%) of participants use iron supplements regularly while 79.4% of participants have had regular three times meal per day (16). Women’s practices related to pattern of food intake, the study group showing fair to good level of practices among the items in pre-test and showing a good level in all items post-test. The control group showing the same level of practices among items for both; pre and post test in which they are showing fair to good level of practices. This finding agree with a study about “Prevalence of anemia and associated factors among pregnant women in Southern Ethiopia”, half of the pregnant women, 237 (47%) had low dietary diversity score 17. Additionally, most pregnant women have poor dietary habit and lack of nutritional education 18. Regarding women’s practices related to prenatal care and visits, the study group showing fair level of practices related to prenatal care and visits in all items pre-test and showing good level of practices post-test in all items, while the control group showing the same level in pre and post periods; except the item related to “adherent to appointment to visits” that is show good level This finding agree with a study about “Anemia in Pregnancy: Prevalence, Risk Factors, and Adverse Perinatal Outcomes in Northern Tanzania”; Women who attended (ANC) or more times had lower prevalence of anemia (17.4%) than those who attended only once (35.3%) 19. Concerning women’s practices related daily habits and events, the study group in pre-test period showing poor level toward doing exercise, showing fair level toward doing hard working and lifting leg during sleeping, and good level in sleeping hours, personal hygiene and taking break or rest periods after works. The post-test showing good practices toward daily habits except doing hard work that still fair level and doing heavy work that showing poor level of practice, while the control group showing fair to good level of practices toward daily habits during pre and post-test periods, Singh, (2013) conducted a study about life behavior affects prevalence of anemia among women in India ; the study results, reported that important of rest and sleep during pregnancy conserve energy, provides organ respites, relieves tension (20).

Table 1: Distribution of the Sample According to Reproductive Characteristics

<table>
<thead>
<tr>
<th>No.</th>
<th>Characteristics</th>
<th>Study group</th>
<th>Control group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>f</td>
<td>%</td>
</tr>
<tr>
<td>1</td>
<td>Age at marriage</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>15-19 yrs</td>
<td>17</td>
<td>56.7</td>
</tr>
<tr>
<td></td>
<td>20-24 yrs</td>
<td>7</td>
<td>23.3</td>
</tr>
<tr>
<td></td>
<td>25-29 yrs</td>
<td>6</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>30</td>
<td>100</td>
</tr>
<tr>
<td>2</td>
<td>Gravida</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1-2</td>
<td>13</td>
<td>43.3</td>
</tr>
<tr>
<td></td>
<td>3-4</td>
<td>10</td>
<td>33.4</td>
</tr>
<tr>
<td></td>
<td>5-6</td>
<td>4</td>
<td>13.3</td>
</tr>
<tr>
<td></td>
<td>7≤</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>30</td>
<td>100</td>
</tr>
</tbody>
</table>
Table 2: Pregnant Women Hemoglobin Levels in Pre and Post Instructional Program

<table>
<thead>
<tr>
<th>Levels</th>
<th>Study group</th>
<th>Control group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F.</td>
<td>%</td>
</tr>
<tr>
<td>Pre</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-8 g/dl</td>
<td>5</td>
<td>(16.7)</td>
</tr>
<tr>
<td>8.1-9 g/dl</td>
<td>14</td>
<td>(46.7)</td>
</tr>
<tr>
<td>9.1-10 g/dl</td>
<td>11</td>
<td>(36.6)</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>(100)</td>
</tr>
<tr>
<td>Post</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-8 g/dl</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>8.1-9 g/dl</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>9-10 g/dl</td>
<td>5</td>
<td>(16.7)</td>
</tr>
<tr>
<td>10.1-11 g/dl</td>
<td>16</td>
<td>(53.3)</td>
</tr>
<tr>
<td>&gt; 11 g/dl</td>
<td>9</td>
<td>(30.0)</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>(100)</td>
</tr>
</tbody>
</table>

Table 3: Overall Assessment of Practices toward Anemia among Pregnant Women:

<table>
<thead>
<tr>
<th>Levels</th>
<th>Study Group (N = 30)</th>
<th>Control group (N = 30)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
<td>Post</td>
</tr>
<tr>
<td>f</td>
<td>%</td>
<td>M  SD</td>
</tr>
<tr>
<td>Poor</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Fair</td>
<td>26</td>
<td>86.7</td>
</tr>
<tr>
<td>Good</td>
<td>4</td>
<td>13.3</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>100</td>
</tr>
</tbody>
</table>

F: Frequency, %: Percentage, MS: Mean Score, SD: Standard Deviation

Conclusions

Majority of pregnant women practices in the study group having fair level of practice toward anemia during pre-instructional program, those practices getting better after application of instructional program in which they show good level of practice (100%). While the control group showing fair level of practice toward anemia during pre and post test periods.

Source of Funding: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Maternal and Neonate Department, College of Nursing, University of Baghdad, Iraq, and all experiments were carried out in accordance with approved guidelines.

REFERENCES


Knowledge of Iraqi Midwives and Nurses about Hepatitis C Virus at Maternity Hospitals in Baghdad City

Hawraa Hussein Ghafel
Lecturer, Maternal and Neonate Nursing Department, College of Nursing, University of Baghdad

ABSTRACT
This study conducted to assess the knowledge of Iraqi Midwives and nurses about hepatitis C Virus. This study conducted at maternity hospitals in Baghdad City this hospitals includes (Baghdad Medical City Hospital, Ibn Al-Baladi General Hospital, Karkh Hospital for Childbirth and Al-Elwaya Maternity Hospital). The study starting at October 2018 to March 2019. Non probability (purposive sample) including (150) midwives and nurses that working in the maternity ward and delivery rooms to assess their knowledge about hepatitis C virus, The following statistical data analysis approaches were used in order to analyze and assess the result of the study Frequency and Percentage% & SPSS Version 24. According to the result of this study the highest percentage of Iraqi midwives and nurses have poor knowledge about hepatitis C, the highest percentage of them did not joining in a courses or lectures to increase their knowledge despite they working in the maternity wards and delivery rooms. Iraqi midwives and nurses that working in the maternity wards and delivery rooms have poor knowledge about hepatitis C Virus.

Keywords: Knowledge, Midwives & Nurses, Hepatitis C Virus, Maternity Hospitals, Delivery rooms

Introduction
Hepatitis is the term for several diseases that cause the liver to be inflamed (swollen). The most common types of hepatitis are A, B, and C. These types of hepatitis are caused by 3 different viruses. Hepatitis B and C are caused by viruses that are in blood and body fluids. You can get one of these types of hepatitis by being exposed to blood or body fluids from a person who has the hepatitis B or C virus. The CDC, WHO, USPSTF, AASLD, and ACOG recommend screening people at high risk for hepatitis C infection these populations include people who are workers in a healthcare setting who have had a needle stick injury especially midwives and nurses that works in the delivery room because they are contacted with blood of women that have hepatitis C. Hepatitis C Virus usually occurs as a result of parenteral contact with infected body fluids. Common modes of transmission for these viruses include receipt of contaminated blood or blood products, invasive medical procedures using contaminated equipment and for hepatitis B transmission from mother to baby at birth, from family member to child, and also by sexual contact. Hepatitis C virus (HCV) causes both acute and chronic infection. Acute HCV infection is usually asymptomatic, and is only very rarely (if ever) associated with life-threatening disease. About 15–45% of infected persons spontaneously clear the virus within 6 months of infection without any treatment. The remaining 60–80% of persons will develop chronic HCV infection. Of those with chronic HCV infection, the risk of cirrhosis of the liver is between 15–30% within 20 years. Hepatitis C is found worldwide. The most affected regions are WHO Eastern Mediterranean and European Regions, with the prevalence of 2.3% and 1.5% respectively. Prevalence of HCV infection in other WHO regions varies from 0.5% to 1.0%. Depending on the country, hepatitis C virus infection can be concentrated in certain populations (for example, among people who inject drugs) and/or in general populations. There are multiple strains (or genotypes) of the HCV virus and their distribution varies by region. Transmission via blood the most common
way to get hepatitis C is through exposure to infected blood. This can happen if the blood of someone who has hepatitis C enters your own bloodstream. This might happen if you: use a needle or syringe to inject drugs into your body that someone with hepatitis C has already used and are injured by a needle stick in a lab or other healthcare setting; if that needle has come into contact with blood infected by hepatitis C share razors, toothbrushes, or other personal hygiene items that may have touched an infected person’s blood. Sexual transmission According to the Centers for Disease Control and Prevention (CDC), you can also get hepatitis C from sexual contact. But certain sexual behaviors are riskier than others when it comes to increasing your chances of becoming infected. You increase your risk of getting hepatitis C if you: have more than one sexual partner have a sexually transmitted disease have HIV engage in sex that’s rough or could cause bleeding. The National Institutes of Health (NIH) advises condom use during sex to help prevent the spread of infection. Tattooing or piercing The CDC notes that infectious diseases like hepatitis C can be transmitted through unregulated settings that provide tattooing, body piercing, or body art. Commercially licensed tattooing businesses are generally thought to be safe. However, more informal settings that offer tattooing or piercing services may not have adequate safeguards to help avoid the spread of infections. The Centers for Disease Control and Prevention (CDC) state that approximately 70 to 80 percent of people with hepatitis C don’t have symptoms. While this is true, some people report mild to severe symptoms. These symptoms include: fever, dark urine loss of appetite abdominal pain or discomfort joint pain jaundice. The symptoms may not show up right away. Some may take six to seven weeks to appear. Learn more about the symptoms and delayed symptoms of hepatitis C. Several risk factors have been studied, in which many have been determined as independent risk factors of HCV infection. Well known risk factors for HCV infection take in Intravenous Drug Use (IVDU) contact with infected blood products, and intranasal drug use. High-risk sexual activity, tattooing, and skin piercing have also been recommended to be associated with increased risk for HCV. As well, mother-to-infant transmission has been established, but it is a rare cause of transmission of hepatitis C. Nurses should include patient education in their responsibilities to patients with hepatitis C. With 3.2 million Americans carrying the hepatitis C infection, according to the Centers for Disease Control and Prevention, most nurses will encounter patients with the chronic liver infection at some point in their career. Nursing responsibilities when caring for hepatitis C patients include educating patients and families about the disease and preventing transmission of the infection to themselves or other patients.

Materials and Method

Descriptive study conducted to assess the knowledge of midwives and nurses about hepatitis C virus at maternity hospitals in Baghdad city. Midwives and nurses are usually in contact with human blood and fluids. It is useful to study their knowledge about Hepatitis C virus. To the best of our knowledge there are very limited unpublished studies in Iraq among midwives and nurses regarding blood borne diseases. The study objective was to determine the level of knowledge about Hepatitis C virus among Iraqi midwives and nurses. The study was conducted at the following maternity hospitals: (Baghdad Medical City Hospital, Ibn Al-Baladi General Hospital, Karkh Hospital for Childbirth, Al-Elwaya Maternity Hospital). The study started at October 2018 to Mach 2019. Non probability (purposive sample) consist of (150) midwives and nurses that working in Maternity wards and delivery rooms. Participation in this study was voluntary. Data was collected after obtaining ethical consent from all participants. A developed questionnaire by the researcher was used to collection of the data from the sample this questionnaire consist of two main parts: Part 1: Demographic Data: this part contain demographic data about the study sample such as (Age, occupation, Current work department, Name of the current Hospital, the number of years employed in this profession, educational level, Educational Courses and Continuing Education in their work place about Hepatitis, the source of information about Hepatitis. Part 2 consist of 22 questions regarding hepatitis C virus to assess the Knowledge of Midwives and nurses that participants in this study. Descriptive and inferential statistics were used through the Microsoft Excel Database jointly with the Statistical Package for Social Sciences (SPSS, Version 24). The P value of ≥ 0.05 was considered as non-statistically significant. The P value of ≤ 0.05 was considered as statistically significant. The P value of ≤ 0.01 was considered as highly statistically significant.
**Results and Discussion**

Figure 1 shows that nurse-midwives are young with age of (20 -29) years which refer to the highest percentage among sample (29.3%).

**Table 1: Distribution of Nurse-Midwives according to their Professional Characteristics**

<table>
<thead>
<tr>
<th>List</th>
<th>Characteristics</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hospital:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Baghdad Medical City</td>
<td>26</td>
<td>17.3</td>
</tr>
<tr>
<td></td>
<td>Ibn Al-Baladi Hospital</td>
<td>39</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td>Al-Karkh Hospital</td>
<td>42</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>Al-Elweya Hospital</td>
<td>43</td>
<td>28.7</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>150</strong></td>
<td><strong>100</strong></td>
</tr>
<tr>
<td>2</td>
<td>Department:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ward</td>
<td>46</td>
<td>30.7</td>
</tr>
<tr>
<td></td>
<td>Delivery room</td>
<td>104</td>
<td>69.3</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>150</strong></td>
<td><strong>100</strong></td>
</tr>
<tr>
<td>3</td>
<td>Years of Services:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>&lt; 1 year</td>
<td>8</td>
<td>5.3</td>
</tr>
<tr>
<td></td>
<td>1 – 5 years</td>
<td>74</td>
<td>49.3</td>
</tr>
<tr>
<td></td>
<td>6 – 10 years</td>
<td>38</td>
<td>25.3</td>
</tr>
<tr>
<td></td>
<td>11 – 16 years</td>
<td>18</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>17 – 22 years</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>23 ≤ years</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>150</strong></td>
<td><strong>100</strong></td>
</tr>
<tr>
<td>4</td>
<td>Participation in training courses:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>97</td>
<td>64.7</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>53</td>
<td>35.3</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>150</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Table 1 reveals that the highest percentages of nurse-midwives are working at Al-Elwiya and Al-Karkh hospital (28.7% and 28%), (69.3%) of them are working in delivery rooms. About half of them are working for period of (1 – 5) years of service (49.3%). They refer that (64.7%) are participating in training courses. Regarding source of information about viral hepatitis C, they show that half of them are getting information from training courses (50.7%) and remaining were getting information from posters, scientific symposium and television.

**Table 2: Assessment of Knowledge levels among Nurse-Midwives about Viral Hepatitis C**

<table>
<thead>
<tr>
<th>Levels</th>
<th>f</th>
<th>%</th>
<th>M.S</th>
<th>S.D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor</td>
<td>133</td>
<td>88.7</td>
<td>1.11</td>
<td>0.318</td>
</tr>
<tr>
<td>Fair</td>
<td>17</td>
<td>11.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>150</td>
<td>100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

f: Frequency, %: Percentage, M.S: mean of Score, S.D: Standard Deviation
Poor = 22 – 36, Fair= 37 – 51, Good= 52 – 66

Table 2 indicates that more of the nurse-midwives are having poor level of knowledge about viral hepatitis C (88.7%) while only (11.3%) of them are showing fair level of knowledge.

### Table 3: Analysis of Variance for Nurse-Midwives’ Knowledge with regard to their Age (N = 150)

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>Source of Variance</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>P-value (Sig.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Between Groups</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge</td>
<td>Within Groups</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>285.458</td>
<td>4</td>
<td>71.364</td>
<td>2.632</td>
<td>.037 (S)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3932.116</td>
<td>145</td>
<td>27.118</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4217.573</td>
<td>149</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

df: Degree of freedom, F: F-statistics, P: Probability, Sig: Significance, S: Significant

Table 3 indicates that there is significant relationship between nurse-midwives’ knowledge with their age group at p-value ≤ 0.05 respectively.

### Table 4: Analysis of Variance for Nurse-Midwives’ Knowledge with regard to their Educational Level (N = 150)

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>Source of Variance</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>P-value (Sig.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Between Groups</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge</td>
<td>Within Groups</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>253.104</td>
<td>4</td>
<td>63.276</td>
<td>2.514</td>
<td>.050</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3964.470</td>
<td>145</td>
<td>27.341</td>
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<td>4217.573</td>
<td>149</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

df: Degree of freedom, F: F-statistics, P: Probability, Sig: Significance, S: Significant

This table reveals that there is significant relationship between nurse-midwives’ knowledge with their level of education at p-value ≤ 0.05 respectively.

### Table 5: Correlation between Nurse-Midwives’ Knowledge with their Professional Characteristics (N = 150)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Correlation</th>
<th>Pearson Correlation</th>
<th>P-Value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department</td>
<td></td>
<td>0.255</td>
<td>0.002</td>
<td>H.S</td>
</tr>
<tr>
<td>Years of Service</td>
<td>-0.083</td>
<td>0.313</td>
<td>0.001</td>
<td>N.S</td>
</tr>
<tr>
<td>Participation in training course</td>
<td>0.260</td>
<td>0.001</td>
<td>H.S</td>
<td></td>
</tr>
<tr>
<td>Sources of information</td>
<td>-0.154</td>
<td>0.059</td>
<td>N.S</td>
<td></td>
</tr>
</tbody>
</table>

P: probability, H.S: High significant, N.S: Not significant

Table 5 depicts that there is high significant relationship between nurse-midwives’ knowledge with regard to department they are working in and participation in training course at p-value (0.002 and 0.001) respectively and no significant relationship has been seen with regard to years of service and source of information. This study shows that nurse-midwives are young with age of (20 - 29) years which refer to the highest percentage among sample (29.3%). Nurses and midwives are more likely to be women, with women making up 89.3% of all employed nurses and midwives in 2015, around the same as in 2014 (89.4%). The average age of employed nurses and midwives in both 2011 and 2015 was 44.4 years. The proportion aged 50 and over grew from 38.3% to 39.0%, although this was less than in 2014 (39.4%). Between 2011 and 2015, increases occurred in the number of employed nurses and midwives in both the 25 to 34 age group (51,686 to 65,099) and the 55 and over group (63,170 to 77,608). Between 2011 and 2015, there were more employed nurses and midwives in the 50–54 year age group than any other age group. The finding of this study agrees...
with that study the incidence in (25-54) year’s age group 
(9). This study shows that (36%) of nurse-midwives 
are graduated from nursing school and (33.3%) are 
graduated from nursing school. American College of 
Nurse-Midwives represents over 11,000 Certified Nurse-
Midwives (CNMs) and Certified Midwives (CMs) in all 
50 states and most US territories. In 2005, In terms of 
gender, only 2% of CNMs are men. They are able to 
prescribe some medications, use certain medical devices, 
and implement therapeutic and diagnostic measures. The 
finding of this study disagrees with Iraqi midwives and 
nurses (10). The highest percentages of nurse-midwives 
are working at Al-Elwaya and Al-Karkh hospital (28.7% 
and 28%), (69.3%) of them are working in delivery 
rooms. About half of them are working for period of (1 
– 5) years of service (49.3%). They refer that (64.7%) 
are participating in training courses. Regarding source of 
information about viral hepatitis C, they show that half 
of them are getting information from training courses 
(50.7%) and remaining were getting information from 
posters, scientific symposium and television. Nursing 
midwives may choose to work through private clinics, 
but some also work in hospital settings and the clinics 
of other physicians and nurses to provide care alongside 
other medical professionals. This can be a highly 
stressful job depending on the circumstances, and a 
nurse midwife is always on call when a patient suddenly 
goes into labor. CNMs work in many places. Most 
often, they work in private practice, hospitals, birthing 
centers, health clinics and home birth services (11). Most 
of the Iraqi midwives and nurses are having poor level 
of knowledge about hepatitis C virus (88.7%) while only 
(11.3%) of them are showing fair level of knowledge. A 
contributing factor for the transmission of Hepatitis B 
and C virus in developing countries is poor awareness 
of the population. Almost all types of health care workers 
are at the risk of having Hepatitis B and C virus and they 
must acquire a higher level of knowledge for protection. 
Awareness about modes of transmission of Hepatitis B 
and C virus and vaccination is essential for universal 
precautions among the health care workers, where it was 
found that the knowledge is correlated positively with 
the behavior. In this study there is significant relationship etween nurse-midwives’ knowledge with their age 
group at p-value ≤ 0.05 respectively, there is significant 
relationship between nurse-midwives’ knowledge with 
their level of education at p-value ≤ 0.05 respectively, 
there is high significant relationship between nurse-
midwives’ knowledge with regard to department they 
are working in and participation in training course at p-value (0.002 and 0.001) respectively and no 
significant relationship has been seen with regard to 
years of employed and source of information. Cetinkaya 
S. stated that it is so important to investigate the factors 
that affected Hepatitis-B Vaccination (HBV) knowledge 
of the nurses and midwives, serving at various medical 
facilities as part of the primary healthcare services in 
Konya, Turkey. The study was including 127 consentient 
nurses and midwives (out of 161) serving at 22 different 
healthcare centers in the region. In the survey, their 
source of information with regards to HBV vaccination 
varied from continuing education programs (37%) to 
book or brochure reading (11.8%), and their formal 
nursing education (11%) (13)(14)(15).

Conclusion

Iraqi midwives and nurses that working in the 
maternity wards and delivery rooms have poor knowledge 
about hepatitis C Virus. The highest percentage of them 
did not joining in a courses or lectures to increase their 
knowledge despite of their working in the delivery rooms 
and maternity wards. So, special training programs 
should be given to Iraqi midwives and nurses to prevent 
transmission of hepatitis C virus.

Source of Funding: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: The first approval was obtained 
from the Council at College of Nursing, University of 
Baghdad; the second approval was obtained from Iraqi 
Ministry of Health, official permission was obtained 
from the following maternity hospitals: (Baghdad 
Medical City Hospital, Ibn Al-Baladi General Hospital, 
Karkh Hospital for Childbirth, Al-Elwaya Maternity 
Hospital). Participation in this study was voluntary. Data 
was collected after obtaining ethical consent from all 
midwives and nurses they were participants in this study.

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The Impact of Strategic Defense in Attainments and Growing the Mind Thinking for the Students

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¹The Basic education College, Babylon University, Babylon Province, Iraq

ABSTRACT

This studying aims to knowing the impact strategic defense about views in at tainmeut History Subject and retaining it at fourth literary students, Which depends on experimental approach to be appropriate approach for searcho’s proceeding, so, the search socity familiarized from the preparatory and secondary school in Babylon province Al-Hashimyha magistracy, It had choiced one of these school which is Al-Quds preparatory to be search’s sample and the experiment applied in to two groups : The first is experimental group which studied with strategizedfence about views, and the second group is tuned group which studied in traditional way. The searcher proportionated between the two search group in some changes like the student’s age counted in months. The results of search showed that the experimental group supermacied to the tuned group in the attainment test which means that there is a differentiate that countably denote at denote level (0.05) and for experimental group. Also this studying showed the thinking mind role in expressing opinions and discussing between the participated parties for getting the right idea or right opinions that getting the agreement of all.

Keywords: Strategic defence about views, attainments and growing the thinking mind at students.

Introduction

Pedagogy is repansible about the trends development to the Sociy’s Individuls around the producutive work and encourage the students to join the occupational and Technical education programme. This obligates that the pedagogy in stitions don’t care only of thieratical side but it must can cent rate on the applicative side too. This instution must encourage students to work and doing occupational activities and participate in lot of activities that accidence their thencies and serves their socity needs. It must belive that the students directions to work will not be only and by actualpartic pation in working and do not achieve iust by casting moralizing and lectures. The social subrects conected tightly to areal life with in it different externals and it initialize varity domains helps to desired social growth. also, it helps the students to grow perfectly by varions activity dials Gunected to it studying. The history science consider establisher and devices that makes it functional, great scieuce has a distingushible slature between the sciens effect. History is inveterate roots in depth at now days that man live in. In addition to it deep root which extended to very old past assets in all stages So, studing history be coms scientific, social, educational can’t dispensable from it at any time. It surround the students with useful science historical events that the word and the Arab home passing. History is honest log to historical event over the ages. So, The searcher thinks that history subject gets areigious slature in approach to all stages, because it instilled the scientific thinking at students demodulation lessons and expressive and forming the thinking that studs on historical understandings knowledge, express the historical event scientific expression. The importance of views stout on that there is direct interaction between all participater inorder to achieve aims and reconciled which usually be has a combined ben fit between them. The purpose of defence about views is either discussions or dialogue or oponion’s exertion between all sides inorder to arriving to right idea and right opinion or views that will be all individuals agree drenst’s stauds on

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losing or benefit principle. Attainments has an important by what individual can achieve to himself in all his life stage serially and graduated from childhood to advanced steps of his age from science and knowledge. within the science can move from the present stage to the next area and continuous in development. Searchers think the lever of education attainments is the mark that students can got at any mastered exam or any school exam at subject. Searcher thinks that education attainment has a great importance in student’s life and his family. It not just exceeding an education stage successfully and getting high marks qualified him, but it has an important sides consider it the obligatory way to choose kind of studying and the job that he will get it, also attainment has very great importance in social view to individual and his attainment level and dis satisfying the person himself and don’t feeling demerit.

**Methodology**

It represent in usage’s approach in search, the samples individuals, valence his two group tuned and experimental, disclose the inner changings, and search supplies ; his devices and the setting ways and its honest and it fixity, The experimental application procedure, the counted means which depend it look now, the impact of strategic defence about views in attainment history subject retaining it to students the fourth literary class.

The experimental design: The experimental design individuate between all the search approach. The experimental search be distinguish in uniqueness for two reasons : It’s the only kind that try to effect directly on certain changing also can test the assumptions truth around called (The cause and effect relation) the below table explain that.

<table>
<thead>
<tr>
<th>Group</th>
<th>The independent variable</th>
<th>The pursue variable</th>
<th>The search device</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>Strategic defence about views</td>
<td>Attainment</td>
<td>Dimentional attainment test</td>
</tr>
<tr>
<td>Tunned</td>
<td>Traditional way</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**The search so city and the sample:** It includes the search so city to forth literary students all of them in preparatory and secondary governmental for boys following to the general directorate for pedagogy in Babylon province Al-Hashimya magistracy 2018-2019 after knowing the names of preparatory and secondary schools governmental followed to the general alirectorate for pedagogy in Babylon province, Al-Hashimya magistracy. The user chose randomly Al-Quds preparatory among 13 schools to applied his experimental in after choosing the school which will make the experimental in by the searcher which visit the school according to facilities errand expropriation from the general directorate for pedagogy in Babylon province, He founds that the sechdil two classes for fourth literary class. The searcher choose B class by randomly hauling to represent the experimental group. The student number is 33 student which will their student study according strategic defence about views and at the same way the searcher choose randomly class A to represent the tuned group and their students is (32) which will study according an usu all studying. After knowing don the student’s information from the formal logs of school. It had found that there was pervious precipilate of fourth liter vary include the search two groups. They found 3 status failure within the experimental group and one within the tuned group to be to total number for search sample (61) student after improbabilities. The reason in probabilities of the failure student from the counted procedure. Is the keen ness of the because they have previous experts in scientific matter table number (2) explain that.

**Table 1: The modern design to search**

<table>
<thead>
<tr>
<th>Group</th>
<th>The independent variable</th>
<th>The pursue variable</th>
<th>The search device</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>Strategic defence about views</td>
<td>Attainment</td>
<td>Dimentional attainment test</td>
</tr>
<tr>
<td>Tunned</td>
<td>Traditional way</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 2: The sample search student distrubition on two group experimental and tuned before improbabilities of failur’s students and after it**

<table>
<thead>
<tr>
<th>The students number before improbabilies</th>
<th>The failure student’s number</th>
<th>The student’s number before improbabilies</th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>3</td>
<td>33</td>
<td>B</td>
</tr>
<tr>
<td>31</td>
<td>1</td>
<td>32</td>
<td>A</td>
</tr>
<tr>
<td>61</td>
<td>4</td>
<td>65</td>
<td>Total</td>
</tr>
</tbody>
</table>
Search two group valence: The searcher did before wading in the experiment, to be sure from the valence achievement in some changes which could be effects in follower modulus. In order to ensure that he valenced among experimental group students and tuned group students in some of changes. These changes are: age counted with months, first course marks, parent attainments, and intell gence test (Rafen) as it shown in tables. (3, 4, 5, 6)

Table 3: The test result for two groups search in the time age counted with months

<table>
<thead>
<tr>
<th>At level (0, 05)</th>
<th>Scheduling</th>
<th>Favoritism</th>
<th>Freedom</th>
<th>Variation</th>
<th>Normative</th>
<th>Arithmetic</th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Countably</td>
<td>2.000</td>
<td>0.816</td>
<td>59</td>
<td>65.77</td>
<td>8.11</td>
<td>191.97</td>
<td>30</td>
</tr>
<tr>
<td>Insignificant</td>
<td></td>
<td></td>
<td></td>
<td>72.93</td>
<td>8.55</td>
<td>193.71</td>
<td>31</td>
</tr>
</tbody>
</table>

Table 4: The (T-test) test results marks of two group search student in first course–Final test in History

<table>
<thead>
<tr>
<th>The countable denote with level (0, 05)</th>
<th>The T-test value</th>
<th>Freedom mark</th>
<th>Variation</th>
<th>Normative Aberration</th>
<th>Arithmetic average</th>
<th>Students number</th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scheduling</td>
<td>Favoritism</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Countably insignificant</td>
<td>2.000</td>
<td>0.821</td>
<td>59</td>
<td>195.72</td>
<td>13.99</td>
<td>71.27</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>266.99</td>
<td>16.34</td>
<td>68.06</td>
<td>31</td>
</tr>
</tbody>
</table>

Table 5: Repations of academic attainment to the students parents two group search and the freedom degree and (Kα2) (favoritism and scheduling) Values

<table>
<thead>
<tr>
<th>The level of denotation (0, 05)</th>
<th>Freeden mark</th>
<th>(Kα2) value</th>
<th>College above</th>
<th>Institution preparry</th>
<th>Intermediate</th>
<th>Read and write primary</th>
<th>Number</th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scheduling</td>
<td>Favoritism</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Countably insignificant</td>
<td>3</td>
<td>7.815</td>
<td>1.991</td>
<td>9</td>
<td>7</td>
<td>6</td>
<td>8</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6</td>
<td>5</td>
<td>9</td>
<td>11</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The Intruder changes disciple: In addition to what preceeding to valence countably procedure among the experimental and tuned search group, the search try to avoide the impact of some Intruder changes (in experimental) in the experiment happened, the thing that increase the confidence with inner honest to experiment then in resuits, one of the se changes (the sample choosing, the accompanying accedents, the experimental absorption, the maturity process, the device’s measurement and the Impact of the experimental procedure.

The search Supplies: The scientific subject limitation (content): The searcher limits the scientific matter that will studied to the two group search student the experimental and tuned which reperst the last five doors in the Arab Islamic civilization history 2018-2019. In order to check its expiry, the searcher showed on experts and specialists in pedagogy and teaching modalities. the searcher depends on (80%) percent the validity normative of these aims after some suitable modifying procedures so the behavioral aims (125) goals after improbabilities of 2 aims by experts the table 7 show that. The searcher make attain mental test according to scientific subject content that it decided to studying in the experiment frem History subject that it decided to study for fourth literary class and the behavioral aims for Bloom’s sixth levels which are (knowledge – understanding – application – forming – Analyling and assessing). this test consider as measurement device to attainment fourth literary class student in five doors matters from Arab Islamic civilization History. After finishing from History book studying Arab Islamic civilization, limit number test paragraph with (50) a pligatory paragraph. In order to check the test history. The searcher use phenotype honest and in order to check this type of honest. It had distributed the test on group of specialist and arbitrtors to judge on pargraphs validity and
it’s inclusion extent to the decided subject and it’s right distribution according to six knowledge levels (Bloom’s classification). The paragraph considered useful if it gets on dealing (80%) percent above from the arbitrators and specialist totals. First, the test applied on two sample, in order to be sure from the test instruction clarity and the countable analyze to it paragraph as following : The first sample reconnaissance. It’s sample of clarity of instruction and paragraph 7. To know the extent of clarity of the paragraph test, it’s instruction and the ambiguous paragraph, diagnosing the time that taken on answering about it. The searcher applied the test on Wednesday 10/4/2019 on the sample consist of (40) student in Al- Hakeem’s preparatory in Al-Hashimyha magistracy after it and distributed the test and enquiry on any phrase they found it unclear. It had check the extent of the test clarity and it’s paragraph because the enquiry and question lack prom the students side about how to answer, with exception some words that not understood which had explained 8. It had connected the answers time which the students take in answering about the test paragraph, and record the time of each student at the end of answering according to Equation. The second reconnaissance sample, the countable Analyzing. The aim of Analyzing of the paragraph test is to improving the test by reveal about weak paragraph and to work on reforming, delet or exclued the un useful one. Also, doubtlessness that the test paragraph care of individual distinctions among students where by easiness, difficulties and the abilivy of characterizing among students that have high and weak lienable in order to make countable Analyzing to paragraph’s test 9. It has counted each paragraph difficulty level and distinguished power and the effectiveness of the wrang alternative. So the searcher applied the test 14/4/2019 in Al-Medhatiya preparatory on ascend sample consist of (100) answers then it has arranged the marks descend from higher to lower marks. It has chosen (27%) percent from the sample student who get higer marks and 27% from the sample, student who get lower marks. The totaled number of students become (27%) in each group. This percent had chosen because it represent all the samples, Next explaining to analyzing countable test paragraph. It had used equation paragraph difficulty modulus by using equation difficulty modulus is between the difficulty modulus to the paragraph objective test (0.70-0.37) while the difficulty modulus to the essay objective pargbph, It had found that between (0.43-0.33) while the distinguish power to the essay paragraph is between (0.43-0.33). During the anylayze procedures that the searcher followed in finding distinguish paragaph power showed all paragraphs is valid according to distinguish power. The searcher arrange the students answer and he distributed between two group, supreme and minima and after counted the effectiveness of the wrong alternative showed that it limites between (0.04-0.26) this denote that the wrong alternative attracted number of minima group student more that supreme group 10. So, it had maintained on this alternatives. In order to check the zero assumption results which stipulate on “There is no difference that countable denotator at the denotation level (0.05) among the average marks of experimental group who will study according to strategic the defence about views and the average marks to the students within the tunned group who will study according the traditional way in attainment and retaining history subject to fourth literary class The results showed that there is difference the countable denotion between the marks average of the two search 11 group students (experimental and tunned) in attainment test and for the experimental group.

Conclusion

At the search results it had come up to that effectiveness of strategic defence about views works on attainment students increasing to history fourth literary class student. So, they transcendence on the tunned group who study in traditional way and that the studying of fourth literary students according to strategic defence about views to history subject make them attentive in the lesson, woke up to what happened around them that what the searcher touch along the search period. This strategy contributed in make the students effective and participated. In the lessons during the dialogue and the discussion and answering the questions which raised during the lesson. Consequently this strategy had the role in increasing the students attainment toward the subject and keeping information for period of time.

Source of Funding: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Babylon University/The Basic education College, Iraq and all experiments were carried out in accordance with approved guidelines.
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Assessment Nurse’s Knowledge toward Nursing Management for Patients Post Cholecystectomy in Kirkuk City Hospitals

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¹Academic Nurse, Ministry of Health, Iraq; ²Professor Doctor, Nursing College, Baghdad University, Iraq

ABSTRACT

Objectives: To assess nurse’s knowledge toward nursing management for patients post cholecystectomy. 20 nurses chosen by non-probability sampling (purposive sample). The study instrument was a questionnaire (multi choice question) consist of 20 items nurses had low level of knowledge when response to the study questionnaire and the grand mean was (1255). The critical care need to professional nurses working at this situation to provide a high level of care.

Keywords: nurses, knowledge, post cholecystectomy management

Introduction

Cholecystectomy is removal of gallbladder through an abdominal incision (usually right subcostal) after the cystic duct and artery are ligated. The procedure is performed for acute and chronic cholecystitis. In some patients a drain is placed close to the gallbladder bed and brought out through a puncture wound if there. Surgical complication include wound infection, adverse reaction of anesthesia, injury of liver. pancreatitis occur about 5%at time laparoscopic procedure open cholecystectomy have more complication; bleeding, Injury to the bile duct, deep vein thrombosis, Injury to the intestine, bowel and blood vessels, Bile leakage. Nurses who provide postoperative care must have knowledge and practice of the implications of the procedure, clinical manifestations of complications, and risk factors. Identifying patients at high risk for adverse outcomes allows the nurse to anticipate the needs of the patient and provide a less stressful postoperative experience. Nursing care is important during recovery. Nurses must be prepared to prevent postoperative complications, rather than waiting to treat them. Nurses can provide excellent care if they are able to anticipate a patient’s needs, intervene early when symptoms first appear, provide reassurance to alleviate patients’ unease during the recovery process, and educate patients to alleviate unnecessary anxiety related to discharge expectations.

Methodology

Subjects: (20) nurses from Kirkuk General Hospital and Azady teaching hospital working in surgical care units chosen by non-probability sampling (purposive sample).

Instruments: The study instrument was constructed depending on literature reviews and previous studies related to the management for patients post cholecystectomy. It is a questionnaire format for the research purpose and composed of 2 parts and these parts are 1st part (general information part which include age and gender) and 2nd part (The knowledge instrument is consisted of (20) items). The knowledge part was a multi choices question for the nurses knowledge, multi choices question has been scored and rated on two levels dichotomous scale (2) points for the correct answer and (1) point for the un correct answer which assessed by cutoff point (0.33) due to scores (1 and 2) respectively. Scores of responses are categorized according to the following level of nurses’ knowledge: (1-1.33) = low level of knowledge, (1.34-1.67) = moderate level of knowledge and (1.68-2) = high level of knowledge.
Results and Discussion

Table 1: Distribution of the Study Sample by their General Information

<table>
<thead>
<tr>
<th>Variables</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>9</td>
<td>45.0</td>
</tr>
<tr>
<td>Male</td>
<td>11</td>
<td>55.0</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>100</td>
</tr>
<tr>
<td>Age by years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-22</td>
<td>1</td>
<td>5.0</td>
</tr>
<tr>
<td>23-27</td>
<td>6</td>
<td>30.0</td>
</tr>
<tr>
<td>28-32</td>
<td>5</td>
<td>25.0</td>
</tr>
<tr>
<td>33-37</td>
<td>2</td>
<td>10.0</td>
</tr>
<tr>
<td>38-42</td>
<td>2</td>
<td>10.0</td>
</tr>
<tr>
<td>43-47</td>
<td>1</td>
<td>5.0</td>
</tr>
<tr>
<td>47 and more</td>
<td>3</td>
<td>15.0</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>100.0</td>
</tr>
<tr>
<td>Level of education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary Nursing School Graduate</td>
<td>1</td>
<td>5.0</td>
</tr>
<tr>
<td>Secondary Nursing School Graduate</td>
<td>8</td>
<td>40.0</td>
</tr>
<tr>
<td>Nursing Institute Graduate</td>
<td>11</td>
<td>55.0</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>100.0</td>
</tr>
</tbody>
</table>

No. = number, %= percentage

This table indicated that male more than female 55%, the age is between (23-27) for most of the study sample 30% respectively, the educational level of nursing institute graduate 55%.

Table 2: Comparison of Nurses Knowledge toward management for patients post cholecystectomy by mean score

<table>
<thead>
<tr>
<th>No.</th>
<th>Items</th>
<th>M</th>
<th>Ass.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>The respiratory rate of the patient after the exit of the operations for the first hour is measured</td>
<td>1.15</td>
<td>L</td>
</tr>
<tr>
<td>2.</td>
<td>The measured pressure is after the operation for the first hour</td>
<td>1.25</td>
<td>L</td>
</tr>
<tr>
<td>3.</td>
<td>The chart is seen about medicines prescribed by the specialist medical (dose, quantity and how to give it).</td>
<td>1.25</td>
<td>L</td>
</tr>
<tr>
<td>4.</td>
<td>The change position of the patient in the word after surgery operation.</td>
<td>1.25</td>
<td>L</td>
</tr>
<tr>
<td>5.</td>
<td>The pain relive are given to post-operative patients to reduce pain</td>
<td>1.25</td>
<td>L</td>
</tr>
<tr>
<td>6.</td>
<td>The recorded Levels of the pain</td>
<td>1.25</td>
<td>L</td>
</tr>
<tr>
<td>7.</td>
<td>Contraction gall bladder hormone action called</td>
<td>1.25</td>
<td>L</td>
</tr>
<tr>
<td>8.</td>
<td>Fluid is given to the patient.</td>
<td>1.35</td>
<td>M</td>
</tr>
<tr>
<td>9.</td>
<td>The patient begins to move</td>
<td>1.25</td>
<td>L</td>
</tr>
<tr>
<td>10.</td>
<td>Observation A surgical dressing preview and any drainage for bleeding</td>
<td>1.2</td>
<td>L</td>
</tr>
<tr>
<td>11.</td>
<td>Lifting gall bladder and therapeutic surgery</td>
<td>1.2</td>
<td>L</td>
</tr>
<tr>
<td>12.</td>
<td>The types of gallstones are usually</td>
<td>1.35</td>
<td>M</td>
</tr>
<tr>
<td>13.</td>
<td>More symptoms of gallbladder.</td>
<td>1.3</td>
<td>L</td>
</tr>
<tr>
<td>14.</td>
<td>Complications of post-gallbladder eradication</td>
<td>1.3</td>
<td>L</td>
</tr>
<tr>
<td>15.</td>
<td>Gallbladder stones are more susceptible and injured</td>
<td>1.2</td>
<td>L</td>
</tr>
<tr>
<td>16.</td>
<td>The base function of gallbladder is</td>
<td>1.25</td>
<td>L</td>
</tr>
<tr>
<td>17.</td>
<td>From the indication cholecystectomy is</td>
<td>1.3</td>
<td>L</td>
</tr>
</tbody>
</table>
Conted…

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>18.</td>
<td>Lab cholecystectomy usually required.</td>
</tr>
<tr>
<td>19.</td>
<td>Leaking of the bile duct after surgery usually occurs</td>
</tr>
<tr>
<td>20.</td>
<td>The pain of gallstones started when eating fat</td>
</tr>
<tr>
<td></td>
<td><strong>Grand mean</strong></td>
</tr>
</tbody>
</table>

M= mean, Ass.= assessment, level of assessment:
(1-1.33) = low = L, (1.34-1.67) = moderate = M, (1.68-2.00) = high = H

This table indicate that the nurses had a low level of knowledge by the mean for all items except items (8 and 12) had moderate level, the grand mean of all items shows that there is a poor level of knowledge of the study group at pretest the mean was 1.255.

**Conclusion**

Males are working at the surgical units more than female and most of the nurses at age less than 37 years old and most of them had a diploma degree in nursing. Nurses had low level of knowledge toward post cholecystectomy management.

**Source of Funding:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Ministry of Health, Iraq and all experiments were carried out in accordance with approved guidelines.

**REFERENCES**

Cholinesterases Activities in Diabetic and Hyperlipidemic Patient

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ABSTRACT

This study aims to find whether the elevation or the reduction of ChEs levels can be related to the diabetes mellitus and/or dyslipidemia. This study is considered as case-control comparative study. The human plasma and erythrocyte cholinesterase activity was tested in 5 group. Groups 1 and 2 were type 2 hyper- and normo- lipidemic diabetic patients respectively with good control of diabetes. Groups 3 and 4 were type 2 hyper- and normo- lipidemic diabetic patients respectively with inadequate control of diabetes. Group 5 included patient with hyperlipidemia only. The control group consisted of apparently healthy subjects with no history of diabetes or hyperlipidemia or exposure to anti-ChE insecticides or drugs. Also fasting serum glucose, HbA1c and the serum lipid profile were estimated in these groups. The results indicate that there is a relation between the BChe and diabetes, but no such relation could be seen with AChE. Also there is similar relation between the dyslipidemia and the both types of the ChE. The combination of inadequately controlled diabetes with dyslipidemia can cause elevation in both types of ChE enzyme but less than that of dyslipidemia alone.

Keywords: Cholinesterases - Diabetes - Hyperlipidemia - AChE- BChE.

Introduction

Cholinesterases (ChE) are enzymes that catalyze the hydrolysis of the acetylcholine into choline and acetic acid to allow a cholinergic neuron to return to its resting state after activation 1. There are two types of cholinesterases enzymes. 1. Acetylcholinesterase (AChE), also known as true or erythrocyte cholinesterase, found primarily in the erythrocytes and some neural synapses. Pseudocholinesterase (BChE), also known as plasma cholinesterase, butyrylcholinesterase with a lower specificity for acetylcholine, found primarily in the plasma, liver, glia and many other tissues 2,3. The physiological functions of plasma ChE are not known, but one idea is that they protect the body from natural anti-ChE agents (e.g. physostigmine, a plant alkaloid) encountered during the evolution of species. Also it has been shown that BChE is involved in lipid/lipoprotein metabolism 4. Diabetes mellitus (DM) is defined as an elevated blood glucose associated with absent or inadequate pancreatic insulin secretion, with or without concurrent impairment of insulin action 5. Hyperglycemia is a common end point for all types of diabetes mellitus and is the parameter that is measured to evaluate and manage the efficacy of diabetes therapy 5-7. There are two major types of lipids in the blood, cholesterol and triglycerides (TG). They are carried on four types of lipoproteins: chylomicrons, low-density lipoprotein (LDL), very low density lipoprotein (VLDL) and high density lipoprotein (HDL). The primary function of lipid particles is fat transport to the liver and adipose storage areas 8. The lipid abnormalities are prevalent in DM because insulin resistance or deficiency affects the key enzymes and pathways in lipid metabolism 9. Diabetic dyslipidemia is generally characterized by increased plasma TG and LDL-C, and decreased HDL-C concentration 10. Much research indicates that the BChE activity is increased in certain metabolic disorders like hypercholesterolemia, hypertension, obesity and type 1 or type 2 diabetes 11-15. In these studies, BChE activity correlates strongly and positively with serum levels of low density lipoprotein (LDL)-cholesterol and triglycerides (TG) and inversely with serum high density lipoprotein (HDL)-cholesterol. All these observations suggest a relationship between BChE activity and lipoprotein metabolism, but the rationale for this connection is unclear. On the other hand other researchers indicated the opposite 16,17, as their results indicated that the relationship between serum lipid/lipoprotein metabolism and BChE activity
in diabetes lacks any strong supportive evidence. So there is a controversy about the level of plasma and erythrocyte ChE that may be increased or decreased or even remain normal in diabetic and in hyperlipidemic patients. However, other studies have suggested BChE may not have a direct pathophysiological role in the development of metabolic syndrome and diabetes. This study’s objective is to find whether the elevation or the reduction of ChEs levels can be related to the DM and/or dyslipidemia. Such a relationship could be considered as a diagnostic parameter for such diseases, if proved.

Materials and Method

This study is a case-control comparative study. The study took place in Al-Wafaa Center for Diabetes. The subjects included in this study were male and females, whose age not less than 30 years. The human plasma and erythrocyte cholinesterase activity were tested in 5 groups (30 patients for each group). Groups 1 and 2 were hyper and normo-lipidemic type 2 diabetic patients respectively (duration of diabetes and hyperlipidemia was not less than 3 years) with HbA1c = 5-8% (indicating a good control of diabetes). Groups 3 and 4 were hyper and normo-lipidemic type 2 diabetic patients respectively (duration of diabetes and hyperlipidemia was not less than 3 years) with HbA1c >10 (bad control of diabetes). Group 5 were patients with hyperlipidemia only whose duration was not less than 3 years. The control group consisted of apparently healthy subjects with no history of diabetes or hyperlipidemia or exposure to anti-ChE insecticides or drugs. Patients taking any medications other than oral hypoglycemic and antihyperlipidemic drugs (as these drugs have no effects on the ChEs levels) or exposed to anti-ChE insecticides or drugs were excluded. Also patients were excluded if they had chronic cardiac illness (ischemic heart disease, heart failure, cardiac arrhythmias), chronic liver disease (hepatic failure, active hepatitis, liver cirrhosis), renal complications and any other chronic debilitating illness. Blood samples were collected in 5 ml EDTA-treated test tubes then centrifuged at 3000 rpm for 15 min. The erythrocytes and plasma were separately kept on ice for ChE assay. The rest of the sample was used for the glucose and lipid profile assay. In our work we used the modified electrometric method for the assay of ChE activity, validated in humans. The reaction mixture in a 10 ml beaker contained 3 ml distilled water, 0.2 ml plasma or erythrocytes and 3 ml pH 8.1 barbital-phosphate buffer. The pH of the mixture (pH1) was measured with glass electrode using pH meter, then 0.1 ml of aqueous solution of acetylthicholine (7.5%) was added to the reaction mixture which was incubated at 37°C in water bath for 20 min. At the end of the incubation period, the pH of the reaction mixture (pH2) was measured. The enzyme activity was calculated as follows:

\[ \text{ChE activity (ΔpH/20 min.)} = (\text{pH1}-\text{pH2})-\text{ΔpH of blank} \]

The blank contained no blood aliquot. The barbital-phosphate buffer solution consist of 1.24 g sodium barbital (BDH), 0.163g potassium dihydrogen phosphate, and 35.07g sodium chloride (BDH) dissolved in one liter distilled water. The pH of the buffer was adjusted to 8.1 with 1N HCL.

Fasting serum glucose (FSG) was estimated by glucose–oxidase–peroxidase colorimetric method (spectrophotometer (Optima) Japan), by using a kit supplied by Biocon company (Germany). Glycated hemoglobin HbA1c was measured in whole blood sample by ion-exchange resin quantitative colorimetric determination, using a kit supplied from Stanbio (USA). Determination of serum TC concentration was done by the enzymatic colorimetric method, using total cholesterol BIOLABO kit (France). Determination of serum TGs concentration was done by the enzymatic colorimetric method, using triglycerides BIOLABO kit (France). Determination of serum HDL-c concentration was done by the precipitation method, using HDL-c BIOLABO kit (France). Low density lipoprotein cholesterol (LDL-c) was calculated by Friedewald formula.

\[ \text{LDL-c} = \text{TC} - (\text{HDL-c} + \text{TGs}/2.2) \]

\[ \text{VLDL-c} \text{ calculated according to the following formula.} \]

\[ \text{VLDL-c} = \text{TGs}/2.2 \text{ (mmol/l)} \]

Analysis of variance (ANOVA) followed by the least of significant difference test (LSD) post hoc test was used as the statistical method. Additionally, simple Student’s t-test was used for the comparison between the means of all groups (30). The level of significance was set at P<0.05.
Results and Discussion

Table 1 represent the results of the FSG, HbA1c, TC, TGs, HDL-c, LDL-c VLDL-c, BChE, and AChE of the control and the tested groups. The current study demonstrated that Group 1 shows significant alterations and changes in the lipid profile since the patients were already hyperlipidemic, the HbA1C also showed elevation as compared with control group, although the FSG was slightly elevated, this could be attributed to the lipid profile derangements which may affect the liver parameters. In this group the BChE was also significantly elevated with no change in AChE. Published data suggest association between BChE activity and lipid metabolism and weight and body mass index (BMI) 31,32. Moreover, mean BChE activity tends to be higher in obese subjects than in nonobese individuals. Obese humans have high plasma BChE activity, whereas starved humans have low plasma BChE activity 33. Group 2 shows little change in the lipid profile parameters as there is a little elevation of LDL and decrease in HDL, this can be attributed to the eating habits of fats in our locality. Also in this group the BChE shows a significant elevation as compared with the control group. Group 3 like Group 1 shows remarkable changes in the lipid profile as they were initially diagnosed as dyslipidemic patient, also the FSG and HbA1C were significantly elevated as they were uncontrolled diabetic patients. The ChE shows different picture in this group as the BChE was significantly elevated higher than all other diabetic groups and the control group, also the AChE in this group was elevated significantly. This may explained by the inadequate diabetic control (elevated FSG and HbA1C) 34 and having dyslipidemia 35. Coexistence of diseases may affect lipid metabolism and its hemostasis causing abnormality and remarkable change in BChE (more than that of the other groups), resulting in changing the hemostasis between the two types of the enzyme (from their site of production) that may cause change in the AChE level. The results by Mushtaq et al., indicated altered levels of AChE and BChE both in Alzheimer’s disease (AD) as well as in T2DM imply that those two enzymes may be playing a pivotal role in the pathogenesis of the two disorders. AD and T2DM are both characterized by elevated levels of AChE and BuChE in the plasma 36.

Table 1: FSG, HbA1c, TC, TGs, HDL-c, LDL-c, VLDL-c, BChE, and AChE values of the control and the tested groups

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Control</th>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
<th>Group 4</th>
<th>Group 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSG mmol/L</td>
<td>5.64 ± 0.73</td>
<td>6.36 ± 0.69</td>
<td>6.11 ± 1.24</td>
<td>9.71 ± 1.90*</td>
<td>9.24 ± 0.94*</td>
<td>5.98 ± 0.37</td>
</tr>
<tr>
<td>HbA1C %</td>
<td>5.23 ± 0.45</td>
<td>7.25 ± 1.32*</td>
<td>6.46 ± 1.38</td>
<td>11.82 ± 0.88*</td>
<td>10.91 ± 0.15*</td>
<td>5.86 ± 0.52</td>
</tr>
<tr>
<td>TC mmol/L</td>
<td>4.72 ± 0.74</td>
<td>7.88 ± 1.93*</td>
<td>5.12 ± 0.93</td>
<td>7.72 ± 1.41*</td>
<td>5.13 ± 0.83</td>
<td>8.21 ± 1.83*</td>
</tr>
<tr>
<td>TGs mmol/L</td>
<td>2.05 ± 0.81</td>
<td>3.70 ± 1.06*</td>
<td>2.10 ± 1.01</td>
<td>3.51 ± 0.82*</td>
<td>1.82 ± 0.94*</td>
<td>3.80 ± 1.31*</td>
</tr>
<tr>
<td>HDL mmol/L</td>
<td>1.39 ± 0.31</td>
<td>1.09 ± 0.26*</td>
<td>1.28 ± 0.27*</td>
<td>1.07 ± 1.42*</td>
<td>1.21 ± 1.37</td>
<td>1.01 ± 0.21*</td>
</tr>
<tr>
<td>LDL mmol/L</td>
<td>2.67 ± 0.65</td>
<td>4.37 ± 1.99*</td>
<td>2.69 ± 1.04</td>
<td>3.73 ± 0.87*</td>
<td>2.71 ± 0.74</td>
<td>4.71 ± 0.82*</td>
</tr>
<tr>
<td>VLDL mmol/L</td>
<td>0.30 ± 0.18</td>
<td>1.54 ± 0.48*</td>
<td>0.42 ± 1.26</td>
<td>1.62 ± 0.86*</td>
<td>0.52 ± 0.14*</td>
<td>1.81 ± 1.01*</td>
</tr>
<tr>
<td>BChE Δ pH/20 min</td>
<td>1.34 ± 0.07</td>
<td>1.63 ± 0.11*</td>
<td>1.47 ± 0.09*</td>
<td>1.71 ± 0.02*</td>
<td>1.46 ± 0.04*</td>
<td>2.01 ± 0.07*</td>
</tr>
<tr>
<td>AChE Δ pH/20 min</td>
<td>1.01 ± 0.06</td>
<td>1.10 ± 0.04</td>
<td>1.07 ± 0.13</td>
<td>1.56 ± 0.10*</td>
<td>1.13 ± 0.09</td>
<td>2.61 ± 0.04*</td>
</tr>
</tbody>
</table>

The values are represented as means ± SE

*Significantly different from the respective control (0) group, P<0.05

Conclusion

There is a relation between the BChE and diabetes (as there is an elevation of its level in all diabetic groups), but no such relation could be seen with AChE. There is similar relation between the dyslipidemia and the both types of the ChE. The combination of poor control of diabetes and dyslipidemia can cause elevation in both types of ChE enzyme but less than that of dyslipidemia alone (i.e. the diabetes may reduce the effect of the dyslipidemia on the production of the two types of the ChE, as seen in group 3, or the diabetes and dyslipidemia are both affecting the ChE level in different ways -each one act alone- as the diabetes is affecting BChE only and the worse dyslipidemia is affecting both ChE types).
Source of Funding: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Department of Pharmaceutical Chemistry, College of Pharmacy, University of Mosul, Mosul, Iraq and all experiments were carried out in accordance with approved guidelines.

REFERENCES


The present research aims to identify the effect of the formal strategy based on the cognitive burden theory in acquiring the historical concepts of the fourth grade students. The research was conducted on the fourth grade students. The school was randomly selected (Al-Mahaweel Preparatory School for Girls with 61 students). The researcher used the experimental method as the most suitable method for this research. The experiment was applied to the two research groups with a period of (1) years. 8 weeks), and used the pat
The statistical methods (t-test, kai square (k2), coefficient of paragraph distinction, coefficient of paragraph difficulty, effectiveness of wrong alternatives, Pearson correlation coefficient, Spearman-Brown correlation coefficient). The researcher found that there was a statistically significant difference between the two groups of research in the post-acquisition experiment in favor of the experimental group.

Keywords: Formal strategy, cognitive burden, historical concepts, preparatory stage.

ABSTRACT

The present research aims to identify the effect of the formal strategy based on the cognitive burden theory in acquiring the historical concepts of the fourth grade students. The research was conducted on the fourth grade students. The school was randomly selected (Al-Mahaweel Preparatory School for Girls with 61 students). The researcher used the experimental method as the most suitable method for this research. The experiment was applied to the two research groups with a period of (1) years. 8 weeks), and used the pat
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Introduction

Education comes as a mainstay in the building and individualization of the individual as it includes the types of activities that affect the individual and his preparations, behavior, mental orientation, intelligence and skills, and the installation of its effects on his personality in physical, mental and psychological dimensions. The duty of education is the responsibility of building a scientifically educated person who must possess a degree of knowledge and awareness of the general issues related to the various spheres of life so that he can make the right decision regarding the situations and problems he has faced in a society that is constantly changing and evolving. Current era And the impact of this development in the field of education and teaching methods. It is also reflected in the need to teach the teacher to acquire modern teaching skills, which may facilitate the process of learning and teaching, and promote his role as a guide, facilitator and facilitator of the teaching process through modern and unconventional teaching methods. In recent years, several educational theories have emerged, based on a number of methods and strategies used in teaching. These theories include the theory of cognitive burden (John Sweller) A University of New South Wales University of Psychology, where this theory is based on the concepts of information processing in memory and the development of schematics and the mechanism of procedural knowledge. The cognitive burden is the total mental activity that occupies the capacity of the working memory during a certain time. Based on this theory, the theory emphasized that limited working memory capacity is one of the obstacles to learning, and that these obstacles must be addressed through the change of traditional learning and teaching designs. Therefore, the theory of the cognitive burden of many of the design of learning and education is based on knowledge of cognitive engineering. One of these strategies (formal strategy) aimed at expanding the limited working memory through the use of visual learning or audio learning. Historical concepts form a broad base based on the use of a single type of historical material, where the understanding of the teachers of the events is determined by the depth, breadth and diversity of their achievements of the concepts. As the learner gains from concepts, new attitudes and experiences lose their difficulty and thus the learner is able to interpret and think well. Thus, the acquisition of students of historical concepts is one of the most important
fundamentals of the study of history, in turn, constitute the necessary basis for the cognitive behavior of learners and it constitutes an important educational goal at all levels of study because they contribute significantly to the learning process.

Methodology

The researcher followed the experimental approach in the conduct of the research because it is characterized by two reasons: It is the only type that directly try to influence a particular variable and also he can test the validity of hypotheses about the so-called reason relationship and the following table shows this:

Research community and design: The research society included fourth grade students in the preparatory and secondary day schools in Mahaweel district/Babil governorate.

The sample of the study was randomly selected. The Mahaweel Girls’ Preparatory School was the site of two groups, one of which was chosen randomly to be experimental group, and the other group was a total of 63 female students with 31 experimental students. The following table shows the following:

Table 1: Distribution of students of the research sample before and after exclusion on the two research groups

<table>
<thead>
<tr>
<th>Number of female students after exclusion</th>
<th>Number of students excluded</th>
<th>Number of female students before exclusion</th>
<th>Division</th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>31</td>
<td>1</td>
<td>32</td>
<td>A</td>
<td>Experimental</td>
</tr>
<tr>
<td>32</td>
<td>1</td>
<td>33</td>
<td>B</td>
<td>Control</td>
</tr>
<tr>
<td>63</td>
<td>2</td>
<td>65</td>
<td></td>
<td>Total</td>
</tr>
</tbody>
</table>

The control of extraneous variables: Although the researcher investigated the equivalence of the two sets of research in variables that I think affect the course of the experiment, they tried to avoid the effect of some extraneous variables in the course of the experiment. These variables are: Accidents associated with the experiment: The sample was randomized and the two groups were confirmed.

The maturity factor: Because the duration of the experiment was uniform between the two research groups, and the age of the students in both groups was close, this will affect the experimental measures. The researcher worked to limit this factor because it affects the dependent variable during the course of the experiment.

Research tool: Test the acquisition of historical concepts and designed the researcher tested the research and then was presented to a group of experts and specialists and after the amendment and then test students.

Determine the purpose of the test: The purpose of this test is to measure the acquisition of fourth-grade literary female students of historical concepts.

Determination of the objectives of the test: The researcher identified behavioral goals that are (60) behavioral goals after setting the purpose of the test.

Determination of the test paragraphs: The test paragraphs were formulated in their preliminary form and consisted of (20) paragraphs divided into three levels (definition, discrimination, application)

Test instructions: The instructions for the test and how to answer (selecting one correct alternative to the paragraph, answering all paragraphs, the time period for answering, typing the triple name, the class and the division in the assigned space).

Correcting the test answers: After the test paragraphs have been formulated, a standard has been set to correct the answers, with one score for each correct test paragraph, zero for the wrong answer, and the left over paragraph that the student answers. Therefore, The historical concepts are (60) degrees and the minimum is (zero).

The truth of the test: Honesty: It is to measure the test in what is put for it

In this way, the researcher relied on the veracity of the test to verify that the test verbs actually measured the behavioral objectives. It can be defined as the simplest and most reliable types of honesty and used in the tests because it is the easiest in terms of its procedures and its reliance on the logic guaranteed by the test and its relevance to the measured attribute.
Statistical analysis of the test paragraphs: The test paragraphs were analyzed as follows:

A. Coefficient of difficulty paragraph: It means the proportion of the number of students who answered the paragraph answered correctly to the total number and called the amount of this ratio “difficulty coefficient”. If the value of the amount increases, it indicates the ease of the paragraph, and if the value of the value decreases, it indicates that the paragraph is difficult. After calculating the difficulty factor for each test paragraph, it was found to be between 0.39 and 0.7, All the test paragraphs were acceptable, as Sawalma (2009) noted, that the test paragraphs were good if their coefficient of difficulty was between 0.20-0.80. The test paragraphs are therefore acceptable and applicable in terms of difficulty factor.

B. The power of paragraph discrimination: Is the ability of the paragraph to distinguish between the upper group (the students with the high grades in the test) and the minimum (students with low grades in the test) that means the ability to distinguish individual differences between students who know the correct answer and students who do not know the correct answer (Dulaimi and Adnan, (E), (1972: 66). When we calculated the specific force of each paragraph of the test using the parity equation, it was found to be between 0.33 and 0.52. Ebeal (1972) 20-0.80).

C. The effectiveness of wrong alternatives: The wrong alternative is effective when the number of students selected in the lower group is more than the number of students who chose the same alternative in the upper group. All alternatives were found to have attracted more female students in the lower group than the upper group students, and thus were recognized to be retained.

Statistical means: The researcher used the following statistical means:

1. Frequency and percentage of the calculation (Honesty reaches an 80% virtual honesty ratio).
2. Pearson equation to extract the coefficient of stability, reaching (0.86).
3. The researcher used the Spearman-Brown equation to correct the coefficient of stability (0.92).
4. The researcher used the square Kay (Ka 2) to indicate the differences between the two groups of research at the parity of the academic achievement of parents and the calculated value of parents (0.791), less than the value of (k 2) table of (7.815) and freedom degree (3) 0.05, as in Table (1). The calculated value of mothers (1.461) is less than the value of (ka2) of the table (7,815) and the freedom level (3) at the level of (0.05) as in Table (3).

### Table 2: Value of (Ka2) for the academic achievement of parents

<table>
<thead>
<tr>
<th>Level of significance (0,05)</th>
<th>The degree of freedom</th>
<th>Values (Ka 2)</th>
<th>College and above</th>
<th>Preparatory and Institute</th>
<th>Middle school</th>
<th>Reads, writes and initials</th>
<th>The number</th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tabular</td>
<td>Calculated</td>
<td>College and above</td>
<td>Preparatory and Institute</td>
<td>Middle school</td>
<td>Reads, writes and initials</td>
<td>The number</td>
<td>Group</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Not a function Statistic</td>
<td>3</td>
<td>7.815</td>
<td>0.791</td>
<td>6</td>
<td>8</td>
<td>7</td>
<td>10</td>
<td>31 Experimental</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td>8</td>
<td>10</td>
<td>6</td>
<td>8</td>
<td>32 Control</td>
</tr>
</tbody>
</table>

### Table 3: Value (k2) for the academic achievement of mothers

<table>
<thead>
<tr>
<th>Level of significance (0,05)</th>
<th>The degree of freedom</th>
<th>Values (Ka 2)</th>
<th>College and above</th>
<th>Preparatory and Institute</th>
<th>Middle school</th>
<th>Reads, writes and initials</th>
<th>The number</th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tabular</td>
<td>Calculated</td>
<td>College and above</td>
<td>Preparatory and Institute</td>
<td>Middle school</td>
<td>Reads, writes and initials</td>
<td>The number</td>
<td>Group</td>
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<td></td>
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<tr>
<td>Not a function</td>
<td>3</td>
<td>7.815</td>
<td>1.461</td>
<td>9</td>
<td>6</td>
<td>7</td>
<td>9</td>
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<td></td>
<td></td>
<td></td>
<td>6</td>
<td>9</td>
<td>6</td>
<td>11</td>
<td>32 Control</td>
</tr>
</tbody>
</table>
I also used (k2) to demonstrate the validity of the concept acquisition test paragraphs.

### Table 4: The time life calculated in months

<table>
<thead>
<tr>
<th>Statistical significance</th>
<th>T value</th>
<th>Degree of freedom</th>
<th>Standard deviation</th>
<th>Average</th>
<th>Number of sample</th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.05</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Not a function</td>
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<tr>
<td></td>
<td>2.000</td>
<td>0.826</td>
<td>61</td>
<td>4.14</td>
<td>191.03</td>
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<tr>
<td></td>
<td>4.56</td>
<td></td>
<td></td>
<td>31</td>
<td>190.13</td>
<td>Control</td>
</tr>
</tbody>
</table>

The researcher used the t-test to show the first grade of the history of the Arab Islamic civilization for the fourth quarter, the experimental average of the experimental group (66.32) and the standard deviation (18.17) and the difference (330.15), while the arithmetic average of the control group (67.47) and the standard deviation (17.18) and variation (295.15). When we used the t-test to find out the difference between the grades of the students in the first course, it was found that the difference is not statistically significant at the level of 0.05. The calculated T value is 0.277, (2,000) and a degree of freedom (61) This indicates that the two groups are equal in the grades of the first course The history of the Arab-Islamic civilization and the table (6) illustrate this:

The average results were that the average grades of female students, the experimental group that studied the formal strategy, was 42.97. The difference was 79.74 and the standard deviation was 8.93. The average score of the students in the control group was 35.3, the difference was 111.94 and the standard deviation was 10.58. 3.211. It is smaller than the value of T table (2.000) at the level of significance (0.05) and degree of freedom (61). This is the superiority of students of the experimental group on the control group and thus reject the zero hypothesis developed by the researcher and accept the alternative hypothesis. The students of the experimental group, which studied the history of the Arab Islamic civilization for the fourth grade literary according to the formal strategy on the students of the control group, which studied the same article in the traditional way in the acquisition test. This result can be attributed to:

1. The formal strategy has benefited the students of the experimental group by observing the increasing degrees of testing the acquisition of historical concepts, as they outperformed the students of the control group.
2. This strategy is appropriate to the level of students of this stage because they enjoy mental and intellectual maturity and the ability to analyze and summarize.
3. The formal strategy led to the excitement of students and their interest and suspense for the material history and their desire to know the subject or prepare them, which increased their education of the subject matter.
4. The subjects studied during the experiment may be suitable for the use of formal strategy, which led to increased understanding of students in these subjects.
5. The novelty of the strategy has encouraged students to study history and increased their desire to know the concepts.

### Conclusion

The research was conducted on the fourth grade students. The school was randomly selected (Al-Mahaweel Preparatory School for Girls with 61 students). The researcher used the experimental method as the most suitable method for this research. The experiment was applied to the two research groups with a period of (1) years. 8 weeks), and used the pat The statistical methods (t-test, kai square (k2), coefficient of paragraph distinction, coefficient of paragraph difficulty, effectiveness of wrong alternatives, Pearson correlation coefficient, Spearman-Brown correlation coefficient). The researcher found that there was a statistically significant difference between the two groups of research in the post-acquisition experiment in favor of the experimental group.

**Source of Funding:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Babylon University - Faculty of Basic Education and all experiments were carried out in accordance with approved guidelines.
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Effect of Black Seed Oil on Some Physiological Parameters in Female Rats Treated with Aflatoxin $B_1$, $B_2$

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1College of Sciences, University of Babylon, Iraq; 2College of Nursing, University of Kufa, Iraq

ABSTRACT

This study was conducted in order to determine the effect of Black seed oil on the reduction of the negative effects of the Aflatoxin $B_1$, $B_2$ produce from *Aspergillus flavus* in white rat females and effect it’s on the physiological blood parameters. The results of isolation and initial diagnosis showed *Aspergillus flavus* and *Aspergillus niger* in all samples studied percentage (100%) and isolated from the seeds of rice while the percentage of the emergence of fungi *Penicillium* spp and *Trichotheccium* spp and *Rhizopus* spp rates ranged (50, 45, 14)% respectively of the samples studied. The results showed that Black seed oil had a significant effect on the physiological parameters of blood. The rate of white blood cells (WBC) increased to (15 × 10$^3$ and 21 × 10$^3$) cells/mm$^3$ when treated with Aflatoxin $B_1$ (AFB$_1$) and Aflatoxin $B_2$ (AFB$_2$) compared to control treatment. The results showed that the Black seed had decreased the rate of white blood cells when used with aflatoxin (AFB$_1$ + 800) and (AFB$_2$ + 800) mg/kg oil to (11.5 × 10$^3$ and 7.5× 10$^3$ cell/mm $^3$ respectively.

Keywords: physiological parameters, Aflatoxin $B_1$, $B_2$

Introduction

Aflatoxins are a group of mycotoxins, which are toxic metabolites produced by fungi during their growth in various food and cereal crops. These metabolic compounds have relatively low molecular weights, where contamination of human food and animal feeds from the field to the consumer. The human exposure to Aflatoxins leads to serious diseases according to the dose exposed to it as liver cancer, bone abnormalities, embryonic mutations and fetal deformation as well as its effects on sexual efficiency. In studies conducted a significant correlation between human cancers and the contents of food contaminated with aflatoxins. In a study conducted by suggests that aflatoxin has effects on physiological blood parameters, including lowering the number of white blood cells. Mohsen (2006) found that *A.flavus* and *A. niger* had effects on white rat tissue by decrease in body weight weight of ovaries in the rat and a significant increase in the weight of the uterus as well as in the thickness, and cause infertility. *Nigella sativa* is a plant belonging to the family Ranunculaceae. It is used to treat head pain, bladder and kidney stones, chest pain and nausea. It also has a role in reducing the blood sugar level in test animals, also it have a role in reducing blood pressure and the tension of the presence of glycoserin and saponin, which is useful in the treatment of spasticity either directly or in the form of oil. *It* is medicinal plants containing antimicrobial agents and germs. and has an effective role in the treatment of chronic asthma, chronic colds, and used against gastrointestinal bacteria and currently as a disinfectant for harmful intestinal flora for young children and adults. Due to the lack of available studies on the effect of oils and plant extracts on some fungi producing toxins within the body of the organism, this study was conducted, which included:

1. Isolates and identification *Aspergillus flavus* of rice seeds.
2. Identification *Ability Aspergillus flavus* on the production of aflatoxin $B_1$, $B_2$.
3. Test the efficiency of different concentrations of the Black seed oil on the growth of isolated fungi in laboratory.

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4. Studying the effect of different concentrations of Black oil on some of the physiological parameters of blood. In the Albino rat, it is infused with aflatoxins.

**Method**

1. Potato extract and dextrose Agar (PDA) The medium was prepared according to the procedure of (Colle et al; 1996)

2. Coconut extract Agar medium. The medium was prepared according to the procedure of (Dianese and Lin, 1976).

3. Isolation and Diagnosis of *A. flavus* from Rice Seeds
The seeds of rice were brought from the local markets of the city of Najaf in the year 2017 and using the sterilized seeds for isolation of *A. flavus* according to procedure of (Fennel and Raper, 1965, AL-Ansii1999).

4. Testing ability of *A. flavus* on the production of aflatoxin, steps were followed according (Wyllie and Morehouse 1977; Mohsen and Risan 2009)

5. Preparation of concentrations of the Black seed oil and study the effects in medium
In this experiment, two concentration (200, 800) mg \ L were mixed with the sterile PDA after cooling. all dishes were vaccinated with 0.5 cm disc from the fungus at the center of the dish. Their last rate fungi and calculate the amount of orthogonal inhibition according to equation:

In this experiment used 16 animals divided into 7 groups:

1. Two rats were injected orally with 0.5 ml of aflatoxin B₁ and Black seed oil at a concentration of 200 mg/kg of 0.5 ml daily for one week.

2. Two rats were injected orally with 0.5 ml of aflatoxin B₂ and Black seed oil at a concentration of 800 mg/kg of 0.5 ml daily for one week.

3. Two rats were injected orally with 0.5 ml of aflatoxin B₁, daily for one week.

4. Two rats were injected orally with 0.5 ml of aflatoxin B₂ and Black seed oil at a concentration of 200 mg/kg of 0.5 ml daily for one week.

5. Two rats were injected orally with 0.5 ml of aflatoxin B₁ and Black seed oil at a concentration of 800 mg/kg of 0.5 ml daily for 1 week.

6. Two rats were injected orally with 0.5 ml of aflatoxin B₂ per day for a week.

7. Included 4 rats without any dosage as control treatment.

Two days after the last dose, the animals were sacrificed, The blood was collected to calculate some physiological blood parameters.

8. Blood parameters:

1. Estimation of leucocytes count:The blood cell count method and the Turks solution were used to calculate the total number of white blood cells (Brown, 1976).

2. Estimation of Red Blood corpuscles: The blood cell count method and the Hymes fluid solution were used as a dilution solution for total red blood cell count (Hall and Malia, 1984).

3. Hemoglobin Estimation: Hemoglobin Meter and Drabkin fluid as a dilution solution were used to estimate hemoglobin concentrations in the blood sample (Sood, 1996).

**Results and Discussion**

1. Isolation and diagnosis of fungi associated with rice seeds: The results of isolation and diagnosis showed an *A. flavus Aniger*, (100%) of the studied samples, followed by *penicillium spp, Trichothecium spp and Rhizopus spp* (50, 45, 14)% respectively for the studied samples. Figure (1).
2. *Aspergillus spp* is due to simple dietary requirements as well as its ability to produce a large number of non-homogenous reproduction units. As well as the increase in the proportion of carbohydrates and easy to be represented in rice as the fungus *A. flavus* prefer carbohydrate materials on oily materials in addition to the moisture content if referred to *Aspergillus* with a wide range of temperatures and humidity as well as poor storage and accompanied by the production of toxins at different temperatures.

3. Evaluation of the efficacy of Black seed oil in reducing the effects of aflatoxin B₁, B₂ in white rats females.

**White blood cell count:** Figure (2) shows that AFB₁, AFB₂ had a negative effect on the white blood cell count its reached \((210 \times 10^3, 15 \times 10^3)\) cell/mm³ compared to the control treatment of \((5.5 \times 10^3)\) cell/mm³. The Black seed oil has a positive effect in reducing the rate of white blood cells in which it is used with a (AFB₁ + 800) and (AFB₂ + 800) mg/ kg reaching to \((11.5 \times 10^3, 7.5 \times 10^3)\) cell/mm³ respectively compared to control group.

The increase in rate of (WBCs) is due to metabolic products by *A. flavus*, causing excessive secretion of immune response factors Tumor necrosis factor, Interleukin-6, cytokines especially that responsible for the occurrence Primary inflammation and immune regulation. The excessive production of these components is important reason to increase the number of (WBCs) in the treated rats or a result of increasing the number of acidic blood cells that work to offset or remove toxic substances from the body, (Pearce and Pearce, 2013), confirming that metabolic products affect the immune system response.

In addition, the dosage of poultry with a different dose of the metabolic products of *A. flavus, A. fumigatus* led to an increase in the number of (WBCs) and anemia thus lead to stimulate the body’s immunity and increase the number of acid cells in response to the exotic substances in the body which acted as competitive inhibitors of the enzymes responsible for the synthesis of red blood cells (Croopman et al., 2003).
Red blood cell count (RBC): Figure (3) indicates a reduction in RBC to (1.5-2.5) cells/mm$^3$, respectively for rats treatment in AFB$_1$, AFB$_2$. While RBC was observed to increase to (3.3-4.5) cells/mm$^3$ when treated with (AFB$_1$ + 800) and (AFB$_2$ + 800) mg/kg respectively, while (8) cells/mm$^3$, in the control treatment.

![Figure 3: Red blood cells in animals treated with aflatoxin and Black seed oil with different concentrations](image)

The fungal toxins sometimes act as competitive inhibitors of enzymes responsible for the bio-synthesis of (RBC). The ability of the seed oil to play an important role in increasing the rate of hemoglobin and increase the number of (RBC) due to its effect in the activation of bone marrow and spleen responsible for the manufacture of (RBC) $^8$.

In a study conducted by Mohsen et al (2009), the toxic effects of *Aspergillus parasiticus* and *Bipolaris micropus* in white rats showed a reduction in the weight of animals treated with fungi, where (10.2, 7.2) % respectively. The results indicated that the preparation of white blood corpuscles was increased in the blood of animals treated by *A.parasiticus*, which amounted to (6600) cells/ml, while reached (10500) cells/ml in the blood of animals treated with the *B.micropus* and at the same time did not change values ESR in all transactions in addition to the high Hb values was (15-18) % for animals treated with *A.parasiticus* and *B.micropus* compared to the control treatment of (13) %. either the level of P.C.V has risen to (45, 52) % on the respectively.

Hb concentration rate: Figure (4) refer that AFB$_1$, AFB$_2$ had a negative effect on the concentration of hemoglobin as the rate was reduced to (3, 5) g/100 ml respectively compared to the control treatment of (15 g/100 ml) on the other hand, a positive effect on a significant increase in the concentration of hemoglobin concentration in animal blood treated with (AFB$_1$ + 800) and (AFB$_2$ + 800) mg/kg respectively to (11.9) g/100 ml compared to control treatment.

![Figure 4: Concentration of hemoglobin in animals treated with aflatoxin and Black seed oil with different concentrations](image)
The high rate of hemoglobin in the use of black seed oil with aflatoxin is due to lowering the level of hemostatin in the blood. In addition, low levels of hemoglobin in animals treated with aflatoxins (B1, B2) cause increased production of immune response factors, including cytokines in animals that gave toxins, which have increased oxidation in the cell, increasing the free radicals that attack red blood cells, Hemoglobin deficiency or aflatoxin has a strong correlation with blood proteins responsible for the synthesis of red blood cells, which results in a small amount of it. It also affects the blood balance 9-13.

On the other hand, in an experiment with the use of the grain of the pond led to an increase in the concentration of hemoglobin in laboratory animals and increase the immunity of the body through lymphocytes and protein and kidneys and globules to contain the grain of the pond on the most important elements of iron, which enters the construction of hemoglobin and copper 14-19. The reason attributed to raise the proportion of hemoglobin when used The oil has the most effective substances Nigellone, Nigelline, which has the medical effect in addition to the matter of phosphorus and carotene (vitamin A generator) 20-25.

Conclusion

The results showed that Black seed oil had a significant effect on the physiological parameters of blood. The rate of white blood cells (WBC) increased to (15 × 10^3 and 21 × 10^3) cells/mm^3 when treated with Aflatoxin B1 (AFB1) and Aflatoxin B2 (AFB2) compared to control treatment. The results showed that the Black seed had decreased the rate of white blood cells when used with aflatoxin (AFB1 + 800) and (AFB2 + 800) mg/kg oil to (11.5 × 10^3 and 7.5× 10^3 cell/mm^3 respectively

Source of Funding: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Sciences/University of Babylon/Iraq and all experiments were carried out in accordance with approved guidelines.

REFERENCES


Rehabilitation Program Impact in the Treatment of Injury to the Cruciate Ligament of the Knee Joint Care of Five Players Lounges

Naghm Salman¹, Aseel Naji¹
¹College of Physical Education and Sports Sciences, University Muthanna

ABSTRACT

The study of the effect of rehabilitation exercises and physical efforts to determine the impact of these exercises on the functional state of muscles because its main work is to accelerate the process Hospitalization of the incident of injury to perform various physical efforts, as these exercises work to increase the vital interactions rate and speed within the human body, and to identify those changes will help us also in the process of understanding the development of therapeutic and rehabilitative appropriate exercises that the research problem lies in the spread of this case between the members of the community. All ages, races and jobs, as well as the seriousness of the complications of this problem as well as reducing the intake of medicines and replace them with rehabilitation exercises. So the researchers decided to study this problem and know the impact of the therapeutic program to overcome this problem, which young players face. The research aims to identify the therapeutic effect of exercise on the knee joint and link the injured anterior cruciate ACL from where: Lower limb circumference (knee circumference - leg circumference). Motor range (positive range of the knee joint - negative range of the knee joint).

Keywords: rehabilitation program, cruciate ligament injury, five futsal

Introduction

The scientific development that the world is witnessing today is a milestone of progress, culture and creativity, and this Creativity must be preceded by full and directly informed of what is happening around us, whether inside or outside the country. From this point it became important and necessary scientific research went to study the various applications of pure science, including chemistry and physiology of sports in all areas of basic movements and sports because of the importance of these sciences in the development of performance and motor duty and evaluate methods and knowledge of the responses that occur during the practice of movement, and would contribute to raising the level to be the motor, since the knowledge of biochemical changes that occur within the muscle cell to produce the necessary performance sports powers are important and resulting from the increased activity of enzymes and hormones and materials energy. First in the metabolic processes to achieve adaptations in the vital body and members of organs in order to face the fatigue or the resulting injury from physical effort, especially in games where direct contact, such as five-Futsal, bringing the science of sports medicine has taken a new turn in the development of exercise Therapeutic and rehabilitation of muscles that can play an important role in the detection of the effects and physiological responses to people from the implementation of physical loads and lack of attention to physical therapy, which leads to the deterioration of the case of the patient and his failure to restore the full function of the injured part and deprivation of the practice of Nash. The daily fold is temporary or final, especially since the knee joint is the most complex of the joints of the body. Hence the importance of research in the work to alleviate or remove these pain during the preparation of a rehabilitation program to reduce the pain rather than the use of drugs.

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Methodology

The researcher used the experimental approach to suitability and experience as Experimental Method with Tribal and Remote Tests. Sample Was selected sample purposively from the players quintet young people with a torn anterior cruciate ligament and the number was 10 players from the players clubs for the province of Baghdad five Futsal and to determine the sample, the researchers follow the personal interview style with five coaches Futsal As well as with specialists in the field of physiotherapy to determine the conditions of selection of the research sample as follows:

1. Diagnosis and identification of infection by a specialist doctor and the use of the latest methods of diagnosis such as magnetic resonance MIR.
2. The exclusion of people with other injuries in the same knee.
3. Approval of the competent doctor for patients to participate in the program.
4. Not to undergo any other treatment methods during the application of the program.

Data collection methods:

Tools Devices used:

First: Search Forms: To gather information for research the researchers guided by references and previous studies followed the follows - how to record the occurrence of injury form:

They include some questions that explain how the injury (as a result of friction, without) and the degree of pain experienced by the injured in the performance of different movements and detailed degree of assistance received from others.

- Expert consultation form for the determination of measurements of the muscles working on the knee joint.
- Measure the circumference of the thigh and leg using the measuring tape cm.
- Weight using the medical balance.
- Measurement of length using the measuring tape cm.
- Measuring the positive and negative range of the knee joint using the genome.
- Data registration form:

It is a data registration form for each case and includes data

(Age - height - weight - positive and negative range of the knee joint - the circumference of the knee and the circumference of the thigh and the circumference of the leg).

Second: Tools used:

- Medical balance for weight measurement
- Measure tape inserted in centimeters.
- Infrared and sound waves.
- Electrical stimulators (tens).
- Stop Watch.
- Weights starting from half a kilo, whether the dumbbells or fixed on the man.

Third: Measurements used:

1. Measurement of length (Rstmeter).

Measurement Description: Where the individual stands on the wooden base and the back facing the sign so that it touches the three points, the area between the two boards and the farthest point of the pelvis from the back and the farthest point for the safety of the legs and must take into account the individual body lift and look forward is lowered the pregnant until touching the top edge of the skull where the figure opposite to the pregnant Length of the individual.

2. Weight measurement: Measurement description: The measurement uses the medical balance where the patient stands vertically in the middle of the balance with both feet and does not look down when making the measurement.

3. Measure the circumference of the thigh and leg using the measuring tape cm (measurement description): Measure the circumference of the thigh muscles above the circumference of the patellar muscle.

Measure the leg circumference at the extremity of the leg muscle.

Measurement of the knee arthroplasty is divided into three parts directly above the patellar and
mid-knee bone at a distance of four fingers from the first and below the knee at a distance of four fingers from the second measurement.

4. Measuring the motor range of the knee joint: (measurement description)

- Measuring the extent of positive flexion of the knee joint.
- Measuring the negative bend of the knee joint.

A. The electronic genometer shall be placed on the end to be measured by the adhesive tape.
B. The locomotor is cleared to start the patient moving the party to measure the range of motor
C. The injured party moves in the direction required to know the range of motor and take the reading of the device.

Repeat the measurement three times and take the best.

After recording the device, the patient will hold the flexive knee and pressure behind the pain limits and take the machine’s reading to record the negative dynamic range.

Steps numbers of the proposed therapeutic program:

Therapeutic programs are concerned with determining the type and size of work to be carried out in order to achieve agreed goals. These programs are based on long-term and short-term goals. The objectives of this course will focus on the short-term goals in their simplest form

The concept of therapeutic program

The training program is defined as the processes to be implemented so that the start and end date of these operations is according to a specific time and goal. The remedial program is considered as one of the elements of the planning process to achieve the goal of the plan.

* The proposed therapeutic program objectives:

- Restoring basic functions of the knee joint.
- Improves the muscular capacity of the affected muscle groups.
- Increase the flexibility of muscles working on the injured joint and improve its movement.
- Reduce the feeling of pain to the least possible.
- Exercise should be in line with the overall goal of the program with gradual easy to difficult and gradual in the intensity of pregnancy.
- Restore the basic functions of the muscles working on the knee joint.
- The return of the main functions of the joint and the muscles working on it as close as possible to the correct member of the same player.

Suggested therapeutic program content:

- Method of the treatment program used in the search (therapeutic exercises).
- Period of application of the proposed program (12 weeks).
- The program is divided into three phases each stage four Weeks.
- The application took one training session (35 minutes: 55 minutes) by six training units per week and on the basis of individual differences.
- Number Units during the program (72).
- Number of units per week (6 units).

The first step was to find the scientific parameters under study and find the stability of the tests using the re-test method 6. This method requires the application of the test twice on the same group under the same conditions and the appropriate time difference between the two applications. The test was applied to the survey sample of Outside the basictudy sample. The test was re-applied to the same individuals after a period of one week. This method is statistically called the method of re-testing.

<table>
<thead>
<tr>
<th>No</th>
<th>The name of the meter</th>
<th>Arithmetic average</th>
<th>Deviation Standard</th>
<th>Correlation coefficient (stability)</th>
<th>Honesty</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Ocean scale</td>
<td>7.6</td>
<td>0.67</td>
<td>0.89</td>
<td>0.94</td>
</tr>
<tr>
<td>2.</td>
<td>Motor range scale</td>
<td>6.10</td>
<td>0.90</td>
<td>0.93</td>
<td>0.96</td>
</tr>
<tr>
<td>3.</td>
<td>A measure of muscle strength</td>
<td>2.99</td>
<td>0.12</td>
<td>0.90</td>
<td>0.95</td>
</tr>
</tbody>
</table>
The results showed a correlation coefficient for the different stability measures ranging between 0.89-0.93 and true (0.94-0.96). Therefore, the results of the arbitration of the validity of the measures that proved to be highly stable can be considered and this means that the degree of stability and sincerity of great standards, and this standard was completed and became finalized and ready for use in the collection of information was technical standards through knowledge of the views of experts.

**Results and Discussion**

To respond to the first hypothesis of the research that provides (therapeutic exercises have a positive effect on the lower limb (thigh circumference, knee circumference, circumference of the leg). The researcher extracted the arithmetic mean, standard deviation and the value of (T) measurements and tribal dimensions of variables lower limb (thigh circumference, knee circumference, leg circumference) The following table shows that.

<table>
<thead>
<tr>
<th>Significance</th>
<th>Value (T)</th>
<th>Dimension measurements</th>
<th>Tribal measurements</th>
<th>Dimensions of the ocean</th>
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<tr>
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<td>11.98</td>
<td>6.000</td>
<td>50.22</td>
<td>Thigh circumference</td>
</tr>
<tr>
<td>Spiritual</td>
<td>15.89</td>
<td>5.54</td>
<td>40.33</td>
<td>Knee circumference</td>
</tr>
<tr>
<td>Spiritual</td>
<td>13.07</td>
<td>3.000</td>
<td>37.22</td>
<td>Leg circumference</td>
</tr>
</tbody>
</table>

Table (2) shows that there are statistically significant differences between the tribal measurements and the experimental measurements of the experimental group in all the variables of the lower and right periphery. Table (2) shows the mean of the arithmetic mean of the femoral circumference (46,17), and with a standard deviation of (4,646) and for the femoral measurements of the hip circumference, the mean of the mean (50,22), the standard deviation was (6,000) and the value of (T) was (11,98), and the arithmetic mean of tribal measurements of the knee circumference was (37,83) and standard deviation reached (3617) and measurements dimensionality of the ocean knee reached the arithmetic average (40.33) and the standard deviation was (5.54) and the value of (v) amounted to (15.89), and the arithmetic average of the measurements Tribal perimeter leg reached (35.67) and the standard deviation was (The mean value of the circumference of the thigh, the circumference of the knee, the circumference of the leg (11), and the mean value of (13), 98,15,89, 13,07), greater than (t) the table, which amounted to (2.37). Which indicates that there are significant differences between the tribal and remote measurements, and for the benefit of the measurement algebraic and attributed the researcher the reason for the development to appropriate training exercises inevitably lead to a positive effect in raising the functional and motor level of the knee joint, and the return of nature functions in the joint closest to the proper joint. Mohammad Adel Rushdie asserts that the use of appropriate exercise exercises results in good results for the knee joint in general and the front cruciate ligament in particular. This result responds to the imposition of the first research 6. Positive therapeutic exercises affect the lower limb (circumference Thigh - circumference of the knee - circumference of the leg) for those who have torn the cruciate ligament with the front knee joint.

Presentation of the results of the second hypothesis: To respond to the second hypothesis of the research, which provides: Positive therapeutic exercises on the motor range of the knee joint (positive and negative)

Table (3) shows that there are statistically significant differences between tribal measurements and algebraic measurements and the following table shows this.

<table>
<thead>
<tr>
<th>Value (T)</th>
<th>Dimension measurements</th>
<th>Tribal measurements</th>
<th>Dimensions of the motor range</th>
<th>T</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.6</td>
<td>9.22</td>
<td>7.0065</td>
<td>Motor rangePositive</td>
<td>1-</td>
</tr>
<tr>
<td>7.55</td>
<td>7.01</td>
<td>5.89</td>
<td>Negative range of motion</td>
<td>2-</td>
</tr>
</tbody>
</table>
Table (3) showed the mean value of the positive range of the knee joint in tribal measurements (95.24) and the standard deviation (7.0065). The mean value of the mean measurements of the positive range of the knee joint was 100.00 and the standard deviation) while the value of the arithmetic mean of the negative extent of the knee joint in the tribal measurements (15.003) and standard deviation (5.89) and the value of the arithmetic mean of the traditional strategies measurements negative for the extent of the knee joint (7.01) and standard deviation (7.55) and the value of (C) the positive range (10.6) and the value of (v) for the negative range (7.55) greater than (t) the table which amounted to (2.37)

There are statistically significant differences between the measurements of tribal and remote and good dimension measurements in the variables of study and this improvement in the measurement of distance is due to the rapid improvement in the frontal cruciate ligament to contain the program therapeutic exercises to general exercises with the gradient from simple to complex and easy to difficult and choose appropriate and standardized exercise. This improvement in measurement results is due to the regular exercise of the program. This result responds to the imposition of the second research. The therapeutic exercises positively affect the motor range of the knee joint (positive and negative) for those with the cruciate ligament rupture of the front knee.

**Conclusion**

In the light of the objectives of the research and data that have been presented and discussed researcher concluded that T. the following: There are statistically significant differences between the results of the tribal and posttraumatic measurements in the femoral, knee, leg and posterior groups. There were statistically significant differences between the tribal and the remote measurements in the range of positive mobility of the knee and the negative range of the knee and the remote welfare.

**Source of Funding:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the University Muthanna/College of Physical Education and Sports Sciences and all experiments were carried out in accordance with approved guidelines.

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2. Samar SA. Effect of therapeutic programs on some physiological and physical variables of patients with lumbar cartilage, PhD thesis submitted to the University of Sudan/2013.
The Proportion of the Contribution of Some Muscular Capabilities of the Arms to the Accuracy of the Performance in Foil

M. M. Mohamed Qais Mubder¹, Noor Hatem², Kamil Malykh Hussein³
¹Collage of Physical Education and Sports Science, University of Muthanna; ²Collage of Physical Education and Sports Science for Girls, University of Baghdad; ³Collage of Physical Education and Sports Science, University of Muthanna

ABSTRACT

The study aims: Identification of the muscular abilities of the arms (characteristic strength of speed, carrying force, explosive power of the arms), which affect the accuracy of the performance of skill in foil. Identify the percentage of the contribution of muscular abilities to the arms that affect the accuracy of the performance of the skill with a gun. The researcher used the descriptive method in the method of correlative relations to his suitability to the nature of the problem. The sample of the research was selected from the community of origin, represented by the dueling team of the students of the College of Physical Education and Sports Science for Girls/University of Baghdad. The number of (20) And the number of (4) students became the sample research (16) from the original community. Applied tests were conducted for the capabilities of muscle and performance evaluation skills in foil on Wednesday in the Fencing Hall Faculty of Physical Education and Sports Sciences. Through the statistical treatments and the results obtained by the researcher, the following conclusions were reached: The existence of a significant correlation relationship with muscular capacity performance skills in foil.

Keywords: Contribution Ratio, Muscle Capabilities, Blinds

Introduction

Weapon fencing is one of the oldest known games, which is the use of weapons in different ways and methods during the attack and defense between the competitors as they try to record touches within the target of the weapons and laws agreed within the specified time. The sport of fencing is one of the sports that has special requirements and determinants as well as its sports, social, psychological and educational goals. It is practiced in accordance with certain laws and special rules governing competition among competitors. The ability of the swordsman to exert effort and win depends on many variables, Mental, physical and muscular, through which to achieve advanced results, the player who is integrated physically, psychologically and skillfully can get good results in competitions as this sport is characterized by the speed of attack towards the opponent suddenly, and precision in the direction of the weapon. To the goal of the competitor, for the purpose of obtaining a touch, any weakness in the muscle capacity causes weakness in the accuracy of access to the touch and thus not achieve the desired results in the competitions, muscle capacity as other abilities that should be concerned by each coach in the field of sports training are physical and skill. Hence the importance of research in the identification of the most important muscular capabilities of the arms and the proportion of their contribution to the accuracy of the performance of skill With the duel of female students of the College of Physical Education and Sports Science for girls/University of Baghdad in order to focus on them by the trainers to reach the best results in sports competitions. Many studies, field and laboratory research have dealt with most of the physical abilities of the fencing game,
which directly affect the development of the physical aspect to improve the technical and skillful aspects. However, most of these studies have training curricula based on the development of special physical abilities and skill 7, advanced we must stand at the points that have not previously observed by the trainers that affect the results and the level of the player, acknowledge ofthe proportion of the contribution of muscular capacity of the arms in the performance of performance skills and thus Tozviha within the training modules, fencing streaking Anaj to special abilities must know the coach and focus on the training modules to obtain good results. Research Objectives. Identification of musculoskeletal abilities (characteristic strength of speed, bearing force, explosive force of arms) that affect the accuracy of performance of skill in foil. Identify the percentage of the contribution of muscular abilities to the arms that affect the accuracy of the performance of the skill of in foil.

Methodology

The researcher used the descriptive method in the method of correlative relations to suit the nature of the problem.

Research Sample: The sample of the research was chosen from the community of origin, represented by the dueling team for the students of the College of Physical Education and Sports Science for Girls/University of Baghdad. The number of (20) female athletes was adopted by the intentional method in selecting the sample. We excluded the students who participated in the exploratory experiment of (4) 16) of the original community.

Research tools Information collection methods:

- Arab sources and references.
- Questionnaire.
- Information and Data Dissemination Form.
- Interviews.
- Observation and experimentation
- Information Network (Internet)
- Expert Consultation Form Annex (2,4,6)
- Duel Mask Number.
- Abdul Shish number 16.
- An electric vest for the gun which represents the legal target number 16.
- Electronic stopwatch.
- Registered device.

Tests used in research

Muscle capacity tests:

Test characteristic force as fast as armrests (10 Tha) (1:56)

- Objective of the test: Measure the speed of the arms.
- Tools used: Stopwatch.
- Performance description: The slant position (the number of folds and the length of the arms in 10 tha).
- Recording method: The number of folds and arm lengths is calculated in 10 seconds.

2 - 4 - 1 - 2 test the performance of the armed arm.

- Test Name: Hold the performance strength of the armed arm.
- Objective of the test: Measure the performance of the armed arm of the duel.
- Tools used: Stopwatch - Blind.
- Performance description: From the standby mode, extend the armed arm towards the person to touch it, and then the back of the arm so that the hand attachment touches a tool placed between the trunk and the heel of the player to show the sound when it is touched to ensure that the arm is properly returned to the player within 60 seconds.
- Method of recording: The number of times the performance is calculated within 60 th.

test payment of medical ball 3 kg hands(2:73)

- Purpose of the test: Measurement of muscle strength (for the arms).
- Performance Specifications:
- The laboratory sits on the chair holding the medical ball in the hands so that the ball is in front of the chest and below the chin level and the trunk must be attached to the edge of the chair.
A rope shall be placed around the chest of the laboratory so that it is held from the back by an airway, in order to prevent the movement of the experimenter forward while pushing the ball with the hands.

The movement of the ball is done using only hands.

**Test Instructions:**
- The laboratory gives an independent attempt at the beginning of the test, such as performance training.
- The laboratory is given three attempts.
- When the laboratory vibrates or moves on the chair during the performance of an attempt, the result is not counted and another attempt is made instead.

**Calculation of grades:**
- The degree of each attempt is: the distance between the front edge of the chair and the nearest point on the floor of the chair hand rounded to the nearest (1.5) cm.
- The degree of testing is the best attempt of the three attempts.

**Performance evaluation skills:** In order to know the level of skillful performance of the fencing players picture the game researchers karma video and then distributed to the expert performance skills that have already proven validity and reliability and objectivity of the disc with the video to give each of each player to form the banner of an expert evaluation form

**Reconnaissance experiment:** Conducted researcher of this exploratory experiment on 29/11/2018, at ten o’clock in the morning in the Fencing Hall at the College of Physical Education and Sports Science on (4) players, it has applied the researcher tests after conducting measurements tests in order to reach the following:
- Know the obstacles encountered by the researcher when conducting the main experiment.
- To determine the accuracy and validity of measurements and tests for research.
- The extent to which the research sample understands the tests used.

**Test Stability:** To determine the stability of the test, the researcher used the method of retesting that «if the test is re-applied to the players themselves, it gives the same results or close results.»(3:23)

The researcher applied the tests on 2/12/2015 and a sample of (4) of the selected fencing players were selected by the intentional method. The test was re-applied on 9/12/2015. The stability was obtained using the simple correlation coefficient as shown in Table 1

<table>
<thead>
<tr>
<th>T</th>
<th>Test vocabulary</th>
<th>Stability</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>The speed of the arms</td>
<td>0.87</td>
<td>Spiritual.</td>
</tr>
<tr>
<td>2.</td>
<td>Carry the performance strength of the armed arm</td>
<td>0.86</td>
<td>Spiritual.</td>
</tr>
<tr>
<td>3.</td>
<td>Push the medical ball 3 kg hands (muscle capacity of the arms)</td>
<td>0.94</td>
<td>Spiritual.</td>
</tr>
<tr>
<td>4.</td>
<td>Performance skill</td>
<td>0.90</td>
<td>Spiritual.</td>
</tr>
</tbody>
</table>

It is noted from the table that all correlation coefficient values were greater than r (0.811) under the free degree (4) and the significance level (0.05).
Objective of the test: The researcher used a clear and understandable test by the testers, where the registration was done using the units of measurement which are (time, grades). Therefore, this test is of good objectivity. When applied “(4:26)

Main experience: Applied tests of the capabilities of the muscle was conducted on Tuesday, 14/12/2018 Fencing College of Physical Education and Sports Science Hall. Either evaluate the skill performance With the weapon of the blinds on Wednesday, 15/12/2018 in the Fencing Hall Faculty of Physical Education and Sports Sciences.

Statistical means: The researcher used the statistical bag (SPSS).

Results and Discussion

Table (2) shows that the coefficient of correlation between the test carrying the speed of performance of the armed arm by skill performance Blinds with a weapon of (.77) and contribution rate (60%) and reached the revised value of the ratio of contribution (57%).

<table>
<thead>
<tr>
<th>Statistical means</th>
<th>Link coefficient value</th>
<th>Contribution Ratio</th>
<th>The adjusted value of the contribution</th>
<th>Link indication</th>
</tr>
</thead>
<tbody>
<tr>
<td>The speed of the arms</td>
<td>0.77</td>
<td>60 %</td>
<td>57 %</td>
<td>Spiritual</td>
</tr>
<tr>
<td>Carry the performance strength of the armed arm</td>
<td>0.81</td>
<td>66 %</td>
<td>64 %</td>
<td>Spiritual</td>
</tr>
<tr>
<td>Muscle power of arms</td>
<td>0.94</td>
<td>89 %</td>
<td>88 %</td>
<td>Spiritual</td>
</tr>
<tr>
<td>The value of the covalent link (0.49) at the degree of freedom (14) and the probability of a line (0.05).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This means that the relationship between the test characteristic force as quickly as armrests Bperformance skills with a weapon blinds were significant correlation when compared to the value Tabulated (0.9 4) at the 14 degrees of freedom and the possibility of error (0,05), theresearcher attributes the reason for this is that the greater the susceptibility player to withstand the speed of performance increases the performance of the movement to challenge the accuracy as seen (SMA intruder) «the fundamental cause of the development of basic and carry speed due to the choice of the appropriate method for training endurance speed» (5:74). And that the value of the correlation coefficient between the endurance test the performance of the armed force of the arm with the skill of performance weapon blinds reached (.81) and contribution rate (66%) and reached the revised value of the ratio of contribution (64%).And this means that the relationship between the endurance test the performance of the armed force of the arm with the skill of performance weapon blinds were significant correlation when compared to the value Tabulated amounting to (0.49) at the 14degrees of freedomand thepossibility of error (0.05)

Conclusion

Through the statistical treatments and the results obtained by the researcher, the following conclusions were reached: the existence of a relationship of significant correlation between the muscular abilities to the skill performance of the weapon of the blinds. The proportion of the contribution of high muscle capacity appeared in the B performance skills with a weapon blinds.

Source of Funding: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the University of Muthanna/collage of Physical Education and Sports Science and all experiments were carried out in accordance with approved guidelines.

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2. Saad MD. Effect of Proposed Training Curricula for Developing Endurance Characteristics for


The Impact of the Strategy of the Three-Step Interview in the Rugby Thinking and the Accuracy of the Performance of the Skill of Students

Fadya Abdul-Hussein Kadhim¹, Nihad Mohammed Alwan¹

¹College of Physical Education and Sports Sciences for Girls, University of Baghdad

ABSTRACT

The study aimed to prepare educational units using the strategy of the three-step interview and identify its effect on the rugby thinking and the accuracy of the performance of the wall of the volleyball team. The researchers followed the experimental research method by designing the experimental and control groups with the strict control of the pre- and post- In the College of Physical Education and Sports Science for Girls at the University of Baghdad for the academic year (2018/2019), the number of (42) students randomly chosen by (44.681%) of their community of origin, The school is presented with a skillful part of the learning, accompanied by details of how to master it. The information that the learner may encounter when performing to build a knowledge base is the experience of the learners in their performance and the questions they ask in the applied part of the unit. allocated for this skill (30) minutes of section Chief of time (60 minutes), it has been allocated (4) educational units by its educational unit and one in the school week, and the results were processed results of the study statistical system bag SOCIAL Yeh (SPSS)

Keywords: strategy, rugby thinking, performance, skill

Introduction

Not only motor skills learning is limited to traditional methods, most of which remained constant in their specific steps in the duties of the teacher and the learner, although some allow the latter to be active in his lesson in the lesson considering that modern schools in this learning aims to increase the activity of the learner More than the teacher, which casts a shadow on those conducting academic studies to address the methods and strategies that take into account the privacy of learners and target their thinking by adopting the theories of cognitive structure in learning on the one hand, and the privacy of the game or effectiveness on the other hand, It is essential that the strategy and the contents of the exercises are as close to the nature of this game as the study is important in that it simulates the actual reality and facilitates its application without exaggerating the concepts as the need arises. Here is the strategy of the three-step interview to activate the role of learners in the lesson by sharing ideas and asking questions and taking notes in light of the determinants of this strategy to be applied to a degree of easy and easy to allow them freely in the lesson and in line with the same Time with the goals of modern schools in learning. Recalling Mouston and Ashort (Mosston & Ashworth) “That The foundations upon which the choice of teaching in physical education strategy is the abilities of students, age and content to be taught to them and abilities of self and environmental teaching teacher (tools and facilities), weather conditions, time.”¹ and refers that Indian Muhammad that» recommended DEWEY that learners They need to acquire, discover and interact with the environment around them and then increase their ability to solve the problems they encounter in the environment and society. The psychological basis of the survey is based on the cognitive theory that interpreted learning as the result of the interaction of the mental powers of the individual

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with the stimuli that exist in the environment. Around it, the authors of this theory pointed out that the learner can be contained in the learning process by allowing him to choose, exercise, think and make his decisions based on his analysis and self-evaluation of the information provided to him, so the activity of the learner in the educational situation according to that theory is a mental activity based on interaction mental powers of the learner with stimuli and educational experiences, and then understanding and awareness of stimuli and phenomena and the relationships between them, and thus have been learning.”

modern learning theories have shown that learning is to build knowledge through the involvement of the learner in the process. The knowledge-based strategies are no longer available, so strategies based on information transfer are no longer valid for educational goals. The learner must participate in the learning process. He should ask questions, draw hypotheses, collect information and draw conclusions. This is the scientific study that is the focus of learning science. « (1) Wei Abdullah Suleiman presented the determinants of those questions they “questions should be consecutive to make it easier for the learner to identify the skill sequence parts and must be based on the assumption and give the reason for the evaluation of the answer, and must possess the skills of asking these questions should not be dull or very complex or deceptive or ambiguous or non-productive questions and balanced in terms of bifurcation or assembly also takes into account the chronological age of them and able to control the lesson time as it is waiting for a response time of 3 seconds and must allow a greater number of learners to participate, whether they are volunteers or non-volunteers, namely it is a learning method Direct. “ (4) To put Abdullah Khatib and others determinants in the questions and codification in that it is “waiting time of the components of the questions of class is the period of time in which it is expected to hear the answer of the learner and the length of time that awaits after the learner gave his answer and before the teacher’s reaction to what the learner said”.

Methodology

The researchers used the experimental approach to find solutions to the problem of the study and achieve its objectives, and the design of the experimental and control groups, which are controlled by the tribal and remote tests.

Search community and design: That the boundaries of the research society of the study is represented by the second stage students in the College of Physical Education and Sports Science for Girls in the University of Baghdad for the academic year (2018/2019) the number of (94) students distributed by nature on four divisions (A, B, C, D) The sample of the study was randomly selected by two groups (A and D) to represent 42 students with 44.681% of their origin. Both were randomized to be experimental and control groups in each group, the selection of students of the Division of (c) of their number (27) students experience as required by the scoping study of Procedures.

Measuring tools and tests in the study: T researcher deliberately tan to choose the rate of wishful thinking born scale crusader in favor of Shima (5) the number of paragraphs (37) with five alternatives to paragraph (Annex 1) degree range (37-185) degree in central Varzi (111), and choose your test Skillfully wall block (11) degree range (0-12) degree, and after checking the foundations of scientific transactions of the two tools of measurement after applied to the exploratory sample and validated, were prepared exercises technique for improving the two variables officers recruited triple the corresponding strategy steps, as it offers school Part educational skill accompanied by details of how mastered is information you may encounter educated at the performance to build a knowledge base as an experience based on the learner’s data when performance n ask questions n that inquires n in the applied part of the unit, as it was dedicated to the skill offline (30) flour (60) minutes, 4 educational units were allocated to them By one educational unit in the school week, and the results were processed. SPSS) Release (V 23) , (statistical package for social sciences) , By calculating both the percentage values, the arithmetic mean, the standard deviation, the median, the torsion coefficient, and the test T-test) For interrelated samples, and test T-test) For interrelated samples.
### Results and Discussion

**Table 1:** Shows the results of tribal tests between experimental and control groups

<table>
<thead>
<tr>
<th>Variables</th>
<th>The experimental group</th>
<th>Control group</th>
<th>(T) Calculated</th>
<th>Degree (Sig)</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N  s ± P</td>
<td>N  s ± P</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wishful thinking</td>
<td>21  92.38 ± 5.035</td>
<td>21  92.62 ± 7.419</td>
<td>0.122</td>
<td>0.904</td>
<td>Non-Spiritual</td>
</tr>
<tr>
<td>The skill of the wall of resistance</td>
<td>21  2.67 ± 0.966</td>
<td>21  2.48 ± 1.289</td>
<td>0.542</td>
<td>0.591</td>
<td>Non-Spiritual</td>
</tr>
</tbody>
</table>

Degree of Freedom (N-2) 40 The level of significance 0.05) (V) is calculated function if the degree (Sig) > (0.05)

**Table 2:** The statistical parameters of the T-test results of the interrelated samples of both the experimental and control groups in the tribal and remote

<table>
<thead>
<tr>
<th>The variables</th>
<th>My search group</th>
<th>Tribal Test</th>
<th>The test is run</th>
<th>F</th>
<th>P</th>
<th>(T) Calculated</th>
<th>Degree (Sig)</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>s ± P</td>
<td>s ± P</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wishful thinking</td>
<td>Experimental</td>
<td>92.38</td>
<td>5035</td>
<td>155.95</td>
<td>3.122</td>
<td>63.571</td>
<td>5.363</td>
<td>54.325</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>92.62</td>
<td>7.419</td>
<td>137.29</td>
<td>3.964</td>
<td>44.667</td>
<td>9.134</td>
<td>22.409</td>
</tr>
<tr>
<td>Wall of Destruction</td>
<td>Experimental</td>
<td>2.67</td>
<td>0.966</td>
<td>7.9</td>
<td>0.625</td>
<td>5.238</td>
<td>1.221</td>
<td>19.662</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>2.48</td>
<td>1.289</td>
<td>5.81</td>
<td>0.814</td>
<td>3.333</td>
<td>1.528</td>
<td>10</td>
</tr>
</tbody>
</table>

N = (21) In each group degree of freedom (n - 1) For each group the level of significance 0.05) Unit of measurement (degree)

**Table 3:** Shows the results of the remote tests between the experimental and control groups

<table>
<thead>
<tr>
<th>Theequations</th>
<th>The experimental group</th>
<th>Control group</th>
<th>(T) Calculated</th>
<th>Degree (Sig)</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N  s ± P</td>
<td>N  s ± P</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>wishful thinking</td>
<td>21  155.95 ± 3.122</td>
<td>21  137.29 ± 3.964</td>
<td>16.952</td>
<td>0.000</td>
<td>Spiritual.</td>
</tr>
<tr>
<td>The skill of the wall of resistance</td>
<td>21  7.9 ± 0.625</td>
<td>21  5.81 ± 0.814</td>
<td>9.36</td>
<td>0.000</td>
<td>Spiritual.</td>
</tr>
</tbody>
</table>

Degree of Freedom (N-2) 40 The level of significance 0.05) (V) the calculated function if the degree (Sig) (> 0.05)

Showing the significance of the results of the table (2) Exceeded the improvement of the two groups in the two variables in the table, showing the significance of the results of the table 3) The improvement of the learning group of the experimental group surpassed those of the control group. The researchers attributed the emergence of these results to the effectiveness of the strategy in question and its role in improving the thinking of the rugby among the educated as the step of the responsibilities involved helped the thrill and excitement and continued desire to continue according to the nature of the human psychologically, it looks to identify and find out what is the answer to the question raised and reinforced by the use of thinking Asking questions that are in fact supportive of how to reach the proper application of the skill of the wall of the resistance, especially as it is a skill characterized by the change of the ocean and depends on the different positions shown by the opposing team of attempts to deceive or from overwhelming blows Surprised him, which helped to adopt more than an educational position helped by the exercises matched with the use of strategy in order to improve this type of thinking, which is necessary in the lesson of physical education, as modern schools emphasize the increased activity and role of the learner in the lesson, at the same time emphasizes the lack of The learner in circumstances compelling or philosophical to bring about the process of learning
and must be excluded or increased in the learning to be meaningful and meaningful learning can be reliable to be free of mistakes, and here the teacher must be familiar with how to control or control the thinking of learners to reach them. It is not possible to limit the freedom of the learner or restrict within the lesson, and this is evidenced by the results of the strategy that targeted the structure of knowledge of the educated and expand the horizons of knowledge application to have the skill performance volleyball skill wall block.

Considering Kawthar Abdul Rahim as a “clear of ideas and opinions” Piaget “for cognitive learning and growth of thinking Omgoing away is that learning is active and continuous process leading to the creativity of the learner’s new knowledge of structures (systems knowledge), check interaction is successful with environmental stimuli perceived and benefit Which gained the learner from experience, in new positions.”(9)

The more these methods are related to the nature of the learning process and the cognitive, emotional and social factors that affect them, the more successful and effective it will be in the emergence of new meanings and ideas that may be used in new educational situations or in solving problems,” said Thaer and Khaled . (2)

Talha Hussein pointed out that “there are several variables that affect the accuracy of performance of the most important sense of direction and distance and timing and the amount of strength required and the ability to control and control muscle work.” (3)

It is reported Chnov, a Russian scientist, quoting Mohammed Shehata, «that man remembers responses because of the interdependence of experiences.”(10)

Hani and others note that this type of learning works to fix new information in the learner’s cognitive structure, making it easier to remember and retrieve in the future to be used to learn, understand and recognize the new information that he or she faces.”(12)

**Conclusion**

The application of the students to the strategy of the three-step interview in the lesson of physical education helps them to improve their thinking rugby, to implement this strategy a positive role to improve the learning of the skill of the volleyball wall of students, and it is necessary to pay attention to the level of thinking rugby among the educated To initiate the learning of the motor skills in the lesson of physical education, and it is necessary to increase the knowledge of teachers and enable them to apply the strategy of the three-step interview with motor skills learning in the lesson of physical education.

**Source of Funding:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the College of Physical Education and Sports Sciences for Girls/University of Baghdad and all experiments were carried out in accordance with approved guidelines.

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Measuring the Therapeutic Calendar of the Elbow Joint
According to the Rate of Change of Rehabilitation Exercises

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1Physical Education and Sports Sciences, Dhi Qar University, Iraq

ABSTRACT
The importance of physical fitness by the safety of the affected parts is of great importance, it works to restore the joint function appropriately if the diagnosis is appropriate according to the nature, type and severity of the injury in addition to the level, the goal of the research is the calendar through the exercises articulation elbow attachment, By (10) injured players, and that the type of rehabilitation exercise indirectly helps to restore work as a simple comfort without complicating the work of the muscle part of the injured, and by achieving the goals and obtain the positive results, the researchers have to pay attention to the side application Exercises that match the nature of the level of injury in order to restore the work of the injured part gradually.

Keywords: Measurement, therapeutic calendar, elbow joint injury

Introduction
The great attention given by nations and peoples to the subject of human health and the establishment of special standards for the human body that the health level of society is a measure of the progress of each nation, and the most prominent 1 science examined in this area is the science of therapeutic sport through its various therapeutic means to treat injuries and Rehabilitation of injuries resulting from some excessive use or friction and bruises and others 2, where the strength is one of the most important manifestations of the individual health, and has long been successful scientific research to provide several studies to find the optimal methods and the best both to retain or return the body to its natural composition. Physical fitness contributes to the development of the individual in several different aspects, including physical, which is reflected positively on the health side through the direct impact in the functional organs 2, as many studies and research that there is a close link between physical fitness and public health, The health and safety of the body’s organs and their adequacy in the performance of their functions to the fullest. The importance of fitness for the public health of the individual is confirmed by many studies conducted in different parts of the world. The rate of infection occurs in those who work in occupations and work requiring movement and activity less than people who work in offices and for long periods without movement and this activity represents our physical aspect is an important element to maintain and maintain the integrity 3 of the devices by maintaining a certain level of fitness, and the other side Physical exertion may have other positive outcomes by utilizing energy to stimulate the organs by moving the organs in order to perform all sports activities, as well as other vital functions such as cellular building process, growth process, and tissue reconstruction in the body 4. The research problem came through the follow-up of the field researchers and for several years this participation in several courses for sports injuries and field follow-up to the level of injuries that occur during the matches and the acceleration and through his meetings with many of the workers in this field in the sports clubs, noted the lack of scientific research that dealt with this type of injuries 5 As well as lack of interest in the diversification of exercises and methods applied after the diagnosis of injury in the annex Tennis, as well as most handball players do not give enough physical exercise in both preparation stages.
or before the start of the game, which is Which is one of the most important elements to avoid sports injury and also lack of interest by the trainers to give a variety of ways to achieve the dimensions of mobility greater than required by the joint during the deliveries and delivery as well as scoring in various aspects of handball game.

**Methodology**

**Research Methodology:** The way in which a human finds a logical scientific method consistent with reality to realize the truth of the scientific facts, which is the way to acquire the real knowledge... The curriculum is one of these methods that regulate the side or the intellectual steps taken by the researchers To solve a certain problem. The research in all scientific fields resort to the selection of a curriculum that is appropriate to the problem The nature of the problem requires a specific approach to reach the truth, it is the primary tool to collect information and impose hypotheses and set goals to solve the problem and access to it. Therefore, the descriptive approach is used in the survey method. This approach is considered an appropriate method for studying social phenomena. It presents data on the reality of these phenomena and the relations between their causes and their results.

**The research community and its design:** Among the procedures that the researchers are interested in is the selection of the community and the sample that is being tested. The research community is identified as the tennis players in the specialized handball schools in the governorates of Iraq who are injured for the sports season (2017-2018) (100%) of the research community. The researchers conducted a homogeneity of the research sample in order to determine their distribution under the Kaus curve as shown in Tables (1) and (2).

<table>
<thead>
<tr>
<th>Table 1: Shows The homogeneity of the sample according to normal distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Variables</strong></td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Titration of the ball between the characters(15) time</td>
</tr>
<tr>
<td>Accuracy correction</td>
</tr>
<tr>
<td>Proper handling (30) time</td>
</tr>
<tr>
<td>Throw the ball to the farthest distance</td>
</tr>
</tbody>
</table>

**Tests used**

**Test of plutonium ball spherical distance (15) meters [4]**

- Name of test: plump ball zigzag (15) meters.
- The aim of the test: to measure the level of skill Albatba.
- The tools needed: 5 high profile, stopwatch, handball.
- Method of performance: Five characters are shown on the ground in a straight line, the first is from the starting line (3) meters and the distance between the characters is 3 m.
- The player stands behind the starting line when the signal starts to flatten the ball with running in the form of winding between the flags back and forth until the finish line.

**Registration:** Calculates the recorded time back and forth from the start to the student’s graduation

**Test (handling from head level to flat wall (30 ths) from distance (3 m):** Purpose of the test: Measuring the handling skill.

- **The tools:** flat wall, handball number (3), measuring tape, stopwatch, adhesive tape.
- **Performance and calendar specifications:** The player stands in front of a line drawn on the ground about 3 m away from the wall and with the word (start) the player handles the ball from the level of the head to the wall and received it and the most number of times during (30 seconds). Calculate the correct number of times the ball is handled and delivered to the wall.

**Test accuracy of correction on overlapping rectangles:**

Test the accuracy of the drawing on overlapping rectangles.

- **Purpose of the test:** Measurement accuracy.
- **Tools:** Five tennis balls, wall in front of paved ground. Draws on the wall three overlapping
rectangles whose dimensions are the bottom border of the large rectangle rising from the ground by 180 cm, drawing a line on the ground that is about 5 meters from the wall.

- **Performance specifications:** The student stands behind the line, and then straighten the five balls (consecutive) on the rectangles trying to hit the rectangle small student the right to use any of the hands in the correction.

- **Registration Method:**
  1. If the ball hit the rectangle (inside the rectangle or on the lines specified for him) is calculated for the student (3) degrees.
  2. If the ball hit the middle rectangle (inside the rectangle or on the lines specified for him) is calculated for the student (2) degrees.
  3. If the ball fit the large rectangle (inside the rectangle or on the lines specified for him) is calculated to the student one degree.
  4. If the ball came out of the three rectangles calculated for the student zero.

**Test Ball Throwing:** Purpose of the test: Measure the explosive force of the arms of the arms and trunk.

- **Tools:** medical ball weighing (3 kg), measuring tape.

- **Performance specifications:** The laboratory stands behind the starting line, holding the medical ball trying to throw it to the farthest point.

- **Registration:** The distance is calculated to the farthest point recorded by the laboratory.

**Main experience:** The researchers prepared a curriculum for the duration of this curriculum is (6 weeks) by three units per week for the duration of the unit from 10-1,50 minutes depending on the nature of the program which is a physical exercise intended to restore the work of the injured joints gradually according to the intensity used and the program began after the stage. The appropriate diagnosis through the resonance of the magnet with the appropriate rest period through the opinion of the specialist doctor and these exercises are performed without the use of any devices or any tools and applied to the first group of (10) injured players. These exercises were used for the purpose of achieving the desired level of physical, where the start of the use of exercises in a streamlined and gradual from easy to difficult as required by the severity of the program and began to work hard (10%), according to the opinion of the doctor as the injury type The second was known as the intermediate injury, and the gradient in the intensity required according to the gradient increase in an orderly manner, taking into account the nature of rest that must be proportional to the nature of intensity used during rehabilitation program, and the size of the frequencies on the first day (10). This is the first period after the positive rest. These exercises are a sense of the work of the joint after the rest period. These exercises during this day are a group of movements performed by the patient to include movements of the joint and muscles surrounding the work. Joint with the element of the exercises and tandem with the movements of the rotation that occur to us some contractions in the muscles surrounding the injured joint as well as the exercises and tandem that allows the appropriate range of motor during this intensity used and all these exercises result from a set of physical characteristics of the goal Is the sense of the detailed work of the injured facility, and then begin the process of increasing the intensity required with the necessary repetitions and in a proportional fit with sufficient rest appropriate to the intensity used until we reach the injured player at the end of the rehabilitation period to a severity of up to (90%).

**Statistical:** The researcher used the SPSS ver20 program to process the data. The following treatments were extracted from the program: * - arithmetic mean * - standard deviation * - torsion factor (t) for interrelated samples.

**Results and Discussion**

**Table 2:** Shows the computational dynamics and standard deviations of the tribal and remote tests and the calculated degree (t) and the significance level

<table>
<thead>
<tr>
<th>Variables</th>
<th>Measuring unit</th>
<th>Before Test</th>
<th>After Test</th>
<th>standard error</th>
<th>(T)</th>
<th>Level Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Titrination of the ball between the characters(15) time</td>
<td>Time</td>
<td>13.14</td>
<td>11.77</td>
<td>0.34</td>
<td>4.03</td>
<td>0.03</td>
</tr>
<tr>
<td>Accuracy correction</td>
<td></td>
<td>7.20</td>
<td>9.70</td>
<td>0.60</td>
<td>4.16</td>
<td>0.02</td>
</tr>
<tr>
<td>Proper handling (30) time</td>
<td>Degree</td>
<td>13.10</td>
<td>18.0</td>
<td>1.31</td>
<td>3.73</td>
<td>0.04</td>
</tr>
</tbody>
</table>
Throw the ball to the farthest distance & Degree
9.04 & 1.76 & 12.45 & 2.69 & 0.52 & 3.06 & 0.02

Table 3: Calculations, degrees of change and the total amount of change between variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Means</th>
<th>Degree of change</th>
<th>Total amount of change</th>
<th>Level Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean1</td>
<td>Mean2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Titration of the ball between the characters(15)time</td>
<td>13.14</td>
<td>11.77</td>
<td>1.37</td>
<td>10.42</td>
</tr>
<tr>
<td>Accuracy correction</td>
<td>7.20</td>
<td>9.70</td>
<td>2.50</td>
<td>34.72</td>
</tr>
<tr>
<td>Proper handling (30) time</td>
<td>13.1</td>
<td>18.0</td>
<td>4.90</td>
<td>37.40</td>
</tr>
<tr>
<td>Throw the ball to the farthest distance</td>
<td>10.84</td>
<td>12.45</td>
<td>1.61</td>
<td>14.85</td>
</tr>
</tbody>
</table>

Both tables show that the amount of differences in the group of exercises that were applied to the members of the research sample as well as the statistical ratios that clearly show the amounts of the significance of the change due to the application of rehabilitation exercises, which have a positive effect in improving the level of injury which result from a number of reasons, The rehabilitation programs carried out by the members of the research sample showed a clear percentage of differences between the two tests, which helped to reconstruct and adapt the muscles working in the elbow joint. It can give relative reactions in the development of these muscles of the affected arm, Repeat and strengthen. The training exercises in sports injury are of great scientific importance in terms of the use of any type of injury because the actual practice of exercises mainly stimulate blood circulation and that such activity in the circulatory system significantly helps the flow of lymphatic fluid, which has the most role in the structure of the joint, And the amount of movement produced by these exercises improve the movement of muscles, which leads to an improvement in nutrition within the tissues, which is one of the positive indicators of therapeutic exercises, and this in turn leads to increase the functional efficiency of the affected part through the amount of improvement of nutrition d Remove the tissue as an appropriate reaction to the exercises used. Exercise also plays an important role in acquiring the appropriate motor range for the affected part and depending on the type of exercise. “Any practice of sports activities has benefits, but with the presence of injury because they increase the flow of appropriate amounts of substances, components and elements in the healthy. For any of the infected parts 5. It is noted scientifically that the use of rehabilitation exercises for any infected part that comes after the rest of the time allocated by the therapist or the specialist and the exercise and exercise according to the type of injury and severity that suits the type and severity of the injury is a positive rest for the work of the injured part, and the period of the part of the injured part of the injury until the disappearance Pain and swelling are considered a passive comfort which follows the type and severity of injury because it is a period free of any action and may be limited in motion due to injury and comes the rehabilitation stage that contributes to the return of this part to work gradually without stress. In the injured part which is a positive rest as a result of the practices of exercises may be simple or recreational and then vary according to the intensity of the injured part. All the rehabilitation exercises that have been applied in the field have a high correlation with the muscular ability, which was highlighted during the special rehabilitation program used by the researchers on the sample, and the development in the results of these tests indicated the effect of these exercises in the development of muscle groups working in arm movements 5 The two researchers adopted a range of the kinetic range, the tidal and flexural movements of the joint and the muscles associated with the joint, which have a relationship between the length of the force arm and the strength of the muscle, which represent an important scientific fact determined by Which determines the strength resulting
from muscle contraction whether it is positive against gravity or negative with the gravity of the work of the muscles working on this joint if it is a driving force or a resistance force. This is what the researchers adopted in his rehabilitation program, which achieved the purpose of using these exercises. The results were significant for the members of the research sample in this field. Most exercises have different characteristics and have the effect in many fields but most often they are related to motor efficiency. Mechanical, chemical and other order attainment type of development in muscular work.

**Conclusion**

In the light of the results obtained by the researchers through this applied study we can conclude the following: Therapeutic exercises have an effect in the rehabilitation stage as a result of giving the affected organ the increased kinetic action of the muscles involved in the performance. All the exercises that have been implemented and through the positive results of the level of improvement evidence that the injured member began to receive nerve cells correctly. In the light of the results also achieved the period of time to give such exercises that helped give the joint flexibility that helped achieve the goal of performance during the rehabilitation period.

**Source of Funding:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Physical Education and Sports Sciences/Dhi Qar University, Iraq and all experiments were carried out in accordance with approved guidelines.

**REFERENCES**

Effectiveness of an Instructional Program on Promoting Lifestyle of Patients with diabetes Mellitus type 2 at Diabetes and Endocrinology Center in Missan City

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¹MSc Student, ²Professor, Adult Nursing Department, College of Nursing, University of Baghdad, Iraq

ABSTRACT

Diabetes in adults is a global health problem. Diabetes mellitus is a disorder of the endocrine system characterized by abnormal fluctuations in blood glucose levels, usually related to a defect in insulin production and glucose metabolism. Aim: To assess effectiveness of the instructional program on promoting lifestyle of patient with diabetes mellitus type 2. A quasi-experimental design (two-group pretest-posttest) was used to conduct this study. The present study was carried out at Diabetes and Endocrinology Center in Missan Governorate/Iraq for the period 8th of October 2018 to 28th of April 2019. A non-probability (purposive) sample of (100) patients was selected. A 28 item self-rated questionnaire was constructed for the purpose of the study. Validity and reliability of the instrument were determined through a pilot study. Data were analyzed through the use of Statistical Package for Social Sciences (SPSS) version. Descriptive and inferential statistical measures were employed. The study indicated that the life style levels of participants were inadequate for both groups in the pre-test, but the study group life style levels scores have increased after introducing them to the instructional program. Thus, there were significant differences between both groups.

Keywords: Promoting Lifestyle, Patients, diabetes Mellitus type 2, Endocrinology

Introduction

The proportion of people with type 2 diabetes is on the rise and is a major cause of death world-wide. Type 2 diabetes is a major risk factor for vascular disease with 65% of all diabetic deaths being due to cardiovascular disease. Lifestyle characteristics, such as physical activity, diet, and stress are important factors that influence development and prognosis of type 2 diabetes. Changes in diet and increase in physical activity (walking, etc.) and exercise (running, cycling, etc.) are key components of the management of type 2 diabetes, and guidelines recommend changes in these lifestyle characteristics for both prevention and management of the disease.(1) The number of people with diabetes has risen from 108 million in 1980 to 422 million in 2014. The global prevalence of diabetes among adults over 18 years of age has risen from 4.7% in 1980 to 8.5% in 2014. Diabetes prevalence has been rising more rapidly in middle- and low-income countries. (2) Diabetes is a major cause of blindness, kidney failure, heart attacks, stroke and lower limb amputation. In 2015, an estimated 1.6 million deaths were directly caused by diabetes. Another 2.2 million deaths were attributable to high blood glucose in 2012. (3)

Methodology

A quasi-experimental design was carried out at Diabetes and Endocrinology Center in Missan Governorate from 8th of October 2018 to 22 of May 2019. The sample involved patients at Diabetes and Endocrinology Center which is divided into two groups, one is study group (50) patients and one is control group (50) patients. A non-probability (purposive) sample of (100) patients was selected. The researcher depends on Type 2 Diabetes and Health Promotion Scale (T2DHPS) which is a 28-item self-rated questionnaire that assesses six domains related to lifestyle. Reliability was determined through collecting the data from 10 patients and performing test and re-test, the reliability coefficient results are significant for knowledge and validity of questionnaire was determined through the experts.
Results and Discussion

Table 1: Distribution of the Diabetes Mellitus Patients According to their Demographic Characteristics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Study (n = 50)</th>
<th>Control (n = 50)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Freq.</td>
<td>%</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30-39</td>
<td>3</td>
<td>6.0</td>
</tr>
<tr>
<td>40-49</td>
<td>10</td>
<td>20.0</td>
</tr>
<tr>
<td>50-59</td>
<td>25</td>
<td>50.0</td>
</tr>
<tr>
<td>60-69</td>
<td>10</td>
<td>20.0</td>
</tr>
<tr>
<td>≥ 70</td>
<td>2</td>
<td>4.0</td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>54.6 ± 9.3</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>26</td>
<td>52.0</td>
</tr>
<tr>
<td>Female</td>
<td>24</td>
<td>48.0</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>46</td>
<td>92.0</td>
</tr>
<tr>
<td>Single</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td>Divorced</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Widower</td>
<td>3</td>
<td>6.0</td>
</tr>
<tr>
<td>Level of education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Read and write</td>
<td>8</td>
<td>16.0</td>
</tr>
<tr>
<td>Primary school</td>
<td>29</td>
<td>58.0</td>
</tr>
<tr>
<td>Intermediate school</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td>Secondary school</td>
<td>6</td>
<td>12.0</td>
</tr>
<tr>
<td>College and above</td>
<td>6</td>
<td>12.0</td>
</tr>
<tr>
<td>Not working</td>
<td>11</td>
<td>22.0</td>
</tr>
<tr>
<td>Governmental employee</td>
<td>11</td>
<td>22.0</td>
</tr>
<tr>
<td>Freelancer</td>
<td>3</td>
<td>6.0</td>
</tr>
<tr>
<td>Housewife</td>
<td>22</td>
<td>44.0</td>
</tr>
<tr>
<td>Retired</td>
<td>3</td>
<td>6.0</td>
</tr>
</tbody>
</table>

Table 2: Distribution of Pre and Post Test for the study Groups

<table>
<thead>
<tr>
<th>Study group</th>
<th>Pre</th>
<th>Std</th>
<th>Post</th>
<th>Std</th>
<th>t-test</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Activity</td>
<td>7.9200</td>
<td>.92229</td>
<td>31.4200</td>
<td>9.39190</td>
<td>-17.913-</td>
<td>49</td>
<td>.000</td>
</tr>
<tr>
<td>Risk Reduction</td>
<td>9.3600</td>
<td>1.42514</td>
<td>32.5400</td>
<td>2.05247</td>
<td>58.686</td>
<td>49</td>
<td>.000</td>
</tr>
<tr>
<td>Stress Management abilities</td>
<td>7.5000</td>
<td>1.34392</td>
<td>23.3800</td>
<td>1.72485</td>
<td>-59.261</td>
<td>.49</td>
<td>.000</td>
</tr>
<tr>
<td>Enjoying Life</td>
<td>4.9400</td>
<td>.95640</td>
<td>14.2600</td>
<td>.77749</td>
<td>-59.124-</td>
<td>.49</td>
<td>.000</td>
</tr>
<tr>
<td>Health Responsibility</td>
<td>3.5200</td>
<td>.57994</td>
<td>14.8000</td>
<td>.85714</td>
<td>-77.367</td>
<td>.49</td>
<td>.000</td>
</tr>
<tr>
<td>Healthy Diet</td>
<td>3.8600</td>
<td>.98995</td>
<td>12.2200</td>
<td>1.43271</td>
<td>-49.312</td>
<td>.49</td>
<td>.000</td>
</tr>
</tbody>
</table>

There is a statistically significant difference in Physical Activity, Risk Reduction, Stress Management abilities, Enjoying Life, Health Responsibility, Healthy Diet, for participants in the study group between the pretest and posttest time (p-value = .001).
Table 3: Distribution of diabetes mellitus lifestyle Related to physical activity and risk reduction in Pre and Post follow up for the study and the Control Groups

<table>
<thead>
<tr>
<th>Lifestyle</th>
<th>Items</th>
<th>Periods</th>
<th>Study group: n = 50</th>
<th>Control group: n = 50</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean</td>
<td>S.D.</td>
</tr>
<tr>
<td>physical activity</td>
<td>Exercise, even if I’m busy</td>
<td>Pre</td>
<td>1.2400</td>
<td>.43142</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post</td>
<td>5.3200</td>
<td>7.22366</td>
</tr>
<tr>
<td></td>
<td>Exercise, even if my weight not reduced</td>
<td>Pre</td>
<td>1.0200</td>
<td>1.14142</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post</td>
<td>4.1400</td>
<td>.85738</td>
</tr>
<tr>
<td></td>
<td>Exercise, more than 150 minutes weekly</td>
<td>Pre</td>
<td>1.0800</td>
<td>.27405</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post</td>
<td>4.3800</td>
<td>.75295</td>
</tr>
<tr>
<td></td>
<td>Exercise, even if I have to do much work</td>
<td>Pre</td>
<td>1.0800</td>
<td>.27405</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post</td>
<td>4.1600</td>
<td>.84177</td>
</tr>
<tr>
<td></td>
<td>Indoor exercise on bad weather</td>
<td>Pre</td>
<td>1.0800</td>
<td>.27405</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post</td>
<td>4.4200</td>
<td>.85738</td>
</tr>
<tr>
<td></td>
<td>Eating something before exercise</td>
<td>Pre</td>
<td>1.0800</td>
<td>.27405</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post</td>
<td>4.4800</td>
<td>.86284</td>
</tr>
<tr>
<td></td>
<td>Exercise with family or friend</td>
<td>Pre</td>
<td>1.0400</td>
<td>.19795</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post</td>
<td>4.5200</td>
<td>.95276</td>
</tr>
<tr>
<td></td>
<td>Checking foot for wounds</td>
<td>Pre</td>
<td>1.1600</td>
<td>.30305</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post</td>
<td>4.9200</td>
<td>.56569</td>
</tr>
<tr>
<td></td>
<td>Reading to get diabetes information</td>
<td>Pre</td>
<td>1.3600</td>
<td>.59796</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post</td>
<td>4.5000</td>
<td>.73540</td>
</tr>
<tr>
<td></td>
<td>Brushing teeth after meals</td>
<td>Pre</td>
<td>1.9600</td>
<td>.72731</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post</td>
<td>4.8200</td>
<td>.43753</td>
</tr>
<tr>
<td></td>
<td>Checking little pieces on feet</td>
<td>Pre</td>
<td>1.0200</td>
<td>.14142</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post</td>
<td>4.7800</td>
<td>.46467</td>
</tr>
<tr>
<td></td>
<td>Reading food labels when shopping</td>
<td>Pre</td>
<td>1.0400</td>
<td>.19795</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post</td>
<td>3.9600</td>
<td>.53299</td>
</tr>
<tr>
<td></td>
<td>Using slippers or shoes</td>
<td>Pre</td>
<td>1.7800</td>
<td>.58169</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post</td>
<td>4.8400</td>
<td>.42185</td>
</tr>
<tr>
<td></td>
<td>Doing foot and ankle exercise</td>
<td>Pre</td>
<td>1.0000</td>
<td>.00000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post</td>
<td>4.7200</td>
<td>.57286</td>
</tr>
</tbody>
</table>

n= number of samples, S.D = Standard Deviation, Ass. = assessment L= Low level of life style (1-2.5), M= moderate level of life style (2.6-3.5), G= high level of life style (3.6-5).Table (4-3) Demonstrated the items of life style of diabetes mellitus patients related physical activity and risk reduction the shows all patients life style levels were low at pre and post-test for the control group while low life style at pretest and good at posttest for study group

Table 4: Distribution of diabetes mellitus lifestyle Related Stress management and Enjoyment of life in Pre and Post follow up for the study and the Control Groups

<table>
<thead>
<tr>
<th>Lifestyle</th>
<th>Items</th>
<th>Periods</th>
<th>Study group: n = 50</th>
<th>Control group: n = 50</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean</td>
<td>S.D.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>risk reduction</td>
<td>Trying to relax when bad mood</td>
<td>Pre</td>
<td>1.1000</td>
<td>.30305</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post</td>
<td>4.3400</td>
<td>.62629</td>
</tr>
<tr>
<td></td>
<td>Trying to know reasons of pressure</td>
<td>Pre</td>
<td>1.0200</td>
<td>.14142</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post</td>
<td>4.6600</td>
<td>.74533</td>
</tr>
<tr>
<td></td>
<td>Continuing to work after diagnosis</td>
<td>Pre</td>
<td>1.8400</td>
<td>.84177</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post</td>
<td>4.8800</td>
<td>.52060</td>
</tr>
<tr>
<td></td>
<td>Maintaining activities with friends</td>
<td>Pre</td>
<td>1.7000</td>
<td>.46291</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post</td>
<td>4.8800</td>
<td>.32826</td>
</tr>
<tr>
<td></td>
<td>Arranging the daily life well</td>
<td>Pre</td>
<td>1.8400</td>
<td>.46773</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post</td>
<td>4.6200</td>
<td>.49031</td>
</tr>
</tbody>
</table>
Table (4) Demonstrated the items of life style of diabetes mellitus patients related Stress management and Enjoyment of life that shows all patients life style levels were at pre and post-test for the control group while low life style at pretest and high at posttest for study group.

Table 5: Distribution of diabetes mellitus lifestyle Related to Health responsibility and healthy Diet in Pre and Post follow up for the study and the Control Groups

<table>
<thead>
<tr>
<th>Life style</th>
<th>Items</th>
<th>Study group: n = 50</th>
<th>Control group: n = 50</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>S.D.</td>
<td>Ass.</td>
</tr>
<tr>
<td>health responsibility</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Periodic eye examinations</td>
<td>1.0400</td>
<td>.19795</td>
<td>L</td>
</tr>
<tr>
<td>Post 4.9000</td>
<td>.41650</td>
<td>H</td>
<td>1.0200</td>
</tr>
<tr>
<td>Periodic medical visits</td>
<td>1.3800</td>
<td>.49031</td>
<td>L</td>
</tr>
<tr>
<td>Post 4.9800</td>
<td>.14142</td>
<td>H</td>
<td>1.6800</td>
</tr>
<tr>
<td>Periodic measuring blood lipids</td>
<td>1.1000</td>
<td>.36422</td>
<td>L</td>
</tr>
<tr>
<td>Post 4.9200</td>
<td>.34047</td>
<td>H</td>
<td>1.0200</td>
</tr>
<tr>
<td>healthy diet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Controlling diet in special days</td>
<td>1.2800</td>
<td>.45356</td>
<td>L</td>
</tr>
<tr>
<td>Post 4.4000</td>
<td>.60609</td>
<td>H</td>
<td>1.1200</td>
</tr>
<tr>
<td>Avoiding to eat high fat foods</td>
<td>1.2400</td>
<td>.43142</td>
<td>L</td>
</tr>
<tr>
<td>Post 3.8400</td>
<td>.58414</td>
<td>H</td>
<td>1.0200</td>
</tr>
<tr>
<td>Having a balanced daily diet</td>
<td>1.3400</td>
<td>.47852</td>
<td>L</td>
</tr>
<tr>
<td>Post 3.9800</td>
<td>.71400</td>
<td>H</td>
<td>1.0800</td>
</tr>
</tbody>
</table>

n= number of samples, S.D = Standard Deviation, Ass. = assessment L= Low level of life style (1-2.5), M= moderate level of life style (2.6-3.5), G= high level of life style (3.6-5).

Table (4-5) Demonstrated the items of life style of diabetes mellitus patients related to Health responsibility and healthy Diet that shows all patients life style levels were low at pre and post-test for the control group while low life style at pretest and high at posttest for study group. Analysis of diabetes mellitus patients’ demographic characteristics revealed that the half (50%) of the study group and (32%) of the control group were (50-59) years old. This study congruent with (Al-Ebrahimy, 2003; Upadhyay,2008). Regarding gender, the study finding revealed that more than half (52%) in the study group were males while the control group, female patients were recorded slightly increased than male and they are accounted 29 (58%), and 21(42%) respectively. Viera et al 2006 mention that the male/female ratio, is now equivalent or minimally favors females and is due in great part to the healthier lifestyle followed by women. One explanation for this difference in sex distribution of the disease may be that females use more health services and pay more attention to their health. Regarding educational status, the study finding displayed that (58%) majority of study and (36%) of control were low educated levels (Primary School). This study was supported by Saffari et al,2015 who reported that the majority of patients low educated levels. Concerning to occupational status of the patients, a high percentage (44%) of study and (58%) of the control, were House wife. This study was supported by Saffari et al,2015 who reported that House wife present the majority of patients. Regarding Marital status, the
study finding most patients were married, and they are accounted 46(92%) and 37(74%) in study and control group. This finding was supported by Awodele,2015. Data analysis of present study have revealed that most participants reported a level of life style were Low at pre and posttest in all items of scale (all domains) for control group, while Low level of life style at pre and high level of life style at post the implementation for the study group. The implementation of instructional program has a positive effect on patients regarding (physical activity, risk reduction, stress management, enjoyment of life, health responsibility and healthy diet) tables (4-3, 4-4, 4-5). The data analysis of six domains of Health promoting lifestyle domains of DM patients shows that the control group had revealed that there are no significant differences between pre and posttests of Health promoting lifestyle domains (physical activity, risk reduction, stress management, enjoyment of life, and health responsibility domains) except (healthy diet domain) (p-value = .019) table (6). Sone et al 2010; Schellenberg 2013 both these studies found a lack of involvement by patients in activities, and total physical activity after intervention was significantly higher in the study group than in the control group. (9) There is a statistically significant difference in Risk Reduction for participants in the instructional program this study was supported by (Perreault et al, 2012). (10) Krishna, (2018); Zange et al 2009 found that psychological distress is an important concern of many type 2 diabetes patients and coping with that distress is their main priority to improve stress management levels (11,12). This finding indicates the positive influence of the instructional program in improvement patient’s health responsibility. this study is supported by Mary (2008): Chang, et al (2015). (1) the statistically significant difference in healthy diet Responsibility for patients (pre – post) periods through implementation of instructional program shows the positive influence of the instructional program in improvement patients healthy diet responsibility. This study is supported by Evert et al, (2014). (11) the difference in Physical Activity for participants in the study group between the pretest and posttest time (p-value = .001). supported by Kirk 2004; Balducci 2017; Johansen2017 where intervention included 5 to 6 weekly aerobic training sessions (duration 30-60 minutes). 12-15

Conclusion

The instructional program was effective in promoting patient’s lifestyle related to T2DM (for all domains).

Source of Funding: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the University of Baghdad, College of Nursing, Iraq and all experiments were carried out in accordance with approved guidelines.

REFERENCES


Outcomes of Laparoscopic Appendicectomy in Al-Diwanyiah Teaching Hospital

Zaman Alrekabi1, Muayad Alkafaji1, Shakir Abid Jassim1

1General Surgery, Al-diwaniyah Teaching Hospital, Department of Surgery, AL-Diwania, Iraq

ABSTRACT

Aim of the study: To evaluate the clinical results of laparoscopic appendectomy for the treatment of chronic or recurrent appendicitis and interval appendicectomy. A prospective analysis was conducted at Al-Diwanyiah Teaching Hospital on 100 cases of laparoscopic appendicectomy over a period between January 2013 to January 2016. The diagnosis of appendicitis was established with history, physical examination, laboratory tests and ultrasound examination. The patients were analyzed for age, sex, conversion rate, operation time, postoperative complications, length of hospital stay, time to return to work and cost effectiveness. The postoperative complications including wound infection and ileus were generally low in our study with short hospital stay and early return to work and normal activity. Complication rate is higher after interval laparoscopic appendicectomy than laparoscopic appendicectomy for chronic appendicitis as well as operative time, conversion rate and hospital stay. Laparoscopic appendicectomy is a safe and effective procedure in the management of chronic or recurrent appendicitis and as interval appendicectomy after non-operative management of appendicular mass. There is an indication that laparoscopy is becoming an excellent method for management of recurrent or chronic appendicitis.

Keywords: Recurrent appendicitis, chronic appendicitis, interval appendicectomy, laparoscopic appendicectomy

Introduction

Laparoscopic appendectomy has become a common procedure worldwide in recent years. Numerous studies tried to define the role of laparoscopic appendectomy in the treatment of chronic appendicitis. Interval appendectomy is defined as performing an appendectomy following initial successful non-operative management of appendicular mass. Most patients underwent interval appendectomy 2 to 4 months after their acute presentation. The major argument against interval appendectomy is that many patients treated conservatively never develop manifestations of appendicitis, and those who do generally can be treated without additional morbidity. The major argument for interval appendectomy is to prevent future attacks of appendicitis and the need to establish a definite diagnosis and to rule out an underlying malignancy. The precise etiology is unknown. Recurrent appendicitis is thought to occur from transient obstruction of the appendix or secondary to excessive mucus production, while chronic appendicitis is secondary to partial but persistent obstruction of the appendiceal lumen. In both cases, luminal secretions accumulate until they are subsequently released.

Methodology

A prospective clinical analysis on 100 cases of laparoscopic appendicectomy over a period between January 2013 to January 2016 was conducted at Al-Diwanyiah Teaching Hospital. The diagnosis of appendicitis was established with history, physical examination, laboratory tests and ultrasound examination. Operations were performed by many surgeons who are licensed to practice laparoscopic surgery. The inclusion criteria for our study on laparoscopic appendicectomy were:

- chronic recurrent symptoms that could be attributed to appendicitis.
- interval appendicitis after 2-4 months of non-operative management of appendicular mass.
- age 15 years or more.

All patients in whom we performed a laparoscopic appendicectomy or an appendectomy after conversion to an open procedure were included in our analysis (100 pts). The patients were categorized for age, sex, conversion rate, operation time, postoperative complications, length of hospital stay, time to return to work and cost effectiveness.
Surgical team and surgical technique: The surgical operations were performed by a surgical team consisting of an experienced surgeon, a surgical trainee and a scrub nurse. Laparoscopic appendicectomy was performed under general anesthesia and all patients received prophylactic antibiotics (ceftriaxone 1 gram IV) at time of induction of anesthesia followed by 2 subsequent doses at 8 and 16 hours post op. Laparoscopic appendicectomy was performed with 3 ports; a 10-mm umbilical, a 10-mm suprapubic, and a 5-mm port in the left iliac fossa. Intraabdominal pressure of approximately 12 mm-Hg was provided by CO$_2$ insufflation. The mesoappendix was divided using harmonic ace. The base of the appendix was ligated twice with 2/0 vicryl endo-loop. The appendix was cut out with scissors. The appendix was removed from the abdominal cavity with a plastic bag or a piece of glove through the 10-mm port site. Peritoneal suction-irrigation with normal saline solution was performed in some patients.

Results and Discussion

A total of 100 patients examined. There were 81 (81 %) appendicectomies for chronic or recurrent appendicitis (Group I) and 19 (19 %) interval appendicectomies Group (II). 58 male and 42 female patients included in the study. M:F ratio was 1.38 : 1 (table 1) Mean age for all 100 cases was 20.1 years, range from 15 to 30 (table 2)

The mean operative time was 44 minutes while it was 41 min for group I and 56 min for group II. The operation times were shown in (table 3). Post op. complications occurred in 9 cases: 3 wound infections and 6 cases developed paralytic ileus. Postoperative complications were shown in (table 4). Conversion rate in our study was 5% as shown in (table 5). 86 patients (86 %) were discharged from the hospital in the first postoperative day, 8 patients (8 %) in the second, and 6 patients (6 %) in the third day. Mean hospital stay was 29 hours while in group I it was 27 h and in group II was 36 h. (table 6) Patients returned to work or full activity within 5-7 day (mean 5.77 days).

Table 1: Sex distribution of patients

<table>
<thead>
<tr>
<th>Gender</th>
<th>Group I</th>
<th>Group II</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>44</td>
<td>14</td>
<td>58 (58%)</td>
</tr>
<tr>
<td>Female</td>
<td>37</td>
<td>5</td>
<td>42 (42%)</td>
</tr>
<tr>
<td>Total</td>
<td>81</td>
<td>19</td>
<td>100(100%)</td>
</tr>
</tbody>
</table>

Table 2: Demographic characteristics of patients

<table>
<thead>
<tr>
<th>Age</th>
<th>Group I</th>
<th>Group II</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>15–20 years</td>
<td>33</td>
<td>6</td>
<td>39</td>
</tr>
<tr>
<td>21–25 years</td>
<td>24</td>
<td>9</td>
<td>33</td>
</tr>
<tr>
<td>26–30 years</td>
<td>24</td>
<td>4</td>
<td>28</td>
</tr>
<tr>
<td>Mean age</td>
<td>19.1 years</td>
<td>24.4 years</td>
<td>20.1 years</td>
</tr>
</tbody>
</table>

Table 3: Operative times

<table>
<thead>
<tr>
<th>Operative times</th>
<th>Group I (% from 81 cases)</th>
<th>Group II (% from 19 cases)</th>
<th>Total no. (%)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;30 min</td>
<td>44 (54%)</td>
<td>6 (42%)</td>
<td>50 (50%)</td>
<td></td>
</tr>
<tr>
<td>30-60 min</td>
<td>25 (31%)</td>
<td>8 (31.5%)</td>
<td>33 (33 %)</td>
<td></td>
</tr>
<tr>
<td>60-90 min</td>
<td>12 (15%)</td>
<td>5 (26.5%)</td>
<td>17 (17 %)</td>
<td></td>
</tr>
<tr>
<td>Mean time</td>
<td>41 min</td>
<td>56 min</td>
<td>44 min</td>
<td>0.025</td>
</tr>
</tbody>
</table>

Table 4: Post operative complications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Total no.</th>
<th>Group I (% from 81 cases)</th>
<th>Group II (% from 19 cases)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wound infection</td>
<td>3 (3%)</td>
<td>1(1.23 %)</td>
<td>2(10.5 %)</td>
<td>0.1</td>
</tr>
<tr>
<td>Ileus</td>
<td>6 (6%)</td>
<td>3(3.7 %)</td>
<td>3(15.7 %)</td>
<td>0.05</td>
</tr>
</tbody>
</table>

Table 5: Conversion rate

<table>
<thead>
<tr>
<th></th>
<th>Group I</th>
<th>Group II</th>
<th>Total</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>All cases</td>
<td>81</td>
<td>19</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Converted case</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>0.05</td>
</tr>
<tr>
<td>%</td>
<td>2.5 %</td>
<td>15.7 %</td>
<td>5 %</td>
<td></td>
</tr>
</tbody>
</table>
The first laparoscopic appendectomy was performed by Semm in 1983. Laparoscopic appendicectomy is being done at a time when laparoscopic cholecystectomy has shown definite benefits over open technique. A number of meta-analyses have been performed evaluating the cumulative outcomes of multiple prospective studies and randomized controlled trials around laparoscopic appendicectomy. Laparoscopic appendectomy is associated with fewer incisional surgical site infections compared to open appendectomy. There is less pain, shorter length of stay, and quicker return to normal activity and better cosmetic results. Laparoscopic appendectomy is associated with increased operative duration and increased operating rooms costs; however, overall costs are likely lower when compared to open appendectomy. Patients tend to have improved satisfaction scores with laparoscopic appendectomy compared to open appendicectomy.

Laparoscopic technique also provides a clear view of the whole abdominal cavity and pelvic organs in female patients for example. A study reported a fewer intra-abdominal adhesions after laparoscopic appendicectomy compared to open appendicectomy by reducing tissue trauma which in turn reduces circulating inflammatory mediators. Relative risk factors of laparoscopic surgery includes:

- Bleeding
- Visceral injury
- Incomplete appendicectomy

These are significantly reduced with surgeon’s experience.

There are relative contraindications to laparoscopic appendicectomy given by surgeons which include previous operations on the lower abdomen and situations where a pneumoperitoneum may have deleterious hemodynamic effects.

**Wound infection:** The average wound infection rate for laparoscopic appendectomy is reported to be 2.8% in a meta-analysis and 2.5% in a big prospective multi-center study. While infection rate is reduced by a half in the most recent meta-analysis based on the study of more than 6000 cases of laparoscopic appendicectomy.

Wound infection rate in our study was measured and was 3 cases (3%) one case from group I and the other 2 from group II. Although wound infection was higher after interval appendicectomy it was statistically not significant due to small number of cases of wound infection. All three cases of wound infection treated conservatively as out patient. **Post op. paralytic ileus** occurred in 6 cases (6%) and treated conservatively as in-patient.

Paralytic ileus occurred in 3 cases in group I (3.7%) and 3 cases in group II (10.5%)

The percentage of post op. complication is much higher in group II may be due to the small sample.

**Conversion Rate:** Conversion rate ranges in meta-analyses between 0% and 23%. but there are studies which report conversion rates as high as 39%. In everyday practice conversion rate typically seems to range between 10 and 20%. In our study the conversion rate was 5% and the incidence was higher in group II than in group I. (15.7% vs. 2.5%).

Causes of conversion were mostly due to excessive adhesions, phlegmonous mass or difficulty to visualize or find the appendix. This is mainly encountered in cases of interval laparoscopic appendicectomy.

**Operative times:** In considering operating time the exact identification of the timing of the start of the procedure and its conclusion vary. In general the time should be calculated from the insertion of the first trocar to the end of skin suturing, which is the time calculated in our study. Generally all laparoscopic procedures are more time consuming for the following reasons:

1. Inherent nature of slow maneuver of laparoscopic techniques.
2. Time taken by careful slow insufflation.
3. Routine diagnostic laparoscopy before starting procedure.

A meta-analysis of randomized controlled trial has been reported showing the mean operating time was 52 minutes.
In our study the mean operating time was 44 minutes with prolongation of mean time in interval appendicectomy cases 56 minutes vs. 41 minutes in chronic or recurrent appendicitis group.

**Hospital stay:** In a retrospective study on 176 patients, the mean hospital stay was 37.2 h. All the patients in our study were discharged from hospital between day 1 and day 3 post op. but the majority discharged on the first post op. day (86%). Patients who delayed were those who developed complications mostly ileus or those who live in rural areas. The mean hospital stay after laparoscopic appendicectomy in our study was 29 hours.

The mean hospital stay was longer in group II due to more percentage of ileus than group I (36 h vs. 27 h).

**Time to return to work or normal activity:** In a randomized prospective study the average time to return to work was 8 days. In our study the patients returned to normal activity and work in 5-8 days. The average time was 5.77 days. Those who delayed were mostly the patients with post operative complications.

**Cost effectiveness of laparoscopic appendicectomy:** Debate still exists about the cost comparison between laparoscopic and open surgery. Most surgeons believe that laparoscopic appendicectomy is cost effective. It may be more expensive for the hospital due to the cost of laparoscopic equipment, but it offers diagnostic accuracy, lower complications and among employed patients offer cost savings to society as a result of faster return to work.

**Conclusion**

Laparoscopic appendicectomy is a safe and effective procedure in the management of chronic or recurrent appendicitis and as interval appendicectomy after non-operative management of appendicular mass. It resulted in minimal morbidity in experienced hands and it presents advantages such as short hospitalization and early return to work and cost effectiveness. For this reason disadvantages such as longer duration of surgery, higher hospital costs as well as technical limitations must be overcome. There is an indication that laparoscopy is becoming an excellent choice for management of recurrent or chronic appendicitis.

**Source of Funding:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved and all experiments were carried out in accordance with approved guidelines.

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Thyroid Hormone Changes in Early Pregnancy Bleeding Versus Normal Healthy Pregnancy

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ABSTRACT

This study was done to measure the thyroid hormones levels in patient with unexplained early pregnancy bleeding at their first half of gestation and to compare it with those of normal healthy pregnancy from the period of first of October 2017-first of July 2018. This is a case control study conducted in Basra maternity hospital which includes two groups of patients: A: Case group: This include 40 pregnant patients with history of un explained early pregnancy bleeding taken as a case group, with gestational age of up to twenty weeks, with parity range of 05, after we took their consent to be included in the study. B: Control group: Including 58 pregnant healthy women taken as control group they had approximately the same age and parity range those patient was selected from out patient who attend for other cause other than early pregnancy bleeding or those who brought our patient as an attendant. There was a significant decrement in the level of T4, with significant changes in the level of TSH among cases with early pregnancy bleeding compare with normal healthy pregnancy while T3 show no significant changes.

Keywords: Thyroid Hormone, Pregnancy, Bleeding Versus Normal Healthy.

Introduction

Thyroid disease is common in general population, and especially in young women. The incidence of thyrotoxicosis, hypothyroidism, and thyroiditis is probably approaches 1 % for each condition (1). The impact of pregnancy on maternal thyroid physiology is substantial. There are changes in the structure and function of gland that confusing in the diagnosis of thyroid abnormalities, consequently evaluation of thyroid disorders and proper interpretation of thyroid function tests during pregnancy requires an understanding of these changes(2). Thyroid gland is the biggest gland in the neck, the normal adult thyroid gland weight about 15-25g and consists of two lobes connected by an isthmus each thyroid lobe is divided in to lobules consisting 20-40 follicles(3). Thyroid gland volume determined, ultrasonographically, increases during pregnancy, although its echo structure and echogenicity remain unchanged(4,6). Anatomically, there is moderate thyroid gland enlargement as result of glandular hyperplasia and increased vascularity Conversely, pregnancy, usually dose not cause impressive thyromegally and thus any goiter or nodule should be approached as pathological(1). The thyroid gland is responsible for synthesizing and secreting thyroid hormones, L-thyroxine (T4) and L-triiodothyronine (T3). The concentration of circulating free thyroid hormone is closely regulated by hypothalamic-pituitary-thyroid axis. This free thyroid hormone enters the cell, where T4 is converted to T3. T3 then control the metabolism(5). The synthesis of thyroid hormone regulated by thyroid releasing hormone (TRH) which is secreted by hypothalamus and stimulates the production of thyroid stimulating hormone (TSH) from the anterior lobe of pituitary which then stimulates the production and release of T4 and T3 from the thyroid gland (7). The synthesis of these hormones by thyroid gland requires iodine. After releasing of T3 and T4 they exert negative feedback mechanism on TSH production. T4 is the main hormone produced by the thyroid gland while T3 is mainly produced by peripheral conversion of T4, both T3 and T4 are largely protein bound in the plasma, mainly to thyroxin-binding globulin (TBG), only the un bound or free portion (FT3,FT4) is active(3). Iodine is a major component of thyroid hormones with dietary requirements increasing in pregnancy due to the enhanced transplacental uptake of iodide and increased maternal renal clearance (8). Hence pregnancy is a state of relative iodine – deficiency(9).
Spectrum of Thyroid Disease in Pregnancy: Several of thyroid disorders which tend to occur during pregnancy are autoimmune in nature, by this we mean that the body develops antibodies directed against thyroid cells, which then affect the way the thyroid gland functions. Antibodies which damage the thyroid cells may result in lymphocytic thyroiditis (inflammation of the thyroid), also known as Hashemite’s disease. These damaging antibodies can reduce the function of the thyroid and lead to hypothyroidism. On the other hand, our body can make antibodies against thyroid tissue which can stimulate thyroid cell function, in this case, hyperthyroidism due to over-function of thyroid (graves’ disease) may be the result. Postpartum thyroiditis is recently discovered problem that span the spectrum of both hyper-and hypothyroidism this condition, which tends to occur immediately after pregnancy, may produce antibodies which damage thyroid tissue, thereby releasing thyroid hormone passively into the blood stream and producing either temporary or permanent thyroid failure. Since this condition is common, occurring in 8-10% of all women after pregnancy, so postpartum thyroid testing is advisable for all women. Thyroid nodules, goiter, and other thyroid problems are also sometimes first detected in pregnancy but are less common.

Hyperthyroidism and pregnancy: Hyperthyroidism occurs in two of every 1000 pregnant women. This common disease of pregnancy may go undiagnosed because the clinical presentation of thyrotoxicosis is difficult to distinguish the apparent hyper metabolic state of pregnancy particularly in the second and third trimesters as perhaps expected mild thyrotoxicosis is difficult to diagnosis during pregnancy but some helpful sign include:

1. Tachycardia that exceeds the increase associated with normal pregnancy.
2. An abnormally elevated sleeping pulse rate.
3. Thyromegaly.
4. Exophthalmos.
5. Failure in a non-obese woman to gain weight despite normal or increased food intake.

Confirmation has been made easier by assays to determine elevated serum free thyroxine levels along with recent development of assay that reliably measure thyrotropin level less than 0.05 μU/L. Rarely hyperthyroidism may be associated with normal serum thyroxin values but, so called T3 - toxicosis. Untreated or inadequately treated hyperthyroid women deliver Babies having higher incidence of minor fetal anomalies.

Hyperthyroidism can affect the pregnancy:

1. Preterm labour.
2. Increase Peri-natal mortality.
3. Maternal Heart failure where significantly increased in women who remain thyrotoxic despite treatment and in those, never treated.
4. Preeclampsia.

Etiology of thyrotoxicosis in pregnancy:

2. Toxic multi-nodular goiter.
3. Toxic adenoma.
4. Hyper emesis gravid arum.
5. Gestational trophoblastic neoplasia.
6. Pituitary hyper secretion of TSH.
7. Metastatic follicular cell carcinoma.
8. Exogenous T4 or T3.
9. De Quatrain’s thyroiditis. 10-
10. Silent lymphocytic thyroiditis.
11. Struma ovarii.

Graves’s disease and pregnancy: The overwhelming cause of thyrotoxicosis in pregnancy is graves’ disease an organ specific autoimmune process usually associated with thyroid stimulating antibodies. These auto antibodies mimic thyrotrophic in it’s ability to stimulate thyroid function, consequently, they appear to be responsible for both thyroid hyper function and growth in graves disease, it has been reported that thyroid - stimulating antibody activity in graves disease usually declines during pregnancy.

Hypothyroidism and pregnancy: Hypothyroidism occur in pregnant women with frequency of about 1 in 1600-2000 deliveries, women with hypothyroidism had a higher incidence of:

1. Preeclampsia.
2. Placental abruption.
3. Low birth weight.
4. Still born infants.
5. Gestational hypertension.
6. Postpartum hemorrhage.
7. Anemia.
8. Cardiac dysfunction.

All pregnant women should be carefully asked about any personal or family history of thyroid disease or treatment directed at thyroid gland particularly of external radiation to the head and neck (26). The best biochemical tests for diagnosis of hypothyroidism are measurement of serum sensitive TSH and free T4. In primary hypothyroidism, the TSH level is elevated and free T4 level is low. If TSH level is elevated and free T4 level is normal, the patient may have sub clinical hypothyroidism. In secondary or pituitary hypothyroidism the TSH level is normal or low in setting of a low free T4, 10 % of patients with hypothyroidism have pernicious anemia, but neither vitamin B12 nor foliate deficiencies explain the macrocytic anemia that occurs in approximately one third of patients with hypothyroidism and anemia. Hypothyroidism usually is associated with mild normochromic, no myocytic anemia. Patients with insulin-dependent diabetes mellitus should be watched closely for development of hypothyroidism during pregnancy.

**Differential diagnosis of hypothyroidism (22)**

1. Hashimoto’s thyroiditis.
2. Post therapy hypothyroidism.
3. Suppurative and sub acute thyroiditis.
4. Drugs (thionamide therapy, iodides, and lithium, which inhibit the synthesis of thyroid hormones, secretion of thyroid hormone or both).
   Carbamazepine, phenytoin, and rifampicin can increase thyroxin clearance.
   Ferrous sulfate and sucralfate can interfere with intestinal absorption of thyroxin.
5. Lymphocytic hypophysis.
6. Iodine deficiency.

**Iodine deficiency:** Iodine deficiency is a common cause of hypothyroidism in many parts of the world, although it is exceeding rare in the united status. The hypothalamic - pituitary axis responds to iodine deficiency with hyper secretion of TSH. That is probably responsible for the formation of goiters and nodules (22). The goiter frequently grows during pregnancy, and multiple pregnancies result in much larger goiters than those occurring in nulliparous women. Many women may be clinically euthyroid but show biochemical hypothyroidism upon careful testing. The treatment is iodine supplementation, most practically accomplished when potassium iodide is added to salt.

**Materials and Method**

This is a case control study done in Basra maternity and children hospital aimed to study thyroid hormone change among pregnant women with history of early pregnancy bleeding during the period of first October 2007-first of July 2008, the study includes:

**A. Case group:** This includes 40 pregnant patients with history of un explained early pregnancy bleeding taken as a case group, with gestational age of up to twenty weeks, with parity range of 0->5, after we took their consent to be included in the study. Detail history was taken from them including their age and parity with detail previous obstetric history and history of past medical illnesses. Those patients with any of following events were excluded from the study:

1. History of trauma.
2. History of fever.
3. History of maternal infection during gestation.
4. History of drug intake like embertyotic and other for chronic diseases.
5. History of irradiation during pregnancy.
6. History of repeated abortion.
7. Medical illness like hypertension, sickle cell problem ect.

**B. Control group:** Including 58 pregnant healthy women taken as control group they had approximately the same age and parity range those patient was selected from out patient who attend for other cause other than early pregnancy...
The pregnancy of the both groups was confirmed by the following criteria:

1. History of missed period.
2. History of morning sickness.
3. Clinical examination confirms pregnancy with soft and bulky uterus.
4. Laboratory confirmation by pregnancy test and ultrasonography.

Parity of the patient were classified as 0-1 nullipara or primiparous patient, 2-5 multiparous patient and >5 as grand multiparous patients. their age also classified as those <20year, 20-39year. So clinical and laboratory investigations confirming the presence of pregnancy were carried out for every candidate in each group.

Specimen collection and handling: 5ml of blood samples were collected by venipuncture from each candidate included in the study case and control group. The sample then centrifuged for 5 minutes then the serum was collected for immune enzymatic determination of TSH, T3, T4 using ELFA technique (enzyme linked florescent assay). This procedure carried out by VIDAS which is an automated quantities test and used for quantities measurement for TSH, T3, T4.

Principle of the procedure: By using of human serum of lithium heparinate (in amount of 0.1ml for TSH, 0.1 ml for T3 and 0.2ml for T4) the assay principle combines an enzyme immune assay competition method with final fluorescent detection (ELIFA).

Results and Discussion

Table one shows the difference in thyroid hormone level according to parity among the two study group which evidently show no significant differences in TSH, T3, T4 values in both groups, except among grand multiparous women (5 parity) in which T3 value is about 1.76 µiu/l in case group compared to 1.2 µiu/l among control group with a significant P value of 0.44. Table two shows the thyroid hormone differences between cases and control according to the age as we see there was significant differences in T3 and T4 values in those with age (20-39) years, T3 values was 1.83 µ mol/l (p-value in cases which is higher than in control group 1.43 µ mol/l(p-value 0.49 significant) and not significant in those with age more than 40 years. T4 value 96.64 µ mol/l in cases which is lower than control group 105.8µmol/l ( p-value 0.498 significant) and not significant in those with age 40 years or more. Table three TSH value in those with age 40year or more than was 2.165µiu/ml in cases which was also higher than control group 1.54uiu/ml (p-value 0.499 significant) but not significant in those with age (20-39) years. Show thyroid hormone differences between cases mean level and control mean level where TSH value was 1.717µiu/ml in cases which is significantly higher than control group 1.311 (p-value 0.49 significant) T3 value was 1.735 umol/lin cases and 1.564umol/l in control group in which the difference is of no significant. Although thyroid hormone had definite impact on fertility and on the outcome of pregnancy and because of the vitality of thyroid hormone and the pregnant lady, that why we see definite diffuse enlargement of thyroid gland during normal healthy pregnancy this explain the increase demand of the pregnant women to the thyroid hormone, unfortunately no studies found similar to our study and In spite of many studies available regarding the physiological changes In the thyroid during pregnancy, it is uncertain if functional disorder of thyroid play a role in the etiology of spontaneous abortions. Maruo et al. proposed that maternal thyroid hormone level are one of endocrine Factors responsible for the threatened abortion 15. Ross et al. Indicated that Functional disorders of thyroid are not effective in the outcomes of miscarriage, this is in contrast to our study where we found that there is significant decrement in the level of T4 among those with early pregnancy bleeding. Lower TT3, TT4, FT3, FT4 levels and higher TSH values was obtained in the spontaneous abortions group are an indication of the presence of a hypothyroidism situation in this group which goes with our study which evidently showed an increment in the level of TSH among case group as was shown in Table III with a significant decrement in the level of T4 among the same group thus, there are several publications indicating that the ratio of spontaneous abortions rises two -fold in women with hypothyroid as compared to euthyroid women this in turn indicate the importance of thyroxin hormone in the continuation of normal healthy pregnancy.
Table 1: Thyroid hormone differences according to parity in both groups

<table>
<thead>
<tr>
<th>Parity</th>
<th>Thyroid hormones</th>
<th>Cases mean level</th>
<th>Control mean level</th>
<th>P-Value</th>
<th>Test of significant</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1 parity</td>
<td>TSH</td>
<td>1.56</td>
<td>0.45</td>
<td>0.136</td>
<td>Not significant</td>
</tr>
<tr>
<td></td>
<td>T4</td>
<td>93.5</td>
<td>101.8</td>
<td>0.37</td>
<td>Not significant</td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>1.6</td>
<td>1.56</td>
<td>0.19</td>
<td>Not significant</td>
</tr>
<tr>
<td>Sample size</td>
<td></td>
<td>9</td>
<td>14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-5 parity</td>
<td>TSH</td>
<td>1.78</td>
<td>1.3</td>
<td>0.49</td>
<td>Not significant</td>
</tr>
<tr>
<td></td>
<td>T4</td>
<td>95.2</td>
<td>120.5</td>
<td>&lt; 0.49</td>
<td>Not significant</td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>1.7</td>
<td>1.47</td>
<td>0.37</td>
<td>Not significant</td>
</tr>
<tr>
<td>Sample size</td>
<td></td>
<td>19</td>
<td>28</td>
<td></td>
<td></td>
</tr>
<tr>
<td>More than 5 Parity</td>
<td>TSH</td>
<td>1.34</td>
<td>2.1</td>
<td>0.36</td>
<td>Not significant</td>
</tr>
<tr>
<td></td>
<td>T4</td>
<td>93.8</td>
<td>103.5</td>
<td>0.37</td>
<td>Not significant</td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>1.76</td>
<td>1.2</td>
<td>0.44</td>
<td>Significant</td>
</tr>
<tr>
<td>Sample size</td>
<td></td>
<td>13</td>
<td>14</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Thyroid hormone changes in the two study groups according to age

<table>
<thead>
<tr>
<th>Age</th>
<th>Thyroid hormones</th>
<th>Cases mean level</th>
<th>Control mean level</th>
<th>P-Value</th>
<th>Test of significant</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 20 years</td>
<td>TSH</td>
<td>1.031</td>
<td>1.137</td>
<td>0.16</td>
<td>Not significant</td>
</tr>
<tr>
<td></td>
<td>T4</td>
<td>95.34</td>
<td>102.77</td>
<td>0.338</td>
<td>Not significant</td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>1.73</td>
<td>1.5</td>
<td>0.386</td>
<td>Not significant</td>
</tr>
<tr>
<td>Sample size</td>
<td></td>
<td>9</td>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-39 years</td>
<td>TSH</td>
<td>1.83</td>
<td>1.46</td>
<td>0.32</td>
<td>Not significant</td>
</tr>
<tr>
<td></td>
<td>T4</td>
<td>96.64</td>
<td>105.8</td>
<td>0.498</td>
<td>Significant</td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>1.83</td>
<td>1.42</td>
<td>0.49</td>
<td>Significant</td>
</tr>
<tr>
<td>Sample size</td>
<td></td>
<td>22</td>
<td>32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥ 40 years</td>
<td>TSH</td>
<td>2.165</td>
<td>1.54</td>
<td>0.499</td>
<td>Significant</td>
</tr>
<tr>
<td></td>
<td>T4</td>
<td>93.73</td>
<td>97.1</td>
<td>0.215</td>
<td>Significant</td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>1.5</td>
<td>1.42</td>
<td>0.114</td>
<td>Significant</td>
</tr>
<tr>
<td>Sample size</td>
<td></td>
<td>9</td>
<td>11</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3: Thyroid hormones differences between cases & control

<table>
<thead>
<tr>
<th>Thyroid hormones</th>
<th>Cases mean level</th>
<th>Control mean level</th>
<th>P-Value</th>
<th>Test of significant</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSH</td>
<td>1.717</td>
<td>1.311</td>
<td>0.46</td>
<td>Significant</td>
</tr>
<tr>
<td>T4</td>
<td>94.94</td>
<td>102.41</td>
<td>0.49</td>
<td>Significant</td>
</tr>
<tr>
<td>T3</td>
<td>1.735</td>
<td>1.564</td>
<td>0.29</td>
<td>Not significant</td>
</tr>
<tr>
<td>Sample size</td>
<td>40</td>
<td>58</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Conclusion

There was a significant decrement in the level of T4, with significant changes in the level of TSH among cases with early pregnancy bleeding compared with normal healthy pregnancy while T3 show no significant changes; this is possibly because T4 is the main circulating hormone in the blood.

Source of Funding: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved and all experiments were carried out in accordance with approved guidelines.
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Impact of Danger Signs During Pregnancy Upon Pregnancy Outcomes among Pregnant Women in Al-Diwaniya City

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ABSTRACT

Objective(s): To determine the impact of danger signs during pregnancy upon pregnancy outcomes and their relationships with pregnant women demographic characteristics at hospitals and primary health care centers in Al-Diwaniya City. A descriptive design, using evaluation approach, is carried throughout the present study for the period of November 3rd 2018 through May 27th 2019. A purposive sample of (200) pregnant women is selected for the study. A self-report questionnaire is constructed for the purpose of the study which is comprised of (7) Parts that include demographic characteristics, medical history, family history, obstetric history, danger signs during pregnancy and pregnancy outcomes. Data are collected the use of the questionnaire and the structured interview. Data are analyzed through application of descriptive statistical data analysis approach of frequency, percentage, total score and inferential statistical data analysis approach of Multiple Linear Regression. The study findings indicate that the study has confirmed that there is significant impact of danger signs during pregnancy upon pregnancy outcomes of pregnant women in Al-Diwaniya City. The study concludes that the study approves those pregnant women who are housewives with low education and unhealthy medical, family and obstetric histories may experience more danger signs during pregnancy than others.

Keywords: Impact, Danger signs during Pregnancy, Pregnancy Outcomes

Introduction

Pregnancy related complications are among the greatest killers of women of reproductive age in developing countries. Many pregnant women may face the risk of sudden, unpredictable complications that could end in death or injury to herself or to her baby. Studies suggest not all women regard pregnancy complications as abnormal, owing to a lack of knowledge about ‘danger signs’. Danger signs in pregnancy include vaginal bleeding, persistent severe headache or blurred vision (visual disturbances), severe nausea and vomiting, severe abdominal pain, swollen hands and face during the third trimester, reduced fetal movement (baby’s activity level significantly declines), weakness and difficulty in breathing, contractions early in the third trimester, water breaks (rupture of the membrane) and flu symptoms. World Health Organization (WHO) estimates that about (300) million women in the developing countries suffer from short and long term illnesses due to complications related to pregnancy and childbirth. About (529,000) mothers die each year from maternal causes, out of which (99%) of deaths being from the developing world. As literatures indicate about (75%) of maternal deaths are due to direct obstetric complications, such as hemorrhage, sepsis, hypertensive disorders of pregnancy, obstructed and prolonged labor, and unsafe abortion. Maternal morbidity and mortality could be prevented significantly if women and their families recognize obstetric danger signs and promptly seek health care. The (4) commonest danger signs during pregnancy include severe vaginal bleeding, swollen hands and face and blurred vision. Key danger signs during labor and childbirth include severe vaginal bleeding, prolonged labor, convulsions, and retained placenta. Danger signs during the postpartum period include severe bleeding following childbirth, loss of consciousness after childbirth, and fever. Raising awareness of pregnant women on the danger signs would improve early detection of problems and reduces the delay in deciding to seek obstetric care. Based on the early stated evidence, the present study attempts to investigate the impact of danger signs during pregnancy upon the pregnancy outcomes among pregnant women in Al-Diwaniya City.
Methodology

A descriptive design, using an evaluation approach, is carried out throughout the present study to determine the impact of danger signs upon pregnancy outcomes of pregnant women and their relationships with pregnant women demographic characteristics in Al-Diwanyia City for the period of November 3rd 2018 through May 27th 2019. A purposive sample of (200) pregnant women is selected for the study. A self-report questionnaire is constructed for the purpose of the study which is comprised of (7) Parts that include demographic characteristics of age, education and occupation, medical history (21) item, family history (21) item and obstetric history (7) items, as well as danger signs during pregnancy (16) item and pregnancy outcomes (11) item. Pilot study is conducted on (10) pregnant women with danger signs for the purpose of determining content validity through panel of experts and internal consistency reliability of the study instrument that employment of split-half technique and computation of Cronbach alpha correlation coefficient of (r=.87) from January 17th 2019 to March 2nd 2019. Data are collected using the questionnaire and the structured interview technique for the period of March 6th 2019 through May 2nd 2019. Data are analyzed through application of descriptive statistical data analysis approach of frequency, percentage, total score and inferential statistical data analysis approach of Multiple Linear Regression.

Results and Discussion

Table 1: Impact of Women’s Danger Signs upon Pregnancy Outcomes

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>T</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td>13.238</td>
<td>0.366</td>
<td>36.217</td>
<td>0.000</td>
</tr>
<tr>
<td>Danger Signs</td>
<td>-0.055</td>
<td>0.019</td>
<td>-0.204</td>
<td>-2.935</td>
</tr>
</tbody>
</table>

Dependent Variable: Pregnancy Outcomes
B= Regression Coefficient, Std. Error= Standard Error, t= T-test, Sig.= Level of Significance

Result out of this indicates that danger signs during pregnancy have highly significant impact upon pregnancy outcomes.

Table 2: The Relationship between Women’s Danger signs and Their Demographic Characteristics

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>T</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td>17.505</td>
<td>1.107</td>
<td>15.814</td>
<td>.000</td>
</tr>
<tr>
<td>Age</td>
<td>-.032</td>
<td>.022</td>
<td>-.128</td>
<td>-1.485</td>
</tr>
<tr>
<td>Education</td>
<td>.196</td>
<td>.071</td>
<td>.251</td>
<td>2.745</td>
</tr>
<tr>
<td>Occupation</td>
<td>.475</td>
<td>.286</td>
<td>.153</td>
<td>1.663</td>
</tr>
<tr>
<td>Medical History</td>
<td>0.084</td>
<td>0.030</td>
<td>0.191</td>
<td>2.772</td>
</tr>
<tr>
<td>Family History</td>
<td>0.082</td>
<td>0.029</td>
<td>0.190</td>
<td>2.773</td>
</tr>
<tr>
<td>Obstetric History</td>
<td>0.107</td>
<td>0.048</td>
<td>0.187</td>
<td>2.208</td>
</tr>
</tbody>
</table>

Dependent Variable: Danger Signs
B= Regression Coefficient, Std. Error= Standard Error, t= T-test, Sig.= Level of Significance

Analysis of such relationship depicts significant relationships between danger signs and pregnant women’s medical, family and obstetric histories.
Table 3: The relationship between Women's Pregnancy Outcomes and Their Demographic Characteristics

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>T</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>0.007</td>
<td>0.006</td>
<td>1.117</td>
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<tr>
<td>education</td>
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<td>Family History Obstetric</td>
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<td>-1.550</td>
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<tr>
<td>History</td>
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<td>-1.299</td>
</tr>
</tbody>
</table>

Dependent Variable: Pregnancy Outcomes
B= Regression Coefficient, Std. Error= Standard Error, t= T-test, Sig.= Level of Significance

Results out of this table reveal that there is no significant relationship between women’s pregnancy outcomes and their demographic characteristics. Throughout the course of data analysis, the study findings depict that danger signs during pregnancy can create major impact upon pregnancy outcomes (Table 1). A health facility-based cross-sectional study has been conducted. Throughout the course of the study, data are collected through interviewer-administered questionnaires. Descriptive and inferential statistics are used to analyze the data. The study enrolled (384) women from two health centers in Kinondoni Municipality, Dar es Salaam, Tanzania. The study findings present supportive empirical evidence that danger signs can create critical impact upon pregnancy outcomes (4). A cluster randomized controlled trial is carried out and in which the study findings have approved that danger signs can initiate an influential impact upon maternal outcomes (3). Analysis of such relationship illustrates that pregnant women’s education, occupation, medical history, family history and obstetric history have made critical contribution to that of pregnancy danger signs (Table 2). Such findings can be interpreted in a manner that pregnant women who are housewives with low education and unhealthy medical, family and obstetric histories may experience more danger signs during pregnancy than others. A health facility-based cross-sectional study is conducted. Quantitative data are collected through interviewer-administered questionnaires. Descriptive and inferential statistics are used to analyze the data. The study enrolled (384) women from two health centers in Kinondoni Municipality, Dar es Salaam, Tanzania. Among the (384) participants, 67 (17.4%) had experienced danger signs during their pregnancy and five (1.3%) have no education, 175 (45.6%) have primary education, 172 (44.8%) have secondary education, and 32 (8.3%) have post-secondary education as their highest educational levels (4). Analysis for such relationship depicts that pregnant women’s age, education, occupation, medical history, family history and obstetric history do not make any influence to pregnancy outcomes (Table 3). Cohort study assessed whether maternal employment during pregnancy – overall and in selected occupational sectors – is associated with birth weight, small for gestational age (SGA), term low birth weight (LBW), length of gestation, and preterm delivery in a population-based birth cohort design. Data from >200 000 mother-child pairs enrolled in (13) European birth cohorts are collected and compared employed versus non-employed women. Among employees, we defined groups of occupations representing the main sectors of employment for women where potential reproductive hazards are considered to be present. The comparison group comprised all other employed women not included in the occupational sector being assessed. Meta-analyses of cohort-specific estimates and explored heterogeneity have been performed. The study found that employees had a lower risk of preterm delivery than non-employees [adjusted odds ratio (OR_adj) 0.86, 95% confidence interval (95% CI) 0.81–0.91]. Working in most of the occupational sectors studied was not associated with adverse birth outcomes. Being employed as a nurse was associated with lower risk SGA infants (OR_adj 0.91, 95% CI 0.84–0.99) whereas food industry workers had an increased risk of preterm delivery (OR_adj 1.50, 95% CI 1.12–2.02). There was little evidence for heterogeneity between cohorts. This study suggests that, overall, employment during pregnancy is associated with
a reduction in the risk of preterm birth and that work in certain occupations may affect pregnancy outcomes. This exploratory study provides an important platform on which to base further prospective studies focused on the potential consequences of maternal occupational exposures during pregnancy on child development (6).

Cohort study was conducted to investigate the association between maternal job strain during pregnancy and neurodevelopment in infancy. Job strain during pregnancy was measured using Korean version of Job Content Questionnaire (JCQ). Infant neurodevelopment was assessed using Korean Bayley Scale of Infant Development II (K-BSID-II) at 6 and 12 months of age. A total of 343 mother-child pairs that completed JCQ and K-BSID-II more than once were included. Mental Developmental Index (MDI) and Psychomotor Developmental Index (PDI) defined in the K-BSID-II were used as outcome variables. Compared to infants from mothers with low job strain, significant ($p<0.05$) decreases in PDI were found in infants from mothers with active and passive job at 6 months of age. After stratification by infant sex, boys in the high strain group had a lower MDI score than boys in the low job strain group at 12 months. On the other hand, girls in the high strain and active groups had lower MDI scores than girls in the low job strain group at 12 months. PDI at 12 months also showed different results by sex. Boys in the high strain and passive job groups had lower PDI scores than boys in the low job strain group. However, such difference was not observed in girls. The findings of this study suggest that prenatal job strain affects infant neurodevelopment in a gender-dependent manner (7).

A case-control study of (n=2543) nested within a cohort of (58316) births in Los Angeles County, California investigated preterm birth (PTB) in relation to maternal occupational exposure and whether effect measures were modified by Hispanic ethnicity and nativity in a population-based sample with high proportion of Hispanics. The study categorized prenatal occupations using the US Census Occupation Codes and Classification System and developed a job exposure matrix. Odds ratios for PTB were estimated using logistic regression. The study indicated that odds ratios for PTB were increased for all women in health care practitioner and technical occupations, but the 95% confidence intervals included the null value; effects were more pronounced among Hispanics. We estimated elevated odds ratios for foreign-born Hispanic women in building and grounds cleaning and maintenance occupations. Shift work and physically demanding work affected births among US-born but not foreign-born Hispanics. The study concluded that Hispanic women are at particular risk for PTB related to adverse prenatal occupational exposure. Nativity may moderate these effects on PTB. Maternal occupational exposures likely contribute to ethnic disparities in PTB (8).

Conclusion
The study confirms that danger signs during pregnancy have a major impact upon pregnancy outcomes. The study approves those pregnant women who are housewives with low education and unhealthy medical, family and obstetric histories may experience more danger signs during pregnancy than others. The study supports that pregnant women’s age, education, occupation, medical history, family history and obstetric history do not make any contribution to pregnancy outcomes.

Source of Funding: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the AL-Diwania Health Directorate and all experiments were carried out in accordance with approved guidelines.

REFERENCES


The Exercises by Limbs Efforts Unilateral Bilateral and its Impact on Indicators of Electrical Activity Muscular Capacity and Long Pass of Football to Reduce Bilateral Deficits for Young Players

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¹College of Physical Education and Sports Sciences, University Muthanna, Iraq; ²Asst. Prof., College of Physical Education and Sports Sciences, University Muthanna, Iraq; ³Directorate Generate of Muthanna Education, Iraq

ABSTRACT
Identifying the exercises by limbs efforts (unilateral - bilateral) and its impact on indicators of electrical activity, muscular capacity and long pass of football to reduce bilateral deficits for young players of Samawa Sports Club. Identifying the differences between the two groups of research in the indicators of electrical activity, muscle capacity and long pass of football to reduce the double deficit of the players of the players of Samawa Sports Club. In order to achieve these objectives, the researcher used the experimental method in the two groups approach, the research tools were the emerging football players belonging to the Samawa Sports Club, (16) players, as well as data collection methods. After a series of field procedures to ensure the validity of the tests, the researchers began the procedures of tribal testing and then apply exercises by the work of the terminal (unilateral - bilateral) the first experimental group operates the bilateral terminal work while the second experimental group operates the unilateral terminal work. After completion, the remote tests were carried out.

Keywords: terminal work (unilateral - bilateral), electrical activity, muscular capacity, long pass, double deficit

Introduction
There is a growing interest in the game of football in the developed countries, whether developed or developing, because of the role of this game in the status of everyone. This game has received a lot of research and this research has played an important role and the development of the level of players, and countries are making great efforts to provide material and moral facilities to upgrade these game for different categories and ages. The modern scientific devices, in particular EMG and its programs in measuring and analyzing the electrical activity of the muscle, were introduced to determine the work of the motor units of these working muscles. In order to upgrade the players level, it is necessary to focus on all aspects of physical, skill, planning and psychological depending on all the scientific devices and upgrade them because the game of football is complex and changing circumstances and often imposed on the player to be in all situations and situations and efficiency. The phenomenon of bilateral disability is a phenomenon especially for the upper and lower limbs, which we observe often at the weak end, because when the player plays the ball with the non-preferred man, he has difficulty in the strength, speed and accuracy of performance. The result of the game in general.

The theoretical importance of this study lies in the development of a knowledge framework for trainers on:

- The electrical activity of the active muscles of the preferred and non-preferred limbs for the purpose of reducing bilateral disability.
- The efficiency of the muscular system.

Methodology
The researcher used the experimental method in the style of the two groups with the tribal and remote test to suit the nature of the study and its objectives.
Tools, instruments and devices used in research

The Research Tools: The researchers used the following research tools to reach the results and achieve the objectives:

The Research community: The research community is represented by the beginner players from the Samawa Sports Club, with a total of (16) players.

Means of data collection: This research required many means of data collection:

Note: Through the follow-up and naked observation of football matches, as well as the use of new technologies (Internet), the researcher identified the problem of the study.

Testing and Measurement: The researchers used the appropriate tests to gather the data necessary to achieve the research objectives

Hardware and tools (number), assistance: The researchers used many devices and tools in the process of obtaining the required data, including: Football, handball, personal computer (lab tub), stationery (papers and pens), test results registration form

Identification of the tests concerned with the research variables: In order to determine the test for measuring the variables of research, a survey of the relevant scientific sources and references was conducted, resulting in the nomination of one test for measuring each variable. The researchers distributed a questionnaire to survey the opinions of (7) experts and specialists in this field to determine its validity.

The test Instructions:

- The player stands behind the starting line directly.
- Do not support on the left leg.
- Three consecutive hops and instability between any two hops

1) The specialists who were referred to the questionnaire:
1 - Aqil Muslim Abdul Hussein, Professor, physiology specialist, football, college of Physical Education and Sports Sciences, University of Muthanna
2 - Salam Jabbar Sahib, Assistant Professor, Test and Measurement, Football, Faculty of Physical Education and Sports Sciences, University of Qadisiyah
3 - Mohammed Matar Arak, Assistant Professor, Test and Measurement, Football, college of Physical Education and Sports Sciences, Al-Muthanna University

- Each laboratory has three attempts to calculate the best.
- Test Management:
- Recorder: to call on testers and record results.
- Monitor: Calculates distances and monitors performance.

Calculation of grading: Calculating the distance between the starting line and the last part of the ground-based foot is the same as the test for the left foot and the same procedure.

Electrical activity test (EMG): In order to measure the electrical activity of the muscles with the help of the auxiliary team, the Myotrace 400 device was used by Noraxon to record the electrical activity of the 4 Channel structural muscles with a practical application program (1,07,41) which is the latest portable laboratory technology. And recording the electrical activity of four muscle groups at the same time and via Bluetooth signals to the limits of 20 meters away from the computer and requires action to take several steps are:

Preparation: After determining the target muscle groups of the work are:
- Quadriceps muscle
- Bilateral muscle.

To install the clamp on the surface of the muscle stabilizes in the middle third of the muscle, remove the hair and skin cornea located above the area to install the picker to ensure a good connection and then give you gauze and alcohol before installing the pickup.

The exploratory experiments:

First: First exploratory experiment: To verify the validity of the procedures used to conduct the tests, to know the availability of the conditions and to implement them, is a basic requirement, and its achievement necessitated conducting a survey on Sunday, 26/1/2019, on a sample of (8) selected players In a random way, from the club of Samawa – beginners.

The results of the researcher revealed all the purposes for which the experiment was conducted, which indicates the good response of the players and their rush to carry out the test, and the appropriate time for him and the good output and organization, how to conduct and apply and record the results.
Second: Second exploratory experiment: The researchers conducted the second exploratory study during the preparation period on Tuesday and Wednesday, 28-29/1/2019. The aim of the study was to determine whether there are differences between the productive force of the two feet and the collection of each foot separately.

- Choose the most appropriate one-way (single-bilateral) exercises to develop the speed of strength and long-distance handling of the emerging players belonging to Samawa Club.

- Apply two training modules to determine the components of the training load for these exercises.

The number of (18) exercises were chosen by the terminal, including nine unilateral side exercises and nine bilateral terminal exercises to develop the speed of strength of the muscles of the two men and the long pass of football.

The scientific factors for tests used in research:

First. The Honesty: The researchers concluded that the truth, based on the extent to which the test was measured for the phenomenon they measured (speed of force, long pass), was distributed by 7 specialists who indicated the validity of the tests by the following: (100%) of the total experts opinion to approve the representation of the test for the phenomenon measured by).

After collecting the data and unloading, the researchers used (the ka 2) test. The results showed that the two tests were accepted for values greater than (the ka 2) value of (3.84) at the degree of freedom (1) and the significance level (0.05).

Table 1: Shows the validity of the two tests

<table>
<thead>
<tr>
<th>Test</th>
<th>No. of answers</th>
<th>(Ka2) value</th>
<th>Indication of difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fi</td>
<td>Not fit</td>
<td>Calculated</td>
</tr>
<tr>
<td>Muscle capacity</td>
<td>7</td>
<td>-</td>
<td>7</td>
</tr>
<tr>
<td>Long pass</td>
<td>7</td>
<td>-</td>
<td>7</td>
</tr>
</tbody>
</table>

Second: The Stability: The researchers tried to find the stability factor for the tests under study (muscle capacity, Long pass), by finding the correlation between their results, the results of retesting after a period of time 7 days.

After the correlation coefficient (Pearson) was calculated between the two test scores, it was found that the correlation was significant at the degree of freedom (6) and the significance level (0.05), indicating that the tests under examination were highly stable.

Third. Objectivity: The researchers tried to find the objective coefficients for the tests under consideration (muscular ability, Long pass), by finding the correlation between the results of the two arbitrators. After the correlation coefficient (Pearson) was calculated between the scores of the arbitrators, it was found that the correlation was significant at the degree of freedom (6) and the significance level (0.05), indicating that the tests under examination were highly objective.

Table 2: Shows the stability coefficient for the tests used in the research applied to the sample of the exploratory experiment

<table>
<thead>
<tr>
<th>Tests</th>
<th>Coefficient stability</th>
<th>Subjectivity factor</th>
<th>Statistical significant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Muscle capacity</td>
<td>0.81</td>
<td>0.94</td>
<td>Moral</td>
</tr>
<tr>
<td>Long pass</td>
<td>0.89</td>
<td>0.87</td>
<td>Moral</td>
</tr>
</tbody>
</table>

Field research procedures:

The pro -Tests: The post tests were conducted on Sunday, 3/2/2019 at 2:30 pm on the first two experimental groups. The researchers conducted homogeneity and equivalence of individuals in the research sample.
Table 3: Shows homogeneity and equivalence of the two groups

<table>
<thead>
<tr>
<th>Variables</th>
<th>The first experimental group</th>
<th>The second experimental group</th>
<th>Accounted T</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Arithmetic mean</td>
<td>Deviation</td>
<td>Difference</td>
<td>Arithmetic mean</td>
</tr>
<tr>
<td>Electrical activity</td>
<td>Preferred leg</td>
<td>1024.75</td>
<td>92.11</td>
<td>8.99</td>
</tr>
<tr>
<td>Quadriceps muscle</td>
<td>Not preferred leg</td>
<td>561.13</td>
<td>42.52</td>
<td>7.58</td>
</tr>
<tr>
<td>Bilateral muscle</td>
<td>Preferred leg</td>
<td>932.46</td>
<td>195.13</td>
<td>20.93</td>
</tr>
<tr>
<td>Not preferred leg</td>
<td>5.38</td>
<td>0.52</td>
<td>9.63</td>
<td>5.50</td>
</tr>
<tr>
<td>The Muscle capacity</td>
<td>Preferred leg</td>
<td>932.46</td>
<td>195.13</td>
<td>20.93</td>
</tr>
<tr>
<td>Not preferred leg</td>
<td>5.38</td>
<td>0.52</td>
<td>9.63</td>
<td>5.50</td>
</tr>
<tr>
<td>The accuracy passing</td>
<td>Preferred leg</td>
<td>9.18</td>
<td>0.65</td>
<td>7.07</td>
</tr>
<tr>
<td>Not preferred leg</td>
<td>6.38</td>
<td>1.06</td>
<td>16.64</td>
<td>6.63</td>
</tr>
</tbody>
</table>

Table 4: Shows the differences between the preferred and non-preferred leg in the post tests in the electrical activity of the muscles and the muscular capacity and accuracy of passing of the first and second experimental groups

<table>
<thead>
<tr>
<th>The variables</th>
<th>Preferred leg</th>
<th>Not preferred leg</th>
<th>T accounted</th>
<th>Level of significant</th>
<th>Statically significant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical activity</td>
<td>Quadriceps muscle</td>
<td>1034.98</td>
<td>72.75</td>
<td>510.96</td>
<td>126.77</td>
</tr>
<tr>
<td>Bilateral muscle</td>
<td>985.59</td>
<td>200.45</td>
<td>688.21</td>
<td>124.67</td>
<td>3.96</td>
</tr>
<tr>
<td>The Muscle capacity</td>
<td>5.44</td>
<td>0.51</td>
<td>4.06</td>
<td>0.77</td>
<td>7.87</td>
</tr>
<tr>
<td>The accuracy passing</td>
<td>9.47</td>
<td>0.72</td>
<td>6.50</td>
<td>0.89</td>
<td>19.05</td>
</tr>
</tbody>
</table>

The exercises in the limbs work (unilateral - bilateral): The researchers carried out the exercises in the limbs work (unilateral - bilateral) for the sample in question from 10/2/2019 to 30/4/2019 with three training units per week for a period of (12) weeks.

The post-tests: Post-tests on the sample were conducted on Sunday (2/5/2019) at 2:30 pm, including the same conditions and procedures as in the pro- tests.

Statistical Methods: The researchers used the statistical bag (SPSS) to process the data and show the results.

Results and Discussion

Showing the results of differences between the preferred and non-preferred men in the values of electrical activity of muscles in the post-test of the control group and analyze and discuss

Table 5: Shows the differences in the pro and post tests in the electrical activity of the muscles and the muscular capacity and accuracy of passing of the first experimental group

<table>
<thead>
<tr>
<th>The variables</th>
<th>Pro test</th>
<th>Post test</th>
<th>T accounted</th>
<th>Level of significant</th>
<th>Statically significant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical activity</td>
<td>Quadriceps muscle</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preferred leg</td>
<td>1024.75</td>
<td>92.11</td>
<td>8.99</td>
<td>1045.20</td>
<td>51.18</td>
</tr>
<tr>
<td>Not preferred leg</td>
<td>561.13</td>
<td>42.52</td>
<td>7.58</td>
<td>660.17</td>
<td>164.17</td>
</tr>
<tr>
<td>Bilateral muscle</td>
<td>Preferred leg</td>
<td>932.46</td>
<td>195.13</td>
<td>20.93</td>
<td>858.71</td>
</tr>
<tr>
<td>Not preferred leg</td>
<td>705.61</td>
<td>163.23</td>
<td>273.58</td>
<td>126.90</td>
<td>1.08</td>
</tr>
<tr>
<td>Muscle capacity</td>
<td>Preferred leg</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preferred leg</td>
<td>5.38</td>
<td>0.52</td>
<td>6.25</td>
<td>0.46</td>
<td>7.00</td>
</tr>
<tr>
<td>Not preferred leg</td>
<td>4.00</td>
<td>0.53</td>
<td>4.25</td>
<td>1.53</td>
<td>0.17</td>
</tr>
<tr>
<td>Accuracy of passing</td>
<td>Preferred leg</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preferred leg</td>
<td>9.18</td>
<td>0.65</td>
<td>11.29</td>
<td>0.70</td>
<td>9.22</td>
</tr>
<tr>
<td>Not preferred leg</td>
<td>6.38</td>
<td>1.06</td>
<td>7.00</td>
<td>0.93</td>
<td>0.09</td>
</tr>
</tbody>
</table>
Based on the data extracted for the members of the research sample, Table (5) shows the differences in the values of the variables under study in the pre-test and post-experimental tests of the first experimental group. As shown in the table above, the nature of the sample showed a difference in the differences between the tribal and post-test. The results showed that there was a significant difference in the mean activity of the preferred leg and the use of the T test of the interrelated samples to extract the differences, with significant differences (2.69, 7.00 and 9.22) respectively at the mean level (0.03, 0.00, 0.00) Respectively.

Table 6: Shows the differences between the preferred and non-preferred leg in the post tests in the electrical activity of the muscles and the muscular capacity and accuracy of passing of the first experimental group

<table>
<thead>
<tr>
<th>The variables</th>
<th>Preferred leg</th>
<th>Not preferred leg</th>
<th>T accounted</th>
<th>Level of significant</th>
<th>Statically significant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical activity</td>
<td>Quadriceps muscle</td>
<td>1110.45</td>
<td>663.65</td>
<td>7.57</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>Bilateral muscle</td>
<td>1072.19</td>
<td>753.58</td>
<td>6.63</td>
<td>0.00</td>
</tr>
<tr>
<td>The Muscle capacity</td>
<td>6.25</td>
<td>4.25</td>
<td>8.64</td>
<td>0.00</td>
<td>Moral</td>
</tr>
<tr>
<td>The accuracy passing</td>
<td>11.29</td>
<td>7.00</td>
<td>10.46</td>
<td>0.00</td>
<td>Moral</td>
</tr>
</tbody>
</table>

In the light of the data extracted for the members of the research sample, Table (6) shows the differences in the values of the variables under study in the post-test of the first experimental group between the preferred and non-preferred men. As shown in the table above, the nature of the sample showed differences between the preferred and non-preferred. In the electrical activity (quadriceps, biceps), the speed of force, the accuracy of handling and the use of T test to extract the differences showed significant differences with their calculated values (7.57, 6.63, 8.64, 10.46) respectively at the level of 0.00, 0.00, 0.00, 0.00) respectively and for benefit of the favorite leg. It is clear from tables that there are statistically significant differences between the mean and the pro tests in the tests of electrical, physical and skill activity under study in favor of the post-test of the second experimental group, which works as a unilateral action, which is the performance of each individual leg.

Conclusions

Through the results and in light of the objectives and methodology used and within the sample of the research and the fact that the data collected by the researchers and in the framework of statistical treatments, it was possible to reach the following conclusions: There is a positive effect of the use of unilateral work of the two men in the electrical activity of the muscles of the two men to reduce the bilateral deficit of players in the football in question. There is a positive effect of the use of unilateral work of the two men in the speed of strength of the two men and the long handling of football to reduce the bilateral deficit of the players in the search.

Source of Funding: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the AL-Muthanna University, Iraq and all experiments were carried out in accordance with approved guidelines.

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4. Farahat RA. Biological characteristics of football players to rationalize the selection of youth, PhD thesis, Faculty of Physical Education, Helwan University, 2001; 9(2): 133-137.
The Kinetic Compatibility of the Upper and Lower Limbs and their Relation to the Skill Level of Tennis for the Emerging Players

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1Collage of Physical Education and Sports Science for Girls, University of Baghdad; 2College of Physical Education and Sports Sciences, University Muthanna

ABSTRACT

The duties of educational, educational and training is to pay attention to the physical compatibility of the players, where they must be prepared skillfully and physically for the purpose of performing motor skills and planning so that the player has a valid base to reach a high level in the performance of skills, hence the importance of research in identifying the relationship between compatibility of parties Upper and lower, and their relation to the skill level of the players. The researchers used the descriptive method of associative study on the 16 players. Of the academy and the intentional manner. Thus, the measurement of the compatibility of the two men and the eyes was tested, the compatibility between the arms and the eyes was tested and the skill level of the accuracy of the transmitter was measured. Simple correlation Pearson and concluded that the existence of a significant correlation between the compatibility of the upper and lower limbs and the level of skill performance of the accuracy of the transmitter. Therefore, the researchers recommend the need to care about the motor capacity of the upper and lower limbs when performing the level of See for the accuracy of the transmitter.

Keywords: kinetic compatibility, upper and lower limbs.

Introduction

The tennis ball of important sports games that have an important role in the number of educated physically through Oak Lea motor compatibility development for novice players, where kinetic compatibility is necessary for any Sporting event in terms of achievement depends on the learner Maimitleke of these capabilities, “can not master basic motor skills for the type of physical activity specialist for the type of skill in the case of lack of consensus motor necessary for this particular type of physical activity. One of the educational, educational and training duties is attention to compatibility Kinetic learner in order to be prepared Mharria and physically for the purpose of the performance of the motor and tactical skills so that the player has a valid base to reach a high level in the performance of the skill level. At the tennis game you need a dynamic compatibility upper limbs and lower in all skills and in most of the time, both in the case of Attack or defense needs The player to the compatibility so that he can perform skills correctly and harmoniously and have a high skill level to overcome the difficulties and positions that will be faced in competitions. Hence the importance of research in identifying the relationship between the kinetic compatibility of the upper and lower sides and their relation to the performance of the skill level of the players. Tennis is a sport that is characterized by the speed of skill performance because it requires the strict compatibility of the learners. Through the experience of the researcher being a tennis teacher noted that most learners have a weak muscle compatibility and difficulty in performing skills due to poor compatibility and the occurrence of excessive movements, The question is whether there is a relationship between the motor compatibility abilities of the upper and lower sides in

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performing the skill level of the players? research goals: Identify the compatibility relationship between the upper and lower limbs and the skillful performance of the emerging players.

Force search. The existence of a significant correlation between the motor compatibility of the upper and lower limbs and the skill performance of the emerging players.

**Methodology**

The appropriate approach is one of the most important steps that result in the success of the research, “as the approach depends on the nature of the problem and the goal to be achieved.

Where the researcher used the descriptive method of associative study “which aims to determine the degree of relationship between two or more variables.

**The research community and its design:** The goals set by the researcher and the procedures used in the research determine the nature to be chosen

The research community was deliberately chosen as the junior players Academy in a tennis (18) players. The researcher chose a sample of (16) players, representing (88%) of the research community, as well as taking (2) players to conduct the exploratory experiment.

**Data collection methods:**

Arab and foreign sources.

International information network.

Equipment and Search tools

Tennis Court.

Tennis Balls.

Tennis rackets.

stopwatch.

Colored pens.

**Tests Used:**

**Circuit test numbered:**

**Purpose of the test:** measuring the compatibility of both men and eyes

**Tools:** Stopwatch, the drawing on the ground eight circles that Qatar will be all of them (60) o m, numbered circuits.

**Method Performance:** The laboratory stands within the circle (1). When the start signal is heard, the two feet are brought together into the circle (2), then to the circle (3) and then to the circle (4) until the circle (8).

**Registration:** Records the time it takes to move through the eight

**Test Throw and reception the ball**

**Purpose of the test:** Measuring the compatibility between the eye and the hand

**Tools used:** (10) tennis ball, wall, drawing line at a distance (5 meters) from the wall.

**Performance Method:** The laboratory stands in front of the wall and behind the line drawn on the ground where the test is conducted according to the following sequence:

1. Throw the ball five times in a row with the right hand, and the laboratory will receive the ball after it is rebounding from the wall with the same hand.

2. throwing a ball five consecutive times with the left hand and that the laboratory receives the ball after rebounding from the wall with the same hand.

3. throw the ball after five consecutive times with the right hand and the laboratory to receive the ball after the rebound from the wall with the left hand.

**Registration:** In every correct attempt, the laboratory is assigned a score of (15)

**Measurement the level Mahari**

**The purpose From Test:** transmitter accuracy 7

**Measures:**

- The player must hit (12) three consignments to the wide area in the first transmitter box and three consignments to the central area of the first dispatch as well as three consignments to the middle area of the second dispatch and three consignments to the wide area of the second dispatch.

- The score is calculated by the light of the first ball falling.
**Calculate Accuracy Transmitter:**

**First transmitter:**
1. Two points when the ball falls in the correct transmitter area (center area).
2. (4) points when the ball falls in the area where the first transmitter is intended (in the wide side area of the transmitter area)

**Second Transmitter:**
1. One point when the ball falls in the correct transmitter area (center).
2. Two points when the ball falls in the target area of the transmitter (the side area of the transmitter area).

**Note:** To calculate the skill level, the sum of the precision points/speed of performance is calculated.

**Experience Exploration:** The researchers conducted the pilot experiment on 16/10/2018 on (2) players who were excluded from the main experiment. The aim of the exploratory experiment is to identify the obstacles that may hinder researchers during the experiment and to identify the validity of the tools used in the research.

**Experience Home:** After the experiment was carried out and the validity of the test and the availability of scientific filters, the tests were applied to the sample of the (12) player on the playgrounds of the College of Education for Girls/University of Baghdad on 21/10/2018 until 23/10/2018.

**Means Statistics:** The researchers used the ready-made statistical bag spss.

**Results and Discussion**

Presentation of the results of the computational circles and the standard deviations of the tests for the research, analysis and discussion.

**Table 1:** Shows the computational and standard deviations of the search variables

<table>
<thead>
<tr>
<th>The exams</th>
<th>Measuring unit</th>
<th>Arithmetic mean</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Numbered circuits</td>
<td>a second</td>
<td>14.96</td>
<td>0.55</td>
</tr>
<tr>
<td>Throw and receive the ball</td>
<td>Degree</td>
<td>11.9</td>
<td>1.17</td>
</tr>
<tr>
<td>Skill level</td>
<td>Degree/time</td>
<td>1.68</td>
<td>0.66</td>
</tr>
</tbody>
</table>

Can be seen from Table 1 that the arithmetic mean of the test circuits were numbered (96, 14) with a standard deviation was (.55), either in a test throw and receive the ball reached the arithmetic mean (11.9) with a standard deviation was (1.17), In the transmission accuracy test, the mean (1.68) and the standard deviation (0.66).

For the purpose of finding a relationship between the compatibility between the upper and lower limbs with the performance of the skill level was used simple correlation coefficient Pearson and Table (2) shows that

Presentation and analysis of the correlation between motor compatibility of the upper and lower parties and performance of the skill level

**Table 2:** Shows the value of the correlation coefficient for motor compatibility of the upper and lower parties to perform the skill level

<table>
<thead>
<tr>
<th>Simple correlation coefficient</th>
<th>Numbered circuits</th>
<th>Throw and receive the ball</th>
<th>Link indication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance level skill</td>
<td>0.82</td>
<td>0.75</td>
<td>moral</td>
</tr>
</tbody>
</table>

The value of the correlation coefficient (0.49) at the degree of freedom (14) and the probability of a line (0.05)

Table (2) shows that the correlation coefficient between the numbered circuit test and the skill level performance was 0.82. This means that the relationship between the test of the numbered circuits and the skill level was significant when compared with the scale value of (0.49) Freedom degree 14 and probability line (0.05). The researcher attributed the reason that the compatibility of motor between the two men and eyes is important in tennis, the player needs to agree to the length of the performance of the skill level, especially
that the accuracy of the transmitter requires the player compatibility while hitting the ball through the transfer of body weight from the back foot to the front in a consistent movement The arm.

And this is Mayakde Louay “and the compatibility of motor between the eye and hand is one of the most important factors for the performance of the athlete as it through the performance there is a transmission of nerve signals between the nervous and muscular systems and therefore all movements that require sports performance is very important compatibility 8.

As shown in Table (2), the correlation coefficient value between the test The correlation between the eye and the hand and the level of performance reached (0.75). This means that the relationship between the eye and hand compatibility test and the performance level was significant correlation when compared to the scale value of 0.49 at the freedom level 14 and the probability of a line (0,05).

The researcher points out that the accuracy of the transmitter requires the player to agree for the performance of the skill correctly and there must be coordination and compatibility in motion, especially when the arm is weighted so that there must be consistency between the eye and the movement of the arm and ball in a manner aimed at hitting the ball as soon as possible until the level of performance good.

Also, we note the importance of motor compatibility in all movements that depend on the physical according to the different motor tests performed by the player, and because tennis requires a kind of compatibility between the eye and the arm and the man to perform the skill level with high flow.

Good compatibility requires the elements of balance, speed, motor sense and accuracy of motor performance, the need to distinguish the player and the total body and the compatibility between the upper and lower sides where the compatibility component of the most important mechanisms that contribute to the success of the player to perform the skill level 4-8.

Conclusions

By discussing the results of the research within the sample limits, the following researcher concluded: There is a significant correlation between the compatibility of the higher limbs and the performance of the skill level. There is a significant correlation between the lower limb compatibility and skill level performance.

Source of Funding: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the University of Baghdad/collage of Physical Education and Sports Science for Girls and all experiments were carried out in accordance with approved guidelines.

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Serum Lipid Profile in Healthy Collegian Women During Consumption of 25 and 13 G of Ukrainian Walnut

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ABSTRACT

Objective: Nuts offer many health benefits, this study conducted to estimate the effect of different dose and period of Ukrainian walnut consumption on lipid profile parameters among healthy young collegian women. Subjects of this study were feed on two different dose of walnut including 13 g and 25 g for 10 days to each dose, fasting blood sample had been drawn pre- and post-walnut consuming, entirely period of this experiment last for 20 days, tested parameters included Total cholesterol (TCH), high density Lipoprotein (HDL), low density lipoprotein (LDL) and triglyceride (TG). Body mass index (BMI) was conducted for study population pre and post consumption of walnut. Highly significant decrease (p<0.001) was detected in the serum total cholesterol, Triglyceride and LDL-cholesterol level in the women when eat 25g of walnut for 10 days interval pre-consumption of walnut. Highly significant increase (p<0.01, p<0.05, p<0.01) respectively was found in the total cholesterol, LDL-cholesterol and Triglyceride after the same subjects were had 13 g of walnut for the other 10 days. HDL-cholesterol level was non-significantly (p>0.05) difference neither eat 25g nor 13 g of walnut consumption against pre-take walnut.

Keywords: lipid profile, collegian women, Ukrainian walnut.

Introduction

There is a significant amount of research now which highlights the importance of eating nuts regularly for health benefits, nuts are a particularly nutrient dense food [1,2]. A large number of clinical studies has been conducted looking at the effect of walnut consumption on blood fats, and showed that regular inclusion of nut in the diet can lower both total and LDL-cholesterol [3,4], other studies revealed the role of nuts in weight management [5,6]. This study was concerned on Ukrainian walnut to evaluate whether the different quantity of walnut nourishment if have the same effect on lipid profile and body weight management on the healthy young women.

Methodology

This study conducted in college of science for women in Babylon University, features of subjects participated in the present study were young women their age arranged between 20-26 years, free of chronic disease, non– smoker, and not have allergic to walnut. At first, the fasting blood samples have been taken from women pre-consumption walnut, after that, population study were feed with 25 g of walnut plus their normal meal lasting for 10 days, then blood fasting sample was withdrawal, the same subjects feed with 13 g of walnut lasting for further 10 days, thereafter fasting blood sample has been withdrawal and separated by device centrifuge to get serum protein.

The TG, cholesterol, HDL-cholesterol were measured by using (BIOLABO Kits), but LDL-cholesterol was calculated depending on friedwald formula [7].

Body mass index BMI for subjects were twice calculated after body weight and height measured for women [8] on pre and post walnut consumption.
Statistical Analysis: Data were analyzed with spss software version 24.0 used repeated measurement ANOVA test, and paired T-test method have been done to data analysis.

Results and Discussion

The data of lipid profile as consuming walnut or without walnut eating were plotted in figure (1).

Decrease significant p<0.001 was exhibited in the mean level of total cholesterol (109.9 ± 39.4 mg/dl) and triglyceride (29.2 ± 14.5 mg/dl) and LDL- cholesterol (59.1 ± 25.1 mg/dl) after had 25 g of walnut for 10 days period in comparison to the same parameters when estimated pre-consumption of walnut, TCH (213.9 ± 79.1 mg/dl), TG (52.2±20.1 mg/dl) and LDL-cholesterol (154.5 ± 74.2 mg/dl). While the same subjects when had 13 g of walnut for the other 10 days highly significant increase was found (p<0.01, p<0.05, p<0.01) for total cholesterol(136.5 ± 30.5 mg/dl) and LDL-cholesterol (72.9 ± 27.3 mg/dl) as well TG (59.8 ± 22.7 mg/dl) upon their level after consumption of 25 g walnut. Neither consuming of 25 g nor 13 g from walnut significantly impact (p>0.05) on the HDL-cholesterol level (45.1 ± 18.0 mg/dl), (51.1 ± 16.1 mg/dl) respectively opposite pre-consumption of walnut (49.3 ± 19.6 mg/dl).

Figure 1: Lipid profile levels pre and post consumption of walnut

![Figure 1: Lipid profile levels pre and post consumption of walnut](image)

Our result agreement with studies which suggested that fatty acids found in walnut would lower serum cholesterol levels, as nuts contain plant sterols including beta-sitosterol, campesterol and stigmasterol [9,10,11] since the plant sterols can reduce total and LDL cholesterol [4,5] by lowering cholesterol reabsorption from gut. Although walnut are high in fat, but most of fatty acids are polyunsaturated fatty acid and free of trans fatty acids and is unique due to having alpha-linolenic acid ALA [3,4] notable, walnut is a rich source of fiber in which there is almost 9.7 g of fiber per 100 g of it, it was shown that fiber rich foods can reduce cholesterol levels and prevent heart disease and stokes[6], another previous study accordance with us results noted that nuts are rich source of mineral including magnesium, copper, zinc, potassium and selenium, all of which may play a role in heart health [6,18] accordingly, there was decreased in TG level as women consumed 25 g of walnut but increased level in TG as eating 13 g of walnut, this occur may owing to that 13 g was not enough to show positive effect on TG concentration, but in the same time there was increase HDL level in accordance with increased TG level during eating 13 g of walnut, this may due to protective role of unsaturated fat as reported by Balk et al [12] who confirmed that marine sources of omega -3 fatty acid such as fish oil have higher hypotriglyceridemic effects, as well as another study [13,16] confirmed that walnut intake reduce TG level in healthy people. In concerning with HDL level there were non-significant difference in pre and post consumption of walnut, previous literature was founded increase in HDL level as eating 30 g of black walnut per day for an eight-week period [12] this disagreement with our results may owing to that different kind of walnut and to long period of eating, however our results agreement with Rose et al [14] in which reported that walnut consuming per day regularly for four weeks, the good cholesterol in participants remained the same. The present study don’t showed significant difference (p>0.005) in BMI between pre- and post-consumption of walnut (22.9 ± 2.6 kg/m²) (23.0 ± 2.7 kg/m²) respectively as revealed in table 1, these finding are supported by researches [14,15,17] in which has shown that nuts do not cause weight gain when included as part of cholesterol lowering diet.

Table 1: Body Mass Index value pre-post consumption of walnut in study population

<table>
<thead>
<tr>
<th>BMI</th>
<th>Pre-consumption of walnut</th>
<th>Post-consumption of walnut</th>
<th>T-value</th>
<th>sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kg/m²</td>
<td>22.9 ± 2.6</td>
<td>23.0 ± 2.7</td>
<td>0.402</td>
<td>0.69</td>
</tr>
</tbody>
</table>

Conclusion

Regular daily consuming for walnut have active role on lipid profile and may get better benefit while dose and period of walnut consuming are amplified.
Source of Funding: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Department of biology, Faculty of Science for women, University of Babylon, Al- Hila, Iraq and all experiments were carried out in accordance with approved guidelines.

REFERENCES


The Association between (CT60) Cytotoxic T-lymphocyte Antigen-4 Gene Polymorphism with its Plasma Levels in Alpecia Areata Patients

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1College of Medicine, University of Babylon, Iraq

ABSTRACT

Alopecia areata (AA) is a dermatological disease featured by non-scarring hair loss of the scalp and/or body, with a variable and unpredictable development in the patients in whom, despite diverse efforts, its cause is not yet fully known, some signs suggest that genetic, environmental and immunological factors may cause the disease. Cytotoxic T-lymphocyte antigen-4 (CTLA-4) said negative T cell proliferation regulator by attenuating either T-cell response post-activation or by preventing the activation of self-reactive T cells. The present study, aims to report the impact of the (CT60) CTLA-4 gene polymorphism (rs3087243) on the CTLA-4 levels in plasma samples of AA Iraqi patients.

Keywords: Alopecia areata, Hair loss, CTLA-4, CT60 Polymorphism.

Introduction

Alopecia areata (AA) is a dermatological disease characterized by hair loss and no scars on the head and/or body, manifested by a different and unpredictable development for patients in which, despite various experiments, the cause is not yet known, some evidence suggests for the genetic, environmental and immunological factors to cause the disease. 1. AA is a chronic, inflammatory, autoimmune disease that attacks the hair follicles and causes hair loss. Hair loss is usually on the scalp, but it can also affect the beard, eyebrows and other areas of the body. Genes of the immune system have been implicated in AA pathogenesis 2. The CTLA4 gene (2q34) produces a full-length CTLA4 protein, predominantly expressed in activated T cells, and a soluble CTLA4 protein, predominantly secreted by resting T cells 3. CTLA-4 is a negative regulator of the T-cell proliferation either by reducing T-cell response post-activation or preventing the activation of self-reactive T cells 2.

CTLA-4 polymorphisms are associated with a lot of human autoimmune-diseases, including systemic lupus, Graves disease, rheumatoid arthritis and type I diabetes (4,5). More than 100 single-nucleotide polymorphisms (SNPs) have been identified in the CTLA4 region 2q34 and several variants have been associated with autoimmune disorders 6. However, some of these associations have not been confirmed, and some contradictory data are evident in different populations. Two recent articles show that certain genetic variants of the CTLA4 gene promote AA sensitivity. The strongest relationship was found in the change of + 49AG infection (rs231775), resulting in a threonine to alanine amino acid substitution at codon 17 in the leader peptide, and for the (CT60) dimorphism (rs3087243), which is located 236bp downstream of CTLA4 gene (2,7). The present study, aims to report the impact of the (CT60) gene polymorphism (rs3087243) on the CTLA-4 levels in plasma samples of AA Iraqi patients.

Patients and Control Groups

One hundred (100) distinct patients with AA were selected in this study. The patients had mean standard deviation age of (26.00 ± 9.47), for males and (23.68 ± 11.65) for females and age range of 15-48 years. These patients were selected from Baghdad teaching medical city and diagnosed by neurologist based on the McDonald criteria 8.
Besides, one hundred (100) ethnically, age, and sex matched healthy individuals with no personal or family history of autoimmune diseases were selected. Control group had mean age of (29.42 ± 12.93) for males and (31.53 ± 7.078) for females and age range of 15-48 years. All controls were informed of the research and gave their full written consent.

**DNA Extraction and Genotyping:** Five mL of blood sample was collected from each individual in EDTA tube and plasma isolated. DNA was extracted from peripheral blood samples by DNA extraction kit. Then DNA sample was subjected to restriction fragment length polymorphism PCR (RFLP). 100 nanograms of extracted DNA were amplified using specific primers: CT60-forward 5' -ATCTGTGTTGCTCGTT TTCCT-3’ and CT60-reverse 5’ -CCATGACAACTGTAAT GCCTGT-3’ primers The PCR conditions were 95 °C for 3 min followed by 35 cycles of 45s at 95 °C, 45s at 60 °C, 45s at 72 °C, and a final prolongation step of 7 min at 72 °C.

The PCR amplification yielded a band of 382 bp. After digestion by HpyCh4IV restriction enzyme (New England Biolabs), the PCR products were digested 252 and 130 bp fragments. 2% agarose gel electrophoresis was used. Plasma levels of CTLA-4 were detected using a Human CTLA-4 ELISA kit purchased from eBioscience company (http://www.eBioscience.com). The kit was used according to its manufacturer’s instruction. Finally, the comparison between CT60 genotype and CTLA-4 plasma level was done.

**Statistical Analysis:** To examine the effect of CTLA-4 polymorphism and its plasma levels, independent Student’s t-test was performed. Differences between the parameters measured in patients and control group were compared, and P value was <0.05 considered significant. Gravepad Prism version 6 (Gravepad Software Inc., La Jolla, CA) for windows software was utilized.

**Results and Discussion**

The frequency of the G allele at the (CT60) polymorphism was insignificantly higher in patients than controls (OR: 0.8851 CI: 0.3825 to 2.048, and P = 0.8323). Moreover, the A/G genotype was more frequent in patients than in control (68% versus 50%, OR: 2.125, CI: 0.6308 to 7.159, and P = 0.3772) as shown in Table 1. Allelic Association of (CT60) CTLA-4 Gene Polymorphism in Promoter AA patients and Healthy Control was shown in Table 2. Relation between CTLA-4 and genotyping of (CT60) CTLA-4 gene polymorphism in promoter were shown in Table 3.

---

**Table 1: The Genotype and Percentage of CTLA-4**

<table>
<thead>
<tr>
<th>Genotype</th>
<th>Control (G1, N = 100)</th>
<th>Patients (G2, N = 100)</th>
<th>OR/CI</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>G/G</td>
<td>30 (30%)</td>
<td>24 (24%)</td>
<td>0.7368 (0.1957 to 2.775)</td>
<td>0.3772</td>
</tr>
<tr>
<td>A/A</td>
<td>20 (20%)</td>
<td>8 (8%)</td>
<td>0.3478 (0.05671 to 2.133)</td>
<td></td>
</tr>
<tr>
<td>G/A</td>
<td>50 (50%)</td>
<td>68 (68%)</td>
<td>2.125 (0.6308 to 7.159)</td>
<td></td>
</tr>
</tbody>
</table>

**Table 2: Allelic Association of (CT60) CTLA-4 Gene Polymorphism in Promoter AA Patients and Healthy Control**

<table>
<thead>
<tr>
<th>Allele</th>
<th>Patients Group (G2)</th>
<th>Controls Group (G1)</th>
<th>OR</th>
<th>(CI)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Count</td>
<td>Proportion</td>
<td>Count</td>
<td>Proportion</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>116</td>
<td>58%</td>
<td>110</td>
<td>55%</td>
<td>0.8851 (0.3825 to 2.048)</td>
</tr>
<tr>
<td>A</td>
<td>84</td>
<td>42%</td>
<td>90</td>
<td>45%</td>
<td></td>
</tr>
</tbody>
</table>

The patients who carried A/G genotype had higher plasma levels of CTLA-4 compared to that measured in controls (P= 0.0312). Figure 1 showed that CTLA-4 levels were lower in patients than in controls.
Figure 1: Serum Cytotoxic T-Lymphocyte Antigen–4 (CTLA–4) in AA Patient and Healthy Control Groups

Table 3: Relation between CTLA-4 and Genotyping of (CT60) CTLA-4 Gene Polymorphism in Promoter

<table>
<thead>
<tr>
<th>Genotype</th>
<th>Control Group (G1) (CTLA-4 level ± SD) ng/mL</th>
<th>Patients Group (G2) (CTLA-4 level ± SD) ng/mL</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>AA</td>
<td>0.47 ± 0.31</td>
<td>0.25 ± 0.18</td>
<td>0.1252</td>
</tr>
<tr>
<td>GG</td>
<td>0.45 ± 0.23</td>
<td>0.14 ± 0.10</td>
<td>0.0167</td>
</tr>
<tr>
<td>AG</td>
<td>0.59 ± 0.35</td>
<td>0.07 ± 0.028</td>
<td>0.0312</td>
</tr>
</tbody>
</table>

CT60 G/A genotype of CTLA-4 gene may have an effect on decreasing CTLA-4 plasma level in general population (e.g., control group). Since carriers of G/A genotype in the AA patients group have significantly lower CTLA-4 levels in comparison to healthy controls, it seems that maybe there are additional mechanisms that affect or control the relation of G/A genotypes and CTLA-4 levels in AA patients.

In this study, we investigated the association of the G/A genotype at the CT60 position of the CTLA-4 gene with the plasma levels of CTLA-4 in Iraqi AA patients. We observed that this effect is significantly higher in AA patients than in healthy controls. It shows there would be relation between this SNP and level of CTLA-4 in AA patients. It seems that studies with large sample size are required to bring about more authentic results.

CTLA4 is an important negative regulator of T-cell activation, whose polymorphisms have been reported to be implicated in the genetic susceptibility of several autoimmune diseases, recently also Alopecia Areata. In this study, we evaluated the association between CT60 SNPs in CTLA4 gene using 100 patients and 100 healthy individuals from Iraq. Using a case-control approach, we found that AA was significantly more frequent in patients carrying the (CT60) G allele (G/G and A/G genotypes) than in A/A homozygotes, while A/A genotype seemed to have a protective effect. Our findings are agreed with those obtained in the German study performed by John et al., in which a significantly decrease of (CT60) A variant was present in AA cases than in controls. Even the fact that the association is specific for A/G G/G genotypes agrees with the dominant effect of the G allele that we speculated. Furthermore, a specific haplotype of the CTLA4 gene, carrying the (CT60) A variant, resulted to be negatively associated to AA evolution. A previous study suggested that CTLA4 molecular pathway plays a major role in the AA pathogenesis, and might also manifested that the two genetic risk factors, CTLA4 and HLA, act autonomously of each other. The study continued saying “Regarding +49AG CTLA-4 SNP, very similar frequencies for either genotype or allele were observed in patients and controls. These data, however, did not replicate the
association with the +49G CTLA-4 variant reported in German people and genetic heterogeneity among European populations, SNP interactions might explain this result\(^\text{(2,11)}\). We cannot exclude the possibility that other CTLA-4 genetic variants present are involved in the autoimmune etiology of the disease. In conclusion, the carriage of the (CT60) G allele participate, even if moderately, as a disease risk factor of AA, which is encourage the importance of CTLA4 as an autoimmune susceptible locus. Since CTLA4 molecule has a major role in the measurement of immune response and tolerance, it is probably that some particular CTLA4 polymorphisms could be causes the differences in the individual capability to have autoimmune diseases, altering the function of the protein itself. Notice that, the (CT60) SNP is located near the 30 un-translated region of CTLA4 gene, and the association of several diseases with the G variant has been explained as the result of a reduced CTLA4 expression with a subsequent reduced inhibitory function \(^\text{12}\). Further investigations is required to investigate the effect of the (CT60) G allele on the possible binding of some major genetic factors, for example the microRNA regulatory molecules and the concentration and function of the CTLA4 translated protein with a view to find out new molecular mechanisms implicated in the AA development. Moreover, the research for disease preparing genetic variants in other immunological pathways and co-stimulatory molecules must be investigated to give clear vision into the AA pathogenesis.

**Conclusion**

Lower plasma levels of CTLA-4 in AA patients appeared in those who carried G/A genotype.

**Source of Funding:** There is no financial disclosure.

**Conflicts of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the College of Medicine, University of Babylon, Iraq and all experiments were carried out in accordance with approved guidelines.

**REFERENCES**


A Study for Detection the Causes of Vaginal Bleeding in Pregnant Women at 1st Trimester in Bint al-Huda Teaching Hospital at al-Nasiriyah City, Iraq

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ABSTRACT

The present study was aimed to detect the more suspected causes related to incidence of vaginal bleeding (VB) in pregnant women during 1st trimester. Using specific questionnaire forma, the required information were obtained from a totally 50 pregnant women at 1st trimester of gestation. Collected data were divided into three parts; socio-demographic, reproductive, and other-related factors. Regarding to socio-demographic factors, significant increase (P<0.05) for affected cases were showed in women 21-25 years of age, uneducated or primary school graduated, housewives, resident in urban, and poorly economic status. In reproductive factors, significant elevation (P<0.05) were detected in women married at 16-19 years of age, 4-8 gravida, 4-8 para, 1-2 abortions, 3-6 live children, 3-5 years interval for last pregnancy, irregular attended to hospital and singleton pregnancy. Among other factors, significant increasing (P<0.05) were detected only in mother-related factors including abnormal mother’s weight, have reproductive illness, Rh incompatibility, non marriage to relatives, non infected, received medication, smoking passively, and having previous history for abortion and curettage.

Keywords: Women, Vagina, Bleeding, Trimester, Thi-Qar, Iraq

Introduction

Abnormal vaginal bleeding (AVB) is one of the most frequent reproductive problems for women, which categorized as irregular, inter-menstrual and excessive menstrual bleeding ¹. It occurs more widely in women aged (25-44) years per year, and reported in 15-25% of all pregnancies particularly at 1st trimester of gestation (²,³). Meta-analyses were detected that this event is more related with increasing the risks of other complications occurred during gestation ². Although, VB can be seen as a normal sign for implantation of gestation, it may refer to a pathologic condition/s such as gestational trophoblastic disease or ectopic pregnancy ⁵. Also, VB may indicate for an initiation of spontaneous abortion ⁶. Further assessment of VB after confirmation with the positive pregnancy test is required in order to identify the normal or abnormal development of gestation or existence of pathologic condition/s that may require as soon as an intervention (⁷,⁸). However, many diagnostic tools can be used to provide a primary decision on the cause/s of VB. Physical examination of pelvic region in addition to laboratory testing and imaging methods are used usually to diagnose VB particularly with the closed cervix ⁹. In early months of gestation, many pregnancies are losses their fetus due to VB ¹⁰. Several studies reported that the more serious causes of 1st trimester VB include the ectopic pregnancy, induced abortion, spontaneous miscarriage, and molar pregnancy in addition to uterine problems (¹¹,¹²). It looked that there is a specific relationship between VB and miscarriage which usually conducted to the women recruit to emergency departments or hospitals ¹³. Although, many VB episodes may require an immediate medical intervention, these studies do not provide the useful information about the risks of miscarriage on women who experience VB ¹⁴. As the most miscarriage
cases occur during the 1st trimester period of gestation, detailed data about the characteristics of VB is important for early identification of miscarriage.\textsuperscript{15}

**Materials and Method**

**Samples and Data collection:** During 6 months of 2018, a total of 50 pregnant women attended to Bin Al-Huda Teaching Hospital (Dhi-Qar province, Iraq) with VB at 1st trimester of gestation were submitted for this study. The required information was obtained from study’s women after an extensive interview by using a special questionnaire forma in addition to independence on their hospital profiles. The collected data were divided into three parts; socio-demographic, reproductive, and other-related factors. In 1st part, the data include specific information about the characteristics of age, level of education, occupation status, resident and the economic status of study women. While the 2nd part was involved specific information related to age of study’s women at marriage, gravid, para, number of abortion/s, number of live children, interval with last pregnancy, type of last delivery, attention to hospital, and the pregnancy status. In 3rd part, other factors were comprised three categories are the mother-related factors (mother’s weight, reproductive system illness, Rh compatibility, marriage to relatives, infections, therapy, smoking, and previous history), in addition to fetus-related factors, and environment-related factors.

**Data analysis:** All obtained data were introduced firstly into the computerized Microsoft Office Excel (2013) program, and analyzed statistically using IBM/SPSS (V\textsubscript{23}) programs. Significant differences among study values were detected with Chi-square ($X^2$) test at a level of $P<0.05$. In addition, the credibility of the contents was estimated through a panel of (5) experts, whereas, the stability of the items in based on internal consistency of the questionnaire was evaluated by calculating Alpha Cronbach equal to 0.72.

**Results**

Significant elevation ($P \leq 0.05$) in characteristics of socio-demographic factors was encountered in 21-25 years of age, uneducated or primary school graduated, housewives, resident at urban, and with insufficient economic status, (Table 1).

**Table 1: Results of socio-demographic factors**

<table>
<thead>
<tr>
<th>Factor</th>
<th>Rating</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age/Year</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-20</td>
<td>9</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>21-25</td>
<td>16</td>
<td>32*</td>
<td></td>
</tr>
<tr>
<td>26-30</td>
<td>9</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>31-35</td>
<td>8</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>36-40</td>
<td>8</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td><strong>Level of Education</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uneducated or Primary School Graduated</td>
<td>26</td>
<td>52*</td>
<td></td>
</tr>
<tr>
<td>Intermediate School Graduated</td>
<td>8</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Secondary School Graduated</td>
<td>3</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>High School Graduated (Institute or College)</td>
<td>13</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td><strong>Occupation Status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employee</td>
<td>10</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Housewife</td>
<td>38</td>
<td>76*</td>
<td></td>
</tr>
<tr>
<td>Student</td>
<td>2</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Free job</td>
<td>10</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td><strong>Resident</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>39</td>
<td>78*</td>
<td></td>
</tr>
<tr>
<td>Suburban</td>
<td>7</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>4</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td><strong>Economic Status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sufficient</td>
<td>18</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>Sufficient to Some Extent</td>
<td>7</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Insufficient</td>
<td>25</td>
<td>50*</td>
<td></td>
</tr>
</tbody>
</table>

Total No.: 50, * ($P \leq 0.05$)

Among reproductive factors, significant increases ($P \leq 0.05$) were showed among values of 16-19 years of marriage’s age, 4-8 gravid, 4-8 para, 1-2 abortions, 3-6 live children, 3-5 years interval of last pregnancy, irregular attended to hospital and singleton pregnancy, (Table 2).

**Table 2: Results of reproductive factors**

<table>
<thead>
<tr>
<th>Factor</th>
<th>Rating</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Marriage Age/Year</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 15</td>
<td>6</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>16-19</td>
<td>23</td>
<td>46*</td>
<td></td>
</tr>
<tr>
<td>20-23</td>
<td>10</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>24-27</td>
<td>9</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>≥ 28</td>
<td>2</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td><strong>Gravida</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 - 3</td>
<td>2</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td>4 - 8</td>
<td>26</td>
<td>52*</td>
<td></td>
</tr>
<tr>
<td>&gt; 8</td>
<td>7</td>
<td>14</td>
<td></td>
</tr>
</tbody>
</table>
Regarding to other factors, the significant elevation (P<0.05) in results of mother related factors were reported in abnormal mother’s weight, having reproductive system illness, Rh incompatibility, do not marriage to relatives, do not infected, received medication, smoking passively, and having previous history for abortion. On other hand, there no factors related to fetus or environment, were appeared to be incriminated with VB, (Table 3).

Table 3: Results of other factors

<table>
<thead>
<tr>
<th>Factor</th>
<th>Rating</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mother- related factors</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mother’s Weight</td>
<td>Normal</td>
<td>12</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>Abnormal</td>
<td>38</td>
<td>76  *</td>
</tr>
<tr>
<td>Reproductive System Illness</td>
<td>Yes</td>
<td>32</td>
<td>64  *</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>18</td>
<td>36</td>
</tr>
<tr>
<td>Rh Compatibility</td>
<td>Yes</td>
<td>13</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>37</td>
<td>72  *</td>
</tr>
<tr>
<td>Marriage to Relatives</td>
<td>Yes</td>
<td>24</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>24</td>
<td>52</td>
</tr>
<tr>
<td>Infections</td>
<td>Yes</td>
<td>19</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>31</td>
<td>62  *</td>
</tr>
<tr>
<td><strong>Total No.:</strong> 50, (P≤0.05)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Association of socio-demographic factors to other factors was presented in (Table 4). However, significant variations (P<0.05) in values of age, level of education, occupation status, and economic status with the mother, fetus and environment factors were appeared statistically.

Observational studies suggested that there are many factors have a prognostic value regarding to outcome of a subsequent pregnancy 17. In this study, the results of socio-demographic and reproductive factors in addition to VB causes were appeared to play an important role in incidence of bleeding and/or miscarriage during the 1st trimester of gestation. Also, most studied factors might overlap or act together to induce of VB. Results of marriage’s age with maternal age were detected in this study at 16-19 years and 21-25 years, respectively.
The elevated VB rates at this level of age could be attributed to complications that studied extensively such as the hypertension, uterine decompression, placental abruption, prolonged rupture of membranes, and short umbilical cord. However, many studies dealt separately with the influences of maternal age on risks of VB, were reported that the increased maternal age will heighten the fold-rates of VB. Among the socio-demographic factors, there positive correlation between the levels of education, occupation status, resident, and economic status were observed in this study. In many countries, despite the elevated degree of opportunity equality; family background still plays great roles in an inheritance of income, education and social class. Many studies have been suggested that the economic conditions are of great importance at early childhood as the parental characteristics can be influenced on education more during adolescence. In contrast, suggested that the economic conditions of less value than other factors. However, other causes could heighten the negative role of socio-demographic factors such as the psychological stress, family structure and low-life experience. It appeared that the numbers of abortion/s and live children were intermediate, whereas interval to last gestation was elevated among VB pregnant women at 1st trimester disregarded on types of last delivery. In addition, irregular attention to hospital or physician might increase the chance for frequent bleeding in pregnant women as reported in present study. In women with previous history of abortion, expectant management has a variable success rates, but with medical therapy, it provide a high success rate for completion of reproductive problems without surgical intervention. Heavy or irregular VB is important medical issue which can lead to diminished quality of life and consequential anemia. Currently, there no available standardized clinical tools are reliable to obtain data regarding to severity of patient’s bleeding. However, gynecologists and emergency room physicians can regularly provided the suitable medical care to patients requesting an evaluation and/or treatment to decrease bleeding, decrease a risk, and improve a quality for life.

Regarding to pregnancy status, the results of present study were showed that VB in 1st trimester of gestation more prevalence in women with single than twin pregnancies. Very few studies have specifically examined the relationship between 1st trimester VB and pregnancy outcome in single or twins. However, these findings might be explained by the fact that more samples involved in this study have single pregnancy. Results reported by were showed that VB in case of singleton correlates with an increased rate of preterm and very preterm birth and consequently a lower birth-weight. In other factors of this study, mother-related-factors were revealed on significant variations in their characteristics but neither in fetus- nor environment-related factors. According to new reporters, the obese or overweight pregnant women having higher blood glucose result in fetus larger than normal. Up to now it has been unclear the factors might be important in linking a mother’s size to that of her fetuses. In low mother’s size, placental or uterine problems might be incriminated in incidence of vaginal bleeding during 1st trimester of gestation particularly in younger pregnant women.

**Conclusion**

In reproductive factors, significant elevation (P<0.05) were detected in women married at 16-19 years of age, 4-8 gravida, 4-8 para, 1-2 abortions, 3-6 live children, 3-5 years interval for last pregnancy, irregular attended to hospital and singleton pregnancy. Among other factors, significant increasing (P<0.05) were detected only in mother-related factors including abnormal mother’s weight, have reproductive illness, Rh incompatibility, non marriage to relatives, non infected, received medication, smoking passively, and having previous history for abortion and curettage.

**Source of Funding:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the College of Nursing, University of Thi-Qar, Nasiriyah, Dhi-Qar, Iraq and all experiments were carried out in accordance with approved guidelines.

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Analysis of Meiotic Genes Under Different Temperatures

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ABSTRACT

One of the most consumed crops globally is bread wheat (*Triticum aestivum*). This crop possesses a hexaploid genome that makes it possible to manipulate its genome and produce new mixtures of desirable traits. However, the fertility of bread wheat is highly affected by heat stress occasioned by global warming. In this study, wheat spikes RNA was extracted and used for cDNA synthesis. The conventional PCR approach was used to amplify some gene prior to gene cloning and determination of genes expression via quantitative PCR. The differences in genes expression were determined over a range of temperatures. Heat stress effect on the activity of meiotic genes, transcription factors, and chromatin organization was showcased in the varying levels of genes expression at the studied temperatures.

**Keywords:** *Triticum aestivum*, meiotic genes, genes expression, heat stress, sterility.

Introduction

Among the most planted food crops in the world is bread wheat (*Triticum aestivum*) due to its significance in human nutrition. It is also an economic crop in most countries, like in the UK where contributes nearly in £1.6 Billion to the country’s economy. However, it is exposed to some issues that may reduce its yields. These issues include the global warming and overpopulation. The global warming is increased every 10 years by 0.2 °C. This increase could affect the fertility of wheat. The other problem is concerned with the overpopulation that could reach 8.9 billion in the next 40 years. This causes highly consumption of bread wheat. From another point of view, bread wheat has an interested genome which subjected to series of manipulations and adaptations throughout decades to be in its current hexaploid form. In addition, its genome is still not fully sequenced. The first step in meiosis involves reduction in the number of chromosomes by half. In the second step, fertilization takes place to restore the number of chromosomes to the original diploid homologues. During meiosis Chromosomes undergo homologous crossing-over to rearrange their traits and produce new chromosomal combinations. *TaDMC1* locates on chromosome 5 of (A, B, and D) genomes of *T. aestivum*. It is about 1035 bp and its protein (*TaDMC1*) has 344 a. a. According to RT-PCR analysis, gene expression was detected in both reproductive and vegetative cells with more levels of expression in meiotic tissues. Moreover, *TaDMC1* produces higher level of expression in B and D genomes than its expression in A genome. *TaDMC1* is a meiotic-specific protein, its action starts after the formation of DSBs. It stimulates homologues recombination instead of the sister chromatid to form a double holiday junction. A mutated *dmc1* in yeast resulted in sterility due to the accumulation of disabled *dmc1* and subsequently the DSB repairing system and SC are defected. Crossing-over regulation in most organisms is maintained by Synaptonemal Complex (SC). This complex is initiated by ASY1, ASY3, and ZYP1 during zygotene. The activity of these different protein complexes that involved in (SC) formation in most organisms is regulating the crossover formation between homologous chromosomes. SC is necessary for the progression of meiosis and maintenance of normal homologous crossover levels.

The first SC gene in *T. aestivum*, (*TaASY1*) has a significant similarity to other *ASY1* sequences in plant...
species such as BoASY1 in *Brassica oleracea*. Its location is on chromosome 5 of each ancestral genome in *Triticum aestivum* with 6.5 kb in length, 22 exons and 21 introns. Northern analysis, microarray and qPCR methods were performed by (4) to identify the expression of TaASY1. These methods were helpful to follow the expression of TaASY1 which starts before meiosis and continues to pachytene where it ends there.

The other SC gene (TaASY3) is still not well identified. Therefore, AtASY3 in Arabidopsis was a good alternative to understand its characteristics. AtASY3 length is 3kb and encodes about 793 a.a. It is important for stabilizing protein structure and maintain normal protein-protein interactions 8. According to RT-PCR, ASY3 expression was noticed in reproductive tissues. This means it contributes in reproductive processes. Knocking-out AtASY3 reduced 75% of the fertility in the plant. That means it has an important role in meiosis 8. During cytological analysis of normal pachytene, synopsis between the homologues chromosomes is normally processed while synopsis failed in the mutated version. This results in producing univalent chromosomes and consequently produce aneuploidy tetrads 8.

Finally, the last SC gene (TaZYP1) has counterparts in other plant species such as maize (ZYP1), Arabidopsis (AtZYP1a, AtZYP1b), and rice (ZEP1). Transverse filament (TFs) protein of the SC in plants is encoded by ZYP1. TF is important in the formation of CE (central element) which is included in SC formation 3, 13, 18, 10. In the three genomes of T. aestivum (A, B and D), TaZYP1 founds on chromosome 2. qPCR was used to detect the first signal of TaZYP1 expression 10. This signal started at leptotene, increases during prophase I substages, and finally disappears during diakinesis. in Arabidopsis the same behaviour has been noticed 13, 15. This behaviour leads to estimate that ZYP1 foci are continued to be formed during synopsis13. ZYP1 is considered to have a noticeable contribution in meiosis. This consideration is generated from firstly the immunolocalization studies on (TFs), which found that there is a significant homology in (TFs) among plants 3, 10, 13. Secondly, qPCR results showed that the youngest meiotic tissues exhibit the highest level of ZYP1 expression. Moreover, ZYP1 has an important contribution in controlling COs formation and consequently in producing the normal haploid gametes 3. This contribution was estimated from ZYP1 function in building a normal chiasmata structure. Finally, ZYP1 was knocked down in Barley. This resulted in producing less seeds per spike in the transgenic plants. The explanation of this defects at the molecular level is that many univalents were produced from the transgenic plants, which resulted in reducing the number of bivalents per cell.

This study aims to detect the temperature level that influences wheat sterility by growing different wheat varieties at different temperature ranges.; another aim is the detection of some meiotic gene expression levels at varying temperatures in a bid to understand their role in wheat sterility using qPCR and bioinformatics databases. This study mainly focuses on some of the selected wheat genes that are implicated in DSBs formation, SC formation, and homologous recombination.

**Experimental Method**

**Plant Material:** Six anthers from six Apogees grew at six different temperatures were used to extract RNA and later reverse transcribed 5µg of it into cDNA using Bioline kit. My Taq- red mix (Bioline) was used for PCR amplification of ASY1 and ZYP1, ASY3.

**Gene cloning and transformation:** The TOPO® XL PCR Cloning Kit was used for cloning and transforming the genes.

Minipreps were prepared to isolate DNA by E.Z.N.A.® Plasmid Mini Kit I.

**Genomic sequencing:** The cloned vector was sequenced by GATC Service. For this process, 5 µL of the vector and its inserted gene was placed in a tube before adding either the forward/reverse primers to get the sequence from either direction (this requires two microcentrifuge tubes). The primers from the vector sequence surrounding the inserted sequence were used to obtain the sequence of the inserts. The sequence was finally downloaded from the website of GATC.

**SYBR Green qPCR:** The amplification and detection of the sequences via qPCR require small sizes of the sequences; thus, the size of the amplified sequence
must range from 150-300bp. The primers work better at a concentration of 250nM while the best annealing temperature is 60°C.

The qPCR machine (Model: ABI 7500 Real-Time PCR System) was used to perform the PCR.

**Results and Discussion**

**Real-time-based meiotic gene expression quantitation at varying temperatures:** RNA was extracted from Apogees, that grew at different temperatures (20°C - 30°C), and reverse transcribed into cDNA. ZYP1 and DMC1 were amplified from the cDNA using qPCR. Their relative expression levels were calculated using The ΔΔCT method, (Figure 1 and Figure 2). The expression level at 20°C served as the reference level for benchmarking those from the other temperatures. The highest level of ZYP1 expression was at 24°C. Then it starts to decrease gradually at 26°C and 28°C. Then surprisingly increased at 30°C in a U-shaped curve.

![ZYP1](image1)

**Figure 1:** The relative expression of ZYP1. ZYP1 was amplified from Apogee spikes grown at six different temperatures. Setting the expression level of ZYP1 from the 20°C tissue as a control, and the relative expression at other temperatures.

![DMC1](image2)

**Figure 2:** The relative expression of DMC1. DMC1 was amplified from Apogee spikes grown at six different temperatures. Setting the expression level of DMC1 from the 20°C tissue at one as a control, and the relative expression at other temperatures.
The expression level of DMC1 at 22°C was a bit higher than its expression level at 20°C; however, it takes the U-shaped curve where there was a significant increase in the expression level at 24°C before gradually decreasing at 26 and 28°C. It increased later at 30°C.

**Gene Sequencing:** ASY1, ASY3 and ZYP1 were amplified via PCR from wheat spikes cDNA and later they were sequenced. The identity of the purified DNA sequences was confirmed by BLASTing them in ENSEMBL. These genes were cloned as well to determine their genome origin. Then, the gene sequences were finally matched to the wheat genomic sequence database in ENSEMBL, followed by the determination of the phylogenetic tree using Geneious software.

The whole sizes of the whole cloned meiotic genes were determined to be: ASY1 =1.8kb, ZYP1 =2.7kb, ASY3 =3kb.

These genes were successfully sequenced and matched to their ancestral genomes, hence, their phylogenetic trees were produced to estimate their evolutionary relationships and to determine the genome with more manipulations over time (based on the length of the horizontal branches; where longer branches indicate larger genetic manipulations over time). It also discloses the similarity of the individual clones to their respective genome in ENSEMBL.

Figure 3 depicts the phylogenetic tree of ASY1 in the ancestral genomes of the wheat tree. This figure displays the relationship of each genome with the other 2. Expectedly, there was a close relationship between B and D genomes compared to A genome, indicating that A genome has undergone more manipulations compared to the other 2 genomes. Meanwhile, ASY3 and ZYP1 trees depicted exhibited unusual outcomes regarding the relationship between the 3 genomes. From the two trees, A and D genomes are closely related but B genome is the most unrelated.

![Figure 3: ASY1 tree shows the alignment of the cloned sequences to their similar sequences that were obtained from ENSEMBL.](image-url)
**Discussion**

*Real-time PCR-guided quantitation of meiotic gene expression at varying temperatures:* Six anthers were picked from 6 different Apogees growing at 6 different temperatures. From these anthers, cDNA was synthesized from their RNA and used for ZYPI and DMC1 amplification in qPCR. The ΔΔCT method was used to calculate the relative expression levels of these genes at different temperatures. The expression level at 20°C served as the reference point (Figure 1 and Figure 2). This experiment mainly aims at checking the influence of different temperatures on certain meiotic genes, as well as clarifying the role of increased temperature on the sterility of wheat plants. The highest levels of ZYPI and DMC1 expression were achieved at 24°C. However, the lowest expression level was at 28°C, followed by an abrupt increase at 30°C. This gradual decrease could be due to the effect of increased temperature on the activity of the transcription factors (TFs) which are subtle to heat shock. Similarly, the organization of chromatin can be transformed at increased temperatures, thus, limiting the transcription of TFs from chromatin. Meanwhile, the outcome of heat stress on multiple factors could be the reason for the unexpected high expression of the genes at 30°C.

**Gene sequencing:** Based on ASY1 tree depicted in Figure 3, ASY1 on chromosome 5 is oldest in the A genome (ASY1 5A) compared to the other 2 genomes (B and D) as it aligned far from them. This is an expected result since it is established that in the T. urartu (AA), the A genome appears before B or D genomes. Meanwhile, the 2 other trees produced different results regarding the oldest genome. These trees presented B as the oldest genome while D genome was more related to A genome. This observation could be attributed to the phylogenetic tree-associated restrictions which could cause major alterations in any of the related sequences (such as a new alteration affecting the reading of B genome sequence, hence, making A and D genomes look more related).

**Conclusion**

In this study, the levels of expression of 2 genes (ZYPI and DMC1) were determined at 6 different temperatures and the obtained results from the qPCR analysis showed a real effect of temperature on the expression levels of these genes which could be the reason for most cases of sterile wheat plants. The molecular analysis showed that this effect on the genes was due to the destruction of the genes at higher temperatures, thereby making them lose their function. The effect was more on the transcription factors such that their activity was altered at higher temperatures. From the phylogenetic trees for the 3 genes (ASY1, ASY3, and ZYPI), it was shown that ASY1 in the 3 genomes exhibited the expected evolutionary history, where A was shown as the oldest genome, followed by B, while D is the newest one. Meanwhile, the 2 other genes exhibited a different genomic order for the 3 genomes; B genome was shown as the farthest from the other 2 genomes probably due to the alterations of its genome, making it be different from the other two genomes.

**Conflict of Interest:** The researcher has no conflict of interest to report.

**Source of Funding:** Self-funding.

**Ethical Clearance:** All data has been prepared in the department of Genetics and Genome Biology laboratories/Leicester University.

**REFERENCES**


Using the Level of Serum YKL-40 as an Indicator to the Pathogenesis of Allergic Asthma and Helminths Infection

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ABSTRACT

The aim of this study was to investigate the role of YKL-40 as a possible marker in the diagnosis of allergic asthma and to study its relationship with the level of total and specific serum IgE in allergic asthmatic patients and allergic asthmatics with helminths infection. This study included 150 patients, 100 patients with allergic asthma and 50 patients having allergic asthma and helminths infection, fifty subjects of them were males and 100 females, age 15-60 years. In addition, 30 healthy individuals were depended as a control, divided into 14 males and 16 females age 15-60 years. For each subject, the medical history was considered. The total and specific IgE, as well as the YKL-40, were determined in the patients’ sera using ELISA technique. The mean serum level of total IgE was 374.540 IU/mL in allergic asthmatic subjects, which is significantly different from its value in the healthy control, mean 29.216 IU/mL, and in the group of allergic asthma with helminths infection, mean 472.242 IU/mL. In addition, the IgE level was also significantly different in the subjects of allergic asthma with helminths infection from its level in healthy control.

Keywords: Allergic asthma, asthma with helminths infection, YKL-40, Chitinase-like protein, Asthma biomarkers, total and specific IgE.

Introduction

Allergic asthma is a chronic disorder of airways with acute lung inflammation and bronchial hyperresponsiveness. Its airway inflammation is heterogenic in its type and intensity and characterized by different respiratory symptoms including dyspnea, wheezing, chest discomfort and cough, and variable airflow limitation (¹,²). These symptoms are often triggered by several factors such as allergen exposure, irritant exposure, exercise, viral respiratory infections, or change in weather (³,⁴). Asthma is a major public health problem which affects many people, young and old, males and females, all over the world. However, its thought to be caused by a combination of complex genetic and environment interactions, and it may be divided into extrinsic (allergic asthma) and intrinsic asthma (non-allergic asthma), which are both have the same signs (⁵,⁶). Allergic asthma is characterized by airway eosinophilia, goblet cell hyperplasia with mucus hypersecretion and hyper-responsiveness to both inhaled allergens and nonspecific stimuli. The mast cells also play an important role in the pathogenesis of allergic asthma by releasing its inflammatory mediators ⁷. The severity of allergic asthma is affected by the presence of helminths infections as it induces an immune response by activating some immune cells especially eosinophil. In addition, parasites like helminths are stimulating a strong polarization of Th2 response which correlates with the development of allergic diseases and IgE production ⁸. Moreover, some parasitic helminths can secrete and encode certain proteins which have are highly similar to known allergens, so that, after a helminth infection, the host develops an IgE response to the helminth which can interact with the aeroallergens ⁹. A YKL-40 is a chitinase-3-like protein1 (CHI3L1) which is produced at the sites of Inflammation. It has been identified in 1993 as a product secreted by articular chondrocytes and synovial cells. The

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name of YKL-40 is derived from the three N-terminal amino acids: tyrosine (Y), lysine (K) and leucine (L) which are found in its structure and its molecular mass. YKL-40 is a glycoprotein (40 kDa in size) that binds to chitin and encoded by the CHI3L1 gene (10,11). YKL-40 is secreted and expressed by a variety of cells including the chondrocytes, macrophages, vascular smooth muscle cells, fibroblast-like synovial cells and hepatic stellate cells. Its expression is associated with pathogenic conditions such as allergic asthma, allergic diseases, tissue inflammation, extracellular tissue remodeling, carcinomas and fibrosis (12,13). The measurement of YKL-40 levels has a useful prognostic and diagnostic value in asthma. The high serum levels of YKL-40 are correlated with the severity of allergic asthma, airway remodeling and decreased pulmonary function 14. Importantly, the elevated serum levels of YKL-40 protein in allergic asthmatic patients are positively associated with the total serum IgE levels (T.IgE). Therefore, YKL-40 is believed to contribute in the pathogenesis of allergic asthma and it has been found to be either the cause or a biomarker of allergic asthma (15,16).

Materials and Method

Subjects: The current study included 150 allergic asthmatic patients immunologically confirmed (100 with allergic asthma and 50 having allergic asthma and helminth infection together). This group was comprised of 100 women and 50 men aged 15-60 years. These Patients were adopted from the Specialized Center of Allergy in Baghdad/Al-Rusafah and Al-Zahraa Center of Allergy in Baghdad/Al-Karkh for the period from July 2018 to January 2019. Allergic asthmatics was firstly diagnosed by physicians specialized in Respiratory diseases and in Ear, Nose and Throat (ENT) diseases, according to the international criteria based on the clinical details of the medical history, chest X-ray, physical examination, medicines and the history of recurrent episodes of wheezing and chest tightness. Exclusion criteria were included: smoker, oral corticosteroids, respiratory tract infection, cancer, any chronic disease other than asthma, parasite infection and pregnancy. In addition, parasitic infections were diagnosed by stool examination (SE) of asthmatic patients. The control group included 50 healthy individuals, 20 males and 30 females, in age of 15-60 years. Exclusion criteria were chronic respiratory disorders, current or past history of allergy, having or not helminths infection and all chronic diseases mentioned in reference to the study group.

Study Design: All patients underwent a detailed clinical examination and complete total immunoglobulin E test (T.IgE), specific immunoglobulin E test (S.IgE), general stool examination (GSE) and determination of serum YKL-40.

Five milliliters of peripheral blood sample were collected from each subject using a plastic disposable 10ml syringes under sterile conditions. The blood collected in a gel tube to get the required serum for serological tests (T.IgE, S.IgE, YKL-40). After blood clotted, it was centrifuged for 10 minutes at 2500 rpm, then the serum divided onto three Eppendorf tubes, one for each test. All serum samples were kept frozen at -20˚C until they are used.

The stool samples have been taken from all the participants. The specimens were collected in clean dry plastic jars. Samples were treated with normal saline and/or Iodine dye and examined under the microscope to investigate the presence of helminths infections. For the best outcomes, the stool samples should be conveyed to the examination immediately.

Determination of T-IgE: The T.IgE levels were estimated using a sandwich Enzyme Linked Immunosorbent Assay (ELISA) kit (Euroimmune, Germany) according to the manufacturer’s instructions. Each well in the microtiter plate was coated with polyclonal anti-IgE, then samples were applied followed by adding the conjugate enzyme. The IgE concentration was determined in the end using a calibration curve.

Determination of S-IgE: The determination of S-IgE was performed using an enzyme immunoosorbent assay (polycheck kit, Germany). The inhalation profile kit that used to diagnose the types of allergens contains 20 parameters from the common allergens as shown in Table 1. The polycheck strips first wetted with buffer solution then coated with allergens and calibrators (Figure 1) before starting the work. Patient’s serum and control were added following this step and incubated on rocker shaker (according to the manufacturer’s instructions). In the next step, the conjugate was applied followed by the substrate.
Table 1: The Inhalation Allergens

<table>
<thead>
<tr>
<th>Allergen code</th>
<th>Name of Allergen</th>
</tr>
</thead>
<tbody>
<tr>
<td>T7</td>
<td>White Oak pollen</td>
</tr>
<tr>
<td>T3</td>
<td>Birch pollen</td>
</tr>
<tr>
<td>T4</td>
<td>Hazel pollen</td>
</tr>
<tr>
<td>T2</td>
<td>Alder pollen</td>
</tr>
<tr>
<td>W9</td>
<td>Plantain pollen</td>
</tr>
<tr>
<td>W6</td>
<td>Mugwort pollen</td>
</tr>
<tr>
<td>G6</td>
<td>Timothy Grass pollen</td>
</tr>
<tr>
<td>G12</td>
<td>Rye pollen</td>
</tr>
<tr>
<td>D1</td>
<td><em>Dermatophagoidespteronyssinus</em> Allergen</td>
</tr>
<tr>
<td>D2</td>
<td><em>Dermatophagoidesfarina</em> Allergen</td>
</tr>
<tr>
<td>E2/E5</td>
<td>Dog epithelia allergen</td>
</tr>
<tr>
<td>E1</td>
<td>Cats epithelia allergen</td>
</tr>
<tr>
<td>E3</td>
<td>Horse epithelia allergen</td>
</tr>
<tr>
<td>E6</td>
<td>Guinea epithelia allergen</td>
</tr>
<tr>
<td>E84</td>
<td>Hamster epithelia allergen</td>
</tr>
<tr>
<td>E82</td>
<td>Rabbit epithelia allergen</td>
</tr>
<tr>
<td>M2</td>
<td><em>Cladosporium herbarum</em> allergen</td>
</tr>
<tr>
<td>M3</td>
<td><em>Aspergillus fumigatus</em> allergen</td>
</tr>
<tr>
<td>M1</td>
<td><em>Penicillium notatum</em> allergen</td>
</tr>
<tr>
<td>M6</td>
<td><em>Alternaria alternata</em> allergen</td>
</tr>
</tbody>
</table>

Figure 1: The strip of polycheck kit

Determination of serum YKL-40: The levels of patient serum YKL-40 were determined using a sandwich enzyme linked immunosorbent assay (ELISA) kit (My BioSource, USA) based on the manufacturer’s instructions where microtiter plates have pre-coated with the anti-YKL-40 antibody. The YKL-40 will bind to the anti-YKL-40 in the first step. This is followed by adding the biotin and the conjugate to detect the pre-coated antibodies in the wells. Adding the TMB substrate will produce a blue color which will be changed to yellow when adding the stop solution. The concentration of CHI3L1 is proportional to the density of the produced yellow color, which is read using the microplate reader at 450nm to find the concentration of CHI3L1.

Investigation of helminth infections: The association of parasitic helminths infection which may found in the group of allergic asthmatic patients were investigated using general stool examination. Fecal samples were collected from the patients and control groups. The specimens were directly examined under 10X and 40X objectives.

Statistical analysis: Data were analyzed using statistical software (IBM SPSS Statistics 23.0). Demographic data were analyzed with a t-test to compare among two means. The concentration of YKL-40, T.IgE and S.IgE were compared in allergic asthmatics, allergic asthmatics with helminths infection and in the control groups. For these analyses, the least significant difference test (LSD) was utilized to significant comparison among means over than three where data were expressed as (mean ± SE). Level of significance was defined as 0.05 by using ANOVA test, with probability $P \leq 0.05$ (significant), $P > 0.05$ (none significant) or $P < 0.01$ (highly significant).

Results

Studying the relationship between the infection with allergic asthma and serum level of YKL-40 as well as its relationship with the level of total and specific IgE has been addressed in this study for the first time in an attempt to find the potential role of YKL-40 in asthmatic patients. In addition, the effect of the association of helminths infection with allergic asthma and the effect of this association on the immune response of allergic asthmatic patients was also investigated for the first time, particularly in regard with the biomarkers mentioned above.

The current study has observed a significant elevation in the levels of the total serum IgE and serum level of YKL-40 in allergic asthmatic subjects and allergic asthmatics with helminth infection compared with healthy individuals. The mean serum level of total IgE of asthmatics was $374.540 \pm 10.394$ IU/mL which is highly significant than its level in the healthy control (mean value $29.216 \pm 1.786$ IU/mL, $p < 0.01$). In addition, the mean T.IgE level in allergic asthmatic subjects with helminth infection is $472.242 \pm 6.273$ IU/mL which is more highly significant than that of the
However, the T-IgE levels in the patients with allergic asthma and helminth infection was higher than its level in the patients only having allergic asthma, the full comparison is presented in Figure 2.

![Figure 2: The levels of total IgE in allergic asthma, allergic asthma with helminths and the control](image)

**Figure 2:** The levels of total IgE in allergic asthma, allergic asthma with helminths and the control

Allergens sensitization test was also performed in the current study by evaluating the level of serum S.IgE. The results have disclosed that 113 (75%) patients were positive reacted to S.IgE, whereas 37 (25%) patients were negative in this test. A percentage of 72% of allergic asthmatics were positively reacted, while 28% were negatively responded to the S.IgE test. In addition, in the group of allergic asthmatics with helminths infections, 82% of patients were positive to S.IgE test, and only 18% of them were negative to S.IgE, Figure 3.

![Figure 3: positive and negative specific IgE in the groups of allergic asthma and allergic asthma with helminths](image)

**Figure 3:** positive and negative specific IgE in the groups of allergic asthma and allergic asthma with helminths

*The most common aeroallergens were house dust mites D1 and D2 (27%, 26%) respectively, whereas Guinea epithelia (E6) and Hamster epithelia (E84) have the lowest percentage (1%, 1%). In addition, the groups of allergic asthma’s subjects were also showed that D1 and D2 have the highest rate of sensitization with a percentage of 23, 19, respectively. While subjects of allergic asthma with helminth infection had the percentage of D1 (36%), D2 (34%), as it can be seen in Table 2.

**Table 2: Aeroallergens type in the groups of allergic asthma and allergic asthma with helminths**

<table>
<thead>
<tr>
<th>Allergen code</th>
<th>Name of Allergen</th>
<th>Asthmatics</th>
<th>Asthmatics with helminth infection</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1</td>
<td><em>Dermatophagoides pteronyssinus</em></td>
<td>23</td>
<td>18</td>
<td>41</td>
</tr>
<tr>
<td>D2</td>
<td><em>Dermatophagoides farina</em></td>
<td>19</td>
<td>17</td>
<td>36</td>
</tr>
<tr>
<td>T7</td>
<td>White Oak pollen</td>
<td>22</td>
<td>13</td>
<td>35</td>
</tr>
<tr>
<td>T3</td>
<td>Birch pollen</td>
<td>11</td>
<td>10</td>
<td>21</td>
</tr>
<tr>
<td>T4</td>
<td>Hazel pollen</td>
<td>5</td>
<td>6</td>
<td>11</td>
</tr>
<tr>
<td>T2</td>
<td>Alder pollen</td>
<td>17</td>
<td>16</td>
<td>33</td>
</tr>
<tr>
<td>W9</td>
<td>Plantain pollen</td>
<td>17</td>
<td>15</td>
<td>32</td>
</tr>
<tr>
<td>W6</td>
<td>Mugwort pollen</td>
<td>9</td>
<td>10</td>
<td>19</td>
</tr>
<tr>
<td>G6</td>
<td>Timothy Grass pollen</td>
<td>18</td>
<td>9</td>
<td>26</td>
</tr>
<tr>
<td>G12</td>
<td>Rye pollen</td>
<td>27</td>
<td>13</td>
<td>37</td>
</tr>
<tr>
<td>E2/E5</td>
<td>Dog epithelia</td>
<td>9</td>
<td>12</td>
<td>21</td>
</tr>
<tr>
<td>E1</td>
<td>Cats epithelia</td>
<td>16</td>
<td>10</td>
<td>26</td>
</tr>
<tr>
<td>E3</td>
<td>Horse epithelia</td>
<td>6</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>E6</td>
<td>Guinea epithelia</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>E84</td>
<td>Hamster epithelia</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>E82</td>
<td>Rabbit epithelia</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>M2</td>
<td>Cladosporium herbarum</td>
<td>2</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>M3</td>
<td><em>Aspergillus fumigatus</em></td>
<td>5</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>M1</td>
<td>Penicillium notatum</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>M6</td>
<td>Alternaria alternate</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>
In allergic asthmatic patients, the mean level of serum YKL-40 was 993.595 ± 27.995 pg/mL which is significantly different from its level in the healthy control where it was 358.712 ± 5.676 pg/mL. In addition, highly significant differences ($p < 0.01$) has also been observed between the level of serum YKL-40 in allergic asthmatics with helminths infection and healthy control where it was 1204.722 ± 38.009 and 358.712 ± 5.676 respectively. The YKL-40 levels were also higher in allergic asthmatic patients with helminths infection 1204.722 ± 38.009 pg/mL compared to allergic asthmatic patients 993.595 ± 27.995 pg/mL. The full details are displayed in Figure 4.

![Figure 4](image)

**Figure 4:** Serum levels of YKL-40 in the groups of allergic asthma, allergic asthma with helminths and control

There was a significant correlation between the high levels of T.IgE and the increased YKL-40 concentration in all the study groups as it can be seen in Figure 5.

![Figure 5](image)

**Figure 5:** the positive correlation between T.IgE and YKL-40 in the groups of allergic asthma, allergic asthma with helminths and control

Discussion

Allergic asthma is one of the most common chronic diseases and it is a major public health problem that affects many people, young and old, men and women, all over the world. Although any age can be infected with this disease, the rate of allergic asthma was found to be higher in the fourth decades of age in the present study, which is quite similar to the result of Peng et al., (2019) who found that allergic asthma sensitivity was replicated in the midchildhood. Jarvis et al., (2012) whom found that the symptoms of asthma appear under 50 years of age. However, Milgro and Huang (2014) have expected that the prevalence of allergic diseases, particularly allergic asthma, in elderly people may be a result of the gradual decline in immune function and changes in tissue structure that related with ageing, which may affect the development of these diseases.

The present study indicated that allergic asthma is spread among women more than men in Iraq at a ratio of 2:1, which is in agreement with another study in Iraq of Wahhab (2013) who found that the females were more severely affected by asthma compared with men. Such results may correlate with many important factors such as the biochemical and hormonal differences associated with patients’ gender which play a role in the pathophysiology of asthma.

The innate and adaptive immune response plays a key role in the severity and pathogenesis of allergic asthma. IgE is well known component of allergic reactions since it produced through the process of sensitization which is initiated on the first exposure to the allergen. Additionally, the T.IgE level increases also with helminths infections; it binds with specific receptors (Fc Epsilon RI) on the mast cells and basophils’ surface. The observed results of the T.IgE are indicating that the T.IgE plays a central role in the initiation and propagation of the inflammatory cascade in the allergic response and in the immune response to helminths infection, as in figure 2. This is agreeing with other previous studies in Iraq of Abood et al., (2013), Wahhab, (2013), Hassan, (2015), Brakhas et al., (2016) and Rasheed, (2016) who claimed that the level of T.IgE is significantly increasing in asthmatic patients compared to controls.

Conclusion

As YKL-40 has a prominent correlation with the pathogenicity and some clinical features in allergic asthma and helminths infection such as the total and specific IgE levels, it can be suggested that YKL-40 can be used as a biomarker in asthma and also in the helminths infection.
Source of Funding: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Science, Mustansiriyah University, Baghdad-Iraq and all experiments were carried out in accordance with approved guidelines.

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Assessment of Anxiety Level among Women Prepared for Cesarean Section at Babylon Hospitals

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ABSTRACT

In the preoperative period, women prepared for the cesarean section have anxiety associated with many factors. Anxiety about their surgery, any minor health problem during pregnancy, the number of abortions, etc. All these factors can increase the level of anxiety prior to cesarean birth. Objectives: To assess of Anxiety level among women prepared for cesarean section at Babylon hospitals. A descriptive-correlational study design using (a purposive sample) non-probability of women prepared for cesarean section (N=90) at Babylon hospitals. Taylor manifest anxiety scale was used anxiety levels. The tool consists of 20 questions, the person answers the questions by interview. The analyzed data during descriptive statistical analysis application (mean of score, frequency and percentage) and (SPSS) version 25 with, inferential data analysis (Chi-square) and Microsoft excel (2016) to assess and estimate the study sample. The findings of the study indicate that most women prepared for a cesarean section of samples (65.6%) were moderate anxiety. Moderate anxiety level has highly significant relation with Socio-demographic data (age, education level, occupation) and has highly significant correlation with matters related to pregnancy (primipara, minor health problem and diseases during pregnancy).

Keywords: Anxiety, women, cesarean section.

Introduction

Pregnancy state is within psychological, physiological, social and hormonal changes will be present, the psychiatric morbidity and emotional hurting probability high the risk within phase of a female’s life. A few women may experience pregnancy state associated with self-fulfillment, satisfaction and happiness as a source. Some others, in their mental health, may experience alteration in this period, such as the progress of worry 1. The psychological condition between several cultures that considering the belief of the mother can affect the child in her womb, one of the risk factors is anxiety disorder in pregnancy development 2. The emotional condition characterized through fear and worry leading a threatening event anticipation that called anxiety. In preoperative anxiety, the incidence within adult patients range from (11-80 %) and between several surgical in different groups, there is variation finding 3. It has been observed that obstetric patients have a higher level of preoperative anxiety levels compared to general surgery. Extreme anxiety adversely influences both induction of anesthesia and its recovery. In the caesarean section, increased consumption of anesthesia affects the mother and the baby as well 4. In this study, it is important to know the degree and causes of anxiety for understanding a patient’s psychology. In the preoperative period, women prepared for the cesarean section have anxiety associated with many factors. Anxiety about their surgery, any minor health problem during pregnancy, the number of abortions, etc. All these factors can increase the level of anxiety prior to cesarean birth 5.

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Objectives

1. To assess the level of anxiety among women prepared for a cesarean section.
2. To find out the relationship between various socio-demographic variables and the level of anxiety.
3. To find out the relationship between matters related to pregnancy and the level of anxiety.

Methodology

- **Study design:** (A descriptive-correlational) study is conducted throughout the period of (1st December 2018 to 19th January 2019).
- **Sample of the study:** study design using (a purposive) non-probability sample of women prepared for cesarean section (N=90) at Babylon hospitals.
- **Study instrument:** Data were gathered retrospectively through Taylor manifest anxiety scale is a widely used to measure the level of anxiety among women prepared for a cesarean section at Babylon hospitals. This scale is a self-reported instrument consists of 20 items. The instrument is measured and rated on three levels rating scale from 1 to 3 respectively; 1 indicates never, 2 indicates sometimes, and 3 indicates always. The level of anxiety among women prepared for cesarean section are determined based on the mean of items score. Mean of scores was calculated as follow:
  - Range: 3-1=2
  - Mean of score=2/3=0.66
  - Level of score
    - I. Low = 1-1.66
    - II. Moderate = 1.67-2.33
    - III. Sever = 2.34-3

As independent variables, this study focuses on the two part that including socio-demographic and matters related to pregnancy, either dependent variable focuses on one part that include the checklist of Taylor manifest anxiety scale.

Part 1. Socio-demographic data

- **Information regarding this part contains:** (Age, level of education, occupation, economic status, address)

Part 2. Matters related to pregnancy

- **Information regarding this part contains:** (primipara, gestational age of pregnancy, number of abortions, number of cesarean deliveries, minor health problem during pregnancy {anemia, high blood pressure, diabetes during pregnancy, vomiting and nausea, varicose veins, hemorrhoids, shortness of breath, muscle spasms, constipation}, the reason of cesarean section{ non-dilation of the cervix, deterioration of fetal health, abnormal position and presentation of the fetus, twins, multiple cesarean births, problems in placenta}, date of caesarean section).

Part 3: the checklist to assess level of anxiety: it consisted (20) items.

Data Analysis: Several statistical measures were used by using Statistical Package of Social Sciences (SPSS) version 25, and Microsoft excel (2016) in order to assess and estimate the study sample. A descriptive analysis includes frequencies; percentage and inferential data analysis included the Chi-square test.

**Table 1: Description the level of anxiety according to the sample**

<table>
<thead>
<tr>
<th>Levels</th>
<th>Anxiety</th>
<th>F</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild</td>
<td>7</td>
<td></td>
<td>7.8 %</td>
</tr>
<tr>
<td>Moderate</td>
<td>59</td>
<td></td>
<td>65.6 %</td>
</tr>
<tr>
<td>Sever</td>
<td>24</td>
<td></td>
<td>26.7 %</td>
</tr>
<tr>
<td>Total</td>
<td>90</td>
<td></td>
<td>100 %</td>
</tr>
</tbody>
</table>

Results and Discussion

The table that most of the samples (65.6%) were moderate anxiety level, (26.7%) of the samples were sever anxiety level, and (7.8%) of the samples were mild anxiety level. demographic data (age, education level, occupation) that there is a highly significant relation at p \( \leq 0.01 \), also this table shows between anxiety level with sociodemographic data (economic status) that there is a significant relation at p \( \leq 0.05 \), also this table shows between anxiety level with sociodemographic data (address) that there is a non-significant relation at p > 0.05. anxiety level with matters related to pregnancy (primipara, minor health problem and diseases during pregnancy) that there is a highly significant relation at p \( \leq 0.01 \), also this table shows between anxiety level
with matters related to pregnancy (Number of previous caesarean deliveries, the reason of cesarean section, date of cesarean section) that there is a significant relation at p ≤ 0.05, also this table shows between anxiety level with matters related to pregnancy (gestational age of pregnancy, number of abortion) that there is a non-significant relation at p > 0.05.

The result shows that the majority of the samples (65.6%) were moderate anxiety level, (26.7%) were severe anxiety level, (7.8%) of them were mild anxiety level.

This result is supported by (Al-Amoody, K. 2011) who found that (61.6%) of the patients were moderately anxious.

The physiological functions could be that significant changes through a perinatal stage lead to increase levels of anxiety symptoms, such as hormonal dysregulation, also recent studies showed that the high fear of childbirth during pregnancy was common in women. The result also shows between level of anxiety and age at p value (.000) that there is a high significant relationship. This may be because the Babylon hospitals were accepting pregnant women’s admission at any age. These results are supported by (Hassan, et, al 2018) who found a high significant relationship between age and anxiety. Also, results are supported by (Bansal, T., & Joon, A. 2017) who found a significant relationship between anxiety and age. The education level, the result shows between education level and level of anxiety at p value (.000) that there is a high significant relationship. This may be because lack of interest in the educational level by the government led to the neglect of study in Iraq. These results agree with the findings of (Nekoe, et., al 2015) who found a significant relationship between education level and anxiety. The result also shows between occupation and anxiety at p value (.000) that there is a high significant relationship. These results agree with the findings of (Hassan, et., al 2018) who found a high significant relationship between anxiety and occupation. The result also shows between anxiety and economic status at p value (.010) that there is a significant relationship. These results disagree with the findings of (Hassan, et., al 2018) who found a non-significant relationship between anxiety and monthly family income. The result shows between anxiety and address at p value (.347) there is no significant relationship. These results disagree with the findings of (Piščalkienė, et al., 2012) who found a significant relationship between anxiety and place of residence. The result also shows between anxiety and primipara at p value (.000) that there is a high significant relationship. These results unaccepted with the findings of (Kuo, et al., 2016) who found between anxiety and parity there is a non-significant relationship. The result shows between anxiety and gestational age of pregnancy at p value (.017) there is no significant relationship. This result disagrees with (Silva et al., 2017) who found between anxiety and gestational age of pregnancy there is a non-significant relationship. These results unaccepted with the findings of (Nekoee, et., al 2015) who found between anxiety and history of abortion there is a significant relationship. The result also shows between anxiety and number of cesarean deliveries at p value (.009) that there is a significant relationship. The result also shows between anxiety and minor health problem and diseases during pregnancy at p value (.000) that there is a high significant relationship. These results are supported by (Hassan, et., al 2018) who found between anxiety and associated medical disorder there is a high significant relationship. These results agree with the findings of who found no significant relationship between anxiety and elective or medical cesarean section. The result also shows between anxiety and date of a cesarean section at p value (.006) that there is a significant relationship.

Conclusions

Most pregnant women of a preoperative cesarean section have moderate levels of anxiety in different levels. Moderate anxiety level has highly significant relation with Socio-demographic data (age, education level, occupation) and has highly significant correlation with matters related to pregnancy (primipara, minor health problem and diseases during pregnancy). Pregnant women who undergo a cesarean section after half an hour to 3 hours of an interview have moderate anxiety more than other pregnant women. Pregnant women who undergo to cesarean section for medical reasons have moderate anxiety more than others. Regarding levels of education in the moderate anxiety found in read and write levels are more than others.

Source of Funding: There is no financial disclosure.
Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Nursing, University of Babylon, Hillah City, Iraq and all experiments were carried out in accordance with approved guidelines.

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Biofilm Producing by *Staphylococcus aureus* and *Lactobacillus* spp. Isolated from Urogenital Tract Infections of Women

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Abstract

**Aim:** To assess the ability of vaginal lactobacilli and staphylococci that associated with urinary tract infection to form biofilm. Out of sixty vaginal samples, thirty samples were positive culture for *Staphylococcus aureus* which were cultured on congo red agar medium for determined their ability for biofilm formation, only 19 isolates were able to form biofilm. Whereas out of sixty vaginal samples forty two samples were positive culture for *Lactobacillus* spp., 16 isolate were able to form biofilm. Genetic detection of icaD gene by PCR of *Staphylococcus aureus* isolates was done and 86% of isolates give positive result of this gene. Not all isolates of vaginal lactobacilli and staphylococcus were able to produce biofilm.

**Keywords:** *Staphylococcus aureus*, *Lactobacillus* spp., UTI

Introduction

There are two types of the mode of growth in the cells of bacteria i.e. planktonic cell and sessile accumulation that is called biofilm. Biofilm is participation of microorganisms in which cells adhere to each other on a surface coated within extracellular polymeric substance that is bacteria produce it. Biofilms are composed of microorganisms in which microbes formed an extracellular polymeric component like proteins (<1-2%) including enzymes, DNA (<1%), polysaccharides (1-2%) and RNA (<1%), and besides to these ingredients, water (up to 97%) is the main part of biofilm that plays an important role in the influx of nutrients intra biofilm. The cells of bacteria inside the biofilms are regulated in method with a various physiological and physical characters. Biofilms of bacteria prevent of antibiotics arrival and the action of immune elements. Microorganisms that form biofilm improved effort to hold and manage antimicrobial materials that need for a period of therapy. Production of biofilm is converting of the planktonic bacterial growth to sessile type. It was found production of biofilm is related to the some genes that instruct to the constitution of biofilm. Biofilm begin with the bacterial attachment to a surface then formation of small colony after that building of three dimensional structure then this process ended with biofilm formation, maturation and detachment.

**Biofilm forming bacteria:** The ability to form biofilm were detected in many types of bacterial genus It was mentioned that *H. influenza* has ability to produce biofilm in the body of human and can elope from effect of body immunological elements. Biofilm formation was mentioned in different types of bacteria like *P. aeruginosa*, *S. epidermidis*, *E. coli* and *S. aureus*. *Staphylococcus aureus* was well known by their ability of preventing the action of multiple kinds of drugs which consider the main cause of nosocomial infections. *Staphylococcus aureus* grow well on catheters and chronic wounds as biofilm. *Staphylococcus epidermidis* was classified an opportunistic pathogen that has major action to infect the persons with immune-compromised state, patients that need for intravenous administration drug, patients with immuno deficiency diseases, immuno-extinctive therapy patients and new born infantile. Using of polymeric devices during surgical operation increases the chances of contamination with *S. epidermidis* that can grow and form biofilm on them. Production of biofilm is considered the main cause of infections with *S. epidermidis* that related with device and consequently effect of bacterial pathogenesis. polysaccharide intercellular adhesion (PIA) is responsible for adhesion of *staphylococci*. *Staphylococcus* cells are surrounded with PIA that stich them together as the most important compositions of the extracellular substance. Study of showed presence of PIA in 27% of *S. epidermidis* that isolated from infections associated with prosthetic joint.
Bacterial Vaginosis: The indigenous microbiota of the vagina contains high numbers of lactobacilli that play a protective role by disturbance the adhesion and growth of the pathogen. documented that vaginal lactobacilli can produce protective biofilm.

Bacterial strains which have the ability to form biofilm could be the main cause of the recurrence of urogenital infections (UGI).

Material and Method

Samples Collection

Vaginal samples: The study involved 60 women infected with urinary tract infection who admitted to maternity and children hospital in Hilla city. The ages of women were between 21-55 years. The vaginal samples were taken from infected women by sterile cotton swabs by physician. Each sample was placed in sterile tube contain 0.5 ml of transport media in order to reaching the samples to the laboratory.

Culturing on Selective media

A. Culturing on manitol salt agar medium: Manitol salt agar was prepared according to the manufactured company (HiMedia). The vaginal samples were inoculated into Manitol salt agar and incubated aerobically at 37C for 24 hours. Manitol salt agar agar is a selective medium used for growing and diagnosis of Staphylococcus aureus isolated from vaginal samples.

B. MRS agar medium: MRS was prepared according to the manufactured company (HiMedia). The vaginal samples were inoculated into MRS and incubated in aerobic conditions at 37C for 24 hours. MRS agar is a selective medium used for growing and diagnosis of Lactobacillus spp. which obtained from females.

Microscopically and Morphologically diagnosis: The colony shape and colony color on the above selective media give characteristic features for diagnosis of bacteria. Gram stain and biochemical tests were useful for Further diagnosis of bacteria.

Biofilm Detection Method (Congo Red Agar method): Congo Red Agar method (CRA) CRA medium consist of brain heart infusion broth 37 g/L, sucrose 50 g/L, agar 10 g/L and Congo Red indicator 8 g/L. Congo Red stain was prepared as a concentrated aqueous solution and sterilized by autoclave separately from the other medium compositions. Then it was added to the sterilized brain heart infusion agar with sucrose. CRA plates were Inoculated with tested bacteria and incubated at 37C for 24 hours aerobically. Appearance of black colonies indicated for biofilm production. (Freeman et al.,1989).

Molecular detection of icaD gene of Staphylococcus aureus

A. DNA extraction: The bacterial genomic DNA was extracted according to the protocol supplied by the synthesized company (Promega, USA), additionally with using lysozyme enzyme 10mg/ml

B. Primer sequence and PCR amplification: The primer sequence F 5-ATGGTCAAGCCCCAGACAGAG-3 and R 5-AGTATTTTCAATGTTTAAAGCAA-3 was used for detection of ica D gene in all S. aureus isolates Hussein, (2017), this primer was melting and prepared according to the manufactured company (alpha-canda).

It was designed for amplifying 198 bp for ica D gene.

In the PCR reaction mixture was composed from 5μl of the template DNA, 1μl of each primer (10pmole/μl, 1μl forward and 1μl revers), 12.5 master mix (promega, USA) and 5.5 μl Nuclease free water to gain final volume 25 μl in each PCR tube.

PCR amplification was achieved through using of DNA Thermal cycler with an initial 94 ºC for 5 min, and 30 cycles including denaturation at 94 ºC for 1 min, and annealing at 55 ºC for 1 min and extension at 72 ºC for 1 min followed by a final extension at 72 ºC for 10 min. All reaction mixes were held at 4°, Finally, 16μl of PCR mixture was detected by 1.5% agarose gel electrophoresis. After electrophoresis, gels were seen under UV light. The Gene Ruler 100 bp was used as a DNA ladder.

Result and Discussion

Bacteriological investigation: A total of 60 vaginal samples were collected from women infected with urinary tract infection who admitted to maternity hospital in Hilla city, the ages of patients were between 21-55 years. The samples collection were done by physician.
Among 60 vaginal samples, 30 isolates (50%) of *Staphylococcus aureus* were detected by using selective media and 42 isolates (70%) of *Lactobacillus* spp. were recovered by using selective media. (Table -1).

**Table 1: Number and percentage of bacterial types isolated from vaginal samples**

<table>
<thead>
<tr>
<th>No. of vaginal samples</th>
<th>Types of bacteria</th>
<th>Percentage</th>
</tr>
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<tbody>
<tr>
<td>60 samples</td>
<td><em>Staphylococcus aureus</em></td>
<td>30(50%)</td>
</tr>
<tr>
<td></td>
<td><em>Lactobacillus</em> spp.</td>
<td>42(70%)</td>
</tr>
</tbody>
</table>

The results of the present study demonstrated that *Staphylococcus aureus* associated with urinary tract infection, similar results were mentioned by. Also our results showed presence of high percentage of *Lactobacillus* spp isolated a Variety of vaginal lactobacilli from 215 sexually active women. *Lactobacillus* species has been reported to be the predominant vaginal flora. It was documented that if H2O2-producing Lactobacillus species are not present this will lead to elevation of growth of catalase-negative organisms an absence of H2O2-producing Lactobacillus species could allow an overgrowth of catalase-negative organisms, like organism present in females infected with bacterial vaginosis found that (36%) of women suffering from bacterial vaginosis have non producing hydrogen peroxide anaerobic Lactobacillus.

**Biofilm Formation:** The results of our study showed ability of *Lactobacillus* spp. and *Staphylococcus aureus* for biofilm production on CRA, were the biofilm producing bacteria appear as black colonies comparison with non producing biofilm bacteria appear as red colonies (figure- 1). The recovered *Staphylococcus aureus* were tested for biofilm production, our results showed that out of 30 isolates 19 isolates (63%) of *Staphylococcus aureus* were able to produce biofilm (table-2). The recovered *Lactobacillus* spp. were tested for production of biofilm, it was found that out of 42 isolates 16 isolates (38%) of *Lactobacillus* spp. were able to produce biofilm (table-2).

**Table 2: Percentage of biofilm-production**

<table>
<thead>
<tr>
<th>Types of bacteria</th>
<th>Percentage of biofilm-production</th>
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<tbody>
<tr>
<td><em>Staphylococcus aureus</em></td>
<td>19 (63 %)</td>
</tr>
<tr>
<td><em>Lactobacillus</em> spp.</td>
<td>16 (38%)</td>
</tr>
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</table>

Our results was consisted with those presented by who found that vaginal Lactobacilli have the ability to produce biofilm.

Studies demonstrated that Gt lactobacilli have ability to produce biofilm that contributes with health and immune modification. The present results were consistently with those conducted by who found that *Staphylococcus aureus* have a strong ability to produce biofilm.

**Genetic investigation:** According to the result of PCR amplification test, our results showed out of 30 isolates 26 (86%) of 26 *staphylococcus aureus* explain positive result for icaD gene. The PCR product size was 198 pb (figure-2)
those detected by biofilm formation on Congo red plate method. This result may be caused by the protective effect of biofilm of Lactobacilli which contribute with decrease the biofilm formation rate of *Staphylococcus aureus*. 14 found that most strains of *Staphylococcus aureus* isolated from catheter gave positive result for icaD gene. (15-19) found that the *Staphylococcus aureus* isolated from various clinical specimens produce biofilm by CRA plate at percentage (65 %) while all these isolates (100%) were positive for detection of icaD gene by PCR method.

**Source of Funding:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the College of science for women, Babylon University, babil. Iraq and all experiments were carried out in accordance with approved guidelines.

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The Impact of Reading Comprehension Skills and building Standards Typical according to Thinking Creative

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¹Faculty of Basic Education, Babylon University, Iraq

ABSTRACT

Aims search Present to me Building Standards Typical To compose Books School according to Thinking Creative And calendar Book literature And texts For the row the fourth Literary in a Light And followed Researcher Approach Descriptive (Scans) to match Procedures search Present To achieve Goal search Prepared Researcher Questionnaire In its image Initial And Included On (6) standards she (Foundations Preparation the book, Objectives, Content, activities, Calendar, output the book) And (109) paragraphs distance Verification From Truth the tool From Display On Collection From Experts And the arbitrators Which D Number (17) experts I became the tool Composed From (90) paragraph Distributed On six fields The Put Researcher Before Each Indicator three Alternatives Which (Valid, Is not Valid, Edit) And used Researcher means Statistics Appropriate Procedures Search And processing data Which Done Get on her.

Keywords: The book School, thinking Creative, Calendar, Literature And texts, Iv Literary

Introduction

Prepare Standards From Most important And more means Used To answer About Questions Related How to Definition of Institutions Education ¹ On Levels Achieve For tasks And objectives Which Seeking to reach to her It is in a stand up On Quality That Institutions Show Take care And interest in a Being Represent Basically Whatever For reform Educational ² level Where get up Select Specifications the quality And excellence And mastery for every An individual From Individuals the society ³ and help in a Reduce Sharpness Differences About What Complete Teaching And achieve it in a Institutions Education And identification Role And duty Each an item Human in a system Education And reveal About Aspects Power And weakness in a Institutions Education ⁴. Lead the book School Dura Active in a the operation Education Which Considered document Procedural Of the decision Study And for content Approach and he The bowl Which Includes Subject Education Which Considered From Most important means Necessary To achieve Goals Approach Educational And its role actor in a Success the operation Education ⁵ Therefore It is Represent center The project Educational level Which Get off from him the teachers in a Their work Educational Wilga mechanism Learners in a Collectible Lots From Their knowledge The book School Acquires On Top Rate From Activity Educational in a The environment Classroom Especially in a Curriculum Education in a the countries Developing countries Which Consider Book On it’s a Source Chairman From Sources Learning. Aims search Present to me Building Standards Typical To compose Books School And calendar Book literature And texts For the row the fourth Literary in a Light To achieve Goal search Prepared Researcher questions ⁶ The following What Standards Typical Which From It is possible Evaluation Book literature And texts For the row the fourth Literary in a Light. What Aspects Power And weakness And proposals the cure For results Calendar

Methodology

Use researcher Approach Descriptive Approach To study and he One Curricula search Scientific research Used in a a study Phenomena Social And educational (Spring, 64,2006) and studies Survey she that Type From Research Which Complete Through it

Corresponding Author:
Hind Abd-AL Reeda
Faculty of Basic Education, Babylon University, Iraq
Email: hendathab@gmail.com
interrogation Individuals Community search All of them or a sample big who are they And so on With a view Describe Phenomenon Studied From Where Nature And degree Availability as such she List in a Reality And identification to me That Phenomenon And identification Status Present to her (Books And modalities Teaching And jobs ... etc And identification to me Aspects Power And weakness In which is From More Research Used in a a study Phenomena Education And social development It reports this is studying in a Solution Lots From the problems Education Including Offer From informations Diagnosis About Themes Related By 14 And used researcher This Scanning As a Something From Species Approach Descriptive And he Proportional to With What Designed mechanism this is studying 2

A tool search: He thought researcher in a this is studying that Be The resolution she the tool Occasion To poll Opinions Experts And the arbitrators They are Instrument Easy Application It allows Of the respondent that Make His views clearly And give it Freedom in a Time Sufficient To think in a His answer In Arches Select them By himself and this is He pays For scrutiny in a the information It enables researcher From plural More Number From data in a Less time Featuring Easily Interpretation And analysis. The rely researcher in a Preparation a tool search On Measures The following

1. See researcher On a tool Evaluation the book School Rapporteur
2. See researcher On Benchmarks Quality Indicators Quantity
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<td>Objectives</td>
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<td>Content</td>
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<td>Calendar</td>
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<td>Directed by the book</td>
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<td>Total</td>
<td>14</td>
<td>128</td>
<td>100%</td>
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<td>establish Preparation the book</td>
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<td>88%</td>
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<td>Objectives</td>
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<td>3</td>
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<td>4</td>
<td>Activities</td>
<td>0.87</td>
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<td>Calendar</td>
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<td>6</td>
<td>Directed by the book</td>
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R = coefficient Engagement Pearson

N = number Individuals

C = values Application the first

T = values Application The second

Mg = Total (Allam, 118,2000)

B. Center Likely: To estimate Values Each a paragraph From Paragraphs the tool And their order For to me Paragraphs Other within Each field Calculates Law following

\[ WH = \frac{(T1*5) + (T2*4) + (T3*3) + (T4*2) + (T5*1)}{N} \]

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T = 1 frequency the answer

N = number Individuals the sample (Abbas And others, 308,2012)

C. Weight Cent: To clarify Each a paragraph From Paragraphs The resolution And know Degree And their order For to me Paragraphs Other

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Conclusion

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Source of Funding: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Babylon University and all experiments were carried out in accordance with approved guidelines.

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The Impact of Teaching Critical Thinking Skills to Develop the Habits of Mind for Students

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¹College of Basic Education, University of Babylon, Iraq

ABSTRACT

This study intended to assess English questions for 3rd intermediate stage by analyzing Ministerial English questions for the years 2017 and 2018 and for all attempts (1st, 2nd and 3rd attempt). The questions analysis in this study collects information on the variables: Remember, knowledge, apply, analyze, create and evaluate. Conclusion Depending on the results obtained, the following points are outlined: There is a significant difference between the ministerial questions and Bloom’s levels of knowledge. Bloom’s level of knowledge depends on an old approach while the ministerial questions depend on a new approach. Bloom’s specification tables focus on knowledge and understanding while the new approach in teaching focuses on creative and communicative skills. The ministerial questions don’t focus on creative, analytical and communicative skills. From all the above we can conclude that there is a deficiency in both the ministerial questions and Bloom’s specification tables.

Keywords: ministerial English questions, Bloom’s taxonomy, third intermediate, assessment.

Introduction

Given the great role played by the test so, the researchers give it great importance in the field of education. In general, testing is an integral part of any teaching and learning process. Fortunately, some hopeful progress has been noted in the area of testing. As awareness is increasing, some testing methods are being curtailed as strenuous efforts have been made to improve this situation. So, an attainment progress in language teaching was included into language testing. The methodology and content followed-up to measure the performance of learners is very significant because the methodology that will be followed will affect the process of learning and education in full, according to the form and content. Evaluation is a part of our daily life activities. Where we are continuously evaluated and where we are constantly evaluating others. We assess what others say to us, their facial expression, their choice of words, and their attitudes. We evaluate their reactions to what we say and do. We often study who and what are around us to decide what to do or where to go. Above all, the past researches reveals that exercising “executive control” over one’s language learning through planning, monitoring and evaluating. They are techniques that are used for organizing, planning, focusing and evaluating ones’ learning. Although it was indicated that the Effectiveness of the proposed educational units for general teaching methods subject through the use of cognitive maps. The achievement of the experimental group in the post test is significantly superior to that of the control group. The achievement of the experimental group in the post test is significantly superior to that of the control group. So, There are many interesting questions to be asked: How does the exam influence the day to day activity in the classroom? Do we teach for the test? Are the pupils familiar with the evaluation criteria? Do teachers around the country feel they have sufficient knowledge and competence to guide their pupils through the preparation day and the final exam? As teachers today we are constantly faced with changes, and from time to time it is pertinent to ask teachers about their opinions. What do they actually think about the changes of curriculum or exam? The English occupies an important role in Iraq educational system. In examination system of schools, teachers are responsible for writing and marking the final exam papers. Every teacher has to prepare a new test paper for each term. In terms of the measurement and enhancement of the students thinking abilities, teachers usually use questions that start with words like, what, list, define, and give examples which merely measure and enhance the student’s lower levels
of thinking abilities (Knowledge and Comprehension). They rarely use words like solve, apply, and give reasons which measure and enhance the students’ higher levels of thinking abilities (Application, Analysis, Synthesis and Evaluation).

At the end, the statement of the problem could be summarized in the following question. It is a process through which an information is get for some known goals or objectives. Assessment is a wide expression that involved testing, where the test is a particular format of assessment. The tests are about assessment performed under invented conditions so that they can be managed. It can be said that all tests are reported as assessments, but all assessments not test. Where the teacher can test at the end of the unit or lesson. Assessment of progress can be made by means of the test at the end of the school year, and the quantitative or verbal skills can also be assessed through such tools as GRE and SAT. A person’s knowledge can be assessing in a different of ways, but always there is a jump, any conclusion is made about what a person is doing relates to what he or she knows. A knowledge of weaknesses and strengths of students can assist to plan better for teaching and how to teach 9. To assess texts, there are conditions in which the specific behavior of a goal can be ascertained, and that these conditions are usually in the form of goals written described 9. Test is a manner consists of a set of procedures, techniques and test elements that form a tool of some kind. Firstly, the purpose of the test is to gauge the performance of the maintenance specialist in specific mathematical terms or the expression of evaluative qualification e.g. poor, fair, good, excellent and etc. In addition, the purpose of the test is to gauge the person’s knowledge or ability. In other words, the general goal of any form of language testing is testing the linguistic abilities of the candidates in a way that ensures realistic representation to the extent of knowledge of their skills in using the language in the case of non-testing 10. “A test accurately measures the content or ability it purports to measure. And it is essential to devise and determine some measuring tools, yardsticks, criteria, and points to be added for specific ability or should be deducted on certain mistakes, but they must be same for all assessors. However, the language tests vary in how they are designed and what they are like. In other words, regarding the method of testing and the purpose of the test. According to the method, the tests can be broadly distinguished the language tests with traditional paper and pen from performance tests. Language tests based on paper and pencil are usually used to evaluate the discrete components of language knowledge (vocabulary, grammar, etc.) or comprehension (listening and reading comprehension). As for the performance-based tests, language skills are assessed in the communication process. performance tests are the most frequent tests of writing and speaking. As for the purpose, many kinds of language tests have placed to compute the educating outcomes appropriately.

Methodology

The researcher followed descriptive research to analyze the content of test questions because it is the appropriate method for analyzing questions, which is one of the research methods used in education and psychology. It is defined as: ((trying to access the precise and detailed knowledge of existing problem or phenomenon elements, in order to gain a better and more accurate understanding or development of future policies and procedures). The aim of this approach is to provide data and facts about the problem of the subject to be interpreted and to identify its implications. Descriptive research is characterized by the fact that it is used primarily to describe a particular case or event, which is the collection of descriptive data. And that the descriptive research is not limited to the collection and classification of data, but rather to the analysis, interpretation, evaluation and comparison, so the description was compared in comparison, although the collection of data and description of educational cases and phenomena is one of the necessary steps, but the essence of descriptive research is to organize, analyze and interpret these data and the development of significant results and significance for the problem.

Methodology

The target population comprised a total of fifteen Professor, Asst. Prof and Lecturer selected from Faculty of Education of different universities (University of Babil, University of Baghdad, University of Kufa, University of Misan and University of Karbla) in different states (Baghdad, Najaf, Hilla, Karbla and Ammarah) which are full time teaching students from different ages, from both genders and with different teaching experiences.

Research Population: The major samples are divided into two main samples:
1. The third intermediate student book: the book taught to the third intermediate students in the education institutes in Iraq which contains eight units.

2. The final test of the third intermediate students for the years 2017 and 2018 and for the three attempts.

**Research Tool:** The process of building analytical tool is the first step to conducting research on evaluation of questions. So, the researcher adopts several steps to prepare and formulate tool in its initial formula. The tools were personally administered by the researcher with assistance of the teachers of the selected universities to ensure a hitch free administration. The tools were spelt out uniformly. There was no time limit. Fifteen questionnaires have been completed. The major tool used for collection of primary data was validated questionnaire titled “Evaluating central English questions for third intermediate level according to the specification tables”. This tool was divided into two tables.

**A. The First Table (The Questionnaire):** Is dealt with evaluating the student book units and divided into 8 sections which are the units of the book. The questionnaire is a document designed with the purpose of seeking specific information from the respondents.

The researcher adopts the following steps in preparing questionnaire:

1. Revision of the previous studies that related to the current research and dealt with the same topics to know:
   - Tools and standards.
   - Strategies followed in these studies.

2. Designing questionnaire for the teachers of the college to find the suitability of standards to the Iraqi environment. In the light of that, the researcher was able to reach for several standards that should be available in the ministerial questions.

3. Taking the comments from teacher of colleges (Appendix 1) in the field of education to design a suitable questionnaire.

**B. The Second Table (The Table of Specifications):**
Was further meant to collect information on the variables: Remember, knowledge, apply, analyze, create and evaluate with whole sum of 100% entitled “The table specification of third intermediate school”. The instrument was adopted based on 3-points which are acceptable, unacceptable and need modification (Appendix 2).

**Results and Discussion**

View the Results of the Evaluate Questions in the Light of main level of knowledge

<table>
<thead>
<tr>
<th>Year</th>
<th>Turn</th>
<th>Question</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016-2017</td>
<td>1</td>
<td>First question</td>
<td>5 questions</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Second question 2016/2017</td>
<td>5 questions</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Third question</td>
<td>5 questions</td>
</tr>
<tr>
<td>2017-2018</td>
<td>1</td>
<td>Fourth question</td>
<td>5 questions</td>
</tr>
<tr>
<td>2017-2018</td>
<td>2</td>
<td>Fifth question</td>
<td>5 questions</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Turn</th>
<th>Frequency</th>
<th>Remember</th>
<th>Understand</th>
<th>Apply</th>
<th>Analyze</th>
<th>Evaluate</th>
<th>Create</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016/2017</td>
<td>1</td>
<td>191</td>
<td>72</td>
<td>73</td>
<td>13</td>
<td>10</td>
<td>14</td>
<td>9</td>
</tr>
<tr>
<td>2016/2017</td>
<td>2</td>
<td>207</td>
<td>77</td>
<td>77</td>
<td>19</td>
<td>10</td>
<td>14</td>
<td>10</td>
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<tr>
<td>2016/2017</td>
<td>3</td>
<td>249</td>
<td>87</td>
<td>98</td>
<td>29</td>
<td>10</td>
<td>14</td>
<td>11</td>
</tr>
<tr>
<td>2017/2018</td>
<td>1</td>
<td>237</td>
<td>78</td>
<td>94</td>
<td>32</td>
<td>10</td>
<td>14</td>
<td>9</td>
</tr>
<tr>
<td>2017/2018</td>
<td>2</td>
<td>249</td>
<td>91</td>
<td>107</td>
<td>31</td>
<td>10</td>
<td>20</td>
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<td>Total</td>
<td>-</td>
<td>1153</td>
<td>405</td>
<td>449</td>
<td>124</td>
<td>50</td>
<td>76</td>
<td>49</td>
</tr>
</tbody>
</table>

**Presentation of the results of the analysis in the light of the indicators:** The researcher presents what has been achieved of the main standards of the total quality and the indicators, the achievements of frequencies, percentages in a descending order for all units in the English book.

**View and interpret the results:** The researcher presents the results in the light of the evaluation criteria.

**Bloom’s Levels of Cognitive Field:** The researcher analyzed the questions of the English language examinations for students of the third intermediate grade for the first, second and third turns of (2016-2017) and the first and second turn of (2017-2018) according to Bloom’s levels of knowledge. The total number of questions in the English language exam (5) questions and included (14) branches. The results obtained for the two years were examined and it was found that the total frequency for all questions in 2016-2017 (1) is (191). Where the percentage of the (remember) is (38 %), the understand is (38 %), the Apply is (7%), the Analyze is (5%), the Evaluate is (7%) and the Create is (5%). While in 2016-2017 (2) it was found the total frequencies is (207). Where the percentage of the (remember) is (37 %), the understand is (37%), the Apply is (9%), the Analyze is (5%), the Evaluate is (7%) and the Create is (5%). Also in 2016-2017 (3) it was found that the total frequency for all questions is (249). Where the percentage of the (remember) is (35 %), the understand is (39 %), the Apply is (12%), the Analyze is (4%), the Evaluate is (6%) and the Create is (4%). And the total of frequencies in the year 2017-2018 (1) is (237). Where the percentage of the (remember) is (33 %), the understand is (40 %), the Apply is (13%), the Analyze is (4%), the Evaluate is (6%) and the Create is (4%). At last, it was found that the total of frequencies in the year 2017-2018 (2) is (249). Where the percentage of the (remember) is (34 %), the understand is (40 %), the Apply is (12%), the Analyze is (4%), the Evaluate is (6%) and the Create is (4%).

**Conclusion**

Conclusion Depending on the results obtained, the following points are outlined: There is a significant difference between the ministerial questions and Bloom’s levels of knowledge. Bloom’s level of knowledge depends on an old approach while the ministerial questions depend on a new approach. Bloom’s specification tables focus on knowledge and understanding while the new approach in teaching focuses on creative and communicative skills. The ministerial questions don’t focus on creative, analytical and communicative skills. From all the above we can conclude that there is a deficiency in both the ministerial questions and Bloom’s specification tables.

**Source of Funding:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the College of Basic Education/ University of Babylon and all experiments were carried out in accordance with approved guidelines.

**REFERENCES**


Investigation of Bioactive Natural Compounds of *Diplotaxis cespitosa* Using FTIR Spectroscopic Profile and Evaluation of its Anti-Bacterial and Anti-Fungal Activity

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ABSTRACT

Genus *Diplotaxis* (Brassicaceae) is represented by more than 30 species mainly distributed in the north Mediterranean. In the current study, the anti-microbial activity of *Diplotaxis cespitosa* methanolic extract was evaluated by determining the zone of inhibition against nine bacteria and eight fungi and yeast. Maximum zone formation was against *Staphylococcus aureus* (5.96 ± 0.19). *Diplotaxis cespitosa* was very highly active against *Aspergillus flavus* (6.34 ± 0.21). The FTIR analysis of *Diplotaxis cespitosa* proved the presence of functional group assignment Alkyl halides, Aromatic, Amide, and Alkane with Intensity 71.703 (Strong), 66.405 (Strong), 81.325 (Strong), 80.732 (Strong), 80.345 (Strong), 76.852 (Medium), 70.901 (Bending), 87.336 (Strong), 82.720 (Strong) and Peak (Wave number cm⁻¹) 1001.06, 1049.28, 1238.30, 1386.82, 1394.53, 1517.98, 1635.64, 2854.65, and 2926.01.

Keywords: *Diplotaxis cespitosa*, Bioactive Natural Compounds, Anti-microbial Activity

Introduction

Flavonoids are considered members of a class of plant phenolic constituents that have received increasing interest over the last decades. Thousands of them have been isolated and identified, most of which are from food plants. Flavonoids are divided into several subgroups, and their chemical and biological properties can be quite different 1-3. Flavonoids are regarded among the main dietary phenolic compounds. That flavonoids possess bioactive effect has been recognized for long, but until recently, data about their bioavailability, metabolic fate, and health effects were limited. It is well known that flavonoids are potent antioxidant metabolites, and therefore one of the main interests in the compounds has involved protection against cardiovascular disease. Lipids, proteins, DNAs and RNAs undergo gradual changes due to the formation of toxic free radicals and auto-oxidation by reactive oxygen species (ROS) into the organisms or the food. Several synthetic antioxidants, such as butylated hydroxyanisole (BHA) and butylated hydroxytoluene (BHT), are currently used 4-10 as food supplements and stabilizers. However, these synthetic antioxidants have disadvantages due to their possible toxicity and injurious properties to human health. Thus, most consumers prefer additive free foods or a safer approach like the utilization of more effective antioxidant and antimicrobial agents from natural origins. Accordingly, plant extracts and their derived secondary metabolites, such as phenolic components, offer an opportunity in this regard. Flavonoids are present in photosynthetic 11-16 cells and are usually found in fruits, vegetables, nuts, seeds, stems, flowers, etc. This class of compounds has become well known for its antifungal, antiviral and antibacterial activities. However, several studies have examined the structure–antibacterial activity relationship of these compounds. In addition, several research groups have sought to explain the antibacterial mechanisms of action of selected

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flavonoids 17-23. The activity of quercetin, for example, has been at least partially attributed to inhibition of DNA gyrase. It has also been proposed that sophoraflavone G and (−)-epigallocatechin gallate inhibit cytoplasmic membrane function, and that licochalcones A and C inhibit energy metabolism. Available data dealing with phenolic compounds and biological activities of *Diplotaxis* extracts are very scarce.

**Materials and Method**

**Collection and preparation of plant material:** The leaves were purchased from local market in Hilla city, middle of Iraq. After thorough cleaning and removal foreign materials, the leaves were stored in airtight container to avoid the effect of humidity and then stored at room temperature until further use.

**Preparation of sample:** About 20 grams of the plant sample powdered were soaked in 100 ml methanol for 16 hours in a rotatory shaker. Whatman No.1 filter paper was used to separate the extract of plant. The filtrates were used for further 24-32 phytochemical analysis. It was again filtered through sodium sulphate in order to remove the traces of moisture.

**Fourier transform infrared spectrophotometer (FTIR):** The powdered sample of *Diplotaxis cespitosa* was treated for FTIR spectroscopy (Shimadzu, IR Affinity, Japan). The sample was run at infrared region between 400 nm and 4000 nm.

**Determination of antimicrobial activity of crude bioactive compounds of *Diplotaxis cespitosa***: The test pathogens were swabbed in Müller-Hinton agar plates. Sixty µL of plant extract was loaded on the bored wells. Antifungal activity was evaluated by measuring the zone of inhibition against the test microorganisms. Methanol was used as solvent control. Amphotericin B and fluconazole were used as reference antifungal agent 33-37. The tests were carried out in triplicate. The antifungal activity was evaluated by measuring the inhibition-zone diameter observed after 48 h of incubation.

**Results and Discussion**

**Identification of biochemical compounds:** Analysis of compounds was carried out in methanolic extract of *Diplotaxis cespitosa* shown in Table 1 and Figure 1. The FTIR analysis of *Diplotaxis cespitosa* proved the presence of functional group assignment Alkyl halides, Aromatic, Amide, and Alkane with Intensity 71.703 (Strong), 66.405 (Strong), 81.325 (Strong), 80.732 (Strong), 80.345 (Strong), 76.852 (Medium), 70.901 (Bending), 87.336 (Strong), 82.720 (Strong) and Peak (Wave number cm⁻¹) 1001.06, 1049.28, 1238.30, 1386.82, 1394.53, 1517.98, 1635.64, 2854.65, and 2926.01. The very strong absorption band observed may be due to the presence of bonded N-H/C-H/O-H stretching of amines and amides. The observed very strong absorption band indicates the presence polymeric hydroxyl derivatives. The plant kingdom is a very promising and probably inexhaustible source of drugs and nutraceuticals. However, very few plants have been well studied and a large majority expects to be interested 38-44. Many previous studies refer to the genus *Diplotaxis* as traditionally used plants with therapeutic properties. Moreover, several species of *Diplotaxis* are reported as food crops in different regions. In fact, these herbs are appreciated for their strong pungent flavour and they are consumed raw or cooked, in salads and soups. Eating wild edible plants can be a good alternative? Med Aromat Plants Recently 45-55, it was shown that this species suppresses postprandial hyperglycaemia in mice by inhibiting key-enzymes linked to type 2 diabetes.

<table>
<thead>
<tr>
<th>No.</th>
<th>Peak (Wave number cm⁻¹)</th>
<th>Intensity</th>
<th>Type of Intensity</th>
<th>Bond</th>
<th>Type of Vibration</th>
<th>Functional group assignment</th>
<th>Group frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1001.06</td>
<td>71.703</td>
<td>Strong</td>
<td>C-F</td>
<td>Stretch</td>
<td>alkyl halides</td>
<td>1000-1400</td>
</tr>
<tr>
<td>2.</td>
<td>1049.28</td>
<td>66.405</td>
<td>Strong</td>
<td>C-F</td>
<td>Stretch</td>
<td>alkyl halides</td>
<td>1000-1400</td>
</tr>
<tr>
<td>3.</td>
<td>1238.30</td>
<td>81.325</td>
<td>Strong</td>
<td>C-F</td>
<td>Stretch</td>
<td>alkyl halides</td>
<td>1000-1400</td>
</tr>
<tr>
<td>4.</td>
<td>1386.82</td>
<td>80.732</td>
<td>Strong</td>
<td>C-F</td>
<td>Stretch</td>
<td>alkyl halides</td>
<td>1000-1400</td>
</tr>
<tr>
<td>5.</td>
<td>1394.53</td>
<td>80.345</td>
<td>Strong</td>
<td>C-F</td>
<td>Stretch</td>
<td>alkyl halides</td>
<td>1000-1400</td>
</tr>
<tr>
<td>6.</td>
<td>1517.98</td>
<td>76.852</td>
<td>Medium</td>
<td>C=C</td>
<td>Stretch</td>
<td>Aromatic</td>
<td>1400-1600</td>
</tr>
</tbody>
</table>
**Conclusion**

Medicinal property of *Diplotaxis cespitosa* methanolic extract is due to presence of secondary metabolites. Nine phytoconstituents were identified by (FTIR) analysis. This plant derived bioactive compounds used as source of antibiotic properties and pharmaceutical industries used for drug formulation.

**Source of Funding:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** In our research, all protocols were approved under the Department of Biology, College of Science for women, University of Babylon, Hillah city, Iraq and all methods were carried out in accordance with approved guidelines.

**REFERENCES**


Detection of Bioactive Compounds of *Celosia argentea*
Using Fourier-transform Infrared Spectroscopic Profile and Evaluation of its Anti-fungal Activity

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¹Department of Biology, College of Science for Women, ²College of Pharmacy, ³Biomedical Science Department, College of Nursing, University of Babylon, Hillah city, Iraq

ABSTRACT

*Celosia argentea* is a smooth annual herb type plant and routinely used as leafy vegetable in the rainforest zone of Africa. In India and China, it is known as a troublesome weed. It is a herbaceous plant and is known for its very bright colors and traditional uses. This is plant of tropical origin; they grow best in full sunlight and should be placed in a well-drained area. The purpose of our research were analysis of the bioactive chemical compounds of selected medicinal plant of *Celosia argentea* using fourier transform infrared spectrophotometer analysis. Seven bioactive compounds were identified in the methanolic extract of *Celosia argentea*. The Fourier transform infrared spectrophotometer analysis of *Celosia argentea* proved the presence of functional group assignment Alkenes, Alkyl halides, Amide, and Alkane with Intensity 70.097 (Strong), 79.917 (Strong), 65.933 (Strong), 83.395 (Strong), 73.966 (Bending), 87.917 (Strong), 83.461 (Strong) and Peak (Wave number cm⁻¹) 667.37, 794.67, 1020.34, 1236.37, 1631.78, and 2854.65. In the current study, the anti-fungal activity of *Celosia argentea* methanolic extract was evaluated by determining the zone of inhibition against fungi. *Celosia argentea* was very highly active against *Aspergillus fumigatus* (4.98 ± 0.18).

Keywords: Anti-Fungal Activity, FT-IR analysis, *Celosia argentea*

Introduction

*Celosia argentea* Linn. Commonly named as semencelosiae, cock’s comb, quail grass, the wool flower is a herbaceous annual plant widely grown in many regions of tropical Africa especially Nigeria, Benin and Congo. In India and other tropical regions of the world such as Sri Lanka, South Asia, and America, it grows as a post monsoon weed ¹. It is highly consumed as a leafy vegetable because of its high nutritive value. The whole plant of *C. argentea* is well known as a traditional medicine in India for the treatment of diarrhea, piles, bleeding nose, disinfectant, inflammation, hematological and gynaecologic disorders. The plant is enriched with primary and secondary metabolites such as carbohydrates, lipids, amino acids, peptides, phenols, phenolic acids, flavonoids, terpenes, and alkaloids; the important being bicyclic peptides, celogenamide-A, celogentin-A-D, H, J, and K, moroidin, celosian, citrusin C, cristatainetc. Hayakawa and co-workers reported the anti-metastatic effect of *C. argentea* seed extract based on its immunomodulation properties ²⁴ including induction of cytokines such as interleukin (IL)-12, IL-2, and interferon-gamma that led to a Th1 dominant immune state activating macrophages to tumoricidal state causing basis for the inhibition of cancer metastasis. The plant is also reported to contain flavonoids like 5-methoxy-6,7-methylene dioxy-2’-hydroxyisoflavone and its 2’-methoxy derivative: Tlatlancuayin. Flavonoids play an important role in a plant as a defense and signaling compounds in reproduction, pathogenesis and symbiosis, by inhibition of proliferation of peripheral blood mononuclear cells, two-way MLR and natural

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killer cell, as well as no production. Further inhibition of production of IL-2 and tumor necrosis factor-α production in human peripheral blood mononuclear cells, which further blocked the binding of DNA to various factors 10-17 responsible for synthesis of IL-2 and IL-2R genes, which are necessary for T-cell activation and proliferation. Several classes of flavonoids were also reported for their antiproliferative activity against various human cancer cells. Infrared spectroscopy provides a useful method for herbal analysis and elucidate the compounds structures as well as for quantitative analysis of drugs. Fourier transform infrared spectrometry is a physico-chemical analytical technique and one of the most widely used methods to identify the structure of unknown composition or its chemical group, and the intensity 18-23 of the absorption spectra associated with molecular composition or content of the chemical group. The present study involves an assessment using GC-MS and FT-IR spectroscopic techniques to investigate the authenticity of commercial sample of the herbal drug by analyzing their fingerprints.

Materials and Method

Collection and preparation of plant material: The leaves were purchased from local market in Hilla city, middle of Iraq. After thorough cleaning and removal foreign materials, the leaves were stored in an airtight container to avoid 24-29 the effect of humidity and then stored at room temperature until further use.

Preparation of sample: About 20 grams of the plant sample powdered were soaked in 100 ml methanol for 16 hours in a rotatory shaker. Whatman No.1 filter paper was used to separate the extract of plant. The filtrates were used for further phytochemical analysis. It was again filtered through sodium sulphate in order to remove the traces of moisture.

Fourier transform infrared spectrophotometer (FTIR): The powdered sample of Celosia argentea was treated for FTIR spectroscopy (Shimadzu, IR Affinity, Japan). The sample was run at infrared region 30-38 between 400 nm and 4000 nm.

Determination of antimicrobial activity of crude bioactive compounds of Celosia argentea: The test pathogens were swabbed in Müllér-Hinton agar plates. Sixty µL of plant extract was loaded on the bored wells. Antifungal activity was evaluated by measuring the zone of inhibition against the test microorganisms. Methanol was used as solvent control. Amphotericin B and fluconazole were used as reference antifungal agent. The tests were carried out in triplicate. The antifungal activity was evaluated by measuring the inhibition-zone diameter observed after 48 h of incubation.

Results and Discussion

Identification of biochemical compounds: The common names of Celosia argentea as semen celosiae, celosia, silver cock’s comb, cock’s comb, quail grass, woolflower in English. Analysis of compounds was carried out in methanolic extract of Celosia argentea, shown in Table 1. Analysis of the methanol extract of Celosia argentea showed the presence of seven major peaks. The Fourier transform infrared spectrophotometer analysis of Celosia argentea proved the presence of functional group assignment Alkenes, Alkyl halides, Amide, and Alkanes with Intensity 70.097 (Strong), 79.917 (Strong), 65.933 (Strong), 83.395 (Strong), 73.966 (Bending), 87.917 (Strong), 83.461 (Strong) and Peak (Wave number cm⁻¹) 667.37, 794.67, 1020.34, 1236.37, 1631.78, and 2854.65. In the current study, the anti-fungal activity of Celosia argentea methanolic extract was evaluated by determining the zone of inhibition against fungi. Celosia argentea was very highly active against Aspergillus fumigatus (4.98 ± 0.18). The very strong absorption band observed may be due to the presence of bonded N-H/C-H/O-H stretching of amines and amides. Celosia argentea plant shows different physiological effects because of different bioactive compounds present in it and therefore is widely used to cure several disorders such as fever, diarrhea, piles, bleeding nose, mouth sores, itching, wounds, jaundice, gonorrhea, and has different pharmacological activity such as immunological activity, cytoprotective, inflammation, antioxidant, haematological, antidiarrhoeal, anticancer, antimimritotic activity, hepatoprotective, antimitastatic, antioxidant, antibacterial, antifungal, antidiarrhoeal activity, gynaecologic disorders, anti-ureolithiatic 39,40, growth activity and also as disinfectant; the dry powder of seeds are useful in diarrhea, aphrodisiac, reduce the inflammations, strengthen the liver, gonorrhoea, clearing the vision and healing diseases of the eye; burnt leaves are stypice (Unani). The dried plant is considered antiscorbutic and cooling in China. Herbal drugs are being proved as effective as synthetic drugs with lesser side effects. Plants have formed the basis of sophisticated
traditional medicine systems that have been in existence for thousands of years and continue to provide mankind with new remedies. From ancient literature to modern scientific records of traditional medicinal knowledge, there is evidence that plants supply the main medicinal source for peoples’ healthcare in developing Asian countries. The presence of antimicrobial activity in a particular part of a particular species may be due to the presence of one or more bioactive compounds such as alkaloids, glycosides, flavonoids, steroids, saponins etc. Recently, a number of plants have been reported for antibacterial properties across the world.

Table 1: FT-IR peak values of solid analysis of Celosia argentea

<table>
<thead>
<tr>
<th>No.</th>
<th>Peak (Wave number cm⁻¹)</th>
<th>Intensity</th>
<th>Corr. Intensity</th>
<th>Type of Intensity</th>
<th>Bond</th>
<th>Type of Vibration</th>
<th>Functional group assignment</th>
<th>Group frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>667.37</td>
<td>70.097</td>
<td>1.906</td>
<td>Strong</td>
<td>=C–H</td>
<td>Bending</td>
<td>Alkenes</td>
<td>650-1000</td>
</tr>
<tr>
<td>2.</td>
<td>794.67</td>
<td>79.917</td>
<td>0.621</td>
<td>Strong</td>
<td>=C–H</td>
<td>Bending</td>
<td>Alkenes</td>
<td>650-1000</td>
</tr>
<tr>
<td>3.</td>
<td>1020.34</td>
<td>65.933</td>
<td>3.049</td>
<td>Strong</td>
<td>C-F</td>
<td>Stretch</td>
<td>alkyl halides</td>
<td>1000-1400</td>
</tr>
<tr>
<td>4.</td>
<td>1236.37</td>
<td>83.395</td>
<td>3.097</td>
<td>Strong</td>
<td>C-F</td>
<td>Stretch</td>
<td>alkyl halides</td>
<td>1000-1400</td>
</tr>
<tr>
<td>5.</td>
<td>1631.78</td>
<td>73.966</td>
<td>1.434</td>
<td>Bending</td>
<td>N-H</td>
<td>Stretch</td>
<td>Amide</td>
<td>1550-1640</td>
</tr>
<tr>
<td>6.</td>
<td>2854.65</td>
<td>87.917</td>
<td>2.477</td>
<td>Strong</td>
<td>C-H</td>
<td>Stretch</td>
<td>Alkane</td>
<td>2850-3000</td>
</tr>
<tr>
<td>7.</td>
<td>2927.94</td>
<td>83.461</td>
<td>5.116</td>
<td>Strong</td>
<td>C-H</td>
<td>Stretch</td>
<td>Alkane</td>
<td>2850-3000</td>
</tr>
</tbody>
</table>

Wavenumber (cm⁻¹)  

Figure 1: Fourier-transform infrared spectroscopic profile solid analysis of Celosia argentea

Conclusion

This plant derived bioactive compounds used as source of antibiotic properties and pharmaceutical industries used for drug formulation. Medicinal property of Celosia argentea methanolic extract is due to presence of secondary metabolites. Seven bioactive compounds were identified in the methanolic extract of Celosia argentea. The Fourier transform infrared spectrophotometer analysis of Celosia argentea proved the presence of functional group assignment Alkenes, Alkyl halides, Amide, and Alkane with Peak (Wave number cm⁻¹) 667.37, 794.67, 1020.34, 1236.37, 1631.78, and 2854.65. In the current study, the antifungal activity of Celosia argentea methanolic extract
was evaluated by determining the zone of inhibition against fungi. *Celosia argentea* was very highly active against *Aspergillus fumigatus* (4.98 ± 0.18).

**Source of Funding:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** In our research, all protocols were approved under the Department of Biology, College of Science for women, University of Babylon, Hillah city, Iraq and all methods were carried out in accordance with approved guidelines.

**REFERENCES**


**In vitro Antimicrobial Activity of Methanolic Extract of Apium graveolens**

Lena Fadhil Hamza¹, Ameer Ibrahim Abdulzahra², Imad Hadi Hameed³

¹College of Pharmacy, ²College of Basic Education, ³Biomedical Science Department, College of Nursing, University of Babylon, Hillah city, Iraq

**ABSTRACT**

The aims of our research were analysis of the secondary metabolite products and in vitro antibacterial and anti-fungal activities. Apium graveolens has been used as a food, and at various times both the whole plant and the seeds have been consumed as a medicine. The FTIR analysis of Apium graveolens leaves proved the presence of functional group assignment Alkyl halides, Amide, and Alkane with Intensity 75.578 (Strong), 87.413 (Strong), 86.158 (Strong), 84.616 (Bending), 88.087 (Strong), and Peak (Wave number cm⁻¹) 1020.34, 1238.30, 1317.38, 1608.63 and 2918.30. In the current study, the anti-microbial activity of Apium graveolens methanolic extract was highly against Klebsiella pneumoniae (4.27 ± 0.16). Apium graveolens was very highly active against A. terreus (5.01 ± 0.17).

**Keywords:** FT-IR analysis, Apium graveolens, Anti-Bacterial, Anti-Fungal Activity

**Introduction**

Celery (Apium graveolens) is widely used as a medicinal herb or spice, with prominent antioxidant properties, due to the presence of many bioactive components, mainly phenolic compounds ¹. An understanding of changes in phenolic content and antioxidant activity occurring during preservation of celery is important to develop appropriate drying method and optimal conditions of drying ²-⁴. Apium graveolens is a marshland plant in the family Apiaceae that has been cultivated as a vegetable since antiquity ⁵. Celery has a long fibrous stalk tapering into leaves. Depending on location and cultivar, either its stalks, leaves or hypocotyl are eaten and used in cooking. Celery seed is also used as a spice and its extracts have been used in herbal medicine ⁷-¹⁰.

**Materials and Method**

**Collection and preparation of plant material:** The leaves were purchased from local market in Hilla city, middle of Iraq. After thorough cleaning and removal foreign materials, the leaves were stored in airtight container to avoid the effect of humidity and then stored at room temperature until further use.

**Preparation of sample:** About 20 grams of the plant sample powdered were soaked in 100 ml methanol for 16 hours in a rotatory shaker. Whatman No.1 filter paper was used to separate the extract of plant ¹⁸-²². The filtrates were used for further phytochemical analysis. It was again filtered through sodium sulphate in order to remove the traces of moisture.

**Fourier transform infrared spectrophotometer (FTIR):** The powdered sample of Apium graveolens was treated for FTIR spectroscopy (Shimadzu, IR Affinity, Japan). The sample was run at infrared region between 400 nm and 4000 nm.

**Determination of antimicrobial activity of crude bioactive compounds of Apium graveolens:** The test pathogens were swabbed in Müller-Hinton agar plates. Sixty µL of plant extract was loaded on the bored wells. Antifungal activity was evaluated by measuring the zone of inhibition against the test microorganisms. Methanol...
was used as solvent control. Amphotericin B and fluconazole were used as reference antifungal agent. The tests were carried out in triplicate. The antifungal activity was evaluated by measuring the inhibition-zone diameter observed after 48 h of incubation.

**Results and Discussion**

**Identification of biochemical compounds:** Analysis of compounds was carried out in methanolic extract of *Apium graveolens*, shown in Table 1. Analysis of the methanol extract of *Apium graveolens* showed the presence of five major peaks. The FTIR analysis of *Apium graveolens* leaves proved the presence of functional group assignment Alkyl halides, Amide, and Alkane with Intensity 75.578 (Strong), 87.413 (Strong), 86.158 (Strong), 84.616 (Bending), 88.087 (Strong), and Peak (Wave number cm⁻¹) 1020.34, 1238.30, 1317.38, 1608.63 and 2918.30. In the current study, the anti-microbial activity of *Apium graveolens* methanolic extract was highly against *Klebsiella pneumoniae* (4.27 ± 0.16). *Apium graveolens* was very highly active against *A. terreus* (5.01 ± 0.17). The effect of *Apium graveolens* essential oils on bacterial and yeast growth was studied by the Paper-Disk plate method by measuring the inhibition zone. Based on the present study, it is concluded that the whole plants of *Apium graveolens* contains various bioactive components with high degree of antibacterial activity against various pathogens. It is hoped that this study would direct to the establishment of some compounds that could be used to invent new and more potent antibacterial drugs of natural origin. Further work will emphasize the isolation and characterization of active principles responsible for bio-efficacy and bioactivity. Flavonoids and other phenolic compounds spread widely in plants, and their diverse biological activities such as antioxidant effects have been investigated in many studies such as coronary heart diseases, diabetes, and cancer. Medicinal herbs have fewer side effects than chemical drugs and their antioxidant attributes decrease the toxicity of these drugs. Today herbal drugs are used as an alternative to chemical drugs and the main reason is their low level of side effects compared with chemical drugs. WHO encourages countries to provide safe and effective traditional remedies and practices in public and private health services and it also published two monographs on medicinal plants with information on pharmacopoeial summaries for quality assurance: botanical features, distribution, identity tests, purity requirements, chemical assays, and active or major chemical constituents, clinical applications, pharmacology, contraindications, warnings, precautions, potential adverse reactions, and posology.

**Table 1: FT-IR peak values of Apium graveolens methanolic leaves extract**

<table>
<thead>
<tr>
<th>No.</th>
<th>Peak (Wave number cm⁻¹)</th>
<th>Intensity</th>
<th>Type of Intensity</th>
<th>Bond</th>
<th>Type of Vibration</th>
<th>Functional group assignment</th>
<th>Group frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1020.34</td>
<td>75.578</td>
<td>Strong</td>
<td>C-F</td>
<td>Stretch</td>
<td>alkyl halides</td>
<td>1000-1400</td>
</tr>
<tr>
<td>2.</td>
<td>1238.30</td>
<td>87.413</td>
<td>Strong</td>
<td>C-F</td>
<td>Stretch</td>
<td>alkyl halides</td>
<td>1000-1400</td>
</tr>
<tr>
<td>3.</td>
<td>1317.38</td>
<td>86.158</td>
<td>Strong</td>
<td>C-F</td>
<td>Stretch</td>
<td>alkyl halides</td>
<td>1000-1400</td>
</tr>
<tr>
<td>4.</td>
<td>1608.63</td>
<td>84.616</td>
<td>Bending</td>
<td>N-H</td>
<td>Stretch</td>
<td>Amide</td>
<td>1550-1640</td>
</tr>
<tr>
<td>5.</td>
<td>2918.30</td>
<td>88.087</td>
<td>Strong</td>
<td>C-H</td>
<td>Stretch</td>
<td>Alkane</td>
<td>2850-3000</td>
</tr>
</tbody>
</table>
Conclusion

Medicinal property of *Apium graveolens* methanolic extract is due to presence of secondary metabolites. Five phytoconstituents were identified by (FTIR) analysis. This plant derived bioactive compounds used as source of antibiotic properties and pharmaceutical industries used for drug formulation. Analysis of *Apium graveolens* leaves proved the presence of functional group assignment Alkyl halides, Amide, and Alkane with Peak (Wave number cm⁻¹) 1020.34, 1238.30, 1317.38, 1608.63 and 2918.30. In the current study, the anti-microbial activity of *Apium graveolens* methanolic extract was highly against *Klebsiella pneumoniae* (4.27 ± 0.16). *Apium graveolens* was very highly active against *A. terreus* (5.01 ± 0.17).

Source of Funding: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: In our research, all protocols were approved under the Department of Biology, College of Science for women, University of Babylon, Hillah city, Iraq and all methods were carried out in accordance with approved guidelines.

REFERENCES


ACE gene Polymorphism on Diabetic Type 2 Patients and their Susceptibility to Diabetic Nephropathy

Alaa Shakir Al-Nahi1, Murtadha Jawad Al-Barqaaawee1
1Department of Biology, Faculty of Science, University of Kufa, Iraq

ABSTRACT

One of diabetic type 2 (T2D) complications is diabetic nephropathy, the glycated hemoglobin, poor diabetic control, are considered as risk factors for renal damage. Current study aim the I/D polymorphism ACE gene and serum ACE levels may increase the diabetic nephropathy complications susceptibility in a sample population of Al-Najaf in Iraq. A total of 90 T2D patients (about 32 without nephropathy and 58 with nephropathy) and 50 healthy persons, all groups age were >45 years old. The ACE I/D polymorphism was performed by polymerase chain reaction (PCR) using special primers, followed by electrophoresis on 1.5% agarose gel. We record significant differences between the ACE I/D polymorphism in T2D and control was (P < 0.01). The DD genotype of ACE I/D polymorphism the risk for T2D increased (OR = 7.2 fold), as well as, the carriers D allele, the risk (OR = 0.55). Also T2D patients had a significantly higher level in ACE in diabetic nephropathy (DN) and lower level in T2D without nephropathy if compared with controls (P < 0.01). Our evident show the carriers DD genotype had more serum ACE levels than carriers II genotype in T2D.

Keywords: type 2 diabetes mellitus, ACE1, insertion/deletion polymorphism ACE gene

Introduction

Disturbance in glucose homeostasis and absolute or relative insulin deficiency in addition to resistance to this hormone of diabetes mellitus are widespread in the world population, Type 2 diabetes mellitus (T2D), is characterized by changes in action of insulin and secretion, being linked with genetic susceptibility. It is developed to macro vascular and microvascular complications that constitute a risk for developing diabetic nephropathy1. Powerful system of RAS is responsible balance in fluid electrolyte and systemic blood pressure2. The release of renin is triggered by a number of physiological stimuli, including PGI2, decreased Na+ concentration in the distal tubule, reduced arterial pressure, renal sympathetic nerve activation and stimulation of β1-receptors. Following secretion, action of renin in synthesis of angiotensin I (ang I) from angiotensinogen protein3. At the chromosome 17q23 position is ACE gene, The product of ACE gene is a zinc metallopeptidase widespread in endothelial and epithelial cells surface4 and activate renin to convert angiotensinogen to angiotensin I, by having two homologous domains and two active sites, that shutout the C-terminal dipeptide from angiotensin I to form the potent vasoconstrictor and growth-promoting substance angiotensin II5. There is variation within the gene, a 278 base pair (I/D) polymorphism, produced different three ACE genotypes: I/I, I/D and D/D6. As the polymorphism present in an intron, not change in enzyme structure. However, the polymorphism is highly related to the plasma ACE level, while I/I, I/D and D/D have low, medium and high levels respectively7. ACE was chiefly present on endothelial cells surface of lungs, intestines, brush border membranes of renal, placenta and choroid plexus8. The D/D genotype carriers correlate with the increase in the ACE activity in cardiovascular disease and renal disease9 causing the increased conversion of ang. I to ang II9, other researchers also linked the D-allele to progression of native kidney diseases such as DN10. The frequencies for ACE genotype are differed according to ethnic groups12, observed DD genotypes distribution were 50% in Arab population. These frequency varies from 25% to 30% in Caucasian and African American populations, while less than 20% in Asian populations13.
Material and Method

Study population from AL-Najaf province in Iraq, we taken 90 patients with diabetes mellitus type 2 and 50 non infected persons as control, they were >45 years of age, were referred to Al-Sadder Hospital (located in kufa, Iraq) for diabetes center from November 2017 to September 2018, patients and control groups were approved for sampling and then informed of the results. Evaluation criteria for patients history are considered conventional risk factors for diabetes diabetes mellitus type 2 based on fasting blood sugar (HbA1c (4.8-6.0%), high blood pressure (systolic blood pressure >140 mmHg and diastolic blood pressure >90 mmHg, micro albuminuria >30 mg/24 hrs and creatinine >1.2 mg/dl for diabetic nephropathy.

Determination of ACE polymorphism: Extracted DNA from whole blood by using DNA isolation kit (Geniad gSYNCTM DNA Extraction Kit). the primers synthesis by (Bio Synthesis, USA) were performed for detection of I/D ACE polymorphism.

forward primers were 5'-CTG GAG ACC ACT CCC ATC CTT TCT-3''
reverse primer 5'- GAT GTG GCC ATC ACA TTC GTC AGA T-3'

The amplification of PCR was carried out in a total volume of 25 μl containing 5 μl DNA, 12.5 μl Go Taq green master mix 2X (PCR PreMix from Bioneer) is a premixed ready to use solution contains Taq DNA polymerase. Amplification was performed in Gradient Thermo-cycler (Agilent, USA), the program of PCR amplification were initial denaturation step at 94°C for 5 min followed by 30 cycles, each consisting of denaturation at 94°C for 1 min, annealing at 58°C for 1 min and extension at 72°C for 2 min, followed by final extension step at 72°C for 5 min. then PCR products were separated on 1.5% agarose gel and visualized by ethidium bromide staining on UV transillumination imaging system. the D allele sizes were 190 bp while the I allele 490 bp. To avoid mistyping of DD, perform second PCR on DD genotype samples by using specific insertion primer pairs included:

forward primer 5'-TGG GAC CAC AGC GCC CGC CAC TAC-3'
reverse primer 5'-TCG CCA GCC CTC CCA TGC CCA TAA-3'

In 25 μl reaction mixture volume. Second PCR program were initial denaturation at 94°C for 1 min followed by 30 cycles, each cycle was denaturation at 94°C for 30 s, annealing at 67°C for 45 s and extension at 72°C for 2 min followed by final extension at 72°C for 5 min. Positive control samples (samples showed II genotype in first PCR) were used to confirm the reliability of genotyping, finding of I allele at 335 bp.

Detection of Angiotensin I-converting enzyme: ACE concentrations in serum detected by ELISA kit from Elabscience, cat.no.E-EL-H0002, which applies to the in vitro quantitative determination of human ACE concentrations in serum, plasma and other biological fluids.

Statistical Analysis: Mega stat software used to statistically analyzed to obtained mean ± standard deviation (SD), the odds ratio (OR) and P < 0.05 were considered significant.

Results

Renal functions were established on the basis of the mean serum concentrations of creatinine and Microalbuminuria in urine, this study record in T2D with nephropathy highly creatinine 5.48 ± 2.00 mg/dl than 0.56 ± 0.26 mg/dl in control in addition to Microalbuminuria (mg/24 hrs) was significant P<0.01 than control in table 1.

Table 1: Comparison of some renal function parameters T2D with nephropathy and ACE level

<table>
<thead>
<tr>
<th>Parameters</th>
<th>T2D with nephropathy</th>
<th>T2D without nephropathy</th>
<th>Control</th>
<th>p.value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creatinine mg/dl</td>
<td>5.48 ± 2.00</td>
<td>1.70 ± 0.88</td>
<td>0.56 ± 0.26</td>
<td>0.01</td>
</tr>
<tr>
<td>Microalbuminuria (mg/24 hrs)</td>
<td>103.415 ± 14.7</td>
<td>39.205 ± 16.15</td>
<td>7.09 ± 2.56</td>
<td>0.01</td>
</tr>
</tbody>
</table>

Detection of I/D polymorphism for the ACE gene:

1.5% Agarose gel stained with ethidium bromide illustrating different band sizes in the patients group for ACE I/D polymorphism in Figure 1, the 490 bp band indicating II genotype, 190 bp indicating DD genotype, and both 490,190 bp indicating ID genotype.
Figure 1: Electrophoresis of *ACE* (I/D) polymorphism in a 1.5% agarose gel. The PCR products were illustrated under UV light. Lane 1 DNA ladder (100-1000 bp): Lanes 3,5,6 are DD homozygous at 190 bp; Lanes 8,9 are II homozygous at 490 bp; ID at 490, 190 bp heterozygous Lanes 4, 7: lane 2 there was no PCR product. Table 2 showed DD genotype is risk factor for progression to nephropathy than in control (OR=7.21 ;P < 0.01). whereas II genotype was not comprised risk factor for diabetic nephropathy.

Table 2: *ACE* polymorphisms frequencies and comparison of OR between T2DM without or with nephropathy patients and control groups

<table>
<thead>
<tr>
<th>ACE Genotype</th>
<th>Patients no.90</th>
<th>T2D without nephropathy(32)</th>
<th>Control no.50</th>
<th>T2D with nephropathy(58)</th>
<th>OR</th>
<th>P.value</th>
</tr>
</thead>
<tbody>
<tr>
<td>DD</td>
<td>63(70%)</td>
<td>22(34%)</td>
<td>12(24%)</td>
<td>41(65%)</td>
<td>7.212</td>
<td>0.01</td>
</tr>
<tr>
<td>ID</td>
<td>19(21%)</td>
<td>7(36%)</td>
<td>23(46%)</td>
<td>12(63%)</td>
<td>0.55</td>
<td>0.01</td>
</tr>
<tr>
<td>II</td>
<td>8(8.8%)</td>
<td>3(37.5%)</td>
<td>19(38%)</td>
<td>5(62.5%)</td>
<td>0.16</td>
<td>0.01</td>
</tr>
</tbody>
</table>

The frequency of DD/ID allel in patients as comparison to control were 80.50%and 35% respectively, while II/ID allel show significantly differences (P<0.05) as control table 3.

Table 3: Comparison of different *ACE* gene polymorphism

<table>
<thead>
<tr>
<th>Allel type</th>
<th>Patients</th>
<th>Control</th>
<th>p.value</th>
</tr>
</thead>
<tbody>
<tr>
<td>DD+ID</td>
<td>80.50%</td>
<td>35%</td>
<td>0.05</td>
</tr>
<tr>
<td>II+ID</td>
<td>19.30%</td>
<td>61%</td>
<td>0.05</td>
</tr>
</tbody>
</table>

**Determination of Angiotensin I-converting enzyme:** In patients with DD allele of the *ACE* gene, had high serum ACE concentration compared to those who II allele 19.7 ± 5.13 ng/mL in T2D without nephropathy and 27.2 ± 6.42 ng/mL in T2D with nephropathy, the patient with ID genotype are 53.657 ± 9.23ng/mL in T2D without nephropathy and 80.84 ± 17.98 ng/mL in T2D with nephropathy, ACE activity was also elevated in DD genotype patients about 75.61 ± 18.20 ng/mL in T2D without nephropathy and more raising in T2D with nephropathy 100.6 ± 15.79 ng/mL.
Table 4: Differences between the allelic and ACE level in T2D without nephropathy, T2D with nephropathy and control

<table>
<thead>
<tr>
<th>Groups</th>
<th>ACE ng/mL</th>
<th>P.value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DD</td>
<td>ID</td>
</tr>
<tr>
<td>Control</td>
<td>28.77 ± 12.62</td>
<td>29.1 ± 8.19</td>
</tr>
<tr>
<td>T2D without nephropathy</td>
<td>75.61 ± 18.20</td>
<td>53.657 ± 9.23</td>
</tr>
<tr>
<td>T2D with nephropathy</td>
<td>100.6 ± 15.79</td>
<td>80.84 ± 17.98</td>
</tr>
</tbody>
</table>

Discussion

There is many factors effect on patients with diabetic type2 such as variation in genetic factors, hydrodynamic and metabolism, these alterations responsible for developed diabetic nephropathy.

The high sugar levels in blood for long period causes injuries in most of nephrons lead to disability of kidneys to performed fluid and electrolyte balance. In our study, duration and severity of diabetes strongly correlated with high serum creatinine and Microalbuminuria levels in urine can be used as useful prognostic markers and predictors of renal damage in diabetic patients 15 our findings agree with 16&17. High level of serum creatinine result from decreasing of glomerular filtration rate, the serum creatinine level is related to measure of glomerular filtration, this rise indicates progression of kidney disease and thus serum creatinine has greater prediction ability18. 19findings an increasing in serum creatinine level is signal of kidney injuries in patients with hypertension in diabetic people who are suffering then kidney disease. the microalbuminuria result from leak small amounts of the blood protein albumin into the urine 20, this one symptoms of DN, our study show significantly differences in microalbuminuria and agree with15 of diabetic nephropathy than diabetic without nephropathy and control(P<0.01). The important genes in RAS pathway, ACE gene is one of them, the polymorphism of this gene has effect in progression diabetic nephropathy in T2D patients, when compared with healthy non diabetic control subjects and also compared with T2DM patients without nephropathy, The our results observed the DD genotype was significantly higher (P<0.01) in DN than healthy non-diabetic control subjects and T2D patients without nephropathy, besides, the frequency of the D allele was more in diabetic nephropathy than other groups control and diabetic without nephropathy patients, this finding supported with many studies suspected that the D allele or DD is associated with the progression of nephropathy in type 2 diabetic patients 22,23,17&20. In UAE observed association of ACE polymorphism with diabetic type224. others studies involved the association of D/D genotype with increased T2DM risk in Tunisia 25 and with DN in Iran26 and in Egypt 27. Japanese studies considered the D allele is an independent risk factor for DN in T2D patients 28, other study showed that patients who were DD genotype had diminished in renal function and the D allele revealed significantly associated with DN 29. We reported an increase in plasma ACE level in individuals with T2D (p<0.05) especially in diabetic nephropathy, these findings are in agreement with several previous Studies17,26,30, the rapid damage in nephron function is suspected in DD genotype carriers which is related with raising serum ACE levels than DI and II, The elevated ACE expression caused increases in the plasma angiotensin II level, and enhanced damaged in podocyte then result in developed kidney.

Conclusion

Our current study suggest that D/D genotype of ACE gene associated with susceptibility to diabetes and DN than I/I genotype, we found there is relation between level of serum ACE in D/D genotype carriers.

Source of Funding: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Faculty of Dentistry, University of Babylon, Hillah city, Iraq and all experiments were carried out in accordance with approved guidelines.

REFERENCES


The Epidemiology of Hepatitis a Virus in Iraq

Nisreen Kaddim Radi1, Tsahel H. Al-Dulaimi1, Amal Raqib Shamran1

1Collage of Science for Women, University of Babylon Iraq

ABSTRACT
Is liver infection resulted from the infected with Hepato-virus A (HAV)[1] The time between symptoms and infection (incubation period), in the affected people, is amid (2-6)weeks.[2] vomiting, diarrhea, nausea, fever, jaundice and abdominal pain represented symptoms of infection [2]. In old patient Acute liver failure occur, Many patients have few or even no symptoms, particularly in the young. The spreading of infection can occur throw ingestion of contaminated food and water with infected feces. there is no symptoms when Children have the infection, but they can capable of transfer the virus to others. Diagnosis need blood testing, because the symptoms mimic those of another infection. [3,4].

Keywords: Epidemiology, Hepatitis A virus, Iraq

Introduction
As other Middle Eastern countries, Iran was marked as a high prevalence area. In the last three decades the hygienic level has been improved significantly like sanitation, and teaching Thus researchers predicted a decreased rate of viral hepatitis-A spreading [5]. Multiple studies that performed in Iran studying the prevalence of HAV infection. These studies were carried in different areas of the country with different designs and results. In a study in southern Iran, out of 1050 participants, 88.2% were positive for anti-HAV. a positive serology was documented in 79.3% of participants greater than (20y) old compared to 99% of those greater than 30 years of age. The rate of positive serology was more in rural areas (95.9%) compared to urban regions (85.1%). raise Family number was associated with higher antibody levels[6]. In some Asian and countries of Middle East like Lebanon and Saudi Arabia, which are enduring epidemiologic transition of HAV as hyper-endemic toward intermediate pattern. There is a vital treatment for a program that used national vaccination in order to prevent HAV infection and its consequence [7]. The infection of hepatitis A is increased in Iraq from 1802 in 2009 to 4473 in 2014 between nationals. Because of many factors like poor hygiene, contemned drinking water and unsafe food that facilities mode of HAV, HAE [8].

Vaccination: Now are found two deactivated vaccines in USA and the Canada, contain a collective of Hepatitis A and Hepatitis B vaccine.[9]. Hepatitis A vaccines offer protection for long-term. [10].

Several countries arranged universal vaccinations for prevention of HAV, but such decision to adopt national vaccinations in the Middle East countries needs additional evidence. The burden of vaccination costs and HAV infection are important considerations for making such decision, particularly in a low resource setting. There are multiple of HAV vaccine brands where the cost of single dose is between 15 to 65 USD. In comparison to other viral infections that carry greater disease load but minor cost for vaccination such as hepatitis B virus (HBV) infection, meanwhile, there is no clear evidence for suggesting mass vaccination for HAV in our region[10].

In the future if vaccination for HAV is proven necessary, it can be included in the routine vaccination program such as HBV for all neonates and children. A combined single HBV/HAV vaccine can also be injected by the age of entry into high school as a catch up vaccination for both viruses[11].

When occurrence of HAV infection occurs, we should vaccinate susceptible individuals. This method of prevention found to be cost-effective in multiple studies.
Application of accelerated vaccination needs adequate abilities for early diagnosis of an outbreak, to identify susceptible persons. In the setting of an outbreak, the injection of a vaccine during the pre- and post-exposure period is more effective than an immunoglobulin injection. An accelerated vaccination can be performed for a more rapid effect. One trial studied the combined, accelerated HAV/HBV vaccination injected at 0, 7, 21 days and a12 months booster dose offer good efficacy and safety[12].

The World Health Organization has proposed routine vaccination for all children with rapid outbreak diagnosis and control by accelerated vaccination in countries with intermediate prevalence such as the Middle East when the significant infection of HAV is occur[13].

Viral hepatitis in the Middle East July 28, 2014 marked World Hepatitis Day, and this year people around the world were encouraged to “think again about viral hepatitis”. The Lancet has published hepatitis is one of the major global health care problems and kills around 1·5 million people worldwide every year. The prevalence of viral hepatitis varies from region to region, but is generally higher in Middle Eastern countries than in Europe and the USA. The main causes of viral hepatitis include hepatitis A, B, and C viruses. Hepatitis A virus (HAV) is the most common cause of acute hepatitis in children in the Middle East. However, only a few studies of the epidemiology of HAV in the Middle East have been done. The disease can easily be mistaken for a common cold and the reported prevalence can therefore be underestimated.

The prevalence of HAV in Iran (and probably in most countries in the region) is very high. In a 2006 study of 1869 people 18–65 years of age, the seroprevalence of HAV was 85% in the capital Tehran, 96% in Hormozgan in southern Iran, and 99% in Golestan in the north of the because of improved sanitation, and the average age of infection with the virus has been increasing in the country, children and young adults remain the primary targets; most children in Iran contract the disease and have immunity by 10 years of age. In most areas of Iran, more than 90% of people aged 33 years or older are in the prevalence of HAV has also been reported in Saudi Arabia.

**Taxonomy:** Hepatitis A virus considered as a member Picornavirales order that belong to Picornaviridae family and Hepatovirus genus. Natural hosts of this virus are vertebrate and humans. [14]

**Genotypes:** Single serotype with seven dissimilar genetic groups (4 infect human plus 3 simian) ensured. [15] genotypes that infect human are I, II plus III. subtypes that described are six (IA, IB, IIA, IIB, IIIA, IIIB).[7,16]

**The Structure of virus**

**Capsid:** HAV capsid is formed with subunits called capsomeres (Figure 1,2). every capsomere consist of of 5 protomers. The Structure of every capsomere cosist of 5 protomers. All HAV protomer is created of three proteins; VP1, VP2, and VP3, their function in the cell entry.

The core of all viruses is known as The nucleocapsid, which is consist of nucleic acid and protein. The protein coats protects genome of the virus[17].

HAV varies from other hepatitis strains as it’s belong to the picornavirus family. This family are little germs, non-enveloped, icosahedron-in their shapes, viruses have RNA single strand. [18].

**Figure 1, 2:** HAV structure every capsomere cosist of of 5 protomers. All HAV protomer is created of three proteins; VP1, VP2, and VP3
Genome

![Genome diagram](image)

**Figure 3:** HAV genome is consist of RNA single strand of three section. The genome of HAV is positive-sense, single-stranded RNA, written as ss(+).RNA. Because the virus is positive-sense RNA

Viral Replication

![Hepatitis A Replication Cycle](image)

**Figure 4:** HAV life cycle Lifecycle

The natural hosts of HAV are human and vertebrate. fecal-oral Routes the principle road of Transmission plus blood. HAV enter blood stream Following ingestion, by cross the oropharynx epithelium or intestine epithelium. The virus reach to the liver, and start their replication inside of hepatocytes and Kupffer cells (liver macrophages). The replication of HAV completed in the cytoplasm... Translation of viral protein initiation. then virus leavings the host cell via cell lysis plus viroporins. Virions then exude into the bile and discharged into stool. HAV is liberated in large numbers about 11 days before the symptoms appear or anti-HAV IgM antibodies in the blood are elevated. The incubation period is 15–50 days. % There is No virus-mediated cytotoxicity happens, apparently as of the virus’ own requirement for an intact eIF4G, and liver pathology is likely mediated by immune system.

**Conclusion**

In old patient acute liver failure occur, many patients have few or even no symptoms, particularly in the young. The spreading of infection can occur throw ingestion of contaminated food and water with infected feces. There is no symptoms when Children have the infection, but they can capable of transfer the virus to others. Diagnosis need blood testing, because the symptoms mimic those of another infection.

**Source of Funding:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Collage of science for women/ University of Babylon Iraq and all experiments were carried out in accordance with approved guidelines.
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8. World health Organization web site, Communicable Disease Surveillance & Response (CSR) Hepatitis A: Prevention and Treatment


Assessment of Nurse Midwives Knowledge Regarding Nursing Care of Post-partum Hemorrhage at Al-Najaf AL-Ashraf City Hospitals

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ABSTRACT
A descriptive cross-sectional study design was conducted from 30/July/2018 to 29/July/2019 to meet the previously mentioned objectives. All nurse midwives (n=150) were included who works at the hospital of AL-Najaf AL-Ashraf Province. The result of the study revealed that the mean overall knowledge score of the study participants for all domains was (1.91) which indicated that the overall knowledge of nurse-midwives in Al-Najaf AL-Ashraf city hospitals regarding nursing care of PPH was (fair). the overall knowledge score about prevention of PPH was (1.87) which is also considered (fair). The result of the current study also revealed that there is a significant positive correlation had been found between age of participants and their overall knowledge score (R = 0.412, p. value = 0.004). Other significant positive correlation was found between duration of experience in delivery room (R = 0.575, P. value = 0.001) and a significant direct (positive) correlation was found with receiving training courses or workshops (R = 0.243, P. value = 0.043).

Keywords: nurse-midwives, knowledge, postpartum hemorrhage, prevention

Introduction
Postpartum hemorrhage (PPH) is being designated as the most substantial yet inevitable source of death and maternal illness all over the world (¹). Being the utmost prevailing 5th maternal mortality cause, PPH instigate 140,000 demises each year worldwide (²). Rendering the WHO, the distinct PPH definition is being stated by way of 500ml minimum blood loss after childbirth within 24 hours. However, the severe PPH is termed as 1000ml least blood loss in 24 hours of birth (³). Another definition is that PPH the sufficient loss of blood causing hypovolemia, a (10%) decrease in the hematocrit or a situation necessitating the transfusion of blood products irrespective of the delivery route (⁴). PPH has been categorized into two types: primary and secondary PPH (⁵). Primary (immediate) PPH is typified by a blood loss of more than 500ml owning to vaginal delivery and blood loss of 1500 ml owning to caesarean section within first 24 hrs of delivery (²). Practically uterine atony is considered to be the root of 70% of immediate PPH. Inadequate contraction of the uterus after a child is born referred to as atony of the uterus. The prevalence of immediate PPH is (5%) of all deliveries (⁴). An approximated 14 million cases of PPH are registered every year globally with a (1%) case-fatality rate (⁵). According to an assessment, about 2% of the women childbirths are associated to PPH. Although, another approximation indicates the ratio of 25% global maternal deaths while marking the PPH as a widely held prime reason of demise in low wages countries. Economically well developed countries has overall less decease risk than the developing nations. In the high-income countries, the total death risk is approximated to be 1:100,000 deliveries as compared to 1:1000 in low-income countries (⁶).

According to Rath (2011), a recent WHO analysis showed that in high-income countries, hemorrhage as a result of PPH accounts for (13.4%) of maternal mortality, (30.8%) for Asia, and 34% for Africa (⁵). With
a broad difference globally, the incidence of minor PPH and severe PPH is estimated to be (6%) and (1.86%) of all deliveries (4,5). Morbidity resulting from severe PPH is approximated at 4.5-6.7/1000 deliveries with nearly 20 million women globally every year suffering from an acute or chronic disability due to PPH (6). Midwives play a crucial role in effective prevention, diagnosis and treatment of PPH. They are required to be familiar with all the risk factors associated with PPH, and well-trained to manage them to avoid PPH and complications associated with it. Life-saving skills as a part of the training of the midwives enable them to make a substantial contribution to the reduction of PPH (7). The technical know-how, attitudes, and practices of midwives are very crucial for the prevention and treatment of PPH (8).

**Methodology**

**A study aims:** The purpose of the current study was to investigate the nurse midwives knowledge regarding nursing care of PPH. The current study also aims to find out the relationship between nurse midwives knowledge regarding nursing care of post-partum hemorrhage with their socio demo-graphic and personal characteristics such as (age, marital status, economic status, educational level, etc……).

**Design of the study:** A descriptive cross-sectional study design was conducted from 30/July/2018 to 29/July/2019 to meet the previously mentioned objectives.

**Study Sample:** All nurse midwives (n=150) were included who works at the hospital of AL-Najaf AL-Ashraf Province, 53 of them from AL-Zahra Teaching Hospital, 25 nurse midwives from AL-Forat Teaching Hospital, 17 nurse midwives from AL-Hayderia General Hospital, 22 nurse midwives from AL-Manathera General Hospital, 17 nurse midwives from AL-Hakim General Hospital, 16 nurse midwives from AL-Sajad General Hospital.

**Study instrument:** A constructed questionnaire was prepared and modified after a thorough review of the relevant literature. This questionnaire covers two parts:

**Part 1:** Socio-demographic and personal characteristics: This part included the following (age, level of education, duration of experience in delivery room, receiving training courses or workshop about postpartum hemorrhage, accommodation, type of accommodation, marital status, economic status, others) which included (8) items.

**Part 2:** Knowledge of nurse midwives about prevention of postpartum hemorrhage which included (18)items.

**Validity and Reliability:** The content validity of the instrument was established through a panel of (12) experts, the reliability of the items was based on the internal consistency of the checklist was assessed by calculating Cronbach Alpha which was= 0.765

**Data Collection and Data Analysis:** A structured questionnaire used to collect data by direct interview. The approximate inteview time of 25-30 minutes was provided for the questionnaire completion. Data collection is performed from 2 Jan.2019 to. To determine whether the objectives of the study were met, the current study data were analyzed by using SPSS, version 25.

### Results

**Table 1: Distribution of Duration of Experience in Delivery Training about Postpartum Hemorrhage**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration of Experience in Delivery Room</td>
<td>&lt;1 year</td>
<td>20</td>
<td>13.3</td>
</tr>
<tr>
<td></td>
<td>1 - 10</td>
<td>73</td>
<td>48.7</td>
</tr>
<tr>
<td></td>
<td>11 - 20</td>
<td>31</td>
<td>20.7</td>
</tr>
<tr>
<td></td>
<td>21 - 30</td>
<td>18</td>
<td>12.0</td>
</tr>
<tr>
<td></td>
<td>&gt; 30</td>
<td>8</td>
<td>5.3</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>150</td>
<td>100.0</td>
</tr>
</tbody>
</table>

| Receiving Training about Postpartum Hemorrhage | Training course | 109 | 40.1 |
|                                              | Workshop        | 90  | 33.1 |
|                                              | Other training  | 73  | 26.8 |
|                                              | Total           | 272*| 100.0 |

*Nurse-Midwives Mentioned more than One Choice

Table 1 illustrates the distribution of duration of experience in delivery room together with history of training about postpartum hemorrhage where 20 participants (13.3%) had a duration of experience in delivery room for less than one year, 73 (48.7%) had a duration of one to ten years, 31 (20.7%) for 11 – 20 years, 18 (12%) for 21-30 years and 8 nurse-midwives (5.4%) had a duration of experience in delivery room of more than 30 years. Regarding the training about postpartum hemorrhage, 109 nurse-midwives (40%) had received training courses, 90 (33.1%) had participated...
in workshops and 73 (26.8%) nurse-midwives received other types of training.

Good knowledge was about observe the signs of placenta delivery, delivery of the placenta after completely separated and uterus contract is a preventive measure of PPH, Instruct the mother not to push prematurely, proper sutting of episiotomy.

Poor knowledge was reported about Register time of placenta delivery, give an oxytocic drug as ordered, inspection of perineum after delivery provide instruction about episiotomy, uterine tone prevention of infection, make sure bladder is empty, delivery of the baby slowly with contractions.

Table 2: Knowledge Levels of the Nurse-Midwives about Prevention of Postpartum Hemorrhage

<table>
<thead>
<tr>
<th>Knowledge Levels</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor</td>
<td>59</td>
<td>39.3</td>
</tr>
<tr>
<td>Fair</td>
<td>72</td>
<td>48.0</td>
</tr>
<tr>
<td>Good</td>
<td>19</td>
<td>12.7</td>
</tr>
<tr>
<td>Total</td>
<td>150</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Based on Table 2, 59 nurse-midwives (39.3%) had poor knowledge, 72 (48%) had fair knowledge and only 19 nurse-midwives (12.7%) had good knowledge about prevention of PPH.

Table 3: Results of Bivariate Spearman’s Correlation Analysis for the Correlation between Overall Knowledge of Nurse-Midwives and Demographic Variables

<table>
<thead>
<tr>
<th>Socio-Demographic Characteristics</th>
<th>Overall mean knowledge score</th>
<th>Spearman’s correlation coefficient</th>
<th>P. value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (year)</td>
<td>0.412</td>
<td>0.004</td>
<td></td>
</tr>
<tr>
<td>Level of Education</td>
<td>0.056</td>
<td>0.495</td>
<td></td>
</tr>
<tr>
<td>Accommodation</td>
<td>0.044</td>
<td>0.595</td>
<td></td>
</tr>
<tr>
<td>Type of Accommodation</td>
<td>0.028</td>
<td>0.738</td>
<td></td>
</tr>
<tr>
<td>Economic Status</td>
<td>0.145</td>
<td>0.076</td>
<td></td>
</tr>
<tr>
<td>Marital Status</td>
<td>0.154</td>
<td>0.060</td>
<td></td>
</tr>
<tr>
<td>Duration of Experience in Delivery Room</td>
<td>0.575</td>
<td>0.001</td>
<td></td>
</tr>
<tr>
<td>Receiving Training Courses or Workshops</td>
<td>0.234</td>
<td>0.043</td>
<td></td>
</tr>
</tbody>
</table>

Table 3, shows Spearman’s bivariate correlation analysis. A significant direct (positive) correlation had been found between age of participants and their overall knowledge score (R = 0.412, p. value = 0.004). Other significant direct (positive) correlation was found with duration of experience in delivery room (R = 0.575, P. value = 0.001). Moreover, a significant direct (positive) correlation was found with receiving training courses or workshops (R = 0.243, P. value = 0.043). No significant association had been found between overall knowledge scores and other variables including level of education, accommodation, type of accommodation and economic status, (in all of these variables correlation was not significant, P. value > 0.05). All through the progression of current study, the research outcomes indicated age distribution of the participants while revealing that the major age group is between (20 – 29) years which constitutes (44.7%), followed by age group (30-39) years (22%). This data may slightly differ from that obtained by (40) who found that the major age group is (47-55) years (32.5%), followed by (20-28) years (24.7%). The results of the current study indicate the target population from which the sample is drawn; it also indicates that younger nurses midwives constitute the majority among their groups. Table (3) reveals that some of the midwives’ responses about prevention of PPH are categorized as poor (correct responses equal or less than 33.33%), they include : support perineum area by towel, checking membrane and parts of the placenta, prohibition of fundal pressure, assessment of locia, follow up of contraction every 5 minutes, avoid the routine episiotomy, episiotomy should be timely with crowing of fetal head and support flexion point during labor to prevent perineum laceration. This result greatly differs from the results observed by Faiza, (2015), who found that most items related to prevention have high scores and good knowledge (10). The same table shows that some responses are considered (fair), these include : give an oxytocic drug as ordered, inspection of perineum after delivery, provide instruction about episiotomy, uterine tone prevention of infection and make sure bladder is empty. These result disagrees with Onasoga et al. (2012) who found that about (78.8%) of the midwives have correct responses about the question of using oxytocin to prevent PPH(11); while Faiza (2015) observed about (93.9%) have correct answers (10); Elfaki (2015) noticed that (94.8%) of the investigated midwives have correct answers for the same question (9). It is well known that oxytocin is a hormone secreted by the posterior pituitary.
gland and tend to increase the uterine contraction during delivery\(^{(12)}\); so it is an unexpected result in the current study to find that (21.3\%) of the studied sample to give wrong answers about the question related to oxytocin, and (30\%) of them do not know the correct answer.

Regarding the item of bladder emptying, previous studies found the following correct responses; Faiza (2015) found about (79.6\%); Elfaki (2015) found that (90.9\%); Onasoga et al. (2012) found that (93.8\%)(\(^{9-11}\)). While Bulndi et al. (2017) found a lower score (only 60\%). Their studies that have previously recorded high scores of correct answers related to other questions (inspection of perineum after delivery, provide instruction about episiotomy, uterine tone prevention of infection)\(^{(13)}\). The present study found good knowledge (correct answer above 66.66\%) regarding the following items: (observe the signs of placenta delivery, delivery of the placenta after completely separated and uterus contract, instruct the mother not to push prematurely). It means that knowledge and awareness increases with age, this result is in agreement with Jaber and Abbas (2012) who found a significant association (\(p=0.02\)) between midwives’ age and their knowledge\(^{(14)}\). This may be due to increased practice and experience by increasing age resulting in accumulation of information so that the same table (4.17) shows a high significant positive correlation (\(p=0.001\)) between overall knowledge and duration of experience in delivery room; this result agrees with that obtained by Bulndi et al. (2017) that observed high levels of knowledge about PPH is found in midwives with years of experience more than 15 years\(^{(13)}\). However, Jaber and Abbas (2012) did not find a significant relationship between knowledge and experience\(^{(14)}\). Unexpectedly, this results did not reveal any significant relationship (\(p=0.495\)) between overall knowledge of nurse-midwives and their level of education, this result agrees with the result obtained by Onasoga et al.\(^{(11)}\). However, disagrees with the study conducted by Jaber and Abbas (2012) who pointed a significant relationship with educational status\(^{(14)}\); another study found that doctors have better scores than midwives\(^{(15)}\). The unexpected result in the present study may be explained by what is mentioned in this chapter that most of the study sample (74\%) are graduated from secondary school of midwifery, so that there is no great difference in the level of education of respondents participated in this study. Concerning training, the current study found a significant correlation (\(p=0.043\)) between overall knowledge of nurse-midwives and receiving training courses or workshops, this result agrees with the work obtained by Benedict et al. who found that midwives who completed the training courses named “Essential Steps in the Management of Obstetric Emergencies” ESMOE had better knowledge and performance\(^{(15)}\). However, another study conducted in Baghdad did not find a significant correspondence of about \(p=0.05\) amongst the training and inclusive understanding of nurse midwives\(^{(14)}\). While, no noteworthy correlation has been perceived among nurse midwives’ complete knowledge & their marital status, the \(p\) value in table (4.17) is (0.06) which is very close to the significant cutoff level (0.05). This result agrees with the study of Jaber and Abbas (2012) who did find a significant relationship (\(p=0.584\))\(^{(14)}\).

Conclusions

It was concluded that the nurse-midwives have a moderate level of knowledge about the overall concepts, information and skills related to the prevention of postpartum hemorrhage. Generally, the knowledge of nurse-midwives about postpartum hemorrhage increases with age and years of experience. Training of nurse-midwives by training courses and workshops have an effect on their overall knowledge about postpartum hemorrhage.

Source of Funding: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Nursing, University of Babylon, Hilla City, Iraq and all experiments were carried out in accordance with approved guidelines.

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3. World Health Organization.. WHO recommendations for the prevention and


Measurement & Evaluation of the Method of Quantitative Correlation Related to the Development of Some Types of Volleyball Reception Skill

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ABSTRACT

The methods and methods are important in the development of different skills in learning as the path that leads to the achievement of motor duty and through it to reach the requirements of success and these methods which are modern is the interdependence in the performance that allows the learner to shorten the teaching period and at the same time of exciting ways in learning and that the skill of reception of the most important skills in volleyball and mastering the success of the overall performance and that the imbalance in the reception of the ball, which is the first stages lead to a defect in the construction of a correct attack, and the skill of reception of different forms that the player can perform according to the nature of the transmission. For the transmitter player, the player must master all forms of volleyball reception.

Keywords: Measurement, quantitative correlation, skill

Introduction

The scientific development is taking great strides through solving the scientific problems that have the greatest impact in achieving the mathematical achievement. This development is not confined to one area ¹, but encompasses all areas of life. The field of physical education is one of these areas that develop very rapidly. The methods and methods of the most important areas that have a great interest in the development of physical activities because of their specificities in this area, and these methods are the method of quantitative interdependence, which reflects the application of the interconnected between the parts of one skill and the field is interesting in the process of learning in addition to the Volleyball is one of those games that are characterized by basic skills and the task that most of the parts of those skills are based on scientific grounds and accurate form of performance determines the player’s special situations in the skill of receiving the defense and defense of the stadium, that basic skill is as important as ² The position of the moment of mastery touching the ball is one of the most important requirements of the correct performance is based on the first situation (readiness) and that the construction of this important situation requires proper timing through the interconnection of a group of The kinetic capabilities such as balance and flexibility as well as agility as well as skill mastery. The importance of research is reflected in the researcher’s attempt to contribute to IGAD or the real knowledge of the level of performance of this important skill, which contributes directly to the win and also to know which of these forms are more used during matches within the actual performance through the application of this type of methods, so that Our trainers who train youth teams have an active interest in this skill. As for the problem of research, through the researcher’s follow-up to many local games ³, the researcher noticed there is a failure in the defensive side at the moment of receiving the ball from the sending of the opposing team as well as the lack of use of performance by modern means that have the appropriate impact in learning this skill in its desired form, As well as the lack of interest of most players with this skill, which is the first pillar to build a successful

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attack and its success works to deliver the ball to the player prepared without errors, in addition to the lack of applications in the types of modern methods. In this sense, the researcher was asked to study this problem in order to know the strengths and weaknesses in the forms of receiving the transmission among the members of the research sample. And the goals in this research are based on identification of the most common forms of reception among members of the research sample. Identifying the differences for each form of receiving reception in the research sample. The percentage comparison according to the use of the different forms of transmission among the members of the research sample.

### Table 1: Computational, standard deviation, intermediate, torsion and mangrove-simranov to see normal distribution

<table>
<thead>
<tr>
<th>Variables</th>
<th>Measuring unit</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>Median</th>
<th>Skewness</th>
<th>Mangrove-simranov</th>
</tr>
</thead>
<tbody>
<tr>
<td>weight</td>
<td>Kg</td>
<td>68.2</td>
<td>5.4</td>
<td>68.3</td>
<td>0.05</td>
<td>0.09</td>
</tr>
<tr>
<td>Length</td>
<td>Sentimer</td>
<td>177.1</td>
<td>5.81</td>
<td>175</td>
<td>0.05</td>
<td>0.12</td>
</tr>
<tr>
<td>Age</td>
<td>Year</td>
<td>23.3</td>
<td>1.21</td>
<td>23.1</td>
<td>0.49</td>
<td>0.08</td>
</tr>
</tbody>
</table>

It is clear that the value of the difference coefficient in all the search variables in Table (1) is between (+3, -3). This means that the sample in the research has been distributed closer to normal in all the research variables.

### Search Tools:

- Arab and foreign sources
- Volleyball court
- Volleyball
- Record of documentation.

### Tests used:

- Ball reception accuracy test
  - Test Name: Accuracy of reception.
  - Purpose of the test: Measure the reception accuracy of the ball.
  - Gadgets: volleyball court, five plane balls, adhesive tape.
  - Mode of performance: The laboratory stands in the right place in the center (6) and awaits the ball sent from the opposing team and receives the ball with the arms from the bottom and try as far as possible to deliver the ball to the player in the center (3) directly towards the area (A) (2) towards area (B) or center (1) in point (C) and give the player five attempts.
  - Calculation of scores:
    - Five attempts to give the player the total score of the test (25) degree
    - A score of (5) for region (A) is given when the successful attempt is made.
    - (2) scores are given to Area B when the successful attempt is made.
    - (1) scores for Area C are given when the successful attempt is performed.

Figure 1: Shows the accuracy of the defense of the pitch with arms

### Main experience:

The work of the actual researcher began the main experiment on 15/3/2017 until 15/5/2017,
ie a period of two months, the special exercises were applied according to this method through the adoption of each form of reception used with no score points. For other forms of reception not recorded in the current study in the special form prepared for this purpose and with the assistance of a dedicated staff of the game. As in some of the following exercises: The number of exercises was different and varied for 4 weeks and three units per week. The total number of units (12 units) included exercise according to the related performance of the type of skill to be learned and according to the type of transmission. The researcher also took care of the method of repetition and diversity in the performance of the exercises during each unit according to the performance of each type of transmission in terms of increase and gradation during the inclusion of the type of exercise during the motor as well as in the degree of difficulty, and was intended to develop the type of reception, improve accuracy, and have been careful in the preparation of exercises through the appropriate rest times the player’s possibility.

Different and varied exercises have been applied as in some of the following models:

1. The reception exercise the transmitter facing the jump over the person until the arrival of the ball sent.

2. The reception exercise Wavy transmission (winding) until the arrival of the ball sent.

3. The practice of receiving the overwhelming transmission by jumping in place until the arrival of the ball sent.

4. The reception reception of tennis by running over the rubber ropes until the arrival of the ball.

5. Receiving the transmitter from throwing the ball at a distance of (6) m and play the last stadium.

6. Receiving the wavy transmitter from the jump and the receiver inside the box 1 * 1 and the ball must be directed to the equipment.

7. Receiving the transmitter is forgetting jump on three barriers.

8. The future running winding and then receives the ball rolling transmitter,

9. Receiving the mass transmission by sending six players multiple transmitters and receivers in the defense zone.

10. Receive the overwhelming and receiving receiver in the back zone with the same number of balls sent.

The researcher then conducted a comprehensive survey of all the cases in the observation forms and separated them separately for the purpose of processing them statistically.

**Statistical Methods:** The researcher used the SPSS ver 19 program to process the data.

**Discussion**

**Table 2: Calculations, standard deviations, calculated T scores, and significance level are calculated for each form of receiver reception**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Measuring unit</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>(T)</th>
<th>S.g</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reception from the bottom</td>
<td>Degree</td>
<td>19.2</td>
<td>2.16</td>
<td>2.00</td>
<td>0.05</td>
</tr>
<tr>
<td>Reception from the top (with fingers)</td>
<td>Degree</td>
<td>190</td>
<td>11.0</td>
<td>4.99</td>
<td>0.00</td>
</tr>
<tr>
<td>Front-Down Transmission Receiver (DIV)</td>
<td>Degree</td>
<td>1.80</td>
<td>0.15</td>
<td>0.71</td>
<td>0.86</td>
</tr>
<tr>
<td>The reception (with one hand) of rolling side</td>
<td>Degree</td>
<td>2.27</td>
<td>0.72</td>
<td>1.02</td>
<td>0.53</td>
</tr>
<tr>
<td><strong>Df</strong></td>
<td></td>
<td></td>
<td></td>
<td>22</td>
<td></td>
</tr>
<tr>
<td><strong>Sig</strong></td>
<td></td>
<td></td>
<td></td>
<td>0.05</td>
<td></td>
</tr>
</tbody>
</table>
that most of the competing players were performing Send the A ripple in which the speed of the ball is slow and also does not have the power so large that the process of connecting the ball to the player and the player in the case of parking and without the usual effort or movement in the delivery, and the law may contribute in one way or another after this form, which reception from the top it is not permissible for the law to be a legal offense, but after allowing the players to use it legally, it helped the players to use this form and the abundance of its ease and lack of movement. The researcher sees the reasons for the low difference in the third form which is the receiver from the frontal fall. Player A For a competitor as well as often the ball is very high speed and that the distance that hit the ball also be close and also requires this form to the possibility of comprehensive performance from the beginning of attention and focus and determine the speed and strength and direction of the ball in order for the defender to send correctly to the player prepared as “The process of concentration, as it is highly, provides the player with sound movement and high flow, and when the researcher observed through the experiment in this research, although the use of this form with very little reason and the success of the performance of this form was not the required level and this means there is a weakness in the players in use Such as this form due to the lack of use during the training modules of the research members, as well as the researcher decreases the differences in the last form of reception is the side reception of the fall of one hand to several reasons, including standing defender player with the possibility of determining the direction of the ball during the transmission because the transmission used in the Most often it is the wavy transmission or transmission from the top and both forms can the future player determine the speed and direction of the ball and connect the ball from the stand position and if required to take a step to the side without reaching the fall or roll to one side and reception and this made the proportion of S Its use is very few.

Conclusions

The appearance of differences is obvious for the reception form from the top. Lower differences The most important form of reception is the reception from the bottom. Low use of other forms of receiving transmissions.

Source of Funding: There is no financial disclosure.
Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Directorate of Education Thi-Qar and all experiments were carried out in accordance with approved guidelines.

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Effect of Gold Nanoparticles and Laser on Platelet, Lymphocytes, and White Blood Cells

Lamees. A. Abdullah

Department of Physics, College of Science, University of Baghdad, Baghdad, Iraq

ABSTRACT

In the present work, the effect of gold nanoparticles (AuNPs) and He-Ne laser on lymphocyte, white blood cell (WBC), and platelet (PLT) have been studied. The number of lymphocytes, WBC, and PLT were measured using Hematology Analyzer for all samples before and after adding AuNPs and irradiation by laser, and the results treated statistically. The results showed that all three blood components decreased when they are exposure to AuNPs and laser, and the highest effect observed when the samples exposure to AuNPs and laser in the same time, in this case the percentage decline in lymphocytes, WBC, and PLT is found to be 44.4%, 33.6%, and 44.6%, respectively.

Keywords: Gold nanoparticles, Platelet, Lymphocytes, White blood cells.

Introduction

Nanotechnology is the science of producing nanosized materials with dimensions less than 100nm. Nanoparticles (NPs) have unique physical, biological and chemical properties that have attracted important attention due to their possibility use in many applications 1. Gold nanoparticles is wide used in many areas of medicine that include diagnostics, imaging, biosensing, drug delivery cancer therapy. AuNPs can contact with various cells, including platelet (PLT), lymphocytes, and white blood cells (WBC) because of their high penetration capacity 3-6. Leukocytes are cells have immune role for protecting the body against all foreign bodies such as bacteria and viruses 7,8. All types of leukocytes are produced in bone marrow. And the leukocytes are spread through the body. WBC is little if compared with RBC, but it is very important for the body. It number is ranged (4000-11.000) cell in millimeter cube 9, and it represent 1% of whole total blood volume. Leukocytes have real nuclei and organelles. It have distinguish defense role. Lymphocytes are 20-25% of the total white blood cells in the bloodstream. The lymphoid cells are spherical in shape, and have a nucleus spherical dense dyeing, occupy most of the space cell relatively small amount of cytoplasm baseline weak pigment. Lymphocytes have immune functions, such as cytotoxicity, antibody production and delayed hypersensitivity 11-12. Platelets, also called as thrombocytes are a tiny important blood cells that prevent blood loss at the site of injury. They are sticky cells, they need to be in constant motion after they are donated or they will clump and cannot be transfused. The platelet count is an important diagnostic parameter in hematology. Automated blood cell counters have largely replaced the manual method. In health there are about 150-400 x 10^9 platelets/liter of blood. Moreover, laser technology has been studied for decades and used in medical applications 13-14. Several studied have been performed on the effect of AuNPs and laser on human blood components. Zeng He et al. founded function of citric acid-coated AuNPs (CT-AuNPs) and polyethylene glycol-coated AuNPs (PEG@AuNPs) in RBC function and spreading of the nanoparticles in platelets, leukocytes and erythrocytes 3. The immunomodulatory potential of silver nanoparticles and gold nanoparticles was investigated by Devanabanda M. et al. using murine splenic and human peripheral blood lymphocytes (PBL) in terms of effects on viability and mitogen-induced proliferation 2. V. Wiwanitkit et al. evaluated of gold nanoparticle effects on WBC 15. Mitochondria structure was examined after exposure to He-Ne laser ( doses, 56 J m^-2, wavelength, 632.8 nanometer) by Manteifel V. examined by electron microscopy one hour after the irradiation exposure 16. P.Grešner et al. used flow cytometry for studing effects of a Nd-YAG laser on platelet cell activation and studying activation of glycoprotein of the platelets cell which stained with fluorolabelled monoclonal antibody PAC-1 17. In this paper, the effect of AuNPs and He-Ne laser on platelet,
WBC, and lymphocyte have been studied by measuring the number of these component using Hematology Analyzer before and after exposure to AuNPs and laser.

**Method and Materials**

**AuNPs Preparation:** The chemical synthesis used to prepare AuNPs by water (85) with HAuCla (5) ml were added together and heated. Then sodium citrate (5) ml was added to the solution during heating and heated for (30) minutes even the solution colour changed to wine red. Fig. 1 shows the UV-visible absorption spectra of AuNPs. The concentration of AuNPs was measured using atomic absorption spectroscopy (AAS) and found to be 387µg/ml as shown in Fig. 2.

![Absorption spectra of AuNPs](image1)

**Human Blood Samples:** Blood samples (18-20) ml withdrawn from a vein using syringe size (20) ml for more than (20 donors). These samples are divided into two parts: (2) ml for each part, put in the laboratory tubes containing the anti-clotting. First part considered as control and the second part treated by adding 40µl of AuNPs/2ml blood. Lymphocytes, WBC, and PLT number (for all blood samples) have been measured using Hematology Analyzer by shaking blood samples for 15 min., in Analyzer shaker, then by press on start an automatically metallic needle will step down inside the tube and draw out about 2μml from a blood sample, after a few seconds, all blood data will appear on Analyzer screen, which denoted to lymphocyte, WBC, and PLT account. The blood components (lymphocytes, WBC, and PLT) were measured before and after adding of AuNPs and after irradiation with laser, then they are measured after adding AuNPs and irradiation with laser in the same time. The samples were placed vertically under the source of He-Ne laser at 632.8 nm wavelength for 15 min.

**Results and Discussion**

**Effect of AuNPs and Laser on Lymphocytes:** The number of lymphocytes *10^9/L, before and after adding AuNPs and irradiating laser, have been measured using
It is observed that the number of lymphocytes are no more affect by adding AuNPs or by irradiating laser, the effect is clearly observed when adding AuNPs and irradiating laser in the same time. The results are statistically treated and arranged with SD and P-value in a table 1, then plotted as in fig.3.

<table>
<thead>
<tr>
<th>Table 1: Effect of AuNPs and laser on the number of Lymphocytes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>S. E.</strong></td>
</tr>
<tr>
<td>Lymphocyte</td>
</tr>
<tr>
<td>Lymphocyte + Laser</td>
</tr>
<tr>
<td>Lymphocyte + AuNPs</td>
</tr>
<tr>
<td>Laser + AuNPs</td>
</tr>
</tbody>
</table>

**Effect of AuNPs and Laser on WBC:** The number of PLT is affected by adding AuNPs and irradiation with laser as shown in fig. 5, PLT decreases after adding AuNPs and irradiation with laser, and this decreasing is highly observed after adding AuNPs and irradiation laser in the same time. These results with SD and P value.

<table>
<thead>
<tr>
<th>Table 2: Effect of AuNPs and laser on the number of WBC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>S. E.</strong></td>
</tr>
<tr>
<td>WBC</td>
</tr>
<tr>
<td>Wbc + laser</td>
</tr>
<tr>
<td>wbc + AuNPs</td>
</tr>
<tr>
<td>laser + nano</td>
</tr>
</tbody>
</table>

**Conclusion**

The results of the present work indicate that AuNPs and laser impact on lymphocyte, WBC, and PLT. We found that AuNPs and laser have no had apparent effects when samples exposure to either AuNPs or laser, while this effect is clearly observed when the samples exposure to AuNPs and laser in the same time. The percentage decline in lymphocyte, WBC, PLT after irradiation by laser is found to be 8.5%, 5.1%, and 9.4%, respectively. While the percentage decline in lymphocyte, WBC, PLT after adding AuNPs is 10.2%, 12.6%, and 4.6%, respectively. As for the percentage decline in lymphocyte, WBC, PLT after adding AuNPs and irradiation laser in the same time is 44.4%, 33.6%, and 44.6%, respectively. All the results are significant where P-value for all samples less than 0.005.

**Source of Funding:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Department of Physics, College of Science, University of Baghdad, Baghdad, Iraq and all experiments were carried out in accordance with approved guidelines.

**REFERENCES**


Study the Levels of Thyroid Hormones in Graves’ Disease and Impact on Leptin and Resistin Levels

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¹Department of Chemistry, College of Science, Al-Nahrain University, Baghdad, Iraq

ABSTRACT

Objective: The objective of the study is to assess the clinical execution in Graves' disease. We tested sera of patients with thyroid diseases and estimated (TSH), free thyroxine (FT4), thyroperoxidase antibodies (TPOAb), thyroglobulin antibodies (TgAb) also Leptin and Resistin. A total sera of 40 successive patients (25 females and 15 males) and 35 healthy subjects (20 females and 15 males) with aged between 30–65 years were assessed. The result of this study showed the increase in serum level of resistin in patients with thyroid dysfunction. The results showed that serum leptin levels were significantly low (P<0.004) in hyperthyroid patient groups as compared to control. Resistin hormones levels increased non-significantly (P˃0.05) than control levels. They affects each other in their physiological function in the human body. We concluded that (TgAb) and (FT4) high this leads to changes in levels of thyroid hormones and the result of this study showed the increase in serum levels of resistin in patients with thyroid dysfunction.

Keywords: Graves 'Disease, TSH, Tg-Ab, TPOAb, FT4, hyperthyroidism. Leptin and Resistin.

Introduction

Graves’ disease (GD) is the most well-known immune system pathology with a rate in individuals of approximately 14/100000. GD is the reason for the 70-80% of thyrotoxicosis, despite the fact that its predominance can shift among various populaces, as indicated by iodine exposure. ¹ Resistin as a hormones has an endocrine effects including effects on insulin resistances, obesity and also play a role in energy homeostasis. Resistin gene an expression is major in white adipose tissues, and especially in abdominal fat. ² (GD) is caused by thyroid stimulating hormone receptor activating antibodies that imitative the activity of TSH and deliver hyperthyroidism. Substantial changes in charge of poisonous adenoma and germline changes causing familial hyperthyroidism. ³ Leptin is an adipocytes-derived, 167-amino acid an-orexigenic hormones which is a product of obese gene located on chromosomes seven. Major sites of leptin production is white adipose tissue, but it can be produced by others tissues such as ovary, mammary epithelial cell, liver, stomach, also placenta as well ⁴ The physiologic agonist, thyrotropin, is discharged by the anterior pituitary gland and goes about as the primary regulator of thyroid function, animating thyroid development and function and secretion of thyroid hormones. ⁵ A study with different results on resistin concentrations in patients with hypothyroidism also hyperthyroidism has been reported. ⁶ A study has also shown that resistin levels are increased in patients with hyperthyroidism also its concentrations decreased with equalizing thyroid hormones status following treatments ⁷. Also, leptin increases the thyroid hormones levels. ⁸ Leptin organizes peripheral and central iodo-thyronine de-iodinase activity also conversion of T4 to T3. Leptin management has been shown to inhibit the fasting produced changes in serum T3 also T4 concentrations. ⁹ The point of our work was to assess the clinical execution in Graves’ disease. We tested sera of patients with thyroid diseases. We additionally estimated Thyroid stimulating hormone, free tetraiodothyronine (FT4), thyroperoxidase antibody (TPOAb), thyroglobulin antibody (TgAb) also Leptin and Resistin.

DOI Number: 10.5958/0976-5506.2019.03327.8
Materials and Method

Patients: We assessed the sera of 40 successive patients (25 females and 15 males) and 35 healthy subjects (HS) (20 females and 15 male). Aged between 30–65 years. All subjects experienced finish physical examination and endocrinological assessment TSH, thyroglobulin antibodies (TgAb), thyroperoxidase antibodies (TPOAb) and free thyroxine (FT4) were measured using by (ELISA) an enzyme-linked-immune-sorbent assay kit (Sandwich) technologies using commercially available kits (Human, Germany).

Samples Treatment: Blood was drawn by venipuncture into 2 serum tubes and centrifuged at [4000 rpm] for 10 minutes at room temperature. The 2 sera were utilized as takes after the primary aliquot was quickly used to test TSH, FT4 and TPOAb; the second was stored at -20°C, until used for measuring Tg-Ab.

Data Analysis

The Statistical Analysis System- SAS (2012) was used to determine of different factors in studied parameters, A p-value <0.05 was expressed as significant. Results were considered as mean (standard deviation).

Results and Discussion

Comparison between Grave’s disease (GD) and Healthy subjects (HS) was done using one-way ANOVA (Table 1 and 2)

Table 1: The levels of T4, TgAb, TSH and TPOAb in patients and healthy groups

<table>
<thead>
<tr>
<th>Subjects Groups</th>
<th>No</th>
<th>Thyrotropin (µUI/mL)</th>
<th>Free thyroxine (pg/mL)</th>
<th>Thyroperoxidase antibodies (UI/MI)</th>
<th>Thyroglobulin antibodies (UI/ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All subjects</td>
<td>75</td>
<td>2.10 ± 3.06</td>
<td>20.7 ± 19.7</td>
<td>66.9 ± 35.8</td>
<td>55.6 ± 42.9</td>
</tr>
<tr>
<td>Grave's disease (GD)</td>
<td>40</td>
<td>1.10 ± 1.01</td>
<td>16.3 ± 14.8</td>
<td>54.3 ± 8.7</td>
<td>41.5 ± 9.62</td>
</tr>
<tr>
<td>Healthy subjects (HS)</td>
<td>35</td>
<td>1.48 ± 0.34</td>
<td>13.5 ± 3.4</td>
<td>31.9 ± 2.8</td>
<td>26.9 ± 9.9</td>
</tr>
<tr>
<td>P-value</td>
<td>-</td>
<td>0.0001 **</td>
<td>0.0001 **</td>
<td>0.0001 **</td>
<td>0.0001 **</td>
</tr>
</tbody>
</table>

Mean ± standard deviation, NS: Not significant

Table 2: Comparison of leptin and resistin between patients and healthy groups

<table>
<thead>
<tr>
<th>Subjects Groups</th>
<th>No</th>
<th>Leptin</th>
<th>Resistin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grave’s disease (GD)</td>
<td>40</td>
<td>1.10 ± 106.25</td>
<td>123.32 ± 69.39</td>
</tr>
<tr>
<td>Healthy subjects (HS)</td>
<td>35</td>
<td>152.86 ± 84.93</td>
<td>92.8 ± 71.42</td>
</tr>
<tr>
<td>P-value</td>
<td>-</td>
<td>0.0048 **</td>
<td>0.0994 NS</td>
</tr>
</tbody>
</table>

The general point of our investigations was to examine at the levels of thyroid stimulating hormone (TSH), free tetraiodothyronine (FT4), thyroperoxidase antibody (TPOAb) also thyroglobulin antibody (TgAb) for each group selected in the examination. Auto-immune thyroid disease, consist of Graves’ diseases(GD) also Hashimoto’s thyroiditis (HT). The Thyrotropin receptor is exceptional among these susceptibility genes since it encodes for a protein that is both in charge of the clinical signs of the disease and is the immediate focus of autoimmune response in (GD). ¹⁰ Many patients of Graves diseases can be performance in clinical setting of diffuses goiter, exo-phthalmos, thyrotoxicosis, also dermopathy (pretibial myxedema). The diagnosis is effectively affirmed in many patients with an elevated free thyroxine concentration and a low thyrotropin concentration. In early Graves’ disease, Separating GD from different types on hyperthyroidism consider basic for best possible managements of patients, particularly with references to recognition of related immune system. Our results were aged with a study. ¹¹ On the off chance that the clinical finding of Graves’s infection versus a non-autoimmune causes (eg, poisonous...
multi-nodular goiter) on hyperthyroidism is being referred to, inspiration for thyroperoxidase antibodies also thyroglobulin antibodies would recognize an immune system. A positive thyroperoxidase antibody helps separate auto-immune diseases (GD) from poisonous nodular hyper-thyroidism. Thyrotropin levels positively balance Thyroid-stimulating hormone receptor in typical cells up to a specific breaking point, while down regulating thyrotropin receptor at high concentrations. Thyroid-stimulating hormone (TSH) motioning through its receptor intervenes the paracrine control of thyroid function. The mechanisms by which thyroid dysfunction intervenes these impacts on bone development are yet to be fully explained. It had beforehand been viewed as that the thyroid hormones T4 and tri-iodothyronine (T3) were the key role between of bone rebuilding. Excess thyroid-stimulating hormone receptors activation happens in 2 common stipulations, (GD) in that TSH-ab mimic thyrotropin causing primary hypothyroidism also hyperthyroidism when increased thyroid-stimulating hormone recompense to low thyroid hormones (T4/T3) level results from failure thyroid. However, some study found that serum resistin levels of hyperthyroid patients group were higher than those of control group, where these levels decreased after normalization of thyroid hormones in hyperthyroid patients. Our results were aged with other study

**Conclusion**

In the end we concluded that thyroglobulin antibodies (TgAb)) and free thyroxine (FT4) high this leads to changes in levels of thyroid hormones and the result of this study showed the increase in serum levels of resistin in patients with thyroid dysfunction.

**Source of Funding:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Department of Chemistry, College of Science, Al-Nahrain University, Baghdad, Iraq and all experiments were carried out in accordance with approved guidelines.

**REFERENCES**


Effect of Plant Alkaloids on Some Pathogens

Aseel Mohammad Omran¹, Heyam G.Al Mousawi¹, Rasha hadi Salih¹
¹College of Pharmacy, University of Babylon, Iraq

ABSTRACT

This study aimed to evaluate the antimicrobial activity of Rosmarinus officinalis, Origanum vulgare L. and Cressa cretica L. alkaloids on Staphylococcus aureus, Eschrichia coli and Candida albicans. The results showed a prominent inhibitory effect of all alkaloid extracts on all the microbial isolates, noted by the large bacterial growth inhibition zones (0.2-6.8mm), four concentration were used in this study (10, 20, 30 and 40)%, all these concentrations appeared inhibition effect. C. cretica had more inhibitory effect on the growth of all microbes than other tested plants.

Keywords: Effect, alkaloids, pathogens

Introduction

Alkaloids are the largest group of secondary metabolites, building from ammonia molecules comprising of nitrogen bases synthesized from amino acid building blocks with various radicals and replacing one or more of the hydrogen atoms in the peptide rings and most of them containing oxygen, alkaloids differ in the basicity according to the structure of molecule groups ¹. Alkaloids had so numerous and involve such a variety of molecular structure that lead to difficult in theme classification. So, the best solve to this problem is to group them into families, depending on the type of heterocyclic ring system present in the molecule ². Alkaloids are significant for the protecting and survival of plant because of their activity against micro-organisms (antibacterial and antifungal activities), insects and herbivores (feeding deterrence) and also against other plants by means of allelopathically active chemicals ³. Many of alkaloids containing plants as dyes, spices, drugs or poisons can be traced back to the beginning of civilization. There are many medical activities of alkaloids including antihypertensive effects like indole alkaloids, antiarrhythmic like quinidine, antimalarial activity like quinine, and anticancer actions like dimeric indoles, vincristine, vinblastine. These are just a few example of the great economic importance of this group of plant constituents ⁴. Rosemary (Rosmarinus officinalis L.) originally grows in southern Europe. Its herb and oil are commonly used as spice and flavoring agents in food processing for its desirable flavor, high antioxidant activity and lately as antimicrobial agent (6-8). Furthermore, rosemary extracts have been widely used as a preservative in the food industry due to their inherent high antioxidant activity. In addition, it has been used as a medicinal herb for centuries, due to significant activities against many illnesses. In this sense, many major biological properties have been attributed to this plant, mainly hepatoprotective ⁵, antimicrobial ¹⁰-¹², antithrombotic ¹¹, diuretic ¹⁴, antidiabetic (Bakirel et al., 2008), anti-inflammatory ¹⁵, antioxidant ¹⁶, and anticancer ¹⁷. Origanum (Origanum vulgare L.) grow abundantly on the stony slopes and rocky mountain areas at a wide range of altitudes (0-400m) ¹⁸. Because of the variability in the chemical and aroma characteristics, different species of origanum ecotypes (biotypes) are widely used in the agricultural, pharmaceutical and cosmetic industries ¹⁹. In addition, they have been used in the folk medicine to treat several illnesses as spasmodic, antimicrobial, digestive, expectorant and aromatic for the whooping and convulsive coughs. Origanum known for its antifungal and antimicrobial properties, its Leaves are traditionally used as antiseptics and disinfectants. This is the very aromatic plant ²⁰. Cressa. cretica L. is a small, erect dwarf shrub ²¹ the height of it is 38cm. Roots appear horizontal, with lateral branches. It is a perennial sub shrub or herb, usually much-branched. Stems are at first erect and then

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become decumbent, apparently short-lived. Leaves sessile, ovate to lanceolate. *C. cretica* used in all parts as a paste and decoction to treated fungus infection, asthma, blood purifier and eczema treatment. Aqueous and alcoholic extracts of leaves of this plant have a very good activity against some microbial pathogens such as gram – positive, gram negative bacteria and some fungi species, such as *Candida albicans*, *Aspergillus niger*, and *Penicillium chrysogenum*. The plant can be used as anti-tubercular, and expectorant. Ethanolic extract of *C. cretica* significantly reduced blood glucose, serum cholesterol in rats. Whole plant methanolic extract had antimicrobial activity, Ethylacetate and methanolic extract use as Broncho dilatory activity and mast cell stabilising activity. Aim of this study was evaluate the antimicrobial activity of some alkaloid compounds extracted from *Rosmarinus officinalis*, *Origanum vulgare* and *Cressa cretica*.

### Materials and Method

**Alkaloids extract preparation:** 100 g from dried plant powder was putted in a flask (500 ml), added 350 ml methanol: distilled water (1:4), putted in a horizontal shaker for 24 h, filtered throw filter paper (whatman No1), concentrated in a rotary evaporator, added drops from sulfuric acid (2%) until pH become 1-2, placed in a separatory funnel and extracted with chloroform (three times), mixed and shaken for about five times and allowed to separate into two layers. The lower layer of chloroform contained the alkaloids and the upper layer the aqueous portion, then added ammonium hydroxide (NH₄OH) until pH become 9, transferred to a separatory funnel and another extracted with chloroform: methanol (3:1) for two times, the lower layer was taken, concentrated and dried at 40-45°C, then kept in refrigerator.

**Test for alkaloids:**

A. **Dragendorff’s reagent:** 20 g from Bismuth Nitrate in 40 ml distilled water and 16 g from sodium Iodide in 40 ml distilled water, mixed together and added 1-2 ml from this reagent to 5 ml from the extract, a prominent orange color was indicated the test as positive.

B. **Tannic acid reagent:** 2 ml from 10% Tannic acid solution was added to 5 ml from extract, Alkaloids give orange color precipitate.

**C. Hager’s test:** Hager’s reagent is saturated solution of Picric acid (C₆H₃N₃O₇), after added a few drops from this this reagent appear yellow color precipitate, that’s positive indicator to the presence of alkaloids.

### Microorganisms tested:

Microbial cultures of three different species of microorganisms were used for determination of the antimicrobial activity, they were *Staphylococcus aureus*, *Escherichia coli* and *Candida albicans*. All the test cultures were maintained on nutrient agar media with regular sub-culturing.

### Test antifungal activity of the plant extracts

**Preparation of Inoculum:** Suspended isolated colonies from nutrients agar was added to 5 ml from 0.85% sterile normal saline to achieve 0.5 McFarland turbidity to form a yeast stock suspension of 1 × 10⁶ to 5 × 10⁶ cells/mL, which should produce semi confluent growth with most microorganisms isolates.

**Preparation of the 0.5 McFarland standards:** 0.5 ml of 0.048 M from BaCl₂ (1.17% w/v BaCl₂.2H₂O) was added to 99.5 ml of 0.18 M H₂SO₄ (1% v/v) with constant stirring. Distribute the standard into screw cap tubes of the same size and with the same volume as those used in growing the broth cultures. Seal the tubes tightly to prevent loss by evaporation. Store protected from light at room temperature. Vigorously agitate the turbidity standard on a vortex mixer before use.

**Agar well diffusion method:** Determine the antimicrobial activity of plant extracts was followed by agar well diffusion method. Nutrient agar plates were swabbed (sterile cotton swabs), wells in about 10 mm in diameter were made in each plate using sterile cork borer. Stock solution of each extract was prepared at a concentration 40 % in different plant extract (aqueous and alcoholic), about 100 µl of different concentration of extract were added using micropipette into the well and allowed to diffuse at room temperature for 2 hrs. The plates incubated at 28°C for 24 -48 hrs. After that measured the diameter of inhibition zone (mm). The experiment were maintained triplicates, for each replicate the reading were taken in three different fixed directions and recorded the average values.
Results and Discussion

Table (1) represent the alkaloids constituents that present in the plants under the study. Hager and Tannic acid reagents appear a positive result, while Dragndrof reagent appear a negative result. There was a significant differentiation between the extracts and the microbes according to Pv. Test by using Anova. figure (1) appear the diameter of inhibition zone of S. aureous at concentrations 10, 20, 30 and 40 % for all plant alkaloid extracts, it was appear that the inhibitory effect increase with the concentration increasing. figure (2,3) appear the diameter of inhibition zone of E. coli and C. albicans at concentrations 10, 20, 30 and 40 % for all plant alkaloid extracts, it was appear that the inhibitory effect increase with the concentration increasing. C. cretica alkaloid appear most inhibitory effect on microorganisms growth, which the diameter of inhibition zone reach to 6.8mm on C. albicans, followed by R. officinalis (4.6 mm) then O. vulgare (3.2 mm), on E. coli as appear in table (2). S. aureous was the most affected by alkaloids, followed by E. coli, then C. albicans as shown in table (2). Plants have ability to synthesize chemical products. These products are secondary metabolites and serve as plant defense mechanisms against microorganisms, like alkaloids. This study agreed with the study of Ivanovska et al. (1999) which showed that the alkaloid berberine expresses a protective effect on C. albicans infection induced in arthritic mice, Alkaloids targeting cell wall and ergosterol biosynthesis leading to cell death. 25-30, also alkaloids lead to inhibition of extracellular enzyme activity of Candida and that might be related to decreased pathogenicity 26. Issabeagloo1 et al. (2012) found that extract of rosemary inhibit the growth of S.aureous and this inhibitory effect increase with the increasing concentration. Oliveira et al. (2009) evaluate the antimicrobial activity of O. majorana essential oils on the growth of S. aureous and they found that this inhibitory effect increase with increasing concentration.

Table 1: Qualitative tests of alkaloids according to plant type

<table>
<thead>
<tr>
<th>Test</th>
<th>R. officinalis</th>
<th>O. vulgare</th>
<th>C. cretica</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hager</td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dragndrof</td>
<td>-</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>Tannic acid</td>
<td>+</td>
<td>+</td>
<td></td>
</tr>
</tbody>
</table>

+ positive - negative

Figure 1: Effect of alkaloid concentration on S.aureous growth
Figure 2: Effect of alkaloid concentration on *E. coli* growth

Figure 3: Effect of alkaloid concentration on *C. albicans* growth

Table 2: Effect of alkaloid extracts of different plants on microorganisms growth

<table>
<thead>
<tr>
<th>Plant extract</th>
<th><em>R. officinalis</em></th>
<th><em>O. vulgare</em></th>
<th><em>C. cretica</em></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Microorganisms</strong></td>
<td>10</td>
<td>20</td>
<td>30</td>
</tr>
<tr>
<td>S. aureus</td>
<td>2</td>
<td>3.5</td>
<td>4</td>
</tr>
<tr>
<td>E. coli</td>
<td>1.4</td>
<td>2</td>
<td>3.5</td>
</tr>
<tr>
<td>C. albicans</td>
<td>0.6</td>
<td>1.5</td>
<td>2</td>
</tr>
</tbody>
</table>

Pv. 0.000
Conclusion

Results revealed a strong activity of plant alkaloid extracts on the growth of the microorganisms, C. cretica was most inhibitory effect on microorganisms than R. officinalis and O. vulgare, and this effect increase with concentration increasing. S. aureus was most affected than E. coli and C. albicans.

Source of Funding: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Pharmacy, University of Babylon, Iraq and all experiments were carried out in accordance with approved guidelines.

REFERENCES


Bacterial Contamination of the Local Available Ice Cream in Hila City

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ABSTRACT

Ice cream is a frozen food which is usually consumed during summer. It is considered as good food which may provide refuge for many microorganisms that can cause many diseases. Also, it is considered important because it is associated with consumers health. This research investigates the contamination of ice creams available in markets by microbes. Ten types of Ice cream where gathered from the market(Behtak, Jawaad Azburi, Core Dor, AL-Fakma ice cream, KDD silver, Fistachio, AL-Furat, Solero, KDD White), The samples were transported to the laboratory to conduct the necessary tests using a clean and sterilized container with a temperature of zero Celsius. One gram of each specimen was taken and diluted. afterwards, each sample was cultivated on different cultivation mediums under 37 degree Celsius for 24 hr. Also, other biochemical tests were conducted in this research to determine the type of bacteria. The results shown the type of bacterial isolated was (Staphylococcus aureus, Escherichia coli, Klebsiella pneumonia, salmonella enteritidis) this types of bacteria caused of many type of human diseases and food poisonings.

Keywords: Ice cream, Bacterial contamination, Food poisonings

Introduction

It is not known exactly when ice cream was began synthesis, but it is believed that the Chinese were the first to use a mix of ice and fruit juice to make dishes after food nearly 3,000 years ago 1. The Romans also used ice to cool drinks in the summer and believed that this idea came from the Pharaonic civilization or the Babylonian civilization 2. Marco Polo, the Italian traveler, is said to have brought with him from Beijing to Venice in 1292 a complete recipe to make frozen milk, believed to be the origin of the frozen beverage industry. However, until the mid-nineteenth century, the frozen confectionery industry and its production were very primitive and limited, In 1851 Jacob Fussell was able to establish the first ice cream factory in Baltimore, and since then the ice cream industry has developed a very large development. Ice cream can be defined as the products obtained by freezing a mixture of different ingredients (pasteurized milk, sugar cream, eggs, flavors, natural and artificial dyes, stabilizers, emulsifiers and other additives). This mixture keeps it frozen until consumed. 3. The main ingredient of ice cream is milk, which contains a large amount of saturated fat, protein and calcium, as well as vitamin C and because of it is considered ice cream of nutritious food 4. The composition of ice cream is different according to its type. Ice cream is generally composed of 5-15% milk fat, milk protein 4-5%, lactose 5-6%, milk ash 1%, sugar 15%, stabilizers 0.1- 0.4% And emulsifying materials 0.2%. 5. The high percentage of nutrient material found in ice cream, such as lactose and proteins, as well as the neutral pH, can make it a good growth medium for many microorganisms that cause many serious and infectious human diseases such as cholera, typhoid and chronic intestinal diarrhea. There are many types of microorganisms that cause disease in ice cream such as Listeria monocytogens, Staphylococcus aureus, Bacillus species, Salmonella species, Shigella species, Streptococcus spp., Pseudomonas spp., Campylobacter spp., Brucellaspp. As well as the presence of E. coli in general (6, 7). The presence of such living, accurate and pathogenic organisms in pasteurized ice cream is evidence of their ability to survive after pasteurization in the case of Spor 8. This spor stage may continue to survive under the freezing process in an inhibitory state, unless appropriate conditions are available for growth to start again, causing many diseases. The sources of
microorganisms contamination the ice cream from, the raw materials used in the manufacture of ice cream, especially milk in the case of being a result of a sick animal or the residue of antibiotics or pesticides, pollution from people involved in the process of manufacturing and selling, which add a large germ load at Not following the sanitary conditions in terms of clothing and hygiene in their work, manufacturing machinery and tools. The present research aims at studying the type of bacteria contamination of some types of ice cream in local markets to evaluate and determine the quality of ice cream and to allow the treatment of species that are within The accepted limits set by the World Health Organization because of their association with the health of consumers.

Materials and Method

Collection of Samples: 10 types of ice cream (Behtak, Jawaad Azburi, Core Dor, AL-Fakma ice cream, KDD silver, Fistachio, AL-Furat, Solero, KDDWhite) . Industry in Turkish Iraq, Iran and Kuwait. The collected samples were carried in a clean, sterile and 0 ° C container directly to the laboratory for high resolution results and then microbial tests were performed.

Preparation of serial dilution: 1 ml of each sample of ice cream collected by a sterilized and disinfectant pipette and transferred to a sterile test tube containing 9 ml of peptone for dilution 1:10. In this dilution a sequence dilution of 10<sup>-3</sup> was performed.

Isolation of bacteria from samples: The samples were incubated in nutrient agar at 37 ° C for 24-48 hours. After growth, the isolating colony cultured on blood agar plates, MaConkeys agar, Salmonella Shigella agar, Mannitolaalt agar and TCPS agar and purified in the initial assay of the isolating nutrients of each type. Of the types of bacteria developing and stored in the refrigerator at a temperature of (4) m. Bacterial isolates were identified by growing the colony size, color, surface, edge, slope and elevation. As shown by (9,10).

Gram stain: Bacterial cells were observed under the optical microscope and were observed by the oil lens (100 X) after the bacterial isolates were treated with a gram dye 11.

Biochemical tests: The most important differences between the bacteria observed in the present study were sugar fermentation tests, bile solubility, starch hydrolysis, gelatin digestion, catalase, lecithinase, indole production and nitrate reduction test (9,12,13), which are the most important differences between the bacteria in the current study.

Results

Table (1) shows the types of bacteria isolated according to the type of ice-cream sample, and notes through this table that some bacteria have appeared in more than one type of ice cream.

Table 1: The type of bacteria isolated according to the type of ice cream

<table>
<thead>
<tr>
<th>Type of ice cream</th>
<th>Type of bacteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Behtak</td>
<td>Proteus mirabilis, salmonella enteritidis</td>
</tr>
<tr>
<td>2. Azburi Jawaad</td>
<td>Bacillus subtiliss, Escherichia coli</td>
</tr>
<tr>
<td>3. Core Dor</td>
<td>Staphylococcus aureus</td>
</tr>
<tr>
<td>4. Fakma</td>
<td>Escherichia coli</td>
</tr>
<tr>
<td>5. KDD silver</td>
<td>Klebsiella pneumonia, Bacillus subtiliss</td>
</tr>
<tr>
<td>6. Fastochio</td>
<td>Bacillus subtiliss, Klebsiella pneumonia</td>
</tr>
<tr>
<td>7. Local Azberi</td>
<td>Vibrio paraheamolyticus</td>
</tr>
<tr>
<td>8. AL-Furat</td>
<td>salmonella enteritidis, Escherichia coli</td>
</tr>
<tr>
<td>9. Solero</td>
<td>Escherichia coli</td>
</tr>
<tr>
<td>10. KDD White</td>
<td>Klebsiella pneumonia, Escherichia coli</td>
</tr>
</tbody>
</table>

Table (2) shows the type of isolated bacteria and the number of ice-cream species studied. Table (3) shows the total number of bacterial colonies for each type of ice cream collected for the current study in the 10<sup>3</sup>, 10<sup>2</sup>, 10<sup>1</sup>

Table 2: The type and the number of bacteria isolated

<table>
<thead>
<tr>
<th>Type of Bacteria</th>
<th>Sample Number of Ice cream</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proteus mirabilis</td>
<td>1</td>
</tr>
<tr>
<td>Bacillus subtiliss</td>
<td>3</td>
</tr>
<tr>
<td>Staphylococcus aureus</td>
<td>1</td>
</tr>
<tr>
<td>salmonella enteritidis</td>
<td>2</td>
</tr>
<tr>
<td>Escherichia coli</td>
<td>5</td>
</tr>
<tr>
<td>Vibrio paraheamolyticus</td>
<td>1</td>
</tr>
</tbody>
</table>
In recent years, food safety and health have become a point of concern for many communities. The shift to industrial food is producing and causing a lot of foodborne diseases, and these have increased significantly now. Companies' search for economic efficiency leads to the production of food at low cost on a large scale and such companies do not have the ability to prevent the introduction of bacterial pathogens in their products. Ice-cream is one of many food products that can serve as a means of transmission for a pathogen. The quality and quality of food is the total number of microorganisms detected through total bacterial counts. However, the microbial load or microbial contamination in food products is influenced by a variety of factors, for example the general environment of the food product, Raw materials used in manufacturing, manufacturing and processing conditions, as well as sanitary conditions, which are the cleanliness of the tools used, the packaging and, finally, the storage conditions of the food product. Milk is the main component of ice cream, which is more susceptible to infection with pathogenic bacteria. 17 Ice cream, which is the refuge of many bacterial pollutants, is also a part of the flavors and colors added. Some studies have shown that some flavors, especially cocoa, Other flavors Parker, L.A. (1947). Two types of ice cream, one containing cocoa flavor and the other containing flannel flavor, were found. After examining the samples, they found that the ice cream with three times as much bacteria as the vanilla ice cream. The results of the study showed the emergence of a number of colonies of various types of bacteria, most of which are classified within the bacteria that cause many diseases (Table 1).

That the number of bacteria that appeared in ice cream is due to several reasons, including inadequate treatment of raw materials in the industry, especially milk and pasteurization process as well as the cooling of the good mixture of ice cream in the first stage of production after the heating process, which may be the main reason for the multiplication of the existing microbes In ice cream after pasteurization. Pasteurization of ice cream components, especially milk, eliminates most of the hazards of the existing microbes, as well as the freezing process. However, at long storage times and containing high nutrient content and neutral pH, ice cream remains susceptible to bacterial growth. The results of the present study show the emergence of coliform bacteria in the collected samples of ice cream, as they appeared in (Jawaad Azberi, AL-Furat, solero and KDD). The presence of this type of bacteria is a clear indication of the presence of microbial contamination in the sample. Colon bacteria are generally a good indicator of food and water contamination. According to BSTI standards for the quality and manufacture of global ice cream and the number of bacteria in it, the number of cacti bacteria should be E. coli contained 10 g/g of ice cream, and in this study found through the results that the total number of colon bacteria exceeded the limits allowed. The contamination of this number of bacteria and their spores may be due to the wrong heating and freezing of all ice-cream manufacturing stages, the poor quality of water used in the industry, which may be contaminated, the lack of personal hygiene of the manufacturer and its personnel, and the tools used in industry. C. et al., 2008) Large E. coli contamination occurred in ice cream in Mangalore, India, where E. coli was isolated from the IMVIC test and a report was written stating that E. coli should not be present in 1 g of ice cream. The number of E. coli colony colonies in 100 ml of water used in the ice cream industry is 640 683). Therefore, water is considered the main source of ice-cream contamination when used in its manufacture. In this study, the number of colonies of E. coli has exceeded permissible limits (Table 3). Staph. aureus has been observed in most of the studied samples. These bacteria cease to grow at 7 °C. Some studies have shown that in the case of a mixture of ingredients Staphylococcus aureus is kept alive for 7 months at -18 °C and resistance may increase at this level. According to FSSAI, sta. aureus should be 10 g/d of ice cream. The results of the present research indicate that the number of bacteria in the cluster of gold has exceeded the limits (Table 3).

Table 3: Colony Forming Unit of bacteria isolated from ice cream

<table>
<thead>
<tr>
<th>CFU/ml</th>
<th>Type of ice cream</th>
<th>10^4</th>
<th>10^3</th>
<th>10^2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behtak</td>
<td>76</td>
<td>62</td>
<td>46</td>
<td></td>
</tr>
<tr>
<td>Jawaad Azberi</td>
<td>53</td>
<td>43</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>Core Dor</td>
<td>45</td>
<td>35</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td>AL- Fakma</td>
<td>68</td>
<td>49</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>KDD silver</td>
<td>45</td>
<td>36</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Fistachio</td>
<td>67</td>
<td>54</td>
<td>49</td>
<td></td>
</tr>
<tr>
<td>Local AzbEri</td>
<td>105</td>
<td>85</td>
<td>76</td>
<td></td>
</tr>
<tr>
<td>AL Furat</td>
<td>150</td>
<td>91</td>
<td>78</td>
<td></td>
</tr>
<tr>
<td>Solero</td>
<td>130</td>
<td>98</td>
<td>76</td>
<td></td>
</tr>
<tr>
<td>KDD White</td>
<td>87</td>
<td>69</td>
<td>54</td>
<td></td>
</tr>
</tbody>
</table>
Conclusions

The results of the study showed that the presence of microorganisms that cause possible and serious diseases in the samples of ice cream that have been analyzed and examined should be considered because they cause concern for many people. The presence of Staphylococcus aureus, Escherichia coli, Klebsiella pneumonia and salmonella enteritidis An important threat to human health is caused by many dangerous diseases. Milk pasteurization may destroy most pathogens, but the presence of non-lethal spores and pollution during the manufacturing process, as well as the use of contaminated tools, the lack of cleanliness of the workers, the workplace and the poor storage of the products cause these pollutants to appear. Therefore, in particular, to follow the good and sound steps in the industry through the use of sterile raw materials, automatic and clean in the best pollution-free product in microorganisms

Source of Funding: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the University of Babylon, College of Science, Department of Biology, Iraq and all experiments were carried out in accordance with approved guidelines.

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The Effect of Training Loads and its Relation with Happiness of Volleyball Players in Al-Qasim Sport Club Under the Maximum in Some Physical Variables and Serotonin

Aied Kareem Abdaun1, Abdulrhman Jameel Ghadhab Al- Saadi2, Harith Abdul Elah Abdul Wahid3
1AL-Qasim Green University, Iraq; 2College of Engineering, Al-Nahrin University, Iraq; 3Al-Mustaqbal University College, Iraq

ABSTRACT

The research problem is an attempt to answer the following questions; is there any effect of training loads under the maximum in Serotonin level? And does increasing serotonin level leads to increase happiness? While the aims of the research were to prepare the happiness measure, and the preparation of training exercises without the maximum. The sample of the research contained the players of Al-Qasim Sports Club, the youth of volleyball, through the research sample, the differences of the test of the experimental and control groups have been known with the variables of the research that has studied, this study ended with some conclusions and recommendations.

Keywords: Preparation, exercises, physical variables, happiness and Serotonin

Introduction

Volleyball is a team sport that requires understanding, agreement and coordination among the players. It is different from the other games in the style of play, so, Any mistake during the game leads to a loss of points and this requires special preparation for the physical and psychological abilities of volleyball players. The happiness sense is considered a human aim that the player always seeks for. It is a symbol that the player accepts his/her abilities and enjoys his/her relationship with his/her teammates. It also gives the player self-confidence. That is more patience and is not affected by suffering. The training load exercises under the maximum is a cooperative factor used for preparing the players well through which we try to develop the level of Serotonin that is responsible for the state of happiness of the player, through the high level of happiness there will be positive results achieved by the player with his/her teammates, increasing the level of happiness of the players can be through the development of positive variables and can be perceived as reflecting some of the feelings such as enjoyment, positive sense, friendship and this is exactly what the team needs to achieve positive results. The significance of the research is to preparing the training loads exercises under the maximum, to learn about the level of happiness and to recognize the effect of exercises in develop the level of Serotonin that is responsible of happiness case for the players. One of the most important things in sports training (coaching) is to recognize the variables that happen in physical and physiological aspects that are related to the performance of a volleyball player. The researchers found out that there is a problem in using the training loads under the maximum because of the lack of use of the trainer for exercises suitable for this type of training, so the researchers saw that the use of special exercises taking into account the intensity and frequency and rest time in training loads under the maximum in order to change the physical capabilities in addition to a change the enzyme of serotonin which will increase the level of happiness for volleyball players. The research aims at the following:

1. To recognize the numbers of training loads under the maximum for the players of Al-Qasim Sports Youth Volleyball
2. To Recognize the level of happiness for the players of Al-Qasim Sports Youth Volleyball.
3. To Recognize the effect of exercises in physical ability and serotonin for the players of Al-Qasim Sports Youth Volleyball.
4. To recognize the relationship between the level of happiness and the enzyme of serotonin for the players of Al-Qasim Sports Youth Volleyball.
Methodology

The researchers used the experimental approach to design the two groups of pre-test and post-test combinations for their suitability of the research as shown in the table below.

Table 1: shows the Experimental Design for the Two Samples of the Research

<table>
<thead>
<tr>
<th>Group</th>
<th>Pre-test</th>
<th>Independent Variable</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>The movement abilities and transform of serotonin</td>
<td>Traditional approach</td>
<td>The movement abilities and transform of serotonin</td>
</tr>
<tr>
<td>Experimental</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The Community and the Sample of the Research:
The research community was identified by the players of Al-Qasim Youth Sports Club for the academic year (2018 - 2019). The total number of players (32) was divided into two groups: a control group consisting of (12) players dealt with the traditional approach and an experimental group consisting of (12) players dealt with the semi-parametric training loads and (8) players as a survey sample.

Methods, Instruments Devices Used in the Research:
Sources and references, observation, testing and measurement, questionnaire, volleyball stadium, volleyballs, serotonin measuring.

Methods of Practical Research

Identify the Research Variables: The researchers determined physical properties, namely, explosive capacity, velocity, speed, agility, and serotonin.

Identify the physical ability tests: The following tests were identified for each physical susceptibility as presented to the jury that consists of four members, as shown in the table below

Table 2: Shows the physical abilities and its tests which have chosen to be applied to the two groups of the research

<table>
<thead>
<tr>
<th>No.</th>
<th>Physical ability</th>
<th>Test name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Explosive ability</td>
<td>Vertical jump of constancy (measured by centimeter)</td>
</tr>
<tr>
<td>2.</td>
<td>The speed of the arms</td>
<td>Front end for 15 seconds</td>
</tr>
<tr>
<td>3.</td>
<td>Speed</td>
<td>Running twenty meters</td>
</tr>
<tr>
<td>4.</td>
<td>Fitness</td>
<td>zigzag run according to baro</td>
</tr>
</tbody>
</table>

Measure of serotonin: The serum serotonin was measured before starting by 15 minutes and after 5 minutes by the lactic stress test of Cungham and Folkens.

Preparing the measurement of happiness: The researchers studied many studies that dealt with happiness as a study (6-12), it was agreed to choose the study (Wahid Mohammed Ali 2015) for the suitability and objectives of the study where the items of the measurement on (4) of the experts may be the scale of (29) items that distributed to (8) dimensions, as in the table below:

Table 3: Shows the measurements of happiness items according to its fields

<table>
<thead>
<tr>
<th>No.</th>
<th>Dimension name</th>
<th>Items</th>
<th>No.</th>
<th>Dimension name</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Social Interesting</td>
<td>7, 15, 17</td>
<td>5</td>
<td>Satisfaction with life</td>
<td>2,9,25,28</td>
</tr>
<tr>
<td>2</td>
<td>Ability to control</td>
<td>8, 13, 19, 26, 29</td>
<td>6</td>
<td>Complacency</td>
<td>4,20,24</td>
</tr>
<tr>
<td>3</td>
<td>Positive thinking</td>
<td>6, 18, 21, 23</td>
<td>7</td>
<td>Mental alertness</td>
<td>3,14,27</td>
</tr>
<tr>
<td>4</td>
<td>Cheerful feelings</td>
<td>1, 5, 12, 22</td>
<td>8</td>
<td>Fitness</td>
<td>10, 11, 16</td>
</tr>
</tbody>
</table>

Fifth Likert Scale has been used to give (5 points with very agree), (4 agree), (3 sometimes agree), (2 no agree) (1 never agree).

Experimental Survey: The experience was conducted on a sample of (8) players on (15/11/2018) through which the researchers applied the tests of physical fitness and happiness measure. The purpose of the experience was to identify the possibilities of the sample and to ease applying the tests and extracting the scientific bases.

The scientific basis of the tests used:

Validity: The tests validity was verified by presenting it to a jury of experts.
Stability: Stability of the tests was obtained through applying the test and re-applying the test. The tests were carried out at the Youth Forum of Al-Qassim on 21/11/2018 and were re-applied after 7 days.

Objectivity Tests: The objective degree of the test was obtained by finding the correlation between Pearson and the first and second grades. The validity of the tests for the research sample was confirmed as shown in the table below.

<table>
<thead>
<tr>
<th>No.</th>
<th>Test name</th>
<th>Validity</th>
<th>Objectivity</th>
<th>No.</th>
<th>Test name</th>
<th>Validity</th>
<th>Objectivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Explosive ability of the feet</td>
<td>0.82</td>
<td>0.98</td>
<td>3</td>
<td>Speed</td>
<td>0.79</td>
<td>0.98</td>
</tr>
<tr>
<td>2</td>
<td>The speed of the arms</td>
<td>0.81</td>
<td>0.99</td>
<td>4</td>
<td>Fitness</td>
<td>0.77</td>
<td>0.98</td>
</tr>
</tbody>
</table>

The Main Experience

Pre-tests: The researchers conducted the pre-test on (1/12/2018) on the control and experimental research samples. The aim was to ascertain the level of the sample as well as the homogeneity and equivalence between the two research groups as shown in the tables below.

Table 4: Shows the value of validity and objectively for the variable tests of the physical research

<table>
<thead>
<tr>
<th>No.</th>
<th>Test name</th>
<th>Validity</th>
<th>Objectivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Explosive ability of the feet</td>
<td>0.82</td>
<td>0.98</td>
</tr>
<tr>
<td>2</td>
<td>The speed of the arms</td>
<td>0.81</td>
<td>0.99</td>
</tr>
</tbody>
</table>

The Main Experience

Pre-tests: The researchers conducted the pre-test on (1/12/2018) on the control and experimental research samples. The aim was to ascertain the level of the sample as well as the homogeneity and equivalence between the two research groups as shown in the tables below.

Table 5: Shows the values of homogeneity and equivalence in the two research groups

<table>
<thead>
<tr>
<th>No.</th>
<th>Variables</th>
<th>Measurement</th>
<th>Mean X.</th>
<th>SD.</th>
<th>Sp.</th>
<th>Level of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Height</td>
<td>Cm.</td>
<td>179</td>
<td>1.28</td>
<td>0.86</td>
<td>Randomly</td>
</tr>
<tr>
<td>2</td>
<td>Weight</td>
<td>Kgm.</td>
<td>62</td>
<td>1.43</td>
<td>0.73</td>
<td>Randomly</td>
</tr>
<tr>
<td>3</td>
<td>Age</td>
<td>Year.</td>
<td>17</td>
<td>1.49</td>
<td>0.88</td>
<td>Randomly</td>
</tr>
</tbody>
</table>

Table 6: Shows the values of equivalence in the two research groups

<table>
<thead>
<tr>
<th>No.</th>
<th>Variables</th>
<th>Measurement</th>
<th>Pre-test/control</th>
<th>Pre-test experimental</th>
<th>T-value</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean</td>
<td>SD.</td>
<td>Mean</td>
<td>SD.</td>
</tr>
<tr>
<td>1</td>
<td>Cm.</td>
<td></td>
<td>44.92</td>
<td>2.81</td>
<td>44.25</td>
<td>1.67</td>
</tr>
<tr>
<td>2</td>
<td>No.</td>
<td></td>
<td>9.92</td>
<td>0.79</td>
<td>9.75</td>
<td>0.75</td>
</tr>
<tr>
<td>3</td>
<td>Sec.</td>
<td></td>
<td>4.00</td>
<td>0.22</td>
<td>3.98</td>
<td>0.20</td>
</tr>
<tr>
<td>4</td>
<td>Sec.</td>
<td></td>
<td>10.79</td>
<td>0.66</td>
<td>10.12</td>
<td>0.54</td>
</tr>
<tr>
<td>5</td>
<td>Degree</td>
<td></td>
<td>101.42</td>
<td>1.73</td>
<td>101.75</td>
<td>1.96</td>
</tr>
<tr>
<td>6</td>
<td>N./Gm./Lit.</td>
<td></td>
<td>115.16</td>
<td>1.92</td>
<td>115.41</td>
<td>2.13</td>
</tr>
</tbody>
</table>

Significance be random if the value of Sig is greater than (0.05) with freedom degree (22)

Conduct training loads under the maximum: The researchers prepared and ordered exercises with (80-89%), the exercises was carried out on the experimental sample taking into account (hard work, frequency and suitable rest) while the control group was training according to the traditional approach, the number of unities was (24) per week was (4) unities, for six weeks, whereas time for each unit was (40-55) minutes of the main part only, with frequency arrange between (4-6) times, the aim was to develop the physical abilities and to develop the serotonin enzyme and correlates the training load between (3:1).

Post-Tests: After complete the aim of the exercise, the tests were carried out on the days (12 - 13/1/2019) and the same sequence of pre-tests that were conducted previously.

Statistical Methods: The SPSS program was used in order to find out the research statistics.

Results and Discussion

In order to recognize the impact of endurance training exercises under the maximum, the researchers do the following:
The Results of the Experimental Group

Through the table below, we will recognize the differences between the pre and post-tests for the experimental group.

The researchers attributed that the training programmed on the basis of scientific use of pregnancy less than the maximum have an impact in the development of performance and development of the ability of the nervous system to support the pathways, which help the correct performance and the quality of exercises, which were similar to performance, and these differences emerged as the enzyme is serotonin is a chemical compound and Natural proportions at rest but affected when exposed to physical effort and this led to the high level of happiness that this enzyme is responsible for happiness and this is what we see in the teams in the computation level in the level of happiness between the test of the two groups control and Follicular. In order for the researchers to recognize the relationship between happiness and serotonin, the simple correlation coefficient (Pearson) was used. The correlation coefficient was 0.87 with a significance level of 0.05. Thus providing a better level of physical and skillful performance for youth volleyball players.

Conclusions

In the end, and after complete, show and discussion the procedures of the research, the researchers concluded the following: The training loads excises under the maximum impact on some of the physical capabilities of the club players Al-Qasim young volleyball. The measure of happiness that has been set is able to determine the level of happiness for the players of Al Qasim young volleyball club. The positive relationship between the level of happiness and serotonin was confirmed by the significant correlation between them.

Source of Funding: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the AL-Qasim Green University – Iraq and all experiments were carried out in accordance with approved guidelines.

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Risk Assessment and Heavy Metal (Cu and Ni) Contamination in Sediments of Shatt Al-Arab Canals, Iraq

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ABSTRACT

The present study aims at investigate the relationships between physic-chemical and seasons to determined heavy metals (copper Cu and Nickel Ni) contaminated of sediments of Shat Al-Arab canals. The pH, Electrical Conductivity (EC), Total Organic Carbon (TOC), Oil and grease were measured. The study investigated the effects of season on the sediment characteristics of Shat Al-Arab canals. Data analyses were done using analysis of variance, Tukey’s multiple range, Pearson correlation coefficient and descriptive statistics. pH, EC and TOC were significantly higher at dry season (7.44 ± 0.129), (544.212 ± 133.8 µcm/cm²) and (13.94 ± 2.157 %) respectively, than at wet season (P<0.05). However, hydrocarbons (Oil and grease) was significantly higher at wet season (4360 ± 1129 mg/l) than at dry season (1920 ± 638.3) (P<0.05). The presence of high levels of organic pollutants indicates organic pollution and stress. Positive and negative Pearson correlation relationship between both heavy metals and physic-chemical parameters were found. Contamination of sediments was assessed based on contamination factor (CF), geo-accumulation index (Igeo), pollution load index (PLI) Potential Ecological Risk (Ei) and Potential Ecological Risk Index (RI). Results of geo-accumulation index (Igeo) indicated that sediments were uncontaminated with Cu, uncontaminated to moderately pollution with Ni.

Keywords: sediments; physic-chemical parameter; oil and grease; heavy metals, Geo-accumulation index, Ecological risk assessment.

Introduction

In the past decades, a significant increase in agricultural and industrial development has been witnessed with attended population growth. These activities caused water pollution after release of pollutants. The main sources of pollution are wastewater, and industrial, agricultural discharges, production, refinery and transportation of crude oil. Sediments are important environmental components of the aquatic habitat, which play an important role in maintaining the trophic status of any water body. Sediments near urban areas have high levels of pollutants, which constitute a major environmental problem faced by many anthropogenically impacted aquatic environments. The rivers’ sediments do not only play important roles at influencing the contamination, they also record the history of their pollution. Sediments act as both carrier and sources of pollutants in aquatic environment. Sediments are important sinks for different pollutants like heavy metals and are usually regarded as indicator of water quality. However, the sediments contamination with heavy metals, may lead to serious problem of environment. Heavy metals are hazardous substances of considerable environmental interest and the pollution of aquatic systems by heavy metals has been known as one of the most difficult contamination issues, due to their toxicity, abundance, persistence, and subsequent sediment and bioaccumulation. Heavy metals such as copper and nickel are essential metals since their play a considerable role in biological systems. Therefore, continuous monitoring is necessary to avoid further pollution, as well as to protect water bodies.

in future. In Basrah city, the environmental pollution problem has been exacerbated because of the large quantities of industrial wastes, waste water, fertilizers and pesticides, which find their way into the side branches, hence to the Shatt Al-Arab river and then up to the various living objects \(^{(2,13,15)}\). Moreover, the Shatt Al-Arab is the main source for fresh water in south of Iraq. The purpose of this paper is the following:

1. To assess seasonal variations and relationships between the metal levels and physic-chemical parameters at Shatt al Arab sediments.

2. To assess the ecological risk due to sediment pollution of heavy metal.

**Experimental**

**Study Site and Method:** Shatt Al-Arab River is consisted of the confluence of Tigris and Euphrates Rivers at Qurnah City about 90 Km northern of Basrah City (Fig.1). However, the length of Shatt Al-Arab River from Qurnah to its estuary is 175 km with width of 0.4 km at Basrah and 1.5 km at its estuary. It drains into Arabian Gulf and affected by the tides from the Gulf \(^2\).

Shatt Arab River is characterized by its large number of lateral branches. Some of these branches extend into the center of Basra province. The extension of these branches into the center of Basrah transforms them to locations for the disposal of sanitary sewage and solid waste. Sampling stations: A total of five stations were chosen. They were: Al- Najibiyyah (S1), Al- Robat (S2), Al-Khandek (S3), Al- Ashar (S4), and Al-Kurnish (S5)

**Samples Collections and Analyses:** Sediment samples with grab sampler once a month from each sampling station were collected for (December, January, April and June, 2015) mostly during the low tides. They were stored in a labeled polythene bags and kept in an ice- chest box before transferring to the laboratory. The sediment properties were determined according to the standard methods \(^{17-22}\).

**Heavy Metals Analysis:** After frozen other part of sediment were dried by oven for 24 hours at 105°C. Then grinding and sieving. Trace metals analysis was performed on the 63\(\mu\)m fraction of sediment in which exchangeable trace metals extracted according to Chester and Voutsinon \(^9\). The residual fraction according to procedure of Barak and Mason \[^{20}\] were extracted. Atomic absorption spectrophotometer was used for the determination of the heavy metals including nickel (Ni) and copper (Cu).

**Results and Discussion**

The results of physic-chemical parameters are shown in Table 1. pH is an important parameter for describing the state of chemical processes. Metal Concentrations in the river, decrease with increasing pH, because the binding abilities of metal are decreased with decreasing pH due to proton binding. However, Electrical Conductivity (EC) of sediment samples varied between higher values \(544.2 \pm 133.8\mu\text{S}\text{cm}^{-1}\) in dry season and lower values \(534.4 \pm 208.7\mu\text{S}\text{cm}^{-1}\)in wet season. As well, the EC sediment was range from 30.5 \(\mu\text{S}\text{cm}^{-1}\) in S1 at wet season and higher values in S2 for both seasons (993.2 -859.4) \(\mu\text{S}\text{cm}^{-1}\).

<table>
<thead>
<tr>
<th>Table 1: Variations of sediment parameters in relation to season in Shatt al Arab canals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Season</strong></td>
</tr>
<tr>
<td>Wet season</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Average ± SEM</strong></td>
</tr>
<tr>
<td>Dry season</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Average ± SEM</strong></td>
</tr>
</tbody>
</table>
The dry season percentage of total organic matter (TOC) content (13.94 ± 2.157 %) was significantly greater than the wet season (4.82 ± 1.31%) (P< 0.05) (Table 1), could be due to the relative high temperature and dilution effect (rains and runoff). Due to The climate of the Iraq southern, including the study area is characterized by dry hot summer, cold winter, and rainy spring. This region also receives brief violent rainstorms in the spring. The results indicated unusually high oil and grease of sediments in wet season (4360 ± 1129) mg/g is higher than dry season of (1920 ± 638.3) mg/g (Table 1) for all stations. However, to the petroleum hydrocarbons that reach the water environment from the atmosphere with rain is usually a product of combustion of fuel, oil and its derivatives (15). The analytic results of exchange and residual phases of heavy metals (Ni and Cu) are given in Table (2). In wet season, the exchangeable phase of sediment of Ni (106.74 ± 16.11)μg/g dry weight was significantly higher than dry season (28.04 ± 11.05)μg/g dry weight. The range values of Ni in residual phase of sediment were (0.42-50.35)μg/g dry weight. Seasonal variation was insignificant (P>0.01) in the concentrations of Ni, the values followed the order wet > dry seasons for more stations of Shatt Al-Arab River sediments. The relatively higher Cu concentration of sediment (61.24- 53.63) μg/g dry weight was detected in S2 at both season than that other stations (Table 2), due to located at the major commercial area with high vehicular activities.

![Table 2: Means of heavy metals concentration of sediments in the study area (μg/g)](image)

<table>
<thead>
<tr>
<th>Season</th>
<th>Stations</th>
<th>Cu Exchangeable (μg/g)</th>
<th>Cu Residual (μg/g)</th>
<th>Cu Total (μg/g)</th>
<th>Ni Exchangeable (μg/g)</th>
<th>Ni Residual (μg/g)</th>
<th>Ni Total (μg/g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wet season</td>
<td>S1</td>
<td>15.23</td>
<td>0.87</td>
<td>16.03</td>
<td>80.56</td>
<td>0.42</td>
<td>80.98</td>
</tr>
<tr>
<td></td>
<td>S2</td>
<td>59.51</td>
<td>1.73</td>
<td>61.24</td>
<td>110.77</td>
<td>18.88</td>
<td>129.65</td>
</tr>
<tr>
<td></td>
<td>S3</td>
<td>4.15</td>
<td>3.46</td>
<td>7.61</td>
<td>140.98</td>
<td>BDL</td>
<td>140.98</td>
</tr>
<tr>
<td></td>
<td>S4</td>
<td>1.38</td>
<td>3.46</td>
<td>4.84</td>
<td>140.97</td>
<td>50.35</td>
<td>191.32</td>
</tr>
<tr>
<td></td>
<td>S5</td>
<td>29.76</td>
<td>0.87</td>
<td>30.62</td>
<td>60.42</td>
<td>1.01</td>
<td>61.43</td>
</tr>
<tr>
<td>Mean ± SEM</td>
<td></td>
<td>22.01 ± 10.62</td>
<td>2.76 ± 1.39</td>
<td>24.08 ± 10.32</td>
<td>106.74 ± 16.11</td>
<td>14.13 ± 9.79</td>
<td>120.87 ± 21.0</td>
</tr>
<tr>
<td>Dry season</td>
<td>S1</td>
<td>15.22</td>
<td>4.33</td>
<td>19.55</td>
<td>BDL</td>
<td>BDL</td>
<td>BDL</td>
</tr>
<tr>
<td></td>
<td>S2</td>
<td>48.44</td>
<td>5.19</td>
<td>53.63</td>
<td>1.04</td>
<td>BDL</td>
<td>1.04</td>
</tr>
<tr>
<td></td>
<td>S3</td>
<td>24.91</td>
<td>8.65</td>
<td>33.56</td>
<td>50.35</td>
<td>1.33</td>
<td>51.68</td>
</tr>
<tr>
<td></td>
<td>S4</td>
<td>1.18</td>
<td>34.60</td>
<td>35.78</td>
<td>60.42</td>
<td>18.88</td>
<td>79.30</td>
</tr>
<tr>
<td></td>
<td>S5</td>
<td>2.77</td>
<td>2.59</td>
<td>5.36</td>
<td>30.21</td>
<td>BDL</td>
<td>30.21</td>
</tr>
<tr>
<td>Mean ± SEM</td>
<td></td>
<td>18.54 ± 8.62</td>
<td>11.07 ± 5.96</td>
<td>29.57 ± 8.13</td>
<td>28.40 ± 11.05</td>
<td>4.04 ± 3.65</td>
<td>32.45 ± 15.21</td>
</tr>
</tbody>
</table>

BDL: Below Detection Limit

Table 3: Personal correlation matrix showing the relationship of metals and some physic-chemical parameters in sediments

<table>
<thead>
<tr>
<th></th>
<th>pH</th>
<th>Ec µcm/cm²</th>
<th>TOC%</th>
<th>Oil &amp; grease mg/l</th>
<th>Ni µg/g</th>
<th>Cu µg/g</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ec µcm/cm²</td>
<td>-0.353</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOC%</td>
<td>-0.497</td>
<td>0.746</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oil mg/l</td>
<td>-0.588</td>
<td>0.326</td>
<td>-0.078</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ni µg/g</td>
<td>-0.982</td>
<td>0.421</td>
<td>0.5284</td>
<td>0.655</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Cu µg/g</td>
<td>0.353</td>
<td>0.625</td>
<td>0.607</td>
<td>-0.478</td>
<td>-0.304</td>
<td>1</td>
</tr>
</tbody>
</table>

Indices for assessment of sediment contamination and ecological risk: As well the sediment metal pollution is major concern due to metal toxicity even at low concentrations on aquatic objects 4. A well-known and widely used index to assess the heavy metal contamination in sediments is the geo-accumulation index (Igeo), which was originally defined by Müller, as show Table (4). In Fig. 2, the Igeo values for Cu at the sampling sites of Shatt al Arab canals sediments were negative according to Müller’s geoaccumulation index.
Table 4: Concentration of heavy metals in the sediments of Shatt al Arab canals during the study period

<table>
<thead>
<tr>
<th>Metals</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>Geochemical Background</th>
<th>WHO(^3) SQG*</th>
<th>USEPA(^4) SQG*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ni</td>
<td>76.658</td>
<td>± 17.360</td>
<td>49</td>
<td>20</td>
<td>16</td>
</tr>
<tr>
<td>Cu</td>
<td>26.844</td>
<td>± 7.670</td>
<td>32</td>
<td>25</td>
<td>16</td>
</tr>
</tbody>
</table>

\(^1\)[52]; \(^2\)[53]; \(^3\)[54]; \(^4\)[55]; *Sediment quality guidelines.

The contamination factor (Cf) and the degree of contamination (DC) are used to determine the contamination status of sediments (Table 4, 6). The CF and DC values for Cu and Ni inferred that it comes low polluted to moderately polluted category in Shatt al Arab canals, much in agreement with the finding from $I_{geo}$ value. The ecological risk assessment results of heavy metals in study sediments of Shatt al Arab canals are summarized in Table 4, 7. The risk indices of heavy metals were ranked in the order of $Ni > Cu$ at both season (wet and dry). According to values of $E_i$ or RI for Cu and Ni the sediments had a Blow to potential ecological risk. The potential ecological risk factors are below 40, and the extent of potential ecological hazards is slight for indicated metals at all the sampling sites.

The difference between potential ecological risk index and contamination/background enrichment indices is reflected on the results of Cu and Ni contamination. Potential ecological risk index shows that there is a low pollution of these metals while the values of Cf and $I_{geo}$ indicate a moderate contamination. The main reason is that the $I_{geo}$ assessment method focuses on the comparative evaluation of heavy metals contents in sediments, while the potential ecological risk index confirms the differences in toxicity of various heavy metal ions and a comparison is made to examine the heavy metal contents.

Table 5: Contamination factors (Cf) and degree of sediment contamination (DC) in sediments of Shatt al Arab canals

<table>
<thead>
<tr>
<th>Wet season</th>
<th>Dry season</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Cu</td>
<td>Ni</td>
</tr>
<tr>
<td>S1</td>
<td>0.501</td>
</tr>
<tr>
<td>S2</td>
<td>1.914</td>
</tr>
<tr>
<td>S3</td>
<td>0.238</td>
</tr>
<tr>
<td>S4</td>
<td>0.151</td>
</tr>
<tr>
<td>S5</td>
<td>0.957</td>
</tr>
<tr>
<td>Mean</td>
<td>0.753</td>
</tr>
</tbody>
</table>

Table 6: Potential Ecological Risk ($E_{ir}$) and PER Index (RI) in Shatt al Arab canals sediments

<table>
<thead>
<tr>
<th>Wet season</th>
<th>Dry season</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Cu</td>
<td>Ni</td>
</tr>
<tr>
<td>S1</td>
<td>2.505</td>
</tr>
<tr>
<td>S2</td>
<td>9.569</td>
</tr>
<tr>
<td>S3</td>
<td>1.189</td>
</tr>
<tr>
<td>S4</td>
<td>0.757</td>
</tr>
<tr>
<td>S5</td>
<td>4.785</td>
</tr>
</tbody>
</table>
The pollution load index (PLI) and the Geo-accumulation Index (Igeo) have been used extensively in the assessment of sediment pollution by heavy metals. Consequently, the implication of this, that these heavy metals may pose risk of contamination of the sediments and overlying surface water. Studies have shown that the concentrations of physico-chemical parameters in sediments are positively correlated with the concentration levels in the overlying water. In hence, particular attention should be paid to this problem. And to minimize the probability health hazards of the inhabitants in the catchment areas who depend of the river water for domestic, agricultural and fishing purposes.

Conclusions

The calculated results of Igeo and Cf values indicate that the study area is unpolluted to moderately pollute. Various anthropogenic sources may be the main reasons contributing insignificant heavy metal to the canals sediment. Therefore, Potential ecological risk index and pollution load index show that there is low contamination of these metals in Shatt al Arab canals. If the aim of work is to assess the overall contamination of a study area, the indices are highly appropriate and no serious heavy metal contaminations in Shatt Al Arab River. In sometimes, this kind of studies provides some early warning signals about heavy metal contamination in aquatic and sediment environments. As a result, continuous assessment is highly essential, improving ecological risk assessment, trace elements management in sediment samples, the calculation of pollution indices, the application of statistical methods is recognized as a useful tool to reduce emission the contaminates.

Source of Funding: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Medical laboratory department, Health and medical Technical College, Southern Technical University, Basrah, Iraq and all experiments were carried out in accordance with approved guidelines.

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Mean Shift and Enhancement Contrast Based Technique to Extract Lung Abnormalities in CT Scan Images

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ABSTRACT

Medical image processing techniques are utilized to obtain easier and faster abnormalities diagnosis. In this work two proposed techniques are presented to detect and extract lung abnormalities in four CT scan images. Enhancement contrast based technique and mean shift clustering methods were implemented with aid of many morphological operations. The results indicate that the proposed techniques have good performance and were in good agreement with the radiologist delineation. The percent relative differences were ranged from 0 to 7.2 % for the first method and ranged from 1.9 to 7.2 % for the second method.

Keywords: CT Scan Images, Lung Abnormality, Contrast, Mean shift, Morphological Operations.

Introduction

Computed Tomography (CT) utilizes X-ray to generate cross-sectional images of human’s body. To acquire images, the X-ray tube rotates 360° around the part to be examined, and the transmitted radiation is measured by a ring of detectors located on the gantry around it. The resultant data can be plausible as a three dimensional model to display spatial information or surface characteristics, using the basic principle that the internal structure of the human’s body can be reconstructed from multiple X-ray estimates. CT is utilized to visualize anatomy and to originate quantitative information about the volume or attenuation of structures being imaged. CT scan is an increasingly valuable outcome measure that can be utilized to assess the success of therapies in diffuse lung disease; image measurement accuracy, cogency is dependent on optimal and reproducible imaging methods. CT images demonstrate pathological variations in the lung parenchyma and it is more sensitive than the plain X-ray lung images in detecting alterations in lung parenchyma, the survival from lung diseases is straight linked to with early awareness at the time of detection where the chances of treatment success at detected early. There are several studies to process CT scan images of the lung for the detection abnormalities, including. In this study, mean shift clustering method and enhancement contrast based technique are proposed to extract and isolate the lung abnormalities regions of the infected lung in four adopted CT scan images.

Image Enhancement: Image enhancement techniques divided into two categories: Spatial domain methods and Frequency domain methods, enhancement technique can be expressed as:

\[ g(x, y) = T[f(x, y)] \]  

Where: \( f(x, y) \) is the input image, \( g(x, y) \) is the processed image and \( T \): is an operate acting on \( f \).

The aim from contrast based technique is increase the dynamic range of the gray levels in the image being processed which is adjusted by passing the value of each pixel that a certain range to be a whole range at the image [0 1].

Image segmentation: Image segmentation is an essential procedure for image analysis consequent task. Mean-shift clustering method involved clustering a cloud of N-dimensional points by means of a bottom-up algorithm. Mean-shift technique consists of two stages:
the first, estimation of the points’ probability density function and the second, using the previous of the results to form clusters. 

\[
f'(x) = \frac{1}{nh^d} \sum_{i=1}^{n} k\left(\frac{x-x_i}{h}\right)
\]  

Where \( h \) is the window radius (bandwidth parameter) of the used kernel.

\( K(x) \): the estimate of the density gradient which is defined as the gradient of the kernel density estimate:

\[
\hat{\nabla} f(x) = \nabla \hat{f}(x) = \frac{1}{nh^d} \sum_{i=1}^{n} \nabla k\left(\frac{x-x_i}{h}\right)
\]  

The kernel \( K(x) \) is a function of \( ||x||^2 \): \( K = c_{k,d} (||x||^2) \). \( K(x) \) is called the profile of \( K(x) \) and \( c_{k,d} \) is a normalization constant, which makes \( K(x) \) integrate to one. This class of kernels is called radially symmetric kernels. The density estimator can be rewritten as \((12, 13)\):

\[
f_{h,k(x)}(x) = \frac{1}{nh^d} \sum_{i=1}^{n} k\left(\frac{x-x_i}{h}\right)
\]  

The two commonly used kernels are the multivariate Gaussian kernel:

\[
k_o(x) = (2\pi)^{-\frac{d}{2}} \cdot \frac{1}{2} ||x||^2
\]  

and the Epanechnikov kernel:

\[
k_E(x) = \left\{ \begin{array}{ll}
\frac{1}{2} c_{d} d^{(d-2)} x^2 & \text{for} \quad \|x\| \leq 1 \\
0 & \text{otherwise}
\end{array} \right.
\]  

**Morphological operations:** Morphological operators are utilized in image processing and are favored for their robust performance in preserving the form of a signal, whereas suppressing the noise, image morphology offers a way to incorporate neighborhood and distance information into algorithms, the aim of mathematical morphology is to convolve an image with a given mask structuring element and to binarize the result of the convolution utilizing a given function. The morphological operators include dilation; erosion; opening and closing, for more details see \(1, 11-13\).

**Materials & Method**

The procedure of this study can be summarized as shown in the block diagram of Figure (1):

**Input Dataset:** The input dataset are four CT scan images of lung, these images are acquired from internet websites. Figure (2) first row shows these input images.
Results and Discussion

The results of the proposed techniques are presented as follows:

**Background cutting:** The first stage of this work is background cutting and removing any extra part. Figure (2) second row shows the results of this stage.

![Figure 2: Input lung CT scan images before and after background cutting](image)

Enhancement contrast based technique: In this stage, different ranges of intensity were selected for testing. The utilized gray level ranges were [0.6-0.9], [0.3-0.9], [0.6-0.8] and [0.6-0.7] to be the whole range [0 1]. Morphological operations are implemented on the resulting images. The resultant images are converted to B/W images using thresholding process by extract and isolate the lung abnormal regions. The last step is extra operation to select the proper area in order to converting the resultant image to gray. The results of implementing this method are illustrated in Figure (3a).

Mean shift clustering method: Mean shift is a clustering algorithm; it was implemented here to segment images by partition data into certain number of clusters. It is an iterative algorithm that is utilized to split an image into eight segments or clusters. After getting the clusters of the abnormalities, different morphological operations were applied to get the abnormal regions without extra pixels and convert the final extracted regions to gray form. The results of this method are illustrated in Figure (3b).

Extraction of the infected lung regions: Many histogram based processes and morphological operations were implemented to extract the infected lung regions only and the results of this stage are illustrated in Figure (3c).
In Figure (3a), represents enhancement contrast based technique; Figure (3b) represents mean shift clustering method and Figure (3c) represents isolating infected lung.

In order to calculate the percent relative surface area of the abnormal regions with respect to the whole lung region, the surface area of the whole infected lungs were calculated. The percent relative surface area of the extracted abnormal regions are calculated and presented in Table (1).

Table 1: The percent relative Surface area of the extracted abnormal regions

<table>
<thead>
<tr>
<th>Images</th>
<th>Percent relative Surface area %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Enhancement contrast based technique</td>
</tr>
<tr>
<td>Image1</td>
<td>0.044798162</td>
</tr>
<tr>
<td>Image2</td>
<td>0.034457796</td>
</tr>
<tr>
<td>Image3</td>
<td>0.027751934</td>
</tr>
<tr>
<td>Image4</td>
<td>0.023065699</td>
</tr>
</tbody>
</table>
The percent relative differences of the area for the extracted abnormal regions with respect to the radiologist delineation are calculated and presented in Table (2).

### Table 2: The percent relative differences of the area for the extracted abnormal regions with respect to the radiologist delineation

<table>
<thead>
<tr>
<th>Images</th>
<th>Percent relative differences</th>
<th>Mean-shift clustering method</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Contrast based technique</td>
<td></td>
</tr>
<tr>
<td>Image 1</td>
<td>5.5597</td>
<td>7.2153</td>
</tr>
<tr>
<td>Image 2</td>
<td>1.6529</td>
<td>2.06661</td>
</tr>
<tr>
<td>Image 3</td>
<td>7.0138</td>
<td>1.9483</td>
</tr>
<tr>
<td>Image 4</td>
<td>0.00000</td>
<td>2.4186</td>
</tr>
</tbody>
</table>

### Conclusions

In this study, four lung CT scan images, contain lung abnormalities, were adopted to test the performance of two proposed segmentation methods to isolate and extract abnormal regions. Enhancement contrast based technique and mean shift clustering method, the results showed that, the proposed methods adequately succeeded to isolate and extract lung abnormalities. The resulted extracted tumor regions were in good agreement with the radiologist delineation of the of the abnormal regions in the adopted CT scan lung. The percent relative differences were ranges from 0 to 7.2% for the first method and ranged from 1.9 to 7.2% for the second. The high values of the percent relative differences belong to the utilized structure element radius which affected the shape of the extracted regions.

### Source of Funding: There is no financial disclosure.

### Conflict of Interest: None to declare.

### Ethical Clearance: All experimental protocols were approved under the Department of Physics, College of Science, University of Babylon, Hilla, Iraq and all experiments were carried out in accordance with approved guidelines.

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Medical Applications and Role of Stability on Quantum Dot Semiconductor Lasers with Positive and Negative Optoelectronics

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ABSTRACT

Many applications are depending on the nonlinear dynamics of quantum dot semiconductor laser QDSL. In this study, the QDSL dynamics of a theoretical model including positive and negative optoelectronic feedback (OEF) are studied. Then deal with the density of photons and parameters affecting on OEF by using rate equations at constant value of time delay with positive and negative Optoelectronic feedback parts at. A series of stable pulses are obtained in the majority of the results with some mutations or spike during periods of time and the appearance of the chaos. This stable behavior only emerged with a time of \((t = 110\,\text{ps})\) and that results are importance significant in applications of medical lasers.

Keywords: stability of quantum dot, Quantum Dot, optoelectronics feedback

Introduction

The ability to the direct magnified formation that made Injection stream in a state of confusion has been one of the features of Semiconductors laser. That features has helped in the optical vibration measurement. And that forced us to study Nonlinearity dynamics. The Optical Communication has been used the light as a channel of transmission, it has been distinguished by exhibited with an available transmission bandwidth on a wider range because of the height of frequency carriers and the large drop in the size of the components. Because of very small optical waves. Due to the rapid development, nanotechnology with semiconductors has been an advanced field in many medical fields. By combining semiconductor laser with punctiform nano particle technology, which has a higher density than the electronic levels near the edges of the connection and equivalence beams so the higher concentration on the carriers can contribute to emission from the beam edge. And the theoretical model of quantum pointers of the semiconductors laser (QDSL) shows stable pulses of importance in the medical field. All of these advantages arise from the quantitative limitation. These lasers have been characterized by high energy and high density. The presence of feedback with these lasers has been played an important role in stability. Optoelectronic feedback has been able to obtain stable and unstable pulses. (Hussein B. AlHusseini) has been able to design the light-emitting diode model with the Equations System pattern and was able to examine the first model during the front alignment without confusion and then the dynamic behavior in (QD-LED) was controlled.

In addition, (Lajaurigue 2016) and his group have studied the effect of Binary cavity of optical feedback on emission dynamics and stability timing for passive pattern corroborations (passively mode. Locked) for semiconductor laser using the model of differential equation and achieving stability results in an initial experiment. (Huyet 2011) has studied the automatic resonance for confirm of the pattern with the single-type pattern of for the quantitative punctiform lasers in the presence of optical feedback and studied the effect of feedback on increasing the number of pulses and this affects the chaotic output. (Nada.et. al. 2018)
has studied the quantum dot semiconductor lasers and the success of this model of lasers by integrating the optical feedback with a quantity of nonlinear dynamics and studying the relationship between photons density and probability under the effect of delay time on the amplitude and frequency model 14.

In this research there is a study of the dynamics of the quantum dot semiconductor laser, the laser output which represented as photon density, the density of the charge carriers in the presence of Optoelectronic feedback, the study of the stability of pulse and its importance in the special medical applications of the laser the quantum dot semiconductor

**Optoelectronic feedback:** Optoelectronic feedback involves nonlinear dynamics, whether theoretical or empirical 15. After doing some studies of these non-stationary dynamics, Optoelectronic feedback behaviors were observed that it was these non-stationary 16. These behaviors are useful in many areas, whether they are stable or unstable, the stable has applications in the medical fields and non-stable has applications in communications field 17. The Equations of average used to explore the effects of system parameters 18 in the stability zone and the delay rate numerical simulation show that the region is stable and shrinks with increasing time. In a semiconductor laser with an Optoelectronic reverse feed consisting of a combination of the detector and amplifier to convert the optical output of the laser to an electrical signal it is returned to the laser again by adding it to the inverter stream because the detector responds only to the laser output intensity. In optoelectronic feedback, chaotic pulses can be generated by positive and negative feedback. 19 The laser is controlled flexibly and efficiently through the injection current and the optoelectronic reaction is present on both positive and negative types 20.

**Positive optoelectronic feedback:** It has been a light source for periodic pulses with a short period of time (pico second) compared to short pulses generation by a passive model with absorption saturation. Stable and fast pulses can be obtained with a variable pulse width easily by determining the external parameters appropriately for the system 21. The extent of the anarchic points in the different space parameters of the pulses appear high and the sequence of regular pulses of high density and constant 22. Areas of clutter appear in the chain. This depends on the delay time and generates semi-periodic pulses at three frequencies. The role of the injection affects the laser output through automatic emission and having saturation. The instability that emerges is a thorny behavior of photons density 23.

**Negative optoelectronic feedback:** The number of carriers in this type of nutrition is reduced in the case of free operation. Therefore, the laser threshold increases and the result requires a high injection current with greater bias 24. Pulse fluctuation depends on the high-aligned feeding gain of the injection current and increasing the number of photons that led to an unstable shrinkage region. Regular pulse states and chaotic pulse states appear depending on the output power of the laser, with lockings in the external injection cavity. The intensity of anarchic pulses decreases by separating the frequencies with the number of different rotations 25.

**Theoretical Model:** The operational properties of the punctiform semiconductor laser have been well described by a set of the equations of average that describe the interaction of photons and electrons within the active or effective area of obtaining a single-signal laser or solo laser. A single-signal semiconductor laser through reverse feedback is an external mirror. At this stage, optoelectronic feedback plays a key role in determining laser dynamics. The complex electric field is used with amplitude and phase with the density of photons or carriers in the equations of average because they have the same properties of light 26.

The equations of average for the lasers model of the quantum dot Semiconductor are given in the following relationships 27.

\[ \frac{dE}{dt} = E\left(\frac{g_0 \nu}{2} - \frac{\gamma}{2}(2\rho - 1)\right) + \frac{1}{1}(E(t - \tau) + R_sp) \ldots(1) \]

\[ \frac{d\rho}{dt} = -t_n \rho - g_0(2\rho - 1)|E|^2 + CN^2(1 - \rho) \ldots(2) \]

\[ \frac{dN}{dt} = J - \frac{N}{t_j} - 2n_d CN^2(1 - \rho) \ldots(3) \]

\( \rho \) is the occupation probability in a dot. \( N \) is the two-dimensional density of dots; and \( J \) is the pump. \( N \) is the carrier density in the well, \( c \) is Auger carrier capture rate. Equations (1-3) which are derived from Huyet are utilized this study with a modification to study the dynamics of the (QDSL).

In the Optical feedback, the electric field component exists while in Optoelectronic feedback the intensity
equation of the photons or transducers exists as shown in the following equations.

\[ \frac{dS}{dt} = S \left( -\frac{1}{2r_s} + \frac{g_{n} v}{2} (2\rho - 1) \right) + R_{sp} \quad \ldots (4) \]

\[ \frac{d\rho}{dt} = -\frac{t}{\rho} - g_0 (2\rho - 1) |S|^2 + CN^2 (1 - \rho) \quad \ldots (5) \]

\[ \frac{dN}{dt} = J - \frac{N}{\tau} - 2n_g CN^2 (1 - \rho) \quad \ldots (6) \]

\( G_0 \) Effective gain factor, \( v \) Group velocity. this found. \( \text{Resc} \) is a temperature-dependent function controlling escape from the dots.

In this study, the behavior of the optoelectronic feedback (positive and negative) It was stable for the majority of the values (Optoelectronic feedback strength = \( \zeta \)) using Matlab program.

**Results and Discussion**

The study of the optoelectronic feedback (positive and negative) on the output of the quantum dot semiconductor laser at a fixed delay time (\( \tau = 110 \) ps) to identify the most stable areas and areas of confusion and at the value (\( \zeta = + 0.2, + 0.6 \) and \( \zeta = - 0.2, - 0.6 \))

There is several areas including stable and confusion and (SPIKE) In the fig (1), to study the relationship between photon density and time, we observe that the laser output of the optoelectronic feedback is positive and negative when the delay time is proved (\( \tau = 110 \) ps).

It was found that there are two areas of stability of the first (3.2-14.9 ns) and the second (15.2-25 ns) separated by an area (SPIKE) at (15 ns) as in fig (1-a,b) This corresponds exactly to what is in the figure (4) Note that (feedback strength \( \zeta = \pm 0.5 \)).

![Figure 1](image1.png)

**Figure 1:** Shows the exact congruence between the positive part and the negative part of the values (feedback strength \( \zeta \)).

Either in case (\( \zeta = -0.3 \)) it identical with (\( \zeta = \pm 0.2 \)), either in case (\( \tau = 110 \) ps and \( \zeta = 0.3 \)) they are quite different from what is in the case (\( \zeta = -0.3 \)) here we find two areas of stability first and the second (3.4-25) in addition (3.4-14.7) to the area of (spike) in both positive and negative parts (15 ns) and the area of chaos. In positive part at (16.6-25 ns) as in the fig (2-a,b).

![Figure 2](image2.png)

**Figure 2:** Match in the negative part only at a value (feedback strength \( \zeta = -0.3 \))
Figer (3) match the positive part at value ($\zeta = 0.4$) in case ($\zeta = \pm 0.2$) with the appearance of two areas of stability first (3.1-14.6ns) and the second (15.3-25ns) and the area of (spike=15ns). This positive part accordance with the negative part of the figure (2b) While we find the negative part ($\zeta = -0.4$) has three areas of stabilities (ns3.1-14.6ns, 15.4-16.2ns, 19-25) with area of (spike=15ps) with confusion area (15.5-18.9ns) this behavior does not match any value of other values (feedback strength $\zeta$), and the fig (3,a-b) explain that.

Figure 3: Match in the positive part and mismatch in the negative part at this value (feedback strength $\zeta = \pm 0.4$).

In fig (4) we found that ($\zeta = \pm 0.5$), there is two areas of stability first (3.1-14.6ns) and second (15.4-25ns) separated by an area (SPIKE) at (15ns) as in fig (4-a,b).

Figure 4: Accordance is clear in the positive and negative part (feedback strength $\zeta = \pm 0.5$).

Figure 5 There are two areas of stability at the positive and negative part of the value ($\zeta = \pm 0.6$) and area of (SPIKE=15ns) and area of (Chaos=16.6-25ns) as in fig (5-a,b).

Figure 5: Shows the accordance in the positive and negative part (feedback strength $\zeta = \pm 0.6$).
Table 1: Shows areas of stability and areas of confusion (chaos) and (spike) at the values ($\zeta = +0.2$ and $\zeta = +0.6$).

<table>
<thead>
<tr>
<th>Feedback strength $\zeta$</th>
<th>Stability region (ns)</th>
<th>Spike region (ns)</th>
<th>Chaos region (ns)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.2</td>
<td>11.7 9.8</td>
<td>15</td>
<td>---------</td>
</tr>
<tr>
<td>0.3</td>
<td>11.3 0.7</td>
<td>15</td>
<td>8.4</td>
</tr>
<tr>
<td>0.4</td>
<td>11.5 9.7</td>
<td>15</td>
<td>---------</td>
</tr>
<tr>
<td>0.5</td>
<td>11.5 9.6</td>
<td>15</td>
<td>---------</td>
</tr>
<tr>
<td>0.6</td>
<td>11.3 0.8</td>
<td>15</td>
<td>8.4</td>
</tr>
</tbody>
</table>

Table (1) represent the stability areas, spike areas, and chaos areas for both positive and negative optoelectronic feedback. Here, spike areas are equal for both types of optoelectronic feedback. The first stability areas are approximately equal and the difference between them is 0.2 ns. There are no confusion areas in the case of $(0.2, 0.3, 0.5)$ and the shortest stability in the case of 0.2 positive. In the second table we find a clear correlation with positive feeding in the spike and two areas of stability except for -0.4. There are no third regions added to chaos in areas, (-0.5,-0.2,-0.3), that mean they are not consistent with the positive state.

Conclusion

The accordance of the quantum dot laser output was investigated with the presence of both negative and positive Optoelectronic feedback. In addition to, knowing the areas of stability and areas of (spike) and (chaos). There was a significant accordance between positive and negative feeding in two cases (0.2, 0.5) and used this results on medical applications. There is a difference in the other areas. In addition, all negative and positive (feedback strength $\zeta$) values have a spike at 15ns for both positive and negative. Stability areas are two areas for all values feedback strength $\zeta$ positive and negative except off(-0.4) with three stability areas.

Source of Funding: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the University of Kerbala/Science College/Physics department/Karbala, Iraq and all experiments were carried out in accordance with approved guidelines.

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Serum Zinc Level in Children with Relapsing Nephrotic Syndrome

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1Al-Sadder and AL-Zahra Teaching Hospitals, The Ministry of Health and Environment of Iraq, Iraq

ABSTRACT

Zinc as a second trace element of human body plays an important role in numerous function. Abnormality in the metabolism of zinc in renal problem especially nephrotic syndrome is well documented. We aim in this study to measure the serum zinc level in children with relapsing nephrotic syndrome. A hospital based case control study that conducted at nephrology clinic at Al-Sadder and AL-Zahra teaching Hospitals for period between 1st January 2013 to end of October 2013. A total of 60 pediatric patients with relapsing nephrotic syndrome were included in this study. They were divided in two groups, (30) patients constituent of group A (patients with infrequent relapsing) and (30) patients constituent group B (patients with frequent relapsing). Control group consist of 32 healthy children. Serum zinc was measured by atomic absorption spectrophotometry. patients aged 2-14 years, boys were 40 and girls were 20. The mean age of patients was 7.5 years. The Mean serum zinc level in group B (frequent relapse) (58.45 µg/dl) that was significantly lower than that of group A (infrequent relapse) (61.58 µg/dl) and control group (89.64 µg/dl) respectively

Keywords: Frequent relapses. Nephrotic syndrome. Zinc

Introduction

Nephrotic syndrome was primarily a pediatric disorder and was 15 times more common in children than adults. The incidence was 2-3/100,000 children per year; and the majority of affected children will have steroid-sensitive minimal change disease. The nephrotic syndrome was caused by renal diseases that increase the permeability across the glomerular filtration barrier. It was classically characterized by four clinical features, but the first two are used diagnostically because the last two may not be seen in all patients:

1. Nephrotic range proteinuria (Urinary protein excretion greater than 50mg/kg per day) or 40 mg/m² per hour.
2. Hypoalbuminemia(Serum albumin concentration less than 2.5 g/dL(25g/L))
3. Edema
4. Hyperlipidemia

Risk Factors for Relapse in Childhood Nephrotic Syndrome

1. Cold and infections. Cold and infections are the most common cause of relapse of nephrotic syndrome. If left untreated, illness conditions will become even worse. Children and adolescents are still in the growth period and many of their tissues and organs are still immature. Compared with adults, children patients have weak immune system and they are more susceptible to be attacked by various viruses, bacteria which often cause the proteinuria, hematuria, swelling to reoccur.

2. Poor compliance. Different from adult patients, small children usually do not understand why they need to take so many bitter drugs and the importance to have the right dosage on schedule. Often the reduction of dosage or stopping taking the prescribed medicines often cause relapse of illness. Therefore it is very important that parents should supervise the children to have medicines at the right time and with the right dosage.

Proper treatment is very important to prevent relapse of nephrotic syndrome in children. Hormones and immunosuppressant are effective at relieving symptoms but cannot solve the root problems, that is why patients often become dependent on these drugs and illness often relapse when the dosage is reduced or the drug is stoped. Often these drugs have some side effects and harms to the kidneys if taken for long time, that is why nephrotic syndrome will continue to become worse after each relapse.
Infection is an important cause of morbidity and mortality in nephrotic children. Patients with steroid sensitive nephrotic syndrome (SSNS) have increased susceptibility to bacterial infections and various infections may result in relapses or steroid resistance or may trigger the onset of disease. Relapses in SSNS often follow infections of upper airway or gastrointestinal tract and cellulitis. It is estimated that 52–70% of relapses among children in developing countries chiefly follow the upper respiratory tract infection. Common infections associated with either onset of disease or in the course of disease are acute upper and lower respiratory infections (ARI) including pneumonia with or without empyema, skin infections including impetigo and cellulitis, acute watery or invasive diarrhea, urinary tract infections (UTI) and primary peritonitis. Studies have shown that use of prophylactic antibiotics, immunoglobulins, replacement therapy, vaccination against streptococci pneumoniae, thymosin as immuno-modulating agent, use of Chinese medicinal herb (TIAOJINING) and zinc supplements may have a role in prevention of these infections. However, in a recent Cochrane Database of Systemic Review, it has been concluded that there is no strong evidence for any of above interventions for prevention of infection in nephrotic syndrome. Though pneumococcal peritonitis and cellulitis are decreased with use of pneumococcal vaccine and antibiotics but these infections are still responsible for 1.4-10% of mortality and repeated relapses in more than 80% of cases, requiring high dose steroids and hospitalization. A high frequency of infections in children with nephrotic syndrome (38–83%) has been reported from developing countries like India, Pakistan & Bangladesh in different studies. Studies from developing countries have also suggested that increasing the maintenance dose of steroid from alternate day in a child with remission to daily during the episode of mild infections can prevent relapse. Thus a strong suspicion regarding infections in a nephrotic child is important not only for treatment but also to prevent infection associated relapse.

Zinc was an essential trace element. Zinc intake was closely related to protein intake; where diet rich in proteins stimulate zinc absorption as a result, it was an important component of nutritionally related morbidity worldwide.

The usual oral intake of zinc was approximately 4 to 14 mg/day; the recommended dietary allowance (RDA) was 8 mg/day for children ages 9 to 11 years. Primary dietary sources of zinc include animal products such as meat, seafood, and milk. Ready-to-eat cereal contains the greatest amount of zinc consumed from plant products.

Approximately 10 to 40 percent of dietary zinc was absorbed in the small bowel; absorption was inhibited by the presence of phytates and fiber in the diet that bind to zinc, as well as dietary iron, cadmium, calcium, copper and phosphorus in high amounts. Approximately 0.5 to 1.0 mg/day was secreted in the biliary tract and excreted in the stool. Zinc circulates at a concentration of 70 to 120 mcg/dL with 60 percent loosely bound to albumin and 30 percent tightly bound to macroglobulin. Urinary excretion typically ranges from 0.5 to 0.8 mg/day. The primary stores of zinc include the liver and kidney. Most of the body zinc stores are intracellular where zinc was bound to metalloproteins.

Relapses in steroid-sensitive nephrotic syndrome (SSNS) often follow infections of the respiratory or gastrointestinal tract. Based on data that zinc supplements reduce the risk of infections, we examined the efficacy of such supplements in reducing relapse rates in the patient.

**Materials and Method**

This was a hospital based case control study on samples at nephrology clinic at Al-Sadder and Al-Zahra teaching Hospitals for period between January 2013 to end of October 2013 as following.

**Sample Size:** A total of 60 pediatric patients age 2-14 years with relapsing nephrotic syndrome were included in this study, male were 40 and female were 20. They were separated into two groups: Group A (infrequent relapsing), 30 children, where there were 20 males and 10 females (relapse once time during 6 months since diagnosis of disease). Group B (frequent relapsing), 30 children, where there were 20 males and 10 females (relapse two or more during 6 months since diagnosis of disease). These patients were compared with 32 healthy children called “control group”, where there were 17 males and 15 females.

For both groups and control, blood samples were collected to measure the serum zinc concentration level by using Spectrophotometer.

**Zinc Measurement:** This occur by spectrophotometry where zinc reacts with chromogen present in reagent forming coloured compound which colour intensity proportional to the zinc concentration present in sample.
In fasting state 3 ml of blood was drawn with plastic syringe from each nephrotic and control subject. After centrifugation at 3000 rpm for 10 minutes, separated sera were kept frozen at -70°C. Haemolysed sera were taken out of the study. Serum zinc was measured by atomic absorption device model Carl Zeiss Jena (Jena, Germany) Model AAS3 flame atomic absorption spectrometer. A cut-off value of 70 μg/dl - 115 mg/dl was used for serum zinc, samples below 70μg/dl was regarded as low (hypo-zincemia). After collecting data, statistical analysis was performed by SPSS 16.0.2. Values were presented as means ± 2 SD. Differences were considered significant at P <0.05. Laboratory observer and data analyzer had not any idea about the relationship of samples to patients or normal subjects. The study was approved by the local research and the ethics committee in the hospital and the college, parents consent was taken.

### Results

We made the statistical analyses to correlate the different conditions groups (Control, A, and B). These different conditions were divided according to the historical background of the patients (frequent and infrequent relapsing) in the mentioned hospitals during the lifetime of the disease (nephrotic syndrome).

#### Table1: The Samples Sizes for Each Group

<table>
<thead>
<tr>
<th>Variables</th>
<th>Group Symbol</th>
<th>Sample Size</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>Control</td>
<td>17</td>
<td>32</td>
</tr>
<tr>
<td>Infrequent Relapsing</td>
<td>A</td>
<td>20</td>
<td>30</td>
</tr>
<tr>
<td>Frequent Relapsing</td>
<td>B</td>
<td>20</td>
<td>30</td>
</tr>
</tbody>
</table>

#### Table2: Mean Serum Zinc Concentration for Males and Females in all groups studied

<table>
<thead>
<tr>
<th>Groups</th>
<th>Sex</th>
<th>Mean, mcg/dl</th>
<th>Standard Deviation</th>
<th>Standard Error</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>Male</td>
<td>92.159</td>
<td>17.25</td>
<td>4.18</td>
<td>*0.209</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>86.787</td>
<td>19.46</td>
<td>5.025</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Male</td>
<td>62.095</td>
<td>4.07</td>
<td>0.91</td>
<td>**0.214</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>60.55</td>
<td>5.26</td>
<td>1.66</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Male</td>
<td>58.45</td>
<td>6.60</td>
<td>1.47</td>
<td>***0.498</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>58.46</td>
<td>5.97</td>
<td>1.888</td>
<td></td>
</tr>
</tbody>
</table>

#### Table3: Statistical Analyses to Correlate the Different Groups

<table>
<thead>
<tr>
<th>Variables</th>
<th>Sample Size</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>32</td>
<td>89.64</td>
<td>18.223</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>A</td>
<td>30</td>
<td>61.58</td>
<td>4.469</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Control</td>
<td>32</td>
<td>89.64</td>
<td>18.223</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>30</td>
<td>58.45</td>
<td>6.286</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>30</td>
<td>61.58</td>
<td>4.469</td>
<td>0.028426</td>
</tr>
<tr>
<td>B</td>
<td>30</td>
<td>58.45</td>
<td>6.286</td>
<td></td>
</tr>
</tbody>
</table>

In this study The Mean serum zinc level in group B (frequent relapse) (58.45 μg/dl) that was significantly lower than that of group A (infrequent relapse) (61.58/ dl) and control group (89.64 μg/dl) respectively. P-value <0.001 these finding can be explained by Mild zinc deficiency is believed to result in a reduced production of Th1 cytokines, resulting in Th2 cytokine bias13,14. In contrast, zinc supplementation is proposed to augment gene expression for IL-2 and IFN-γ, thereby restoring the Th1 immune response15 Since the Th1–Th2 cytokine imbalance is also believed to result in relapses of SSNS. So this results support the findings that suggest the patients with SSNS receiving supplementation with RDA of zinc show a trend towards fewer relapses and higher likelihood of remission. The response was better in the frequent relapsers16,17. The Mean serum zinc level of group A (infrequent relapse) is also low (61.58/dl) ,this finding can explained by The increase urinary zinc excretion in children with NS (whether in relapse or in remission) was attributed as a cause for low serum zinc level by many
authors who reported a positive correlation between urinary zinc and protein excretion in their studies,\textsuperscript{(18,19,20,21)}. Also, several studies demonstrated low blood or serum zinc levels among children with NS compared to that of the control groups.\textsuperscript{(16,18)} This study certifies insignificant difference corresponding to sex in all groups of patients studied. This result was also stated by\textsuperscript{22}.

**Conclusion**

Hypozincemia can occur in chronic renal problem like nephrotic syndrome. The low level of serum zinc mainly found in those with frequent relapses there is no effect of sex on mean serum level in all group studied.

**Source of Funding:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Al-Sadder and AL-Zahra teaching Hospitals, Iraq and all experiments were carried out in accordance with approved guidelines.

**REFERENCES**


The Impact of the Strategy of Lists Focused on the Achievement of Second-Grade Students in Science

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ABSTRACT

The study aims to identify the effect of the strategy of the concentrated lists in the achievement of second grade students in science. The researcher adopted the experimental method as the appropriate method for the research procedures. The research community consisted of middle schools for girls in Karbala governorate, (32), and the second was a control group that was studied in the usual manner. The number of female students was 34, and the researcher rewarded between the two research groups in some variables, For students measured in months and the collection of parents and students degrees in science at the end of the first semester (first course) And the degrees of testing the previous information in the science and intelligence test), (The test of two independent samples, the square of Kai, the coefficient of difficulty and ease of paragraphs, the coefficient of discrimination, the effectiveness of alternatives and the equivalence of Kyodar _ Richardson 20) and the magnitude of the effect) Students of the control group in the achievement test, ie, there is a difference of statistical significance at the level of significance (0.05) and for the benefit of the experimental group.

Keywords: Strategy of Focused Lists - Achievement - Second Grade Students – Science

Introduction

The scientific development and the rapid explosion of knowledge in the world has become the hallmark of this age in various fields, especially in the field of communication, which has greatly helped to support the use of theories (models of philosophies and methods of teaching). All this is done in order to improve and develop educational learning process ¹. Education is an effective means of achieving the strategic goals of the society because of its importance in adapting and interacting with the local environment, which create the conditions for the formation of citizens and prepare them able to promote the community and adapt to changes in the environment and society. ². He noted ³ Scientific education is a system whose aim and purpose is to provide the learner with the necessary knowledge and scientific knowledge to become a scientific educator. The purpose of the scientific education is to provide the learner with information, customs and scientific values and to activate the kinetic role in order to be educated scientifically, socially and physically. Understanding scientific facts and knowledge and applying them to reality from the scientific, social, and motor aspects ⁴⁵. The curriculum is very important in education and its importance is reflected in the fact that it is the main tool that achieves the goals of education, which are at the heart of the educational process and its means The importance of curricula is great because it is concerned with human numbers and their construction ⁶. Al-Janahi (2018) pointed out that the curriculum has a close relationship to the teaching methods because it is a corner of its structure, or as Klepatric describes it: “The method is one of the legs of education and the other leg is the curriculum. Education cannot walk on one leg.” ⁷ does not focus on specific teaching methods, but the challenge facing other researchers clearly shows that educational curricula should be centered around students and beyond the role of the educational teacher on the transfer of his teaching function ⁸. The teaching of any branch of science and knowledge must reflect its nature and processes. Thus, the teaching methods of science must reflect the nature of science that deals with natural phenomena of all kinds. ⁹ The study of physics helps students to understand and think in the age of science and technology Which has become difficult for students to live in the twenty-first century without understanding the nature of science and knowledge of basic physical information and the use of scientific thinking methods to solve the problems of life and make good decisions under the innovations of science and technology ¹⁰¹³.
Branches of Medical Physics

Medical Physics is divided into four main branches:

1. Therapeutic Radiological Physics
2. Nuclear Medicine Physics
3. Diagnostic Imaging Physics
4. Medical Health Physics

In the large hospitals, there is a department called Medical Physics, under which people are divided into these four branches. The Division of Radiotherapy Physics is often the largest. Physicists provide support services for the department of oncology at the hospital, such as radiation dose planning and accurate access to tumor patients and diagnostic imaging devices Ray, radiography, magnetic resonance imaging, ultrasound, etc. The presence of diagnostic imaging physicists is necessary to ensure that these devices conform to international standards and standards when used in patients. Radiation at the hospital or facility? If there are healthy physicists make sure that the patients or employees are not exposed to unnecessary radiation and are communicating with the competent authorities in the protection of radiation in the State and in the case of the presence of nuclear medicine devices in the hospital there is at least one medical physicist services for that section, Ensure the safety of the work environment as well as radiation training and education.

Methodology

The research procedures include research methodology, experimental design, identification of the research community and its sample, the equivalence of experimental and control groups, preparation of research requirements and tools, procedures for applying the experiment and presentation of the statistical means used, which will be presented as follows:

Experimental design of the research: The independent variable includes the strategy of the concentrated lists, the usual method and the variable of the collection. Therefore the researcher used experimental design with partial control of two equal groups, one experimental and the other control as in the following table:

<table>
<thead>
<tr>
<th>The group</th>
<th>Independent variable</th>
<th>The dependent variable</th>
<th>Search tool</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>Focused List Strategy</td>
<td>Collection</td>
<td>Post-achievement test</td>
</tr>
<tr>
<td>Control</td>
<td>The usual method</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Search community and design: The current research community is represented by second grade middle school students, all in the public schools of the Directorate General of Education in the province of Karbala, the province of Hindia for the academic year (2018-2019). The researcher chose (medium Omaima for girls) randomly to apply the experiment, as it includes three people for the second grade (A, B, C), the researcher chose (A) random sampling method to represent the experimental group and the number of female students (32) students who studied their students according to the strategy (concentrated strength), in the same way was chosen Division B to represent the control group and the number of female students (34) students who studied their students on (The normal method).

Equivalence of the two groups of research: The researcher conducted the equivalence of the two groups of research in the following variables (the age of the students, the grades of students in the science of the first chapter, the IQ test) The following table shows the equivalence between the two groups:

<table>
<thead>
<tr>
<th>I am equal</th>
<th>Arithmetic mean</th>
<th>variance</th>
<th>The degree of freedom</th>
<th>T value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variables</td>
<td>Division (a) Number (32)</td>
<td>Division (b) Number (34)</td>
<td>Division (a) Number (32)</td>
<td>Division (b) Number (32)</td>
</tr>
<tr>
<td>The chronological age</td>
<td>163.63</td>
<td>162.88</td>
<td>31.81</td>
<td>18.32</td>
</tr>
<tr>
<td>First course</td>
<td>64.09</td>
<td>63.94</td>
<td>240.25</td>
<td>199.37</td>
</tr>
<tr>
<td>Danleys test</td>
<td>29.5</td>
<td>27.79</td>
<td>21.16</td>
<td>46.51</td>
</tr>
</tbody>
</table>
Adjusting the Exogenous Variables: The variables related to the experiment have been set.

Determination of the course material: The course material was determined in the second part of the book of science, 2018, i, which is to be taught for the second intermediate grade for the year by the Iraqi Ministry of Education (2018-2019) Of the teaching plans and the behavioral goals of the two research groups according to the content of the book of science part II (2018, i), which is to be taught to the second grade students for the academic year 2018-2019. 32 teaching plans were prepared with (16) In accordance with the strategy (focused lists) and (16) the group's teaching plan According to an officer (the usual way).

Search Tool:

Steps have been prepared for the research tool (test collection) which is as follows:

To determine the purpose of the achievement test: The requirements of applying the current research to prepare an achievement test used to measure the academic achievement of the sample of research in the science (Part II), so the researcher prepared an achievement test related to the subject matter taught and behavioral purposes related to them and appropriate to the level of sample search.

Believe the test: The results showed that the apparent honesty obtained the proportion of agreement (80%) by the arbitrators and specialists. The results showed that all the clauses of the achievement test are statistically significant, so The achievement test is honest in measuring the comprehension and comprehension of second graders in science.

The pilot application for the test of achievement: It includes the following:

The first pilot application: To determine the clarity of the test instructions, the clarity of the paragraphs and their formulation, and the time it took to answer the test. The test was carried out on a non-sample sample of 30 students from the second grade in Mustansiriyah High School on Monday, 2/2019. After completing the answer it became clear that the instructions for the answer and the test paragraphs were clear and that the average response time for the students was (40) minutes.

The second test application: After confirming the veracity of the test paragraphs and instructions and the time taken to answer, the test was repeated again on a sample of (100) students of the second grade intermediate in the middle of the cities on Wednesday (27/2/2019) After informing the students of the test date several days ago, and supervised the researcher herself to apply the test, and the purpose of this application is the statistical analysis of the test paragraphs.

Statistical analysis of the test paragraphs: The analysis of the test paragraphs of the basic processes that can be used by the researcher in the examination of vocabulary, and determine the quality and effectiveness, each of the paragraphs of the test characteristics of the distinctive, the purpose of analyzing the paragraphs of the test is to know the degree of difficulty of each paragraph (difficulty coefficient), And the possibility of distinguishing between the different levels of female students (coefficient of discrimination) and the effectiveness of the wrong alternatives to the test, so correct the answers of the students of the second survey sample (the number of 100) students and found their grades and rank descending, in order to conduct the following statistical analyzes:

Difficulty factor for paragraphs: Any paragraph whose coefficient of difficulty is between 0.25-0.75 is acceptable. The researcher applied the coefficient of difficulty of the substantive paragraphs on each paragraph of the test and found that the value ranged between (0.35-0.72), which means that it is suitable in terms of difficulty and ease, and thus counted all paragraphs with a coefficient of difficulty acceptable.

The coefficient of discrimination for the paragraphs: The researcher applied the coefficient of discrimination coefficient on each of the test paragraphs and found that the value ranged from (0.26-0.70). Thus, all the paragraphs were considered to have an acceptable coefficient of discrimination. The paragraphs with a coefficient of distinction between (0.25-0.75).

Half way split: The researcher adopted the answers of the sample of the second exploratory application, which amounted to (100) answer sheets, as the individual paragraphs of each student were grouped on one side and the matrices on the other hand (ie the grades were divided into two groups, one representing the degrees of the individual paragraphs and the other representing the vertebrates) Pearson’s correlation between the two test levels was (0.85) and corrected with the Spearman-Brown equation of(0.92). It is a good stability factor that can be trusted. The stability coefficient is good if it is (0.80) and above.
Method (Kyoder-Richardson 20): The researcher used this equation because the test is a multi-choice type. This equation is suitable for this kind of tests with one specific answer that corrects its paragraphs by giving one score for the correct answer and zero for the wrong or abandoned answer or if choosing more than one alternative. Stability was 0.83, indicating that it was a good and acceptable stability factor.

Application of the experiment:

The researcher followed the following steps in applying the experiment: The experiment was implemented on Monday (4/3/2019) of the second semester. The researcher studied the experimental and control groups by herself. The researcher prepared teaching plans for the experimental and control groups. And (16) plan of the control group according to the usual method, the trial ended on Thursday (25/4/2019), the researcher applied the test of achievement on Sunday (28/4/2019) on the two sets of research at one time, And the students’ grades were obtained.

Search results and interpretation: In the experimental group, the students of the experimental group studied the control group students who studied according to the traditional method in the achievement test. This indicates that there was a statistically significant difference at the level of (0.05) between the average of the students of the experimental group and the average score of the students of the control group. In the test of the collection of science and this is consistent with the studies that confirmed the superiority of the experimental group on the control group in the achievement test, and Table (3) shows that

<table>
<thead>
<tr>
<th>The group</th>
<th>Number</th>
<th>Average arithmetic</th>
<th>Variance</th>
<th>The degree of freedom</th>
<th>T value</th>
<th>Level of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>32</td>
<td>30.5</td>
<td>21.81</td>
<td>64</td>
<td>3.19</td>
<td>2.000</td>
</tr>
<tr>
<td>Control</td>
<td>34</td>
<td>26.35</td>
<td>28.62</td>
<td></td>
<td>Statistical function</td>
<td></td>
</tr>
</tbody>
</table>

Note from the table above, we note that teaching according to the strategy of concentrated lists has contributed to raising the academic achievement of second-grade students in science is better than the usual method of teaching.

Conclusion

The focused list strategy has the positive effect of increasing the average second graders’ achievement in science and increasing their ability to understand information, facts and knowledge and raise their academic level. The focused lists strategy plays a role in making female students the focus of the educational process through their active participation in the educational situation, which will increase their confidence in themselves and encourage them to persevere to raise their scientific level.

Source of Funding: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Babylon University/Faculty of Basic Education and all experiments were carried out in accordance with approved guidelines.

REFERENCES


Reliability of Salivary Alpha Amylase as a Biomarker of Obesity

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ABSTRACT

Obesity is generally defined as a condition of body fat accumulation in adipose tissue in excessive manner that may lead to impaired health. Saliva is an easy collected noninvasive biofluid, which contains various components like hormones and enzymes. The researches correlated to salivary α-amylase (sAA) and obesity are quite limited and not fully examined. This study aimed at finding out the reliability of salivary amylase as a biomarker to obesity. The study results showed a significant increase in anthropometric measurements (BMI, NC, WC, HC and WHR) and salivary α-amylase concentration and activity in obese subjects when compared with normal ones. In conclusion, salivary α-amylase activity was increased in obese subjects and could be an indicator to obesity. Further studies should be carried out to confirm that the salivary amylase to be a biomarker of obesity.

Keywords: obesity, salivary amylase, BMI, NC, WC, HC, WHR

Introduction

Obesity is a common but undervalued condition of public health and clinical importance all over the world, and is a result of fat accumulation in adipose tissue in excessive manner that may lead to impaired health. The total amount of fat is not the only important issue in the risks of obesity but where it is distributed in the body. Peripheral or abdominal obesity is supposed to be more risky and related morbidity and mortality because it involves more of the visceral organs. Commonly Body Mass Index (BMI), is the mostly used parameter to express what is considered as an “excess” of body fat. It is easy to measure by calculating the weight in kilograms divided by height in squared meters (kg/m²) in adults. For children and adolescents, the BMI ranges is considered according to their sex and age and expressed as gender-specific BMI percentiles in the growth charts. Waist circumference (WC) is used as simple anthropometric measurements of central obesity. Neck circumference (NC) is a measurement of upper body obesity and could be a significant indicator of central adiposity and maybe of visceral adiposity and a significant risk sign of metabolic conditions. Saliva is an easy collected noninvasive biofluid secreted primarily from the three pairs of major salivary glands: parotid, submandibular and sublingual, which contains hormones, enzymes, antibodies, antimicrobial component, and cytokines. Salivary amylase is one of the first enzymes recognized with several mysteries remain about the molecular mechanisms contribute to amylolysis of starch and the physiological role of the salivary amylase itself. The most important function of the salivary α-amylase enzyme is to catalyze the first stage in starch digestion into dextrin and maltose. The studies on salivary α-amylase (sAA) and obesity are quite limited and not fully examined. Moreover the study results that have been informed are mostly contradictory in many aspects. Limited studies have been done on sAA and its role in diabetes, proposing a close association between the salivary amylase activity and glucose homeostasis. Studies found a positive correlation between sAA activity and obesity expressed by increased BMI in adolescent and a significant positive association between sAA and waist to hips ratio (WHR) in women. While another study revealed that average morning sAA was negatively associated with BMI.

Materials and Method

Study Population: This study was carried in the laboratories of Biology Department, College of Science,
Babylon University, Iraq. The volunteers were recruited from October to December 2018 in the clinics of College of Dentistry, Babylon University. The study was performed on 89 subjects (56 obese subjects and 33 normal subjects) aged from 6 to 50 for both genders (40 males and 49 females). Each subject was given a questionnaire included age, gender, diseases, family history and last medical check. According to the World Health Organization, normal weight subjects were with BMI 18.5-24.9 kg/m² and obese subjects were with BMI of >30 kg/m². Children (aged 6-10 years) and adolescents (aged 11-18 years) were also grouped into normal weight group and obese group depending on their BMI percentile. Subjects with BMI of <85th % for age and gender were included in the normal group and subjects with BMI of ≥95th % for age and gender were considered obese subjects. Subjects with diabetes, hypertension, or other diseases, or having any medicine during the last three months were excluded from the study. Smokers, alcohol abusers, pregnant and nursing women were not involved in the study.

Anthropometric measurements: Height was measured by meters and weight was measured in kilograms by a digital weight scale. BMI were obtained as the weight in kilograms divided by the square of the height in meters (kg/m²) according to WHO. The WC, HC and NC were measured by centimeter according to the protocol of WHO.

Collection of saliva: Unstimulated whole saliva (4 ml) was collected by draining method in the morning at 8:30 to 11am after fasting for at least 8 hours. Before that subjects were told to rinse their mouth with 10 ml of water (preferably distilled) for 30 seconds to remove debris and moisturize the mucosa. Immediately after saliva collection the samples were centrifuged at 3000 rpm for 15 minutes. The supernatant were removed and transferred to the eppendorf tubes and stored at -20°C until analysis (not for more than one month).

Salivary α-amylase measurements: Salivary alpha amylase concentration was measured according to ELISA kit procedure supplied by Elabscience - China company. The activity of sAA was determined according to Sahu et al.

Statistical Analysis: Statistical analysis was performed by using SPSS version 23. All data were analyzed using descriptive statistics for normal distribution and homogeneity of variance by the Kolmogorov–Smirnov tests before statistical analyses were managed. For comparison between obese and normal weight groups, independent t-test or Mann-Whitney U test was performed. Data were expressed as the means ± standard error. P value (P≤0.05) was considered statistically significant. Bivariate correlations were performed using the Pearson correlation coefficient between the anthropometric measurements and sAA measurements.

Results and Discussion

Anthropometric measurements in normal weight and obese subjects: In the comparison between the obese and control groups, there was a highly significant (p≤0.01) increase in the means of BMI, NC, WC, HC and WHR (31.17 ± 0.7 kg/cm², 35.09 ± .67 cm, 93.21 ± 2.21cm, 101.85 ± 2.42 cm and 0.93 ± .023 respectively) in obese group as compared to the means of (18 ± 0.69 kg/cm², 30.00 ± .84 cm, 65.58 ± 2.59cm 80.48 ± 2.78 cm and 0.82 ± .02 respectively) in normal weight group (table 1).

The correlations between anthropometric measurements in obese subjects (table 2) revealed that BMI has highly significant (p≤0.01) positive correlation (R² = 0.77, 0.78 and 0.65) with NC, WC and HC respectively. NC measurement was high significant (p≤0.01) positively correlated (R²=0.85, 0.58) with WC and HC respectively, and significant (p≤0.05) positively correlated (R²=0.33) with WHR. Furthermore WC as a measurement to central obesity had highly significant (p≤0.01) positive correlation (R²= 0.71) with HC and positively significant (p≤0.05) correlated (R²=0.33) with WHR (table 2).

<table>
<thead>
<tr>
<th>Subjects</th>
<th>BMI (kg/m²)</th>
<th>NC (cm)</th>
<th>WC (cm)</th>
<th>HC (cm)</th>
<th>WHR</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>18 ± 0.69</td>
<td>30.00 ± .84</td>
<td>65.58 ± 2.59</td>
<td>80.48 ± 2.78</td>
<td>0.82 ± .02</td>
</tr>
<tr>
<td>OB</td>
<td>31.17 ± 0.7**</td>
<td>35.09 ± .67**</td>
<td>93.21 ± 2.21**</td>
<td>101.85 ± 2.42**</td>
<td>0.93 ± .023**</td>
</tr>
<tr>
<td>P value</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Data are presented as mean ± SE.


**Statistical significant at p≤0.001
Table 2: Correlation between anthropometric measurements in obese subjects

<table>
<thead>
<tr>
<th>Anthropometric measurements</th>
<th>BMI</th>
<th>NC</th>
<th>WC</th>
<th>HC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>R²</td>
<td>p-value</td>
<td>R²</td>
<td>p-value</td>
</tr>
<tr>
<td>NC</td>
<td>0.77**</td>
<td>0.000</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>WC</td>
<td>0.78**</td>
<td>0.000</td>
<td>0.85**</td>
<td>0.000</td>
</tr>
<tr>
<td>HC</td>
<td>0.65**</td>
<td>0.000</td>
<td>0.58**</td>
<td>0.000</td>
</tr>
<tr>
<td>WHR</td>
<td>0.14</td>
<td>0.14</td>
<td>0.33*</td>
<td>0.000</td>
</tr>
</tbody>
</table>


*Statistical significant at p≤0.005
**Statistical significant at p≤0.001

Salivary α-amylase measurements in normal weight and obese subjects: The analysis of results showed no significant difference in the concentration of the enzyme α-amylase in saliva of both groups of this study (37.67 ± 5.62 ng/ml in normal weight subjects and 38.61 ± 4.14 ng/ml in obese subjects) as shown in figure (1), while the α-amylase enzyme activity revealed significant (p≤0.05) elevation (figure 2) in obese subjects (335.85 ± 34.58 U/ml) as compared to normal weight subjects (285.78 ± 35.47 U/ml).

As shown in table (3), α-amylase concentration was significant (p≤0.05) positively correlated (R²=0.37 and 0.36) with BMI and NC respectively. Meanwhile the α-amylase activity was significant (p≤0.05) negatively correlated (R²=-0.43 and 0.38) with NC and WC of obese subjects.
Discussion

Anthropometric measurements in normal weight and obese subjects: The present anthropometric study object was to recognize the most appropriate anthropometric measurement that best correlates with obesity in the population of this study. From table (1) all the anthropometric measurement involved in the current study were high significantly elevated in obese subjects, and correlated with each other (table 2). The BMI was strongly associated with body fat, but abdominal obesity is a distinct predictor of mortality and morbidity, even in people with a normal BMI.

The recent study showed high significant increasing in WC in obese subjects comparing to normal weight subjects. WC is used as simple anthropometric measurements for abdominal obesity. WC than 102cm in men and 88cm in women is a risk factor for diabetes mellitus, insulin resistance and cardiovascular disease.

NC was highly elevated in obese group of this study, it could be a significant indicator of central or visceral adiposity and a significant risk sign of metabolic conditions. Also it could be considered an important measurement in health care clinics especially pregnant women where classical measures are not meaningful. NC can be used as a primary test for the prediction of obesity.

WHR was highly raised in obese group of this study. WHR has lately been proposed as a useful alternate method of percentage body fat assessment. But BMI is still the most commonly used method for identifying obesity in most epidemiological studies.

Salivary α-amylase measurements in normal weight and obese subjects: From this study (figure 1&2), sAA concentration and activity were increased in obese subjects. The concentration of enzyme in obese saliva was not significantly increased as compared with the activity of the enzyme in obese saliva. sAA catalyzes starch digestion into dextrin and maltose. One study revealed a positive association between salivary α-amylase activity and increased BMI in adolescent. Another study found that BMI was negatively associated with average morning sAA. Lamy et al. mentioned that sAA activity increased in obese women as compared with normal weight women. Hossain et al. found that sAA activity to be positively linked with BMI. Most studies linked salivary amylase with diabetes and insulin and cardiovascular risks. A recent study proposed the association between sAA concentration and sweet taste marks in children. The favoring of sweet and high-fat foods is often described as being related to obesity occurrence. Salivary amylase may increase glucose levels in saliva. A relationship between salivary glucose levels and low-sensitivity to sweet taste may lead to a desensitization of these receptors, causing the need for higher concentrations of sweet stimuli to be recognized. Desensitization of taste receptors because of the constant stimulation has earlier been described.

Conclusion

In conclusion salivary α-amylase activity was increased in obese subjects and could be used as an indicator of obesity. Further studies should be carried out to confirm its use as a biomarker of obesity.

Source of Funding: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Dentistry, Babylon University, Iraq and all experiments were carried out in accordance with approved guidelines.

REFERENCES


Infertile Women’s Knowledge Regarding Adverse Effect of Invitro Fertilization Treatment

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ABSTRACT

Objective: To identify Infertile Women’s Knowledge about adverse effect & to find out association between these infertile women’s knowledge & sociodemographic characteristic, reproductive variables. The present study employs a descriptive comparative design held at the Um El Banin Center for Infertility & In-Vitro Fertilization Treatment at Al-Emamain Al-Kadhemain Medical City. Data collection was initiated on 2nd January to end of March/2018. Purposive sample consisted of (100) infertile women. An assessment tool was constructed for the purpose of the study, it was comprised of socio-demographic data, information about women age at marriage, number of years of marriage, age at puberty (menopause), regularity of menstruation, suffering from dysmenorrhea. Previous medical history. The main results of the study show that participants’ knowledge about the adverse effects of IVF are of low-mean scores with low R.S. and their assessment is low in the pretest time. In the posttest time, all items of participants’ knowledge about the adverse effects of IVF are of high-mean scores with high R.S. There is a statistically significant difference in the scores of knowledge about adverse effects of IVF for women in the study group between the pretest time and posttest I (p-value = .000). On the other hand.

Keywords: Contributing Factors of infertility, Invitro fertilization.

Introduction

The definitions of infertility vary according World Health Organization infertility as “a disease of the reproductive system defined by the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse” (Zegers-Hochschild et al., 2009). Population studies differ on infertility from one country to another, according to the area in which the study was conducted. Knowing the prevalence of infertility among the population is of great importance, to identify the potential needs and adapt health care for each particular community (Young, 2013). The infertile couple suffer from enormous psychological burdens, especially for woman. Knowledge about the factors that affect reproduction or fertilization may help couples reduce infertility by avoiding certain dangerous factors that lead to infertility 1.

Methodology

The present study employs a descriptive comparative design held at Um El Banin Center for Infertility & In-Vitro Fertilization Treatment at Al-Emamain Al-Kadhemain Medical City. Data collection was initiated on 2nd January to end of March/2018. Purposive sample consisted of (100) infertile women. An assessment tool was constructed for the purpose of the study, it was comprised of socio-demographic data, information about women age at marriage, number of years of marriage, age at puberty (menopause), regularity of menstruation, suffering from dysmenorrhea. Previous medical history. Include: urinary tract infection, thyroid diseases, diabetes mellitus, hypertension, and cardiovascular diseases. Gynecological History, do you have history of Inflammation of the reproductive system, fallopian tube, Congenital malformations, ovarian dysfunction, previously artificial insemination if found number of trials, ovarian cyst and fibroids and Women’s Knowledge about Diseases and Factors Contributing to Infertility Multiple choice items (Three alternatives) scale was used to measure the knowledge of women about infertility and its contributing factors, these include (11) items. The instrument was constructed through the use of (2) level type of scale, and scored, yes (2) and No (1). The pilot
study conducted on (10) mothers and their neonate to test the, reliability of questionnaire, from 2nd January to 10th February 2018, the actual value is (0.764), in study post I and study post II respectively, this means that the items of the questionnaire were clear and understood and the questionnaire was adequately reliable. To make instrument valid, it was presented to a panel of expert in different medical and nursing specialties. Data were collected through, application, observation, assessment, and interview techniques as a mean of data collection process. Data were analyzed through application of descriptive and inferential statistical data analysis approach through the use of SPSS Version 24.

Results and Discussion

With respect to wife’s level of education, more than a quarter in the study group hold a bachelor’s degree (n = 30; 30.0%), followed by those who are high school graduates (n = 20; 20.0%), those who are intermediate school graduates (n = 13; 13.0%) and those who hold a diploma degree (n = 20; 20.0%) for each of them, those who are unable to read and write (n = 10; 10.0%), those who are primary school graduates (n = 5; 5.0%), and one who reads and writes (n = 2; 2.0%).

Concerning husband’s level of education, more than a quarter in the study group are high school graduates (n = 26; 26.0%), followed by those who hold a bachelor’s degree (n = 24; 24.0%), those who hold a diploma degree (n = 11; 11.0%), those who are unable to read and write (n = 11; 11.0%) and those who are intermediate school graduates (n = 11; 11.0%), and those who reads and writes (n = 9; 9.0%) and those who are primary school graduates (n = 8; 8.0%). Regarding wife’s occupation, most in the study group are housewives (n = 64; 64.0%), followed by those who are freelancers (n = 22; 22.0%), and those who are governmental employees (n = 10; 10.0%). With respect to husband’s occupation, most in the study group are freelancers (n = 54; 54.0%), followed by those who governmental (n = 36; 36.0%), and those who are do not work (n = 10; 10.0%).

Concerning consanguinity, the majority in the study group reported that there a second-degree consanguinity (n = 86; 86.0%), followed by first-degree consanguinity (n = 11; 11.0%), and third-degree consanguinity (n = 3; 3.0).

Regarding wife’s marital status, the majority in the study group reported that they are the first wives (n = 89; 89.0%), followed by second wives (n = 8; 8.0%), and married previously (n = 3; 3.0%).

Finally, Socio-Economic Status through applying of WHO instrument shows that the highest percentage of the study groups are within low category and accounted 62(62.0 %),33 (33%), and 5(5.0%), in women infertility in study group.

Table 1: Distribution of study sample according to Reproductive variables

<table>
<thead>
<tr>
<th>Reproductive variables</th>
<th>Groups</th>
<th>n = 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at marriage (Years)</td>
<td>13-19</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>20-26</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>27-33</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>2-5</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>6-9</td>
<td>49</td>
</tr>
<tr>
<td></td>
<td>10-13</td>
<td>30</td>
</tr>
<tr>
<td><strong>Sem SD</strong></td>
<td>22.88 ± 5.66</td>
<td></td>
</tr>
<tr>
<td>Infertility Duration (Years)</td>
<td>1-2</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>3-4</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>5-6</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>≥ 7</td>
<td>46</td>
</tr>
<tr>
<td><strong>SD</strong></td>
<td>7.8 ± 3.44</td>
<td></td>
</tr>
<tr>
<td>Age at menarche (Years)</td>
<td>11-12</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td>13-14</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>15-16</td>
<td>16</td>
</tr>
<tr>
<td><strong>SD</strong></td>
<td>13.6 ± 3.44</td>
<td></td>
</tr>
<tr>
<td>Regularity of menstruation</td>
<td>Regular</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>Irregular</td>
<td>73</td>
</tr>
<tr>
<td>Dysmenorrhea</td>
<td>Yes</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>80</td>
</tr>
</tbody>
</table>

n= Total sample, F= frequency; % = percentage;

Concerning wives’ age on marriage, the mean age for wives in the study group is 22.88 ± 5.66; less than a half got married on the age between 20-26-years-old (n = 48; 48.0%), followed by those who got married on the age between 13-19-years-old (n = 31; 31.0%), and those who got married on the age between 27-33-years-old (n = 21; 21.0%).

Regarding the duration of marriage, the duration mean for couples in the study group is 7.8 ± 3.44; a half got married for 6-9 years ago (n = 49; 49.0%), followed by those who got married for 10-13 years ago (n = 30; 30.0%), and those who got married for 2-5 years ago (n = 21; 21.0%).
### Table 2: Women’s knowledge regarding to adverse effects of IVF

<table>
<thead>
<tr>
<th>No.</th>
<th>Items women’s knowledge</th>
<th>Resp.</th>
<th>n = 100</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>F</td>
</tr>
<tr>
<td>1.</td>
<td>excessive ovarian response</td>
<td>No</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yes</td>
<td>50</td>
</tr>
<tr>
<td>2.</td>
<td>Increase weight in a few days</td>
<td>No</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yes</td>
<td>48</td>
</tr>
<tr>
<td>3.</td>
<td>Change in mood</td>
<td>No</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yes</td>
<td>50</td>
</tr>
<tr>
<td>4.</td>
<td>Damage in the bowel or bladder during the extraction process</td>
<td>No</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yes</td>
<td>50</td>
</tr>
<tr>
<td>5.</td>
<td>collection fluid inside the abdomen or lungs</td>
<td>No</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yes</td>
<td>50</td>
</tr>
<tr>
<td>6.</td>
<td>Difficult of breathing</td>
<td>No</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yes</td>
<td>54</td>
</tr>
<tr>
<td>7.</td>
<td>Low rate of urination</td>
<td>No</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yes</td>
<td>54</td>
</tr>
<tr>
<td>8.</td>
<td>congenital malformations</td>
<td>No</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yes</td>
<td>52</td>
</tr>
<tr>
<td>9.</td>
<td>Nausea to vomiting</td>
<td>No</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yes</td>
<td>56</td>
</tr>
<tr>
<td>10.</td>
<td>General anesthesia complications</td>
<td>No</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yes</td>
<td>45</td>
</tr>
<tr>
<td>11.</td>
<td>High temperature</td>
<td>No</td>
<td>47</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yes</td>
<td>53</td>
</tr>
<tr>
<td>12.</td>
<td>Infections in the upper genital canal</td>
<td>No</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yes</td>
<td>50</td>
</tr>
</tbody>
</table>

Respo. = Response, F = Frequency, % = Percentage, MS = Mean Score, R.S = Relative Sufficiency, Ass. = Assessment, n= Number of sample, L = Low (R.S = less than 75%), M = Moderate (R.S = 75% - 87.5%), H = High (R.S = 87.6% - 100%), n= Total sample.

Adverse effects of IVF for the study sample shows that, (excessive ovarian response, increase weight in a few days, damage in the bowel or bladder during the extraction process, collection fluid inside the abdomen or lungs, difficult of breathing, low rate of urination, congenital malformations, nausea to vomiting, general anesthesia complications, high temperature and infections in the upper genital canal) as shows all items of participants’ knowledge about the adverse effects of IVF are of low-mean scores with low R.S. and their assessment is low all items of participants’ knowledge about the adverse effects of IVF.

### Distribution of study sample according to sociodemographic characteristics:

Wife’s age, the mean age for women in the study group is 27.88 ± 5.18; less than a half age 27-33-years-old (n = 46; 46.0%), followed by those who age 20-26-years-old (n = 40; 40.0%), and those who age 34-40 years old (n = 14; 14.0%). Regarding husband’s age, the mean age for husbands in the study group is 31.52 ± 4.81; more than a half age 29-35-years-old (n = 56; 56.0%), followed by those who age 36-42-years-old (n = 22; 22.0%), and those who age 22-28-years-old (n = 20; 20.0%). No significant differences were found between both groups (p= 0.161).

The current study agreed with Atuahene & others (2016) who reported mean age with standard deviation of participant (30.05 ± 5.18). There were no significant
followed by those who are high school graduates (n = 20; 20.0%), those who are primary school graduates (n = 5; 5.0%), and third-degree consanguinity (n = 3; 3.0%).

show that the educational status, 3.6% had finished primary school, 31.8% had finished high school, 56.4% were University graduates and 8.2% were graduates of another school. no statistical significant differences between all groups in socio demographic characteristic.

This study was conducted in April 2012 among obstetricians and gynecologists. How do Egyptian gynecologists manage infertility? Cross-sectional study (66.3%) of the participants had a master’s degree or diploma and 33.7% had a medical degree (MD) or doctorate (PhD). Both groups were matched regarding age, gender, and work affiliation significant differences were identified between clinicians with Master degree/Diploma and those with higher degrees (MD or PhD) with regard to knowledge as well as management options of different causes of infertility.

present the demographic and study data of the subjects showed that the majority of the subjects was low levels of education such as illiterate, read and write, primary and intermediate schools, high significant differences were found between all groups (p= 0.006). Also they found in their study that mother’s occupation (housewives) present highest percentages for all groups (87.5%) (80%) respectively. There were no statistical significant differences between all groups in socio demographic characteristic.

Regarding wife’s occupation, most in the study group are housewives (n = 64; 64.0%), followed by those who are freelancers (n = 22; 22.0%), and those who are governmental employees (n = 10; 10.0%).

Concerning husband’s level of education, more than a quarter in the study group are high school graduates (n = 26; 26.0%), followed by those who hold a bachelor’s degree (n = 24; 24.0%), those who hold a diploma degree (n = 11; 11.0%), those who are unable to read and write (n = 11; 11.0%) and those who are intermediate school graduates (n = 11; 11.0%), and those reads and writes (n = 9; 9.0%) and those who are primary school graduates (n = 8; 8.0%).

Concerning consanguinity, the majority in the study group reported that there a second-degree consanguinity (n = 86; 86.0%), followed by first-degree consanguinity (n = 11; 11.0%), and third-degree consanguinity (n = 3; 3.0).

Distribution of study sample according to Reproductive Profile: Wives’ age on marriage, the mean age for wives in the study group is 22.88 ± 5.66; less than a half got married on the age between 20-26-years-old (n = 48; 48.0%), followed by those who got married on the age between 13-19-years-old (n = 31; 31.0%), and those who got married on the age between 27-33-years-old (n = 21; 21.0%).

Age at marriage for female (18.0%) sexual experience at age 15-20 years compare to (22.0%) females who got married on the age between 21-26 years. (10%) females who got married on the age between age between 27 -32 years. No statistical significant differences were found between all groups.

Duration of marriage, the duration mean for couples in the study group is 7.8 ± 3.44; a half got married for 6-9 years ago (n = 49; 49.0%), followed by those who got married for 10-13 years ago (n = 30; 30.0%), and those who got married for 2-5 years ago (n = 21; 21.0%).
Conclusion

The study concluded that the women’s knowledge about adverse effects of IVF and assisted reproduction were few have been improved through the study.

Source of Funding: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Al Emamain Al Kadhamain Medical City, Iraq and all experiments were carried out in accordance with approved guidelines.

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The Impact of Science Knowledge and Program for Developing the Predictive Skill

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1College of Basic Education, Babylon University, Iraq

ABSTRACT

The study was conducted in Iraq and aims to define the effect of the strategy of predicting the correct answer in the collection of Arabic grammar among the students of the first-grade intermediate. The researcher followed the experimental method as the appropriate method for the current research. The research community was the middle schools for boys in Hilla city center in Babylon province. A middle school chose 78 students, 40 students for the experimental group and 38 students for the control group. The research tool was an achievement test for Arabic grammar. The research experiment was carried out by the researcher himself for a full semester of the academic year 2018-2019. The researcher used the SPSS statistical method to use the T-test, chi-square, and Pearson correlation in the study procedures and to reach the results. The results showed that the experimental group was superior to the control group. The researcher had produced a set of conclusions, recommendations, and proposals that had complement the current study.

Keywords: Impact, development the Skills of Students

Introduction

The sons of the Arabic language in this time do not have what helps them to read sound or accurate writing or visual expression has become a mistake written by verbal errors, grammatical, grammatical, linguistic and spelling problem students suffer in the possession of the skill of writing sound without subject to the laws of correct writing in the language of our students complain crisis At the same time, the language of the language has become sober, that it has become problematic, which is reflected every day in the level of rhetoric 1. There are those who say that the Arabic Language is difficult and that dealing with it is difficult and that its rules are not affordable and that its communication is not understood and the answer to this is simple 2. The defect is not in the Arabic language itself, nor in its rules, its meaning and its rhetoric, and not in anything related to language 3. Grammar rules have become subjects and sciences that alienate students from them. Grammar rules are difficult because of the complexities that have been developed by the authors in advance, and rely on the development and the budget and the infractions and division and the rules taught in schools do not achieve the goals of career in the lives of learners and the phenomenon of conservation The rule cannot be applied by the learner in his daily life, and this is far from the purpose for which the grammatical rules have been laid 4. The impact of education on the life of societies, nations and peoples is the foundation of their social, cultural, economic and political development and their basic means of survival and continuity and facing the challenges and developments that face them and represent a major part of the global strategies, no less important than health and defense if not the basis of progress. It monitors the funds and sets plans for the near, medium and long term and prepares the human cadres crisis and works well to organize and develop them 5. In order for educational institutions to achieve their objectives, they must rely on curricula when they are successful. The curriculum in the educational field is a system that is interrelated with all its components so that the vocabulary in the curriculum cannot be separated by teaching, activity, means or tests 6. And that the success of education is linked to the success of the method because the good way to deal with much of the development of the curriculum, and the weaknesses of the learner and the difficulty of the

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curriculum and can contribute significantly to stimulate the learner’s motivation towards the material and the substance of the subject to learners. It is to identify the “impact of the strategy of predicting the correct answer in the achievement of Arabic grammar language among the students at the first intermediate”

To investigate the aim, the researcher put the following null hypotheses: There was no statistically significant difference at the level of (05.0) between the average achievement of students in the experimental group who study Arabic grammar language with a correct answer predicting strategy and the average score of students in the control group who study Arabic grammar in the traditional way. This is the result of the teacher in the behavior of the students of the first grade intermediate in the course of applying his experience of the research sample or object already achieved, which leads to achieving the goal.

Strategy: Hiella defined it as (A set of rules involving means that lead to a certain goal, it is a plan directed towards a particular goal).

Procedural definition: A set of measures, methods, and practices that the researcher adopts in teaching the students of the experimental group the subjects of rules that have been set in advance to enable them to acquire the planned educational experiences and achieve the goals set by them.

Predicate the correct answer: Predicating the correct answer is one of mind-based mental strategies and anticipating the correct answer based on what the learner has of prior knowledge. It is a mental strategy that aims to stimulate the mind of the learner to reach the answer to the question at hand.

Achievement:

A. In linguistics: Achievement of everything is what remains and is proven and gone, and everything else is obtained, and the thing gets earned, and the achievement of the distinction takes place and the name proceeds and the thing gets achieved and proven. (Ibn Masur, article).

B. The term: Defined as worship that: “The level reached by the student in the collection of the subject matter”

Procedural Definition: It is the result of the students of the experimental and control groups (the research sample) of the degrees in the achievement test conducted by the researcher for the purposes of the research, which is the subject of the topics they study during the duration of the experiment.

Fifth: Arabic Grammar:

A. In linguistics: Rule: The origin of the rule, the basic rules, the rules of the house and the foundation, and the download ((And Abraham raises the rules of the house and Ismail 000) ((Baqarah/148).

B. (Khatib) as: “A general term that accommodates the rules of Arabic and its rules, all the rules of the vote, the writing, the drainage, the grammar, the eloquence, and the significance.” (Al-Khatib: 2009, 293).

Procedural definition: It is a set of grammatical and grammatical rules that are included in the subjects studied by the experimental group and the control group (the research sample) during the duration of the experiment.

First intermediate: It is the first the intermediate stage, as the duration of study in the intermediate stage three years, knowing that this stage comes after the primary stage and precedes the preparatory stage.

The researcher did not find any previous study on the independent variable (predicate of the correct answer). The dependent variable (students’ achievement in Arabic grammar language)

Othman study 1995: The effect of cooperative learning on the achievement of ninth grade students in Arabic grammar; This study was conducted at Yarmouk University, Faculty of Education, Jordan; The aim of the study is to identify the effect of cooperative learning methods in the achievement of the ninth grade students in Arabic grammar.

To achieve the study aim, the researcher put the following null hypotheses: There was no statistically significant difference at the level of significance (0.05) between the average achievement of students who study Arabic grammar in a cooperative manner and the average achievement of students who study Arabic grammar in the usual way.

In this study, the researcher did not mention the experimental design and merely indicated that he had followed the experimental and post-test methods.
The sample consisted of (12) departments, the number of students (331) students from (6) schools in the Directorate of Education in the Bani Kenana in Jordan for the academic year 1994-1995. (6) Experimental people taught according to the method of cooperative learning and (6) the people of the officer taught in the usual way, divided the experimental people into small groups of each group of (4-6) students and learning strategy together. The researcher was rewarded between the groups (experimental and control) in terms of tribal achievement and social and economic variables.

**Methodology**

The experimental approach is followed to achieve the aim of the study because it is an appropriate method for the procedures of searching and reaching the results. The experimental term is intended to change something and observe the effect of the change in something else. Intent on the situation within specific conditions, and follows the change that may result from these conditions.

**Research Community:** Middle schools in Hilla city center in Babylon province Middle schools located in Babil province

**Research Sample:** A sample is students at first intermediate school in the center of Babylon province.

**Fourth:** The equivalence of the two research groups: in terms of
1. The student’s age is calculated in months.
2. Educational achievement of parents.
3. Educational achievement of mothers.
5. Grades of Arabic grammar in the half-year test for the current year 2018-2019.
6. The marks of testing the previous information in Arabic grammar language.

**Fifth:** Control of external variables:
1. Experimental and incident conditions.
2. Experimental extinction.
3. Processes related to maturity.
4. Differences in the selection of the two groups (statistical regression).
5. Measuring instrument.
   A. Confidentiality of the research
   B. Media tool
   C. The duration of experiment.
   D. Teacher.
   E. Distribution of lessons.

**Sixth: study requirements:**
1. Determining the educational material.
2. Formulation of behavioral objective.
3. Preparation of the lesson plan.

**Seventh: instrument of study:** Achievement test is structured method which determine the level of learner’s achievement of information and skills in a previously learned subject, from the learner’s answers to a sample of questions or paragraphs representing the academic content. The test may pass the stage of construction steps, notably:
1. Preparing the specifications table.
2. Determine the type of test item.
3. Formulation of test item.
4. Validity of test is the test that measures what has been prepared to measure it.”
5. The pilot study of the test of achievement.
6. Statistical analysis of test item. It includes:
   A. The difficulty of test item.
   B. Calculation of the distinction of test item.
   C. The effectiveness of the wrong alternatives.
   D. Stability of the test: It is intended to “give the test the same results if it is applied to the individuals themselves in the same circumstances”

**Eighth: Application of the experiment:** The experiment was implemented in the academic year 2018-2019 and for a period of a full semester and applied the same researcher experience.

**Ninth: Statistical Means:** The researcher adopted the following statistical means in the research procedures and access to the results
1. TEST for two independent samples
2. Chi-square for independence.
3. Pearson correlation coefficient

Results and Discussion

This chapter includes the review and interpretation of the results, and the conclusions, recommendations, and proposals. The results of the null hypothesis: The hypothesis stated that (There is no statistical difference at the level of (05. 0) between the average achievement of students in the experimental group who study the Arabic grammar by the strategy of expecting the correct answer and the average grades of students in the control group who study Article Arabic grammar in the traditional way). To verify the validity of this hypothesis, the researcher calculated the arithmetic mean, variance and T value for both experimental and control groups, as shown in table1.

Table 1: Calculation the arithmetic mean, variance and T value for both experimental and control groups

| Group     | Sample size | SMA | Standard deviation | T value  | Statistical significance
<table>
<thead>
<tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Calculated</td>
<td>Tabular</td>
</tr>
<tr>
<td>Experimental</td>
<td>40</td>
<td>26.3</td>
<td>11.77</td>
<td>3.71</td>
<td>2</td>
</tr>
<tr>
<td>Control</td>
<td>38</td>
<td>23.03</td>
<td>8</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table (1) above shows that the experimental mean of the experimental group’s students is 26.28, while the mean of the students in the control group is 23.03 and the calculated T is 3.71, which is greater than the T (2) at the degree of freedom (76) and the level of significance (0.05), which means that there are differences of statistical significance for the benefit of the experimental group in the achievement test, thus rejecting the first zero hypothesis.

Interpretation of the results:

1. The results showed rejection of the null hypothesis and acceptance of the alternative hypothesis. This means that there is a statistically significant difference between the two research groups in the achievement of the students in favor of the experimental group. The researcher finds that this difference is due to the efficiency and effect of the strategy of predicting the correct answer, by teaching this strategy, students are accustomed to following steps that require them to think by looking for the right answers that are appropriate for the subject.

2. The researcher believes that the students exceeded the achievement in the experimental group that the strategy of predicting the correct answer gives a large capacity in thinking and skills to answer the questions studied by students, which contributed to the increase in achievement. In light of the research results, the researcher concluded the following: Teaching Arabic grammar with the strategy of predicting the right answer develops the reasoning skills of middle school students. The level of achievement improved among students who study the strategy to expect the correct answer in the middle stage.

Conclusion

The researcher used the SPSS statistical method to use the T-test, chi-square, and Pearson correlation in the study procedures and to reach the results. The results showed that the experimental group was superior to the control group. The researcher had produced a set of conclusions, recommendations, and proposals that had complement the current study

Source of Funding: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Babylon University College of Basic Education, Iraq and all experiments were carried out in accordance with approved guidelines.

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The Impact of Reading Strategy Knowledge and Science Knowledge on Developing Reading Skills of School Students

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ABSTRACT

The samples of the study were randomly selected from the second intermediate school students. The study adopted a pretest treatment-post-test design. The first hypothesis was accepted and was concluded that picture strip story activity was better than the recommended teaching in both the overall achievement and reading comprehension items. Both English teachers and students need to improve and to master the four important language skills, i.e. listening, speaking, reading, and writing. Reading is one of the four language skills required when the students learn the target. The presented study aims at investigating the effects of picture strip story on reading comprehension of Iraqi EFL students. The study uses quantitative research method. By reading texts which is categorized as a receptive skill, the students are able to get a lot of information.

Keywords: Picture Strips, developing, Reading Skills.

Introduction

Reading comprehension (RC), basically, contains a variety of cognitive strategies that can facilitate learners’ comprehension (e.g., posing questions about the text, monitoring one’s comprehension, summarizing and activating one’s background knowledge).¹ RC skills, together with other linguistic skills, are supposed to be improved by the syllabus adopted in Iraqi schools by the Ministry of Education. For that purpose, plenty of reading passages are given; yet many students experience comprehension problems. They show little sign of developing these skills when finishing their intermediate school study. According to Wigfield and Lutz, reading comprehension is the process that includes elicitation and building meaning from texts. Most of reading investigators now assume that comprehension implies active construction of meaning rather than passive receiving of information from a text.¹ A Strip Story technique is a story which has been separated into smaller segments from beginning to end.² These story segments do not have to contain much or many text at all in fact, a strip story could consist entirely of pictures similar to what one would find in a comic book. A picture strip story is divided into separate picture. One picture is handed to each member of group. Without seeing each other picture, the learner in group must decide on original sequence and reconstruct the story.³ This activity gives a fun and provides a useful way of introducing new texts and/or new vocabulary and grammatical items. There are several parts to a Strip Story activity including pre-, during, and post-reading activities. This is not purely a reading activity however, and there are several supplemental activities that can be done to enhance a Strip Story which will lead students having a greater command of the vocabulary, as well as improving their reading, writing, and oral skill. Previous studies exploring the impact of clickers on the process of learning are talked about with a particular ultimate objective and that is to decide how students and instructors have reacted to the use of new procedures and strategies in their standard teaching designs. A couple of studies proposed that picture strip story enhance understudies’ outcomes, for instance, tests marks, succeeding rates, learners’ observation and perception, and furthermore, that students appear to like picture strip story. The First research was conducted by Wulandari (2004), this thesis is The Use of Picture To Improve The Students’ Speaking Ability. The similarity
of the research with this research is; (1) the researchers use pictures. The differences of the research are; (1) this thesis uses picture without a story to emphasize student ability, (2) the place of the study is different. The English language is viewed as the most broadly utilized language on the planet. It is used in both the social life and business savvy. Its use is building up every day by occupying more prominent roles of our lives. The mastery of English requires good teachers and dynamic and business savvy. Its use is building up every day by occupying more prominent roles of our lives. The mastery of English requires good teachers and dynamic and business savvy. Its use is building up every day by occupying more prominent roles of our lives. The mastery of English requires good teachers and dynamic and business savvy. Its use is building up every day by occupying more prominent roles of our lives. The mastery of English requires good teachers and dynamic and business savvy.

Sample of the Study: The sample of the presented study is represented by the second-grade intermediate school students in the province of Babylon for the educational year (2018-2019). Al Huda intermediate school which lies at the heart of the province was chosen to sample both the control and the experimental groups. We randomly selected class (A, 37 students) to represent the experimental group that received picture strip story based instruction and class (B, 39 students) to represent the control group which was taught by conventional method of teaching.

Samples Equivalence: The researcher conducted a statistical equivalence between the experimental and control sets in some variables that could affect the results of the experiment. The researcher has chosen the two groups randomly, the students of the research sample from similar social and economic status and study in the same school. These variables are : age measured by months, first course scores, and parents academic achievement.

The statistical results demonstrated that the two sets were equivalent in all the aforementioned variables.

Extraneous Variables: Despite the fact that the researcher verified the equivalence of the two sets of research in some variables that are believed to affect the course of the experiment, she also tried to avoid the effect of some extraneous variables in the course of the experiment. Some of these variables and how to control them are as follows: 1- Accidents associated with the experiment. There were no accidents during the execution of the experiment. No students left the school or got transported to another one. The sample was chosen intentionally and the two sets were equaled accordingly.2- The maturity factor: Since the duration of the experiment was unified between the two research groups As well as the age of the students in the two groups so all the growth that occurred will be unified between all the students because they are on the same level. So, this factor did not have an impact on the research.3- the impact of experimental procedures: the researcher worked on reducing the impact of experimental procedures that can affect the dependent variable during the course of the experiment.

Preparing the Material: The teaching materials that were used for conducting the experiment were represented by the -"English for Iraq"- syllabus and the
content that was taught during the second semester of the academic year (2018-2019) (Unit 5- Unit 8). The researcher set a number of behavioral objectives to be expected from the test sample. As for the lesson plans, the researcher prepared a total of (30) lesson plan for each tested group based on the second intermediate grade book – “English for Iraq”.

**Research Instruments**

**The Performance Test:** It is defined as the assessment of the knowledge of an individual in a particular area content area, skill or accomplishment in a particular curriculum, time frame, and material. They can also help in diagnosing the level of students and what they need to develop and work on (Brown.2003).

The performance test was constructed by following these steps:

1. The purpose of the test: the desire of constructing the test was to measure students’ reading skill aptitude in the English language by depending on the behavioral objectives specified by the teachers’ guide.

2. Determining test items: the test items were determined by the researcher to be 25 test items and prepared a scoring scheme for the test.

3. The test was designed by depending on the revised Bloom’s Taxonomy of educational objectives.

**Pilot Test:** The researcher chose the students of two schools that are located near the main school on which the experiment was conducted. The two schools were Babylon intermediate school and Al-Rahman. Fifty student from each school for the pilot test. The test items were statistically analyzed and found that the item difficulty ranged from (0.76- 0.31) by which the test items were considered valid as regards the level of difficulty. The item discrimination ranged from (0.82-0.33) which is also accepted.

**Conducting the main test**

**The Pre-test Final Administration:** Both the experimental and control groups were pre-tested on the 20th of February 2019. This pre-test aimed at comparing the scores of the students’ achievement in the pre-test with those in the post-test.

**The Post-test:** Students of both groups (the experimental and control ones) were post-tested on the 20th of April 2019. The same pre-test procedures were followed in conducting the post-test, namely scoring scheme, validity, pilot study, item difficulty, item discrimination, and reliability. It is worth mentioning that the post-test was also approved by a jury of fifteen specialists in linguistics and TEFL methodology.

**Results and Discussion**

The students of the experimental group who studied according to the picture strip story had a better comprehension language (English) in the performance test to the control group, who studied according to the guided method. Thus, the first null hypothesis is rejected and the alternative null hypothesis is accepted: (There is a statistically significant difference at the level of (0.7) and the average score of students in the control group). Roschelle confirmed that the superiority of the experimental group which studied according to picture strip story to the control group, which was taught according to the recommended way. 9

**Conclusion**

The samples of the study were randomly selected from the second intermediate school students. The study adopted a pretest treatment- post-test design. The first hypothesis was accepted and was concluded that picture strip story activity was better than the recommended teaching in both the overall achievement and reading comprehension items.

**Source of Funding:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the University of Babylon –College of Basic Education and all experiments were carried out in accordance with approved guidelines.

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Aluminum Chloride Administration Induced Behavioral and Physiological Changes in Adult Male Rats

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ABSTRACT

Introduction: Aluminium chloride is a neurotoxic metal that induce several neurodegenerative diseases such as anxiety, depression and Alzheimer diseases. The aim of this study designed to investigate the effects of aluminium chloride on some behavioral and physiological parameters of male rats.

Material and Method: Twenty one male rats were used in this study and divided to three groups with seven rats for each group, included untreated control group received distilled water and two treated groups that received aluminium chloride at the doses 300 mg/kg and 400 mg/kg of body weight orally and daily for 60 days, the following behavioral parameters measured by using Elevated Plus – Maze test.

The Results: Administration two different dose of Al for eight weeks of rats in group II and group III causing significantly reduced in brain monoamine oxidase A and neurotransmitters levels (serotonin and dopamine), In addition, Al causing also significantly decreased in serum hormones (testosterone, corticosterone and LH) compared to control group I. The results showed significantly suppressed of the sexual behavior and memory disorders of rats that exposure to aluminium compared to control group. In conclusion, Aluminum enhances depression and anxiety parameters and cognitive disorders characterized by the affection of memory.

Keywords: Aluminum, Depression, Anxiety, Memory, Rat, serotonin, dopamine.

Introduction

Humans are exposed to heavy metals because their ubiquity in environment and wide use in industry and long-term persistence in the nature causing contaminated soil, air, food and water. therefore, the excessive amount of these pollutants such as (barium, cadmium, mercury, thallium, lead, Aluminum and boron) causing dangerous to most human body organ. Accumulation of metals produces damaging effects in the nervous and reproductive system. Aluminium (Al) is the most widely distributed metal in the nature. Al can reach circulation system and rapidly transferred to the brain across the blood brain barrier (BBB). The toxicity of Aluminium induce a wide range of behavioral, physiological and biochemical dysfunctions in lab animals and humans. Evidence suggests that the neurotoxic effects of aluminum may be mediated through impairment the brain neurotransmission system and alteration neurotransmitters may precede neurological, cognitive deficiency and neurobehavioral conditions such as Alzheimer’s disease when it enters the brain. Therefore, impairment of this system may be associated with the behavioral disturbances and enhances depression and anxiety by deficit in learning and memory observed in humans and animals however.

Material and Method

Experimental design: Twenty one male rats were used for this experiment, the ages of rats were between eight and ten weeks. The animals put in the cages and fed ad libitum and they were exposed to a 12 h light: 12 h dark cycle. Animals were divided into three groups each group contain seven rats.

- **Group 1: Normal Control group**, **Group 2: (Aluminum treated group)** rats were oral administered 300 mg/kg/day aluminum chloride for 60 days.
- **Group 3: (Aluminum treated group)** rats were oral administered 400 mg/kg/day aluminum chloride for 60 days. Blood samples and brain tissue were collected and stored in micro tubes.
at –20°C until analysis for serum hormones (testosterone, corticosterone and LH) and analysis neurotransmitters (serotonin, dopamine), monoamine oxidase A in brain by using particular ELISA kits.

Behavioral Studies: The behavioral tests were conducted after the end period of treatment for evaluate effect of aluminum on rats memory by Elevated Plus Maze test.

Elevated Plus Maze test: This test was made of wood consisted of two opposite enclosed (10 cm wide and 50 cm long) and two opposite arms open (10 cm wide and 50 cm long) by 40 cm high walls. Rats put in the end of the enclosed arms and the time (latency) was recorded to withdraw from the arm. After that this step was repeated two successive times at about 30 min of intervals between all attempts and the get out times from the closed arms were recorded for 5 min and called Inhibitory Avoidances (Inhibitory Avoidance 1, Inhibitory Avoidance 2). The Escape test was performed after the IAL 2 and it was represented by the time used for animal to withdraw from the open arms. For assess long-term memory tests (IAL3 and ESL2) measured again after 72 h. later.

Sexual Behavior Testing: Sexual behavior testing was performed in a test room. Female was introduced into the male in home cage and behavior tests were recorded for 10 min.

Statistical Analysis: All statistical analysis for serum hormones and brain neurotransmitters results represent a mean ± S.E. and behavior results represent a mean ± S.D. by using the one-way analysis of Variance (ANOVA) test with post hoc LSD test under a probability significant level (p< 0.05).

Results

Physiological study:

Effect of aluminium chloride administration on brain of Neurotransmitters and Monoamine Oxidase A levels in rats: The result were showed that levels of brain serotonin non –significantly different (p>0.05) in rats group II (277.24 ± 18.62), compared to control group I (296.39 ± 7.27), while it showed a significantly decreased (p<0.05) in rats group III (186.62 ± 9.48) compared to group II and control group I. Brain dopamine were showed a significantly decreased (p < 0.05) (469.15 ± 28.50) in rats group II compared to group I (763.21 ± 13.25) and group III. At the 400 mg/kg/day dose of aluminum group III recorded further a significantly decreased (p < 0.05) levels of dopamine (388.46 ± 32.61) when compared to both the control group I and the group II. On the contrary, brain monoamine oxidase level recorded non –significant different (0.584 ± 0.11) of rat group III compared to rats in group II (0.844 ± 0.15), there are significant decrease in brain monoamine oxidase levels in rats of group II and group III compared to control group I (1.644 ± 0.26).

Effect of aluminium chloride administration on hormones levels in rats: The testosterone, corticosterone and LH hormones levels were dramatically decreased with the increase of the aluminum chloride dose compared to control group I. Testosterone recorded a significant decrease (P<0.05) at the 300 and 400 mg/kg/day dose of aluminum chloride of rats group II and group III (8.54 ± 0.99, 2.73 ± 0.79 respectively) compared to control group I (21.95 ± 2.85). Whereas, corticosterone and LH hormones levels in serum showed non- significant decrease between group II and group III 11.53 ± 0.85, 9.78 ± 0.94 respectively for corticosterone and 1.58 ± 0.43, 0.82 ± 0.19 respectively for LH and these hormones were showed significant decrease (p< 0.05) of rats group II and group III when compared with control group I 17.72 ± 1.70, 3.39 ± 0.74 respectively.

Behavioral study

Effect Aluminum on Memory measured by the Elevated Plus Maze(Test EPM): The inhibitory avoidance latency (sec.) (IAL) and escape latency (sec.) (ESL) of the elevated plus maze test for 5 min. The IAL1 was significantly higher (P< 0.05) in intoxicated animals groups (228.79 ± 10.76) and (252.84 ± 13.70) respectively, compared to control group (87.23 ± 7.47), this rats stayed time (sec.) (IAL1) in enclosed arms were much longer compared to control. In the next attempt IAL2 after 30 min. the results showed a significant decrease in latencies (sec.) in the enclosed arms (162.64 ± 9.59) and (149.90 ± 15.85) respectively, by intoxicated rats when controls stayed there (288.05 ± 8.13). For the first escape 1 experience, rats joined to the closed arms of the apparatus within (sec.) (27.12 ± 6.75) for control group showed a significant decrease in latencies (sec.) compared to intoxicated animals groups (43.59 ± 9.19)
and (55.28 ± 8.45) respectively. The long-term memory tests 3 (IAL3) and (ESL2) were performed at three days (72 h) after avoidance 2 and escape 1 tests. The result showed highly a significant decrease in latencies IAL3 in the enclosed arms (67.23 ± 14.77) and (75.98 ± 11.12) respectively, by rats that exposure to Al compared to control group (184.19 ± 9.21) that showed a significant increase latencies. Whereas in escape 2 showed a significant increase latencies (73.23 ± 14.46) and (84.14 ± 12.44) by rats that exposure to Al compared to control groups (9.40 ± 2.22). when those of Al intoxicated group indicated an impairment in long-term memory process through a highly significant decrease in IAL3 compared to controls.

**Effect of oral aluminium chloride administration on sexual behavior test for 10 min. of rats:** The results showed a significant decrease in Sexual behavior of all parameters (latency of mounting, Intromissions (sec.) and number of mounting, intromissions, anogenital sniffing of the female, nosing and Grooming of the female and self-grooming) in rats group that treated with aluminium compared to control group. Where observed also a significant decrease in latency of mounting, Intromissions (sec.) and number of anogenital sniffing of the female, nosing and Grooming of the female in rats group II compared to group III. Whereas non- a significant in number of mounting, intromissions and self-grooming between group II and group III table (1).

**Table 1: Sexual behavior test for 10 min of rats that exposure to oral aluminium administration. Values are (Mean ± S.D) (n = 7)**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Group I</th>
<th>Group II</th>
<th>Group III</th>
<th>LSD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mounting latency (sec.)</td>
<td>9.32 ± 144.22</td>
<td>326.72 ± 52.54</td>
<td>476.36 ± 30.34</td>
<td>32.85</td>
</tr>
<tr>
<td>Number of mounts</td>
<td>15.14 ± 4.91</td>
<td>4.00 ± 0.82</td>
<td>2.00 ± 0.81</td>
<td>2.70</td>
</tr>
<tr>
<td>Intromissions latency (sec.)</td>
<td>383.40 ± 36.83</td>
<td>468.85 ± 60.52</td>
<td>536.30 ± 54.69</td>
<td>47.89</td>
</tr>
<tr>
<td>Number of intromission</td>
<td>14.57 ± 3.99</td>
<td>3.29 ± 1.50</td>
<td>1.71 ± 0.76</td>
<td>2.32</td>
</tr>
<tr>
<td>Number of Anogenital sniffing of the female</td>
<td>46.86 ± 5.98</td>
<td>1.86 ± 7.86</td>
<td>0.98 ± 3.43</td>
<td>3.39</td>
</tr>
<tr>
<td>Number of Nosing and Grooming of the female</td>
<td>22.86 ± 4.38</td>
<td>10.00 ± 2.16</td>
<td>4.43 ± 1.90</td>
<td>2.80</td>
</tr>
<tr>
<td>Number of Self- grooming</td>
<td>19.71 ± 4.07</td>
<td>7.71 ± 1.60</td>
<td>5.29 ± 1.11</td>
<td>2.42</td>
</tr>
</tbody>
</table>

**Discussion**

Aluminum chloride is neurotoxic and its behavioral toxicity in experimental animals can be easily accumulates in the brain of human and animal, Aluminium is causing several neurodegenerative disorders such as Alzheimer’s disease (4,12). This result agreement with (3,13,14,15). The exposure to AlCl3 produced also a significantly decreased in serotonin, dopamine and monoamine oxidase (A) enzyme, these agreement with (16,17,18,19). Aluminium may be causing an inhibitory effect on 5-HT due to the withdrawal of cholinergic input outcome in decreased levels of 5-HT in different regions or it can interfere with cellular energy status and bring about changes in cholinergic neurotransmitter and destruction of BBB function to cause dementia or other degenerative diseases. Another important resulting of the presence of Aluminium at the synapse could be the reduction of effective neurotransmitters concentrations with biological activity due to Aluminium binding to neurotransmitter molecules receptors 15. Aluminium may be impairs different enzymes that associated with neurotransmitters biosynthesis, A1 is also act as non-competitive inhibitor for MAO-A enzyme 12. The decrease in dopamine levels may be due to increase in cerebral noradrenalin that showed in rats exposed to Al causing the activation of its synthetic pathway, particularly the step which involves the conversion of dopamine to noradrenalin via hydroxylation and explain the decreased level of dopamine 18. High Al concentrations cause oxidative stress is one of the major contributing factors to male brain disorders 20. Studies were found that accumulated heavy metals in the body alterations as plasma corticosterone, LH and testosterone hormones levels and these agreement with our results. In contrast, this result disagreement with 21 they showed increase in LH levels in rat that exposure to AL. Aluminum alteration in spermatogenesis as well as in steroidogenesis of rats with increasing of damage of testicular tissue and a disturbance in pituitary gonadotrophic activity that lead
to a significant adverse effect on the steroidogenesis and inhibit release of testosterone. Exposure to AlCl3 lead to negative effects on rats behavior, increased anxiety rate. Elevated Plus Maze test is behavioral task which reflects memory and learning abilities by measuring inhibitory avoidance (IAL) and escape. Rodents are keeping a vivid memory through measuring the time spent in the open arms during the test showed that Aluminium intoxicated animals presented differences in IAL compared to control animals. This indicates that oral AI administrations of rodents lead to learning process failures and memory deficits.

Source of Funding: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Science, University of Babylon, Hilla, Iraq and all experiments were carried out in accordance with approved guidelines.

REFERENCES


Physiological and Behavioral Changes of Male Rats Following Social Isolation Stress During Early-Adolescence and Fluoxetine Exposure

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ABSTRACT

Stress experiences during youth lead to abnormal behavior profile in adulthood, including an increase in aggression, depression and anxiety disorders in humans. The animals during early-adolescent period (PD 35) were divided into the following groups: Group 1 - Control. Group II – social isolation stress for 42 days – Negative control. Group III – The animals were treated with 10 mg/kg of the fluoxetine for 21 days in combination with isolation stress for 21 days, all groups followed by behavioral studies, and assessed the biochemical effects of exposure to stress and stress with drug. The results showed there was significantly improvement in the open field test including significantly increased locomotor and exploratory activity with decreased anxiety and aggressive behavior after treatment with fluoxetine compared to stress group. The results were also noted significant increase in the levels of brain serotonin in stress with fluoxetine group compared to stress group, The results showed significantly decreased in levels of dopamine and monoamine oxidase A in brain tissue of rats treated with fluoxetine compared to stress group. While corticosterone, testosterone and LH levels in stress rats showed significantly increased compared to stress with fluoxetine group.

Keywords: Fluoxetine; isolation stress; Serotonin; Dopamine; Testosterone; Aggressive behavior

Introduction

In the modern environment, many peoples are exposed to different chronic stressful conditions. Exposure to stress triggers a cascade of hormonal and behavioral changes. However, the stress response is exaggerated a series of pathophysiological changes occur in the brain and immune system that may ultimately result in disease. Stress also alters brain neurotransmitters and enzymes responsible for metabolism of monoamine neurotransmitters such as Monoamine oxidase A. Social stress is a common psychological stressor, especially during early and mid-adolescent (PD 21 – 34) rats, lead to increased rats behavior for anxiety and depression in adulthood and occur changes in neuron morphology, HPA axis, endocrine and neurotransmitters functions.

Antidepressants (Fluoxetine) are consider as efficient treatments for several psychiatric disorders including depression and anxiety disorder which specially inhibit neuronal reuptake of serotonin and correct chemical imbalances of neurotransmitters inside the brain.

Materials and Method

Experimental animals: In this study using 21 male rats, aged five weeks, rats were kept on 14 hour light/10 hour dark cycle and rats allowed to arriving food and water, ad libitum.

Experimental Design: Rats were divided into three groups (n=7). (Group 1) as control group. (Group 2) rats exposure to isolation individual housing for 42 days during early-adolescent (PD 35). (Group 3) where the animals were exposed to isolated stress for 21 days and treated with oral administered of Fluoxetine remaining 21 days for isolation. The whole study was done for a period of six weeks followed by behavioral studies, the animals were sacrificed after 24 hours from the last oral administered of Fluoxetine. Blood samples were collected and stored in micro tubes at−20°C until analysis for serum hormones levels (testosterone, corticosterone and LH) and analysis serotonin, dopamine and monoamine oxidase A in brain tissue by using particular (ELISA) kits.
Preparation of fluoxetine hydrochloride solution: Each fluoxetine capsule containing 20 mg/kg was dissolved in distilled water to obtain on 10.0 mg/ml concentration and it was given daily to animals stress orally for three weeks.

Behavioral Study: For evaluate efficiency of Fluoxetine on social isolation stress of the rats by using the open field test

The open field test: This test provides measures of locomotion, exploration and anxiety, sizes of the open field box (70 x 70 cm with 30 cm walls), blue lines were drawn on the thick paper floor, these lines divided the floor into sixteen squares. In this test, rat was individually placed in one of the four corners of the box, then it allowed to explore for 5 minutes.

Aggressive behavior measured by (Resident-intruder test): In this model, One of the rats (intruders) are allowed to establish a territory (the resident) in its home cage, another animal is placed into the residents’ home cage and two animals are allowed to interact with each other for 10 minutes.

Statistical Analysis: All statistical analysis for results represent a mean ± S.E.M. and behavior results represent a mean ± S.D. by using the one-way analysis of Variance (ANOVA) test with post hoc LSD test by using IBM SPSS Statistic software version (23) under a significant level (p<0.05).

Results

Physiological study:

Effect of isolation stress and isolation stress with Fluoxetine treatment on Neurotransmitters and Monoamine Oxidase A levels in brain of rats: The results were showed a significant decreased (p<0.05) in brain serotonin level (152.48 ± 11.88) and a significant increase in dopamine level (873.71 ± 64.51) in rats group II compare to control group I (281.00 ± 20.73, 703.44 ± 42.52 respectively) and group III(317.86 ± 23.16, 589.16 ± 36.08 respectively). While rats in the group III were showed a significant increased (p<0.05) in brain serotonin level and decreased of brain dopamine levels compare to rats in the group II and non a significant increase of brain serotonin and non a significant decreased of brain dopamine (p>0.05) compared to control group I. Conversely, Brain MAO-A enzyme level (1.787 ± 0.39) observed a significant increase (p<0.05) in the group II when compared to control group I (1.129 ± 0.23) and group III (0.370 ± 0.09). Animals in the group III showed a significant decrease in brain MAO-A enzyme levels compared to control group I and group II

Effect of isolation stress and isolation stress with Fluoxetine treatment on Corticosterone, Testosterone and LH hormones levels in serum of adult rats: A significant increase (p<0.05) of corticosterone and testosterone levels in serum (45.94 ± 4.71, 32.98 ± 2.43 respectively) in rats of stress group II compared to group III (23.27 ± 1.86, 4.99 ± 0.83 respectively) and control group I (24.60 ± 1.77, 19.32 ± 1.68 respectively). Rats in the group III were showed a significant decrease in testosterone level compared to control group I and group II. The results showed also a significant decrease in corticosterone level in group III compared to group II and did not show significant(p>0.05) in corticosterone level in group III compared to group I. on the other hand rats of the group II did not show significant(p>0.05) in serum LH level (1.29 ± 0.14) compared to control group I (1.39 ± 0.33). While in stress with Fluoxetine group III showed a significant decrease in serum LH level (0.70 ± 0.17) compare to stress group II and control group I

Behavioral study:

Behavioral Changes of male rat that exposure to isolation stress following Fluoxetine treatment: For assessment the efficiency and effectiveness of the Fluoxetine treatment on the behavioral activity of male rat that exposure to isolation stress by using the open field test.

The open field test (OF): This test showed assesses the rats locomotor activity of isolation stress group and isolation stress with fluoxetine group in the open field compared to control group, by analyzing latency time (sec), number of rearing, grooming and ambulation(Peipheral and central squares) and time spend in Peripheral, central. The results in showed a significant increase of latency time (sec) and remarkable decreased of rearing and grooming frequency (p < 0.05) in stress rats (group II) compared to control group and group III. Total ambulation number in stress rats (group II) also showed significant decreased compared with control group I and III. While, there was a significant increase of total ambulation in group III compared to control group I and group II. The time spent rats of group
III in the central square (sec) were showed significant increase in duration (sec) compared to stress group II. Whereas, there was not significant between group I and group III. Furthermore, the time spent rats of group II in the Peripheral square (sec) showed significant increase in duration (sec) compared to group and group III and there was not significant between group I and group III, table (1).

Table 1: Behavioral changes of rats that exposure to social stress and stress with fluoxetine groups by using open field test for 5 min. Values are (Mean ± S.D.)

<table>
<thead>
<tr>
<th>Parameters test</th>
<th>Groups</th>
<th>Group I</th>
<th>Group II</th>
<th>Group III</th>
<th>LSD</th>
</tr>
</thead>
<tbody>
<tr>
<td>latency time (sec)</td>
<td></td>
<td>11.97 ± 3.58</td>
<td>60.49 ± 10.13</td>
<td>8.49 ± 3.19</td>
<td>5.99</td>
</tr>
<tr>
<td>Rearing (number)</td>
<td></td>
<td>18.14 ± 5.40</td>
<td>7.29 ± 2.98</td>
<td>21.00 ± 5.32</td>
<td>4.36</td>
</tr>
<tr>
<td>Grooming (number)</td>
<td></td>
<td>9.43 ± 2.37</td>
<td>4.86 ± 1.21</td>
<td>13.43 ± 3.60</td>
<td>2.40</td>
</tr>
<tr>
<td>Ambulation (crossed squares)</td>
<td>number</td>
<td>72.29 ± 7.89</td>
<td>26.14 ± 6.54</td>
<td>95.14 ± 11.89</td>
<td>8.40</td>
</tr>
<tr>
<td>Peripheral (number)</td>
<td></td>
<td>62.29 ± 8.56</td>
<td>23.86 ± 6.28</td>
<td>80.57 ± 10.64</td>
<td>8.04</td>
</tr>
<tr>
<td>Central (number)</td>
<td></td>
<td>10.00 ± 2.16</td>
<td>2.29 ± 1.38</td>
<td>14.57 ± 4.47</td>
<td>2.76</td>
</tr>
<tr>
<td>Time spent in the central square (sec)</td>
<td></td>
<td>107.29 ± 15.85</td>
<td>43.14 ± 10.38</td>
<td>121.71 ± 20.28</td>
<td>14.85</td>
</tr>
<tr>
<td>Time spent in the Peripheral square (sec)</td>
<td></td>
<td>192.71 ± 19.27</td>
<td>256.86 ± 14.53</td>
<td>178.29 ± 17.92</td>
<td>16.09</td>
</tr>
</tbody>
</table>

Effects social isolation stress and isolation stress with Fluoxetine treatment for 6 weeks of male rats on aggressive behavior test: Results observed a significant increase (P<0.05) in aggressive behavior (such as Latency to the first threat, thrust and attack (sec.) and number of threat, thrust, attack and keep down) of rats in stress group II compared to control group I and group III. Whereas, rats in group III showed a significant decreased in aggressive behavior (such as Latency to the first threat, thrust and attack (sec.) and number of attack and keep down compared to rats in stress group II and control group I, table (2).

Table 2: Effects social isolation stress and isolation stress with Fluoxetine treatment for 6 weeks of adults rats on aggressive behavior test for 10 min. Values are (Mean ± S.D.) n = 7

<table>
<thead>
<tr>
<th>Parameters test</th>
<th>Groups</th>
<th>Group I</th>
<th>Group II</th>
<th>Group III</th>
<th>LSD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latency to the first threat and thrust (sec.)</td>
<td></td>
<td>88.70 ± 20.59</td>
<td>21.54 ± 5.82</td>
<td>363.26 ± 41.82</td>
<td>25.14</td>
</tr>
<tr>
<td>Number of threat and thrust</td>
<td></td>
<td>13.14 ± 4.74</td>
<td>33.29 ± 7.95</td>
<td>3.57 ± 1.27</td>
<td>5.00</td>
</tr>
<tr>
<td>Latency to the first attack (sec.)</td>
<td></td>
<td>198.64 ± 21.95</td>
<td>62.55 ± 13.71</td>
<td>493.25 ± 89.60</td>
<td>49.91</td>
</tr>
<tr>
<td>Number of attack</td>
<td></td>
<td>9.86 ± 3.58</td>
<td>25.71 ± 7.67</td>
<td>2.57 ± 0.79</td>
<td>4.55</td>
</tr>
<tr>
<td>Number of keep down</td>
<td></td>
<td>8.14 ± 4.22</td>
<td>17.29 ± 7.27</td>
<td>0.43 ± 0.79</td>
<td>4.52</td>
</tr>
</tbody>
</table>

Stress has a wide arrange of affects behavior. These effects differ by gender and age and also affects endocrine function, brain chemically and physiologically function. Social isolation is enhance to the effects of social defeat stress. post- weaning isolation for 6 weeks from postnatal day (PD 35) has dangerous consequences for brain development, causing alterations in neurotransmission and behavioral abnormalities (aggression, anxiety and depression) in rodents [9, 10]. One of the major mechanisms of adaptation to stress is activation of the hypothalamic-pituitary-adrenal system and increased stress hormones secretion, especially, corticosterone which regulate biochemical and physiological processes in the body, On the other hand, the increase level of corticosterone causing by prolonged stress leads to negative results effect on morphological and functional brain regions [11]. Several studies have showed that chronic stress during adolescence results in a dysfunctional serotonin and dopamine system, social isolation of rats lead to activates the HPA axis which causes imbalances in 5-HT turnover in rats, decreases the number of 5-HT neurons because of stress and glucocorticoids modulate the serotonin system in the brain [12]. This results showed increase in MAO-A enzyme levels in stress group because of Corticosterone is an important regulator of MAO-A expression and activity. During stress, increased brain MAO activity...
due to increased glucocorticoids and decreased brain levels of serotonin (2,13). Whereas administration of fluoxetine after chronic social stress developed showed decrease serum levels of Corticosterone, Testosterone, LH and caused remarkable increases Serotonin levels in brain this result disagreement with (14,15) because of the action of Fluoxetine is preventing neurotransmitter reuptake like serotonin by neuron after it released by inhibit the serotonin transporter protein lead to increase in the extra-synaptic (extracellular) levels of serotonin that stimulates nerve cells in the brain 16. The secondary mechanisms of the antidepressant therapy are blocked monoamine oxidase activity in mitochondrial brain tissue that degrades monoamine neurotransmitters 13. This result showed increased in serum testosterone levels. may be due to catecholamines activation that consider as one of the major mechanisms that stimulate secretion of testosterone during stress or may be due to 5-HT can modulate GnIH neuronal activity following post-weaning social isolation 17. On the other hand, Some experiments showed an increase in testosterone level during stress without altering LH values in both humans and rodents. FLX-treated rats showed lower levels of behavioral despair when exposed to open field test, these results agreement with 7. Rats that exposure to isolation stress showed increased in aggressive behavior compared to the control group I and stress with FLX may be due to altered DA and 5-HT levels in the prefrontal cortex, low 5-HT level and high testosterone/cortisol (T/CRT) ratio acts on facilitates aggression 18.

Conclusion

The results were also noted significant increase in the levels of brain serotonin in stress with fluoxetine group compared to stress group. The results showed significantly decreased in levels of dopamine and monoamine oxidase A in brain tissue of rats treated with fluoxetine compared to stress group. While corticosterone, testosterone and LH levels in stress rats showed significantly increased compared to stress with fluoxetine group.

Source of Funding: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Science, University of Babylon, Hilla, Iraq and all experiments were carried out in accordance with approved guidelines.

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Effect of Competitive Exercises and Hospitalization with Salt Lipson to Develop Performance Tolerance and Some Biochemical Variables for Young Handball Players

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1Asst. Prof., 2Asst. Lecturer, College of Physical Education and Sports Science, Wasit University, Iraq

ABSTRACT

The study aimed to prepare competitive exercises with Hospitalization In the water medium with the salts of the Lipson to develop the performance tolerance and the concentration of lactic acid, magnesium and serotonin in the blood and identify the differences In the measurements of pre and post-tests performance tolerance and the concentration of lactic acid and magnesium and serotonin in the blood of young handball players. The researcher conducted his study on the players of the Wasit province youth handball team, where the number (14) players were selected (6) players The tests used in the research were measured by the ratio of the variables (manganese and serotonin) in the blood and the researcher used a measure of the concentration of lactic acid manually type (Lactate Pro 2) at rest time as well as after effort (Walk test). After (5 days) of the walking test (for Cunningham and Folkens) and concluded that the competitive exercises applied to the sample research contributed to the development of bearing performance, found that hospitalization water medium with Lipson salt has a positive effect on the variants (lactic acid, manganese and serotonin) resulting in improvement the functional status of the players.

Keywords: Salt Lipson, performance tolerance, biochemical variables

Introduction

The level of performance in handball depends mainly on the training and physiological factor, where these factors come first to influence the physical and skill level in the handball game ¹, all closely related to the training process and its vocabulary through which adaptation occurs to the body’s vital organs. Almost all sport activities and events are of great importance for the development of the level of achievement during training and competition through the ability of the individual to perform physical duties and skill as well as the schematic. Due to the lack of consistency in the performance of the handball game, the player’s performance and movements vary according to the game’s position and change. So the player becomes more important to meet these requirements through Great physical effort to increase its physical and technical ability through the use of various competitive exercises which is working to develop the performance, where competitive exercises are the main means to develop the physical requirements of the handball player in addition to the quality of competitive exercises and formations. Those efforts or training stimuli, And athletes are naturally tired after physical exertion the higher the fatigue level, the greater the side effects after training. It appears that in contemporary training trainers must work to find ways and means to ensure that athletes overcome the limiting factors of training as much as possible and also help them to achieve continuous achievement. The most effective way to achieve such goals is to use different recovery methods.

Methodology

The researcher used the experimental method of one experimental group for pre- and post-tests for the nature of the research.

Society and sample research: The researcher’s task is to identify the research community and its vocabulary. The researcher conducted its study on the players of the Wasit governorate, where the number of players was (14) players and (6) players were selected in a deliberate manner representing the sample of the research. Variables with effect on the results of the study as shown in Table (1).
Table 1: Variables with effect

<table>
<thead>
<tr>
<th>No.</th>
<th>Variables</th>
<th>Measurement units</th>
<th>The middle</th>
<th>Deviation</th>
<th>Mediator</th>
<th>Torsion coefficient</th>
<th>Difference</th>
<th>Significant</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Magnesium</td>
<td>Mg/l</td>
<td>1.883</td>
<td>0.232</td>
<td>1.850</td>
<td>0.300</td>
<td>12.301</td>
<td>homogeneous</td>
</tr>
<tr>
<td>2.</td>
<td>Serotonin</td>
<td>Ng/mL</td>
<td>154.167</td>
<td>13.423</td>
<td>157.000</td>
<td>-0.607</td>
<td>8.707</td>
<td>homogeneous</td>
</tr>
<tr>
<td>3.</td>
<td>Acid for lactic acid</td>
<td>Mmol/l</td>
<td>19.633</td>
<td>1.269</td>
<td>19.850</td>
<td>-0.635</td>
<td>6.464</td>
<td>homogeneous</td>
</tr>
<tr>
<td>4.</td>
<td>Carrying performance</td>
<td>time</td>
<td>1.150</td>
<td>0.043</td>
<td>1.145</td>
<td>0.331</td>
<td>3.770</td>
<td>homogeneous</td>
</tr>
</tbody>
</table>

Means, tools and devices used in research:
- Arab and foreign sources.
- The Internet
- The exams
- Handball field
- Hand balls number 15
- Diagnosing number 15
- Medical balls 4
- Stopwatch number 2
- Lactate Pro 2 (Japan)
- Laptop (Lenovo) Chinese origin.
- American Treadmill.
- Medical injection, gel tube, Chinese capsule and box to save blood samples.
- Centrifuge, Universal 16A, Germany for sealing.
- Different grades for measuring (manganese and serotonin).
- Cobas e411 Roche.
- Cobas c111 Roche.

Tests used in research: Walking test (for Cunningham and Folkens) this test requires that the laboratory run at full speed on the treadmill at a 20% angle and at 8 mph, and record the working time until fatigue. This test may also include a specific concentration of lactic acid in the venous blood at the fifth and twelfth minutes after work.

Measurement of lactic acid in the blood: The researcher used a device to measure the concentration of lactic acid (Lactate Pro 2) is the second generation at the time of rest and also after the effort (5 minutes) of blood «being suitable to ensure the transfer of lactic acid from muscle to blood». The measurement method was chosen by selecting one of the fingers of the hand to be pricked and showing the first drop of blood and then wipe it after the emergence of a drop of blood a second time is placed on the measurement tape connected to the device to draw blood towards the tape and then show the result of measuring the proportion of lactic acid in (15) seconds.

Measurement of research variables (manganese and serotonin): After the withdrawal of blood from the research sample and put it in special tubules (gel Tube), after which the separation of the serums by the centrifuge because the measurement of variables (and manganese and serotonin) depends on the blood serum where it is by placing a certain amount of the serum on the relevant pieces to give the final result of Through the device used (Cobas).

Exploratory experiment: The researcher carried out the exploratory experiment on (25/6/2017) at 5:00 pm in the stadium of the College of Physical Education and Sports Sciences. The purpose of the exploratory experiment was as follows:
- Fit the exercises set for the research sample.
- Identify some of the obstacles or difficulties that may face work during the exercise of exercises.
- Determine the maximum time for each exercise.
- Know the rate of pulse during the time of rest (recovery time) between the frequencies and the time of rest between groups.

Field research procedures

Pre-tests: The tests were carried out by intravenous blood withdrawal (5cc) to measure the variables (manganese and serotonin) and then the walking test to measure the concentration of lactic acid in the blood and then give the convenience and implementation of performance test on (30/6/2017) 5 p.m. at the Handball Stadium Faculty of Physical Education and Sports Sciences.
**Competitive exercises:** The competitive exercises were started on Saturday (2/7/2017) in the stadiums of the Faculty of Physical Education and Sports Sciences.

The vocabulary of competitive exercises was as follows:

This period was characterized by the use of competitive exercises suitable to the nature of the game, characterized by repeated performance and continuity as well as the component of diversification so that the continuation of periods of unity without boredom and gradually allows to benefit from these exercises.

1. The researcher used high-intensity fetal pregnancy, and requires the formation of a good pregnancy test predetermined the intensity of the exercise and the number of times or exercise time and the number of groups and the rest period and the number of weekly training.

2. The use of tools lists - hand balls - the figures in the exercises and others of the exercises without handballs.

3. Rotation and diversification in the exercise different muscle groups

4. Using the element of competition between two people or more in one exercise, which increases the thrill.

5. Use exercises in half the pitch and length of the stadium and in the goal area to become aerobic competitive exercises to develop the ability of players.

6. Competitive exercises were included in the main part of the training dose, which was between 30 minutes and 45 minutes.

7. The intensity of the exercises used were (80-90%) of the best achievement of the player and the fact that the intensity of appropriate fit with the period of special endurance.

**Statistical Means:** The data obtained by the researcher were processed using the SPSS program where the following statistical methods were extracted.

1. The arithmetic mean
2. Standard Deviation
3. T test for interrelated samples
4. Coefficient of variation and coefficient of torsion

**Table 2:** Represents the computational and standard deviations and the calculated t value of the performance of the sample

<table>
<thead>
<tr>
<th>Tests</th>
<th>Measurement unit</th>
<th>Pre-test</th>
<th>Post-test</th>
<th>calculated t value</th>
<th>significant</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>x</td>
<td>y</td>
<td>x</td>
<td>y</td>
</tr>
<tr>
<td>Performance bearing</td>
<td>1.150</td>
<td>0.043</td>
<td>1.053</td>
<td>0.074</td>
<td>4.973</td>
</tr>
</tbody>
</table>

Degree of freedom (6-1) = 5 below confidence level (0.05)

**Table 3:** Represents the computational and standard deviations and the calculated (t) value of the biochemical variables of the sample of the research sample

<table>
<thead>
<tr>
<th>No</th>
<th>Variable</th>
<th>Measuring unit</th>
<th>Pre-test</th>
<th>Post-test</th>
<th>Calculated t value</th>
<th>Significant</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td>y</td>
<td>x</td>
<td>y</td>
</tr>
<tr>
<td>1.</td>
<td>Magnesium</td>
<td>Mg/L</td>
<td>1.883</td>
<td>0.232</td>
<td>2.633</td>
<td>0.301</td>
</tr>
<tr>
<td>2.</td>
<td>Serotonin</td>
<td>Ng/ml</td>
<td>154.167</td>
<td>13.423</td>
<td>187.833</td>
<td>14.878</td>
</tr>
<tr>
<td>3.</td>
<td>Acid for lactic acid</td>
<td>Mmol/L</td>
<td>19.633</td>
<td>1.269</td>
<td>17.133</td>
<td>1.104</td>
</tr>
</tbody>
</table>

Degree of freedom (6-1) = 5 below confidence level (0.05).

The results showed a positive effect on the development of performance. The researcher attributed this development to the nature of the various competitive exercises that developed the performance of the performance. The exercises were of a physical and skilled nature and this requires the performance of the handball game. The correct order and quality of exercises through involve all muscle groups needed by a ball player as well as (temporary training) to develop the performance of the performance, including the rest periods as well as...
the intensity and size of loads used to match the nature of the game, as well as the work of muscle groups, which ensures the development of players under a certain level without stress on the player’s physical ability and access to exhaustion, but was working within a certain level of fatigue, which showed the results on the development of carrying the performance required by handball player. The nature and quality of the exercises that were applied were suitable for the sample of the research, especially its intensity and diversity, the difference in its distances and frequencies, as well as the element of competition and suspense, so that they are close to the requirements of the game of handball through the use of balls or without balls and the presence of scoring or handling short, medium or long or exchange sites or moves in the field of handball, which contributed to the harmony of players and away from boredom because of the nature of the various competitive exercises that contributed to the activity of players, The performance in ball games requires an increase in the anaerobic ability of the body. The more the nature of the game requires the speed of the moves in the stadium, the more the body is equipped with the anaerobic power system. Therefore, the player cannot continue to perform very efficiently all the time. Players in the game and to achieve access to high levels in such games, along with the development of anaerobic ability must pay attention to the development of the aerobic ability of the player must also develop general endurance for games that need to develop the element of strength, speed, fitness, and private endurance. One of the basic principles for the development of a performance component through the concept of modern sports training is to repeat the performance of the largest possible number and with appropriate and incomplete rest periods. This is what the researcher did so that the exercises were consistent with the nature of the sample in addition to maintaining the rate of performance during the continuation and the number of exercises during the course of the training unit and the difference, as well as the number of training sessions during the one week, which does not exceed three units with a period of hospitalization between them, which have achieved positive results on the development of performance of the performance of the research sample. The lactic acid system relies on the construction of aerobic ATP by the process of anaerobic glycolysis, where the sugar is broken in the absence of oxygen, which leads to the formation of lactic acid in the muscle and blood, which in turn leads to muscle fatigue when increased. The action requires anaerobic muscle action, which increases the accumulation of lactic acid in the muscle as a result of the anaerobic synthesis, which leads to fatigue and slow performance of the player and low abilities. Abu Alaa and Shaalan (1994) mentioned that with the continued development of anaerobic endurance of the player improves the ability of muscles to tolerate lactic acid as follows:

1. Reduce the rate of the accumulation of lactic acid by reducing the rate of production in the muscles with an increased rate of disposal in the same muscles.

2. Increase the ability of the muscle to bear the pain caused by the accumulation of lactic acid and maintains a high level of speed of motor performance.

The researcher attributed the change in the measurement of the ratio of manganese to hospitalization in the water medium, which contains the esophagus salt after exercise, which increases the feeling of rest and relaxation. Although magnesium can be absorbed through the digestive system, through many foods, drugs and medical materials, but salt bath Epsom Is one of the most effective means of making magnesium penetrate the body of an athlete easily, “Epsom salt, or magnesium sulfate, is a commonly used product known as al Ipsum in relation to the mineral-rich area of the ipsum. The ipsum bath is very useful especially for the players after hard work.

Adding a little water to it and lying down for a while helps to get rid of Detoxification and Sediment After High Physical Effort The body’s absorption of salt helps calm the central nervous system, as well as its natural laxative, which helps relax muscles and relieve post-exercise pain. The serotonin is one of the neurotransmitters and through the exercise increases levels of serotonin. And then we feel comfort and relaxation because the body gets rid of mental stress and muscle and works to balance the levels of hormones in the body, and increases the secretion of serotonin. We feel comfortable and calm, The athlete can resist all the new stresses during exercise in the training modules. All of these positive effects on the body make the athlete more prepared for the training modules. Magnesium is necessary for serotonin absorption, which improves mood and relieves fatigue and stress due to
high stress exercises, especially high-intensity anaerobic exercises “The magnesium is necessary for the body (to bind *) sufficient amounts of serotonin, A chemical to raise the mood within the brain that creates a sense of well-being and relaxation and many functions as magnesium has the ability to regulate more than 325 enzymes. The researcher finds that the use of the sessions of water basins as well as ipsum salt in the hospital have different effects through reflexes that occur in the skin, the circulatory system, the nervous system and the musculoskeletal system, and all the products of metabolic processes, metabolism and oxidation resulting from various exercises and effort spent for varying periods during the implementation of training doses. During the sessions of the treatment of water reaches the cerebral cortex sensory signals of the sensory receptors of the skin and blood vessels and internal organs of the body and can affect these sensory receptors of the body through the temperature of water at different levels between cold and heat as well as when adding some chemicals to water, Water and its friction or collision with the body lead to excitation Sensory nerve endings.

Conclusions

The competitive exercises that applied to the research sample contributed to the development of performance tolerance. It was found that the hospital in the water medium with the salt of the ipsum has a positive effect on the variables (lactic acid, manganese and serotonin), which improved the functional status of the players.

Source of Funding: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Wasit University, college of Physical Education and sports science, Iraq and all experiments were carried out in accordance with approved guidelines.

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Immunological Base Behind the Increased Susceptibility of Diabetic Patients for Infections

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ABSTRACT

A 120 middle-aged adults and elderly were enrolled in this case – control study, including 48 type 2 diabetes without foot infection patients, 36 diabetic foot patients and 36 apparently healthy individuals matched as control group. The current study was carried out to evaluate the immunological status displayed by antimicrobial peptide and their role in diabetes mellitus patients and diabetic foot infection patients. The results of demographic data examination among patients with diabetes mellitus in this work revealed that out of all 84 diabetic patients, 78% had their first signs of diabetes during their forties. Otherwise, the most common age interval for acquisition of diabetic foot infection among diabetic patients were in 50s-60s leading to 60% of diabetic foot patients underwent foot amputation at that age interval. Regarding gender as a demographic factor among diabetes patients in this study, the results showed that the gender of females and males were equal in frequency among diabetes patients without foot ulcers. On the other hand, the results demonstrate that the gender of male was found to have susceptibility to get diabetic foot infection more than the female gender (63.89% versus 36.11%). In this study, biochemical test and hematological parameters that affected on foot amputation were random blood sugar (RBS), hemoglobin A1c, neutrophils (high-significant difference between the groups in the study (P=0.0001)) and neutrophil-lymphocyte ratio (high statistical significant difference between the study groups (P>0.003)). Regarding the evaluation of immune parameters reflected by antimicrobial peptides in present study, serum HNP1-3 and DEF-β2 levels were non-significant difference between the study groups (P>0.05). Otherwise, LL-37 level was significant difference between the study groups (p<0.05). These results suggest that although most AMPs are expressed in DFU, this production is not appropriate to promote wound healing and contain secondary infections but present decrease in human LL-37 can be cause in don’t wound healing in diabetic foot patients.

Keywords: Diabetes mellitus; Diabetic foot ulcer; HNP1-3; LL-37; DEF-β2

Introduction

Diabetes is widely recognized as an emerging epidemic that has a cumulative impact on almost every country, age group, and economy across the world. Type 2 diabetes mellitus (DM) is a chronic metabolic disorder in which prevalence has been increasing steadily all over the world. As a result of this trend, it is fast becoming an epidemic in some countries of the world with the number of people affected expected to double in the next decade due to increase in ageing population, thereby adding to the already existing burden for healthcare providers, especially in poorly developed countries. Diabetes complications are common among patients with type 1 or type 2 diabetes but, at the same time, are responsible for significant morbidity and mortality. The chronic complications of diabetes are broadly divided into microvascular and macrovascular. Microvascular complications include neuropathy, nephropathy, and retinopathy, while macrovascular complications consist of cardiovascular disease, stroke, and peripheral artery disease (PAD). Diabetic foot syndrome has been defined as the presence of foot ulcer associated with neuropathy, PAD, and infection, and it is a major cause of lower limb amputation. For a long time, alterations of immune defences have been implicated in the susceptibility
to infection of diabetic patients. Louis Pasteur was reported to acknowledge in 1895 on his deathbed that the microbe is nothing, the terrain is everything, quoting Claude Bernard’s motto. A lot of immunological defects, mostly related to innate immunity, have been reported in diabetic patients. The most consistent involves altered function of PMNs, specially impaired phagocytosis and bactericidal activity. Twenty years ago, it was shown that ingestion and killing of Staphylococcus aureus by PMNs were significantly reduced in diabetic patients with poor metabolic control. The neutrophils play an essential role in the inflammatory reaction and in the response to an infection. They are one of the first lines of defense against pathogens and during inflammation. Their immunological capacity is linked to their property of migrating to the inflammatory site and phagocytizing the pathogen or killing it via their microbicidal activity.

Materials and Method

Patients group: This study was conducted in the department of Microbiology of Medicine College/Babylon University. A hundred and twenty middle-aged adults and elderly were enrolled in this case – control study, including forty-eight diabetes mellitus only, thirty-six diabetic foot and thirty-six healthy individuals matched as control group. All patients in the study were referred and diagnosed in the Diabetes Center at Marjan hospital Teaching Hospital during the period from November 2018 to February 2019. A full questionnaire including demographic information’s set, residence, history of diabetes mellitus, taking medication subjects. All were matched regarding the age & set to the patients group.

Specimens collection: Blood samples were taken from all subjects in the study for biochemical, hematological and immunological parameters. Blood samples were collected by drawing 3ml of blood from each subject included in this study using sterile 5ml syringes with sterile needle G-22. Blood samples of study groups were collected in sterile 10ml capacity sterile gel tubes and labeled with name, age, gender as well as date of their collection. After blood clot formation at room temperature within 30minutes, clot blood sample were centrifuged at 2500 r.p.m. for 5 minutes. Separated sera samples were collected, distributed in 0.5ml quantities in sterile containers, labeled and stored at -20°C until used. Two ml of venous blood was collected by disposable syringe then withdrawn in EDTA container and mixed with the anticoagulant to avoid clot formation.

Complete blood count: Complete blood count (HB, RBCs, WBC (neutrophil and lymphocyte), MCV, MCH, MCHC, HCT, platelet indices) was tested by automated method (Sysmex).

Biochemical tests: Random blood sugar (RBS) was detected by Glucose kit (Company: Biomaghreb, France, Lot number (20121)). HbA1c was perceived by Finecare HbA1c kit (Company: Wondf, China, Lot number (F20712402AD)). Test should be performed at room temperature.

Serological Markers: HNP1-3, Human DEFβ2/DEFB2 and Human LL-37 detected by enzyme linked immunosorbent assay (Human HNP1-3(Neutrophil Peptide 1-3), Human DEFβ2/DEFB2 (Defensin Beta 2) and Human LL-37 (Antibacterial Protein LL-37) ELISA Kit, Elabscience, U.S.A., Lot number(E-EL-H2299, E-EL-H0996 and E-EL-H2438 respectively). Parameters were measured according to instruction of the manufacturing company.

Statistical Analysis: This done by using statistical package for social sciences (SPSS) version 22, in which the researcher used analysis of difference (ANOVA) and independent sample T-test for measuring the data and chi square ($X^2$) for a categorical data. Set p value < 0.05 as significant (95%).

Results and Discussion

This result was supported by the recommendation of the American Diabetes Association (ADA) that doing annual diabetes screening tests after the age of 45. But the age at which someone develops the condition depends on too many differing factors to accurately predict. Many people have diabetes for years before being diagnosed, causing a large variation between the age of onset and age of diagnosis. Coming in line with this study data about the age distribution among diabetic patients, according to the CDC, the majority of new diabetes diagnoses were among adults aged between 45 and 64. While there might not be a set age for onset for type 2 diabetes, age greatly increases the chances of developing diabetes complications most importantly diabetic foot infection. Otherwise, the most common age interval for acquirement of diabetic foot infection among diabetic patients were in 50s-60s leading to 60% of diabetic foot patients underwent foot amputation at that age interval (Table: 1)
Table 1: Percentages of study groups according to their age groups

<table>
<thead>
<tr>
<th>Factor</th>
<th>DM only</th>
<th>Diabetic foot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age years</td>
<td>40-49</td>
<td>50-59</td>
</tr>
<tr>
<td>No.</td>
<td>6</td>
<td>24</td>
</tr>
<tr>
<td>Total No.</td>
<td>48</td>
<td>36</td>
</tr>
<tr>
<td>% of No.</td>
<td>12.5%</td>
<td>50%</td>
</tr>
</tbody>
</table>

Table 2: Frequency distribution of gender among the study groups

<table>
<thead>
<tr>
<th>Gender</th>
<th>DM only</th>
<th>Diabetic foot</th>
<th>Total No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>No.</td>
<td>24</td>
<td>24</td>
<td>13</td>
</tr>
<tr>
<td>Total No.</td>
<td>48</td>
<td>36</td>
<td>84</td>
</tr>
<tr>
<td>% of No.</td>
<td>50%</td>
<td>50%</td>
<td>36.11%</td>
</tr>
<tr>
<td>% of total</td>
<td>28.57%</td>
<td>28.57%</td>
<td>15.48%</td>
</tr>
</tbody>
</table>

Table 3: The distribution of the study groups according to RBS, HbA1c, Neutrophil, NLR, HNP1-3, DEF-β2 and LL-37

<table>
<thead>
<tr>
<th>Factor</th>
<th>DM only</th>
<th>Diabetic foot</th>
<th>Healthy control</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>RBS</td>
<td>9.8906 ± 3.31763</td>
<td>12.5625 ± 4.96911</td>
<td>4.7125 ± 0.91856</td>
<td>0.0001</td>
</tr>
<tr>
<td>HbA1c</td>
<td>6.8138 ± 1.09464</td>
<td>7.7425 ± 1.13673</td>
<td>5.4608 ± 0.06143</td>
<td>0.0001</td>
</tr>
<tr>
<td>Neutrophil</td>
<td>4.2344 ± 0.73193</td>
<td>7.3521 ± 3.09883</td>
<td>4.2767 ± 1.22586</td>
<td>0.0001</td>
</tr>
<tr>
<td>NLR</td>
<td>1.5795 ± 0.48765</td>
<td>3.6191 ± 3.33925</td>
<td>2.1003 ± 0.81056</td>
<td>0.003</td>
</tr>
<tr>
<td>HNP1-3</td>
<td>7.5645 ± 2.79812</td>
<td>6.8089 ± 4.00288</td>
<td>6.1982 ± 2.46817</td>
<td>0.824</td>
</tr>
<tr>
<td>DEF-β2</td>
<td>151.1111 ± 115.88834</td>
<td>230.6481 ± 141.67729</td>
<td>196.4815 ± 161.53972</td>
<td>0.166</td>
</tr>
<tr>
<td>LL-37</td>
<td>30.8833 ± 19.10989</td>
<td>28.0639 ± 15.09763</td>
<td>44.4611 ± 13.42676</td>
<td>0.045</td>
</tr>
</tbody>
</table>

In this study, blood sugar was studied as a biochemical diagnostic parameter for diabetic patients. Random blood sugar level among the three groups through the current study established that there was a high-significant difference between their serum levels. While HbA1c in the diabetic foot group were significantly higher than diabetes and control groups, and there was a high-significant difference between the groups in the study (P=0.0001) (Table: 3). In recent studies about the distribution of random blood sugar mean value among diabetic patients, the risk factors of foot ulceration varied in studies, loss of glycemic control for any reason may lead with time to diabetes become progressed and less responsive to treatment and resultant increase in DFU risk. Improving ability to predict and prevent diabetic foot ulceration is imperative because of the high personal and financial costs of this complication. Furthermore the better glycemic control the fewer complications from hyperglycemic attacks (12,13). The results regarding HbA1c reached through this study were in consistence with pervious study which reported that higher HbA1c levels were positively correlated with future diabetes complications such as risks of stroke, coronary heart disease, and all-cause death. The risks of ischemic stroke increased by 1% increment of HbA1c regardless of diabetes diagnosis. In addition, HbA1c levels 7.5% (58.5 mmol/mol) incrementally and significantly increased future risks of ischemic stroke, coronary heart disease, and all-cause death compared to the reference group of HbA1c levels <5.5% (36.5 mmol/mol) (Chen et al., 2015). Likewise, these results about HbA1c were agreed with earlier study which found that HbA1c in diabetic foot ulcer was 9.76 ± 2.5, diabetic control group 7.93 ± 2, statistically high significant differences were also observed according to HbA1c (P = 0.000). Short-term glycemic control as measured by HbA1C was variable.
in regression models among patients with diabetic foot ulcers in the study; however, the association between poor glycemic control and development of diabetes complications demonstrated that health-related quality of life was not identified in the diabetic patient group. These findings have implications for clinical and policy decisions, as well as for the design for future studies with larger sample sizes. In particular, the findings underscore the importance of quality of life in the management of diabetic patients with or at risk of foot disease.

Likewise in the present study neutrophil count was studied as a hematological parameter for diabetic patients, the results showed that neutrophils count in the diabetic foot group were significantly higher than diabetes patients and control group and there was high-significant difference between the study groups ($P=0.0001$) (Table: 3). In the present study we hypothesized that the phagocytic activity disturbances in patients with poorly controlled diabetes may play an important role in the pathogenesis of infectious complications in these patients and may augment the progression of immune dysfunction to increased morbidity and mortality rates. These results regarding neutrophils count among diabetic foot patients identified in the present study was in agreement with earlier study who found a higher mean laboratory result for neutrophils count than control. Among laboratory finding neutrophils had a significant impact on extremity amputation, the presence of coronary artery disease, duration of hospital stay, presence of osteomyelitis, decreased levels of neutrophil are crucial for predicting amputation in patients referring to emergency units with DFU. While the neutrophil-lymphocyte ratio in the diabetic foot were higher than both the diabetes patients and control groups, also the healthy control group had high ratio than diabetes mellitus group and there was high statistical significant difference between the study groups ($P>0.003$) (Table: 3). The NLR is a result of dividing the number of neutrophils to lymphocytes acquired by the differential blood cell count test. It is an inexpensive and more accessible way of evaluating immune system activity compared with many other wound-specific markers. These results in the existing study were confirmed with a prior study which mentioned that there was a statistically significant differences observed groups according to NLR ($P = 0.001$). Patient with diabetic foot ulcers and non-ulcer has been analyzed regarding NLR level as inflammatory marker. Determining NLR in the presence of high levels of diabetic foot ulcers is not a local inflammation alone but also showed that there is a systemic inflammatory response. In patients with diabetic foot other macrovascular complications of diabetes can be seen much more and using NLR has been suggested as cheap and accessible inflammatory markers for developing and following of macrovascular complication.

**Conclusions**

In this work foot ulcer of type 2 diabetes mellitus is fairly common. Lack of awareness of foot care and delayed treatment request will increase the extent of tissue destruction. Neutrophils are themain source of antimicrobial peptides which are expressed in DFU, although their expression levels are not appropriate to promote wound healing and contain secondary infections. Administration of antimicrobial peptides may be recommended to be used as augmentation therapy to fasten diabetic foot infection.

**Source of Funding:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Department of Medical Microbiology, College of Medicine, University of Babylon, Hilla, Iraq and all experiments were carried out in accordance with approved guidelines.

**REFERENCES**


The Infection of Child with (Dysgraphia Dyspraxia Problems Related to Language, Perception and Thought, and Affect Fine Motor Activities, Such as Pen-Holding Disease Related to Language, Perception and Thought, and Affect Fine Kinetic Activities

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ABSTRACT

The purpose of this study is to discuss the concept of Dysgraphia with the view to shed some more light on the difficulty in writing for pupils at primary school. In this attempt, we focus on three factors from developmental learning disabilities grounds, mainly: Visual perception disabilities, language and memory difficulties. In so doing, we refer to some particular tests. The result of this study comes about to reinforce and emphasize the existing known relationship between Dysgraphia and the other types of developmental learning disabilities.

Keywords: Dysgraphia Dyspraxia Problems related to language, perception and thought, and affect fine motor activities, such as pen-holding disease, affect fine kinetic activities

Introduction

Before recognizing Dysgraphia, we have a look at Species learning difficulties. There are many types of learning difficulties probably the most common. The difficulty of developmental kinetic synergy is a particular learning disability that affects the individual’s ability to synergize the movement and regulate precise and inaccurate movements 4. The difficulty of developmental kinetic synergy affects the child’s acquisition of handwriting skills, leading to problems in the learning process and in acquiring literacy skills and spelling. The term expresses the disorder of sensory integration and includes problems. Balance is the compatibility between hand and look, no failure enables the student to coordinate and control simple movements such as writing and cutting, or more complex movements such as running and jumping 10. Dysgraphia is basically a difficulty in kinetic synergy. The child has a disability or immaturity in organizing the movement, leading to problems related to language, perception and thought, making the tasks associated with the learning process difficult. This imbalance in the completion of the movement results from a problem in the way the brain sends the information and receives it from a specific organ in the body. The person can be infected with Dysgraphia at any stage of his life due to shock, stroke, accident or illness 20. It can also be caused by myself. 

The boys suffer more than girls Baldesberaxia, they begin to have several symptoms of the form, such as:

- Difficulty in eating, sitting, walking, completing movement and standing, in the sense of all that relates to his kinetic development, and the patient needs help from all around him in clothes, eating or washing.
- He cannot organize his objects or even his thoughts.
- He does not like games that need to be analyzed like cubes.
- It is difficult to grasp objects such as writing tools.
- He suffers from difficulty concentrating.
- Also suffers from muscle dysfunction.

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Dysgraphia is Difficulties Kinetics which is due to cognitive problems, especially visual kinetic difficulties and other kinetic difficulties. The definition of Dysgraphia according to the British Dysgraphia Association in England. It is immobility or immaturity in organizing the movement leads to problems related to language, perception and thought (Disparaxia Association, 2001). These difficulties are in processing the above information seems to relate to the skills necessary for many of the tasks associated with the learning process, and will affect focus, memory and reading. Kinetic difficulties which is due to cognitive problems, especially visual kinetic difficulties. That is, difficulties in the voluntary kinetic system, or sensory integration disorder and include problems of balance - compatibility between hand performance and consideration.

Control minute motion: Difficulties in coordinating fine movement lead to handwriting problems, which can be due to intellectual or intellectual difficulties. They can be problems associated with this area include the following:

- Learn basic movement patterns.
- Develop desirable typing speed.
- Learn the language characters - for example, Latin alphabet, plus numbers.
- Hold the pen correctly
- Pain in the hand while writing.

Precise traffic problems can also cause difficulties in a wide range of other tasks, such as the use of knife and fork, hook studs, shoelaces, cooking, tooth washing, putting beauty tools, hairdressing, opening jars and bags, opening and closing doors, shaving, doing household chores. There are many labels for Dysgraphia the most important of which: Developmental coordination disorder (DCD) Developmental Dyspraxia and Clumsy Child Syndrome Developmental coordination disorder (DCD) Developmental Dysgraphia and Clumsy Child Syndrome.

Symptoms and reasons of Dysgraphia: It has the impact on the student’s performance and behavioral and social. As of the age of 3 years, it is possible to observe the child’s injury when he is late in walking, and when he has difficulty in not specifying the square and triangle. Here we need to use a doctor or psychologist to distinguish whether there is any intellectual problem or only a kinetic problem and can be surer than injury at the age of 7 years. The cause of Dysgraphia is not known today. Researchers believe that nerve cells that control muscles do not develop properly. Since they are not able to establish a proper connection, the brain will need more time to analyze the information. Dysgraphia can be infected at any stage of his life by shock, stroke, accident or illness. Undoubtedly, Dysgraphia has negative consequences. The first is independence. The child will not be able to feel his independence, such as wearing his clothes alone or managing his own affairs, in addition to the difficulties that can result in school performance. There is also dictation, especially as the spelling difficulties are associated with a transcription disorder, so the student makes mistakes in copying when he moves from the board to the book. In this case it is very useful to use the “computer”.

All these problems cause delays in school performance. As well as losing the student confidence, making him isolated from his colleagues, if accompanied by a disorder of lack of concentration and frequent movement. It is possible for a child to attend a regular school or need a specialized school.

He can enter a normal school, but to a certain stage then he will have to become a specialized school with specialized classes. It is possible to detect the infection as soon as the child enters school. Certainly, on condition that the teacher has experience, and thus be able to distinguish between the normal development of the student and abnormal development. One of the most noticeable aspects of a child’s difficulty in dealing with situations that require group work is the difficulty in calculating, writing and copying from the board. There are specific skills or difficulties faced by the student in which the teacher in the nursery can discover a problem.

The consequences of Dysgraphia on student performance: Dysgraphia has negative effects on school performance. And directly affect:

- Movement and trends: low maturity of movement, organization and spatial structures. For example, it is difficult for the child to determine the orientation of the lines on the paper.
- Line: The writing is automatic and thus the result appears to be scribble, as the letters are written in a remarkably uneven size.
• Account: Difficult to apply the rules of addition and subtraction, despite his familiarity with it.

• Reading: Be hesitant and slow and tends to confuse similar characters in the form and has difficulty spelling.

• Research writing: The student does not know the search for suitable information for the subject for the impossibility of the structure of the text.

• Dictation: Spelling difficulties are associated with a transcription disorder. So, the student makes mistakes in copying when he moves from the board to the book.

• Singing and imitation: The student cannot reproduce the movements, and also finds it difficult to follow the rhythm of the song correctly.

**Problem statement:** As well as other disorders that result in learning difficulties such as autism, hyperactivity disorder and activity. Dysgraphia difficulty Kinetic synergy, DyspraxiaDysgraphia. This problem is a silent disability that impairs the child’s learning and life. He needs the help of parents and everyone around him to overcome them.

**Dysgraphia diagnosis:** The first stage is the evaluation of physical development, that is to build a clear and detailed picture from the beginning of the stages of pregnancy through birth to physical development and the accompanying stages. This development is compared to peers who are children of the same biological age. Such as sitting, walking, talking, toilet training and the like. And make sure that the child did not suffer from any diseases have similar symptoms 10.

The second stage is the assessment of mental abilities, i.e. the level of intelligence in the child. We then perform a kinetic sensory assessment to identify difficulties and their degree in the functions of the trunk muscles (e.g. jumping, throwing, walking, jogging, balance) and fine muscles (e.g. lacing, decoding, studying, shearing, writing). Finally, we seek to evaluate kinetic theory Motor Visual PerceptionKinetic Visual Perception. The speed in kinetic performance after looking at the object is an important indicator that develops with age 10.

**The treatment of Dysgraphia:** Dysgraphia has been associated with the patient throughout his life, and his condition can improve with early detection and correct treatment 11. Some of the specialists who should work with people with Dysgraphia are:

- **Therapist Occupational therapist Occupational:** Therapist to help the child organize and develop his movement to facilitate daily tasks 12.

- **Speech and Language:** Specialist Speech therapistSpeech therapist helps him to develop spoken language, written language, thinking and analysis skills 13.

**The effects that may weaken the child’s fine kinetic abilities:** Some children may notice that they are unable to use their hands properly during activities, which in turn can frustrate them. This frustration may appear to be resistant or reluctant to perform activities that may require high coordination in the use of small muscles in their hands and fingers. As a result of their refusal, they cannot properly exercise those skills and miss the opportunity to develop those muscles. This in turn may affect the development of more precise kinetic skills such as typing. It will be easy for the teacher or educator to identify the problem by observing the child’s behavior or reactions when asked to perform some of those skills, for example, we will review some of the expected responses from the child:

1. Techniques of evasion or avoidance of participation:
   a. Rapid refusal to participate in some activities.
   b. evade participation by asking to go to the water cycle or drink water.
   c. Flicks may appear as shredding paper.
   d. Sadness and crying.

2. The techniques of defeatism:
   a. It may appear in the phrases used by the child such as: I do not know - I am not good - or I appreciate her parents!

**Better times to train children on fine kinetic skills:** It is preferable to start training on these skills after exposing the child to activities that stimulate his or her large muscles. The time that follows the time of the break or play time is one of the best times for training, because the activities or movements that the child during his play help to move the big muscles such as shoulders and muscles of the forearm and pelvis and thigh, these muscles in turn are in readiness and readiness to act as an assistant and essential stabilizer and necessary for the muscles of the smallest or minute. If it is not possible to create a suitable timing for training at some times, light
warm-up exercises help stimulate the muscles before starting the training, preferably in a different form, in the sense that they make the teacher in the form of a race to escape from place to place, for example Inventory, and not take a boring and repetitive.

**Teacher helps the child:** One of the most important roles of the teacher is to observe children in the performance of activities and the ability to recognize or discriminate children who show signs of weakness in the performance of some skills and activities. The teacher also has a great role in creating the child’s motivation to practice the skills they create challenging, as well as working on developing those skills by focusing on the child’s weaknesses through classroom activities or through play 10. The teacher’s positive attitude to the child and encourages him not to show a sense of failure, which reduces the fear of the exercise of those skills in the future. It is also necessary to adapt, modify or compartmentalize those skills to suit the level and abilities of the child, which helps him to achieve a simple success, which in turn can positively support the child. It also helps to reduce the high expectations of the child towards his fear of failure, as well as to increase the child’s self-confidence and help to show a marked improvement in performance 18.

**Conclusion**

We mentioned earlier that basic skills begin to develop in the child at the age of breastfeeding and in the following years, and these skills are ready to use school tools. Although the majority of children at this stage are fascinated by the use of school tools from pencils and scissors, emphasis should not be placed on writing and cutting skills, especially in the three to four year period, because it would be useful for them to use that time to develop and increase their readiness to find a solid foundation for those skills in the future. We conclude from the above that working to support and support the child to develop these skills at an early age helps him to achieve success and a sense of satisfaction with his performance both at home and school.

**Source of Funding:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Department of Educational and Human Sciences, Iraq and all experiments were carried out in accordance with approved guidelines.

**REFERENCES**


Socio-Demographic Determinants of Multiple Health Risk Behaviors among School Adolescents in Kurdistan Region, Iraq

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ABSTRACT

The present study was aimed at exploring the prevalence of multiple health risk behaviors and determine their relationship with socio-demographic characteristics among adolescent high school students. The present investigation was a cross-sectional study that was carried out in the public high schools located in Erbil, the Kurdistan Region of Iraq. The study sample consisted of 1000 students who were selected using a multi-stage cluster sampling method from 32 high schools in 6 municipalities of Erbil. The required data were collected using a self-reported close-ended questionnaire. The present study was participated by 1000 adolescent high school students whose mean age was 16.7 years with a standard deviation of 1.2 and a median of 17 years. Over half of the students (57.4%) belonged to the age group 16-17 years. Regarding their gender, 57.4% were females, and the male: female ratio was 0.74: 1. With regard to their grades, about 43% of them studied in the 11th grade. In terms of their socio-economic status (SES), more than half of them (54%) had a low status and 12.8% a high SES. It was observed that their mean risk was 3.38 with an SD of 2.15 and a median of 3.

Keywords: Multiple health risk behavior, smoking, adolescent, violence, alcohol drinking, safety, suicide, physical activity

Introduction

As a transition from childhood to adulthood, adolescence is accompanied with an increase in autonomy and independence ¹ and tendency for risky behaviors in different milieus ². Few research studies have focused on the relationship between living conditions and health risk behaviors, which is a critical issue. Developing effective youth health policies requires a deep understanding of how social and physical environment can influence risk behaviors conducted by individuals ³. Adolescence is characterized by psychological and physical changes including puberty, stress, and family- or school-related challenges which can cause adolescents to conduct negative behaviors like smoking, drinking alcohol, suicide, and violence ⁴. Such adolescents are typically prone to continue such risky behaviors right into their later life, i.e. adulthood and old age period ⁵. It also pointed out that such behaviors can lead to or increase mortality and morbidity ⁶. Unequal distribution of socioeconomic resources has been reported to play a role in health disparities in different communities. In fact, given its potential great impact on school-aged adolescents, socio-economic status should be taken into special attention ⁷. To the authors’ best knowledge, no survey in Iraq has ever focused on multiple health risk behaviors among adolescents in Kurdistan Region except for a single study that was conducted on health risk behaviors among male students in the secondary schools located in Erbil ⁸.

Materials and Method

The present investigation was a cross-sectional study that was carried out on 10th, 11th, and 12th students who were 14 to 19 years old, of both genders, and studying in public high schools in Erbil, the Kurdistan Region of Iraq. A multistage cluster sampling method was employed to select the study sample. In order to collect the required data from the students in each school and grade, the researchers referred to the Directorate General of Education of Erbil. In order to include all quarters of the city, the schools were divided into 6 groups based on the municipalities of Erbil, and a simple random
sampling method was utilized to select the target schools from each municipality. Based on the teaching language (i.e. Kurdish, Arabic, Turkish, or English), the schools in Erbil are categorized into 4 types. The first three types (i.e. Kurdish, Arabic, and Turkish schools) are either male or female schools, while English schools are mixed. In most of the schools (67 out of 78), Kurdish is the language of teaching. The proportion of the students in each municipality was used in order to select a certain number of schools in each municipality. Moreover, during the selection of the target schools, at least 1 and at most 3 schools were selected for each gender in each municipality. A total of 11 males and 15 female Kurdish schools were chosen. There are four Arabic schools out of which 1 female school and 1 male school were chosen. Also, 2 Turkish schools were selected. And from among the English schools, two were randomly chosen. Therefore, a total number of 32 schools were selected from 6 municipalities of Erbil. After the schools were selected, a single class was randomly selected from each school. Afterwards, a minimum 30 students were chosen from each grade. After that, the counseling specialists of the schools collected the required data by attending the classes. Moreover, the students were provided with information on the nature of the research and the definition of multiple health risk behavior. In addition, written informed consents were obtained from the students by giving them a consent form and asking them to have it signed by their parents and return it back the day after. On the next day, the participating students were required to complete the questionnaires. They were asked to complete the questionnaires anonymously and not to include their names in order to ensure confidentiality and the highest possible honesty in their answers. The total population of the 10th, 11th, and 12th graders (i.e. 36777, according to the statistics retrieved from the Ministry of Education for the academic year 2016-17), confidence interval (CI) of 95%, 5% allowed error, and a prevalence rate of multiple health risk behavior of 50% were utilized to determine the sample size, which led to a sample size of 381. Moreover, according to the rules in cluster sampling method, a larger target sample size was considered in order to achieve the required precision, which led to multiplying the calculated sample by the design effect of 2, resulting in a sample size of 762. In addition, 10% more students were included so as to account for non-response or recording error, leading to a sample size of 839 students. Finally, the sample size was considered as 1000 in order to cover all schools and classes.

In order to collect the required data from the chosen study sample, a closed-ended questionnaire designed by the Centres for Disease Control and Prevention (CDC) was modified and employed. This questionnaire is composed of three parts. The 1st part aims to collect data on the respondents’ demographic characteristics including age, gender, grade, ethnicity, and religion. The 2nd part gathers data on their socio-economic status (educational level and occupation of father, house ownership, car ownership, and age of father). The 3rd part focuses on the respondents’ habits and lifestyle such as wearing helmet and seat belt, riding with a drunk driver, drinking alcohol, physical inactivity, less sleeping hours, smoking cigarette, physical fighting, bullying at school, electronic bullying, suicide, and other health-related topics. The questionnaire was translated into Kurdish and Arabic by expert translators in an English language center in Sulaimania to assure it was properly understood by all students.

Results and Discussion

There was no significant association between the students’ age and the prevalence of risky behaviors (p=0.081). However, the 10th graders had a significantly higher prevalence of risk behaviors than among those of than the 11th and 12th grades (p<0.001). Moreover, the male students were found out to be twice more prone to conduct risk behaviors than the females (p<0.001). Also, it was concluded that prevalence of risk behaviors increase with a rise in the students’ SES (p<0.027) (See Table 1).

<table>
<thead>
<tr>
<th>Variables</th>
<th>Total</th>
<th>Risky behavior</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N.</td>
<td>No.</td>
<td>(%)</td>
</tr>
<tr>
<td>Age (years)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14-15</td>
<td>157</td>
<td>62</td>
<td>(39.5)</td>
</tr>
<tr>
<td>16-17</td>
<td>574</td>
<td>212</td>
<td>(36.9)</td>
</tr>
<tr>
<td>18-19</td>
<td>269</td>
<td>81</td>
<td>(30.1)</td>
</tr>
<tr>
<td>Grade</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10th</td>
<td>285</td>
<td>130</td>
<td>(45.6)</td>
</tr>
<tr>
<td>11th</td>
<td>426</td>
<td>128</td>
<td>(30.0)</td>
</tr>
<tr>
<td>12th</td>
<td>289</td>
<td>97</td>
<td>(33.6)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>426</td>
<td>215</td>
<td>(50.5)</td>
</tr>
<tr>
<td>Female</td>
<td>574</td>
<td>140</td>
<td>(24.4)</td>
</tr>
</tbody>
</table>

Table 1: Prevalence of multiple health risky behavior by socio-demographic characteristics of the participants
Conted…

Table 2: Description of multiple health risk behaviors among the sample

<table>
<thead>
<tr>
<th>Multiples health risky behaviors</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not wearing a helmet during riding a bicycle(n=301)</td>
<td>271</td>
<td>(90.0)</td>
</tr>
<tr>
<td>Not wearing a helmet during riding a skateboard(n=148)</td>
<td>128</td>
<td>(86.4)</td>
</tr>
<tr>
<td>Not wearing a seat belt when riding in a car(n=1000)</td>
<td>579</td>
<td>(57.9)</td>
</tr>
<tr>
<td>Physical inactivity(n=1000)</td>
<td>358</td>
<td>(35.8)</td>
</tr>
<tr>
<td>Riding in a car driven by a drunk driver(n=1000)</td>
<td>54</td>
<td>(5.4)</td>
</tr>
<tr>
<td>Carrying a weapon, such as a gun, knife(n=1000)</td>
<td>138</td>
<td>(13.8)</td>
</tr>
</tbody>
</table>

According to the results, it was observed that 90% and 86% did not wear a helmet while cycling and skateboarding, respectively. Moreover, wearing a seat belt was reported by 58% of them, while sitting in a car, while riding a car with a drunken driver was mentioned by only 5.4% of them. It was also reported that about 14% of them carried a weapon, 28.4% got involved in physical fighting, and 27.4% got hurt and treated by a doctor or a nurse. Moreover, 3.4% of the students referred to bullying at school, while electronic bullying was reported by 3.7% of them. Serious attempt to commit suicide was reported by 12.5% of the students, 17.4% reported smoking, and drinking alcohol was reported by 2.2% of them. Taking steroid pills or shots without a doctor’s prescription was reported by only 1.7% of the students. Also, participation in physical activities was reported by 36% of them, and 58% of them reported that they slept for less than 8 hours per night (Table 2). Compared with the 11th grade students, the 10th and 12th grade students (with respectively OR=1.98; 95% CI=1.43-2.75 and OR=2.01; 95% CI=1.40-2.88) were significantly associated with developing risky behavior. Male gender was found as another factor that was associated with risky behavior (OR=3.58; 95% CI=2.65-4.82). Moreover, the students with a medium SES were more likely to develop risky behaviors than those with low SES (OR=1.37; 95% CI=1.04-1.85) (Table 3). Since median is the value that shows the middle position when all observations are arranged in an ascending or descending order, and it is also known as positional average, it has been suggested to be employed to determine the prevalence of multiple health risk behavior among the high school adolescent students. Based on median, the frequency distribution is divided into two equal halves. The results of the present study showed that multiple health risk behaviors were 35.5% prevalent. This finding is in agreement with the one reported by a study carried out in Ontario, Canada (35.1%) [2]. It is also in line with the results of a study conducted on adolescents of 11-15 years old in the UK in 2008 which revealed that about 33% of the adolescents had risky behaviors [13]. However, this prevalence rate is higher than what was reported in studies carried out in Luangnamtha Province, Lao (8.1%) [14], Australia (9.8%) [15], Northeast of Brazil (9.0%) [16] and Pernambuco, Brazil (17%) [17]. As reported by the Australian Bureau of Statistics’ National Health Survey, 14.0% of Australians aged 15-18 years smoked daily [18,19]. The results of a study conducted in Ibadan, south-western Nigeria in 2010 revealed a prevalence rate of 0.8% of risky behaviors among adolescents, which is much lower than the findings of the present study [20]. The results of the present study also showed that 43% of the students with a high SES practiced multiple risk behaviors, which is a significantly higher prevalence rate than other SES categories. This finding is in agreement with the findings of a study carried out in the UK in 2015 which showed that the prevalence of multiple health risky behavior was more among the adolescents with high socioeconomic status [21]. On the contrary, Lawlor et al. concluded that low SES was associated with the risky behavior [18]. It is also stated that social pattern of behavior can change over time, as illustrated by the history of smoking behavior that started in higher SES groups but its prevalence declined in these groups [22]. The results of the present study made it evident that 57.9% of the students did not wear seatbelts while they are in a car, which is higher than the results of the studies conducted in the USA in 2010, 2012, 2013, and 2014 [18,34,41,31] which respectively reported 9.7%, 7.7%, 7%, and 7.6%.

<table>
<thead>
<tr>
<th>Socio economic status</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low SES</td>
<td>541</td>
<td>173</td>
</tr>
<tr>
<td>Medium SES</td>
<td>331</td>
<td>127</td>
</tr>
<tr>
<td>High SES</td>
<td>128</td>
<td>55</td>
</tr>
<tr>
<td>Total</td>
<td>1000</td>
<td>355</td>
</tr>
</tbody>
</table>

| Statistics’ National Health Survey, 14.0% of Australians aged 15-18 years smoked daily [18,19]. | | | | |
Conted…

| Being in a physical fight (n=1000) | 284 (28.4) |
| Being in a physical fight after which treated by a doctor or nurse (n=284) | 78 (27.4) |
| Being bullied at school property (n=1000) | 34 (3.4) |
| Being electronically bullied through e-mail, chat room, message; website, or texting, etc. (n=1000) | 37 (3.7) |
| Suicidal attempt (n=1000) | 125 (12.5) |
| Tobacco smoking (n=1000) | 174 (17.4) |
| Drinking alcohol, other than a few sips (n=1000) | 22 (2.2) |
| Taking steroid pills or shots without a doctor’s prescription (n=1000) | 17 (1.7) |
| Sleeping < 8 hours per night (n=1000) | 578 (57.8) |

Table 3: SPSS output of binary logistic regression analysis where the dependent variable is the prevalence of risky behavior

<table>
<thead>
<tr>
<th>Covariates</th>
<th>B</th>
<th>p</th>
<th>OR</th>
<th>95% C.I. for OR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lower</td>
<td>Upper</td>
</tr>
<tr>
<td>Male gender</td>
<td>1.274</td>
<td>&lt; 0.001</td>
<td>3.575</td>
<td>2.653</td>
</tr>
<tr>
<td>Low (reference) SES</td>
<td>0.092</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medium SES</td>
<td>0.315</td>
<td>0.040</td>
<td>1.371</td>
<td>1.014</td>
</tr>
<tr>
<td>High SES</td>
<td>0.277</td>
<td>0.187</td>
<td>1.320</td>
<td>0.874</td>
</tr>
<tr>
<td>Grade</td>
<td>&lt; 0.001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11th (reference)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10th</td>
<td>0.683</td>
<td>&lt; 0.001</td>
<td>1.980</td>
<td>1.426</td>
</tr>
<tr>
<td>12th</td>
<td>0.697</td>
<td>&lt; 0.001</td>
<td>2.008</td>
<td>1.401</td>
</tr>
<tr>
<td>Constant</td>
<td>-1.740</td>
<td>&lt; 0.001</td>
<td>0.176</td>
<td></td>
</tr>
</tbody>
</table>

OR=Odds ratio. CI=Confidence interval

**Conclusion**

According to the results of the present study, there was an association between demographic characteristics like gender, grade, and socio-economic status factors and multiple health risk behaviors among high school adolescents in Erbil, the Kurdistan Region of Iraq. The 10th and 12th grade students were significantly more prone to develop risky behaviors compared with the 11th graders. Moreover, male gender was another factor that was associated with risky behavior. Finally, it was observed that those of medium SES background were more likely to have risky behaviors than those of low SES.

**Source of Funding:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Department of Community Medicine, College of Medicine, Hawler Medical University and all experiments were carried out in accordance with approved guidelines.

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Evaluation of Knowledges, Attitudes, and Practices of Breast Self-Examination of High School Female Students in Al-Diwaniyha City

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¹Community Health Nursing Department, College of Nursing, Baghdad University, Iraq

ABSTRACT

Objectives: To evaluate the breast self-examination knowledge, attitude, and practice for female students. To determine the relationship between female students knowledge, attitudes, and practices of breast self-Examination in high school and socio-demographic characteristics. Two-hundred and twenty female sample Cross sectional study was used to assess high schools females about knowledge, attitudes, and practices related to breast self-examination among high schools female students in AL-Diwaniyha City. A Cluster “probability” sample of (220) female students were selected. These female students study at school, (220) female students from Al-Diwaniyha directorates Female students were assigned to the study according to the following criteria: 1- Female student 2- High school female students who are of the fourth, fifth, and sixth classes. The overall number of items included in the questionnaire is (77) items. Scored assess high school females about are rated on three levels type Likert scale range from 1 to 3; of Always =3, Sometimes =2 and Never=1 Validity refers to the extent to which an instrument measures what it intends to measure (Polit and Hungler, 2013). There is no statistically significant difference in students’ knowledges, attitudes, and practices related to breast self-examination among father’s level of education.

Keywords: Evaluation, knowledges, Attitudes, Practices, Breast self-examination

Introduction

Breast cancer is the most common form of cancer in females, with over 1.38 million females diagnosed globally in 2008, accounting for 23% of all different cancer cases. Bray,F. et al; 2004) reported that most cancer diagnosis is related to cancer of breast, the most commonly diagnosed cancer among females worldwide. Breast cancer is the most common cancer and leading cause of deaths among females universal. Breast cancer is the most commonly happening cancer in females and it is second most common cancer overall. There were above 2 million new cases in 2018. Breast cancer affects primarily women, but a small number of men are also diagnosed each year. It is estimated that the lifetime risk for men is 0.11%, whilst the risk is 13% for women. The Continuous Update Project Panel made a decision about that there was solid proof that utilization of mixed beverages, more noteworthy body bloatedness all through adulthood, grown-up weight increase and grown-up achieved tallness are reasons for postmenopausal breast malignancy. The Panel additionally made a decision there is solid proof that physical movement (counting enthusiastic physical action) and more prominent body bloatedness in youthful adulthood ensure against postmenopausal breast disease.

Moreover, the Panel made a decision there was solid proof that lactation secures against breast cancer growth (undefined menopausal status) National Cancer Registry records, and now India has turned into the nation with the most elevated evaluated number of breast cancers. Cancer growth passings around the world. An ongoing investigation of breast malignancy chance in India recognized one of every 28 ladies create breast disease during their lifetime. An expanding pattern in occurrence
is accounted for from assorted libraries of national cancer growth library task and now India is a nation with biggest evaluated number of breast disease passings around the world. Absence of mindfulness with respect to screening strategies, chance components and social taboos that make Indian ladies humiliated to discuss their real issues prompts late discovery of disease and demise. In India the occurrence/mortality proportion is 0.48 contrasted and 0.25 in North America. The American Cancer Society guidelines for early detection of breast cancer recommend yearly mammogram starting at the age of forty, clinical breast examination (CBE) about every three years for women in their twenties and thirties, and every year for women at age forty and over and also recommends Breast Self-Examination (BSE) for women starting their twenties.

**Methodology**

The aims of the study1- To evaluate the “breast self-examination knowledges, attitudes, and practices for female students.

2- To define the relationship between female students knowledges, attitudes, and practices of breast self-Examination in high school and socio-demographic characteristics.

**The Design of the Study:** Cross sectional study was used to assess high schools females about knowledge, attitudes, and practices related to breast self-examination among high schools female students in AL-Diwaniyha City. This study was started from 15 October 2018 to Jon 2019.

**Study Sample:** A Cluster “probability” sample of (220) female students were selected. These female students study at school, (220) female students from Al-Diwaniyha directorates.

**Study Instrument:** The study instrument includes the socio-demographic sheet, The triple scale was measured by a scale that was adopted from \(^1, ^2, ^9\). The overall number of items included in the questionnaire is \((77)\) items. Scored assess high school females about are rated on three levels type Likert scale range from 1 to 3; of Always =3, Sometimes =2 and Never=1.

Part I: Which composed of demographical characteristics.

Part II: This part is related to evaluation of student’s knowledge toward Breast self -examination.

Part III: This part is related to evaluation of student’s Attitudes toward Breast self – examination.

Part IV: This part is related to evaluation of student’s practices toward Breast self -examination Data Collection the Methods Data were collected through the utilization of the self-reported questionnaire for the period from March 11th, 2019 to April 10th, 2019.

**Statistical Analysis:** The data were analyzed through the application of statistical package for social science IBM-SPSS version 24.0 and by applying of descriptive and inferential statistical tests that are: Frequencies, Percentages, and Standard deviation.

**Results and Discussion**

Regarding father’s level of education, less than a third are intermediate school graduates \((n = 70; 31.8\%)\), followed by those who are high school graduates \((n = 58; 26.4\%)\), those who are high school graduates \((n = 58; 26.4\%)\), those who hold a bachelor’s degree \((n = 39; 17.7\%)\), those who are primary school graduates \((n = 22; 10.0\%)\), those who read and write \((n = 19; 8.6\%)\), those who hold a graduate degree \((n = 9; 4.1\%)\), and those who are unable to read and write \((n = 3; 1.4\%)\) With respect to family’s monthly income, the monthly income for less than two-fifth is more than 901.000 I.D. \((n = 84; 38.2\%)\), followed by those whose monthly income ranges between 301.000-600.000 I.D. \((n = 50; 22.7\%)\), those whose monthly income is less than 300.000 I.D. \((n = 45; 20.5\%)\).

**Table 1: Mean and standard deviation of students’ knowledges about breast cancer and breast self-examination**

<table>
<thead>
<tr>
<th>List</th>
<th>Item</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Painless lump</td>
<td>1.91 ± .89</td>
</tr>
<tr>
<td>2.</td>
<td>Premenstrual breast nodules</td>
<td>1.55 ± .76</td>
</tr>
<tr>
<td>3.</td>
<td>Nipple radiating pain</td>
<td>1.95 ± .90</td>
</tr>
</tbody>
</table>
4. Breast pain 2.44 ± .82
5. Secretion of milk after breastfeeding 1.82 ± .85
6. Breast asymmetry 2.44 ± .82
7. Bloody discharge from the nipple 1.95 ± .88
8. Change in breast shape and size 2.41 ± .82
9. Change in breast color skin 2.02 ± .92
10. Feeling of breast tenderness 1.97 ± .87
11. Inward inversion of the nipple 1.59 ± .76
12. Orange-peel appearance for the breast 1.56 ± .76

### Risk Factors of Breast Cancer

1. Aging 1.99 ± .85
2. Breast cleanliness 2.15 ± .88
3. Slimness 1.83 ± .87
4. Mother or Sister with Breast Cancer 1.75 ± .85
5. Direct Contact with a Person with Breast Cancer 1.74 ± .84
6. Prolonged Breastfeeding 1.74 ± .77
7. Postmenopausal Obesity 1.85 ± .86
8. Smoking and inhalation of smoke from the smoker 2.41 ± .79
9. Existence of benign nodes 1.82 ± .86
10. Hormones disorders 2.24 ± .86
11. Using contraceptive for long-term 2.15 ± .84

### Breast Self-Examination: Do you know about breast self-examination?

1. Touching Each Breast with Ipsilateral Fingers 1.85 ± .91
2. Breast Discharge Monitoring 2.10 ± .90
3. Looking at the Breasts in the Mirror 2.18 ± .90
4. Squeezing the breast between the thumb and four fingers in the shower 1.75 ± .84
5. Touching the Breast with Three Middle Fingers of Contralateral Hand, While Lying Down or in the Shower 1.60 ± .79
6. I am fully aware of its benefits 2.36 ± .83
7. I do not know how it is done correctly 1.77 ± .85
8. I’m not at risk of getting breast cancer 1.95 ± .84
9. I forget to practice BSE 1.92 ± .88
10. I do not practice BSE because I am afraid of being diagnosed of BC 1.87 ± .85
11. I’m doing the breast self - examination after the period of menstrual cycle 1.62 ± .78
12. Standing in front of mirror, monitoring breast size and comparing between them 2.17 ± .91
13. Notice any change in the breast shape 2.22 ± .89
14. Lying on my back and doing breast self-examination in my palm 1.60 ± .84
15. I gently press on the nipple to note any blood secretions or yellowish secretion 1.81 ± .88
16. I examine my breast during bathing using soap to facilitate locating nodes or abnormal masses. 1.77 ± .89
17. I know the three methods of breast self-examination (standing head the mirror, recumbency, examination during bathing) 1.92 ± .88
18. I know the three main methods for breast self-examination (circular, wedges, lines) 1.56 ± .77
The highest score for students’ knowledges about the signs and symptoms of breast cancer are for the items “Breast pain”, “Breast asymmetry”, “Change in breast shape and size”, “Change in breast color skin”, and “Breast tenderness” (Mean [SD] = 2.41 ± .82; 2.02 ± .92; 2.44 ± .82; 2.44 ± .82; 1.97 ± .87) respectively. Concerning the knowledges about the risk factors of breast cancer, the highest scores are reported for the items “Breast cleanliness”, “Smoking and inhalation of smoke from the smoker”, “Hormones disorders”, and “Using contraceptive for long-term” (Mean [SD] = 2.15 ± .88; 2.41 ± .79, 2.24 ± .86, 2.15 ± .84) respectively. Regrading the knowledges about BSE, the highest scores are reported for the items “Breast Discharge Monitoring’, “Looking at the Breasts in the Mirror”, “I am fully aware of its benefits”, “Standing in front of mirror, monitoring breast size and comparing between them”, “Notice any change in the breast shape” (Mean [SD] = 2.10 ± .90; 2.18 ± .90; 2.36 ± .83; 2.17 ± .91; 2.22 ± .89) respectively.

Table 2: Mean and standard deviation of students’ attitudes toward BSE

<table>
<thead>
<tr>
<th>List</th>
<th>Item</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I believe that every woman is susceptible to contract breast cancer</td>
<td>1.95 ± .88</td>
</tr>
<tr>
<td>2.</td>
<td>I believe that women are unable to detect breast abnormalities prior to BSE</td>
<td>2.14 ± .76</td>
</tr>
<tr>
<td>3.</td>
<td>I believe that there is no need to do BSE monthly</td>
<td>1.52 ± .74</td>
</tr>
<tr>
<td>4.</td>
<td>The majority of women do not know how to perform BSE.</td>
<td>2.57 ± .64</td>
</tr>
<tr>
<td>5.</td>
<td>Women prefer to visit a physician for breast examination</td>
<td>2.41 ± .70</td>
</tr>
<tr>
<td>6.</td>
<td>There is no need for regular examination of the breasts by a doctor when there is no any breast problem.</td>
<td>2.09 ± .78</td>
</tr>
<tr>
<td>7.</td>
<td>Diagnosis methods have nothing to do with successful treatment</td>
<td>1.92 ± .70</td>
</tr>
<tr>
<td>8.</td>
<td>Adhering to hygienic rules decreases the probability of breast cancer</td>
<td>2.57 ± .64</td>
</tr>
<tr>
<td>9.</td>
<td>Early detection and treatment of breast cancer ensure patient’s normal life.</td>
<td>2.67 ± .61</td>
</tr>
<tr>
<td>10.</td>
<td>Fear of finding a lump may inhibit breast self-examination.</td>
<td>2.43 ± .69</td>
</tr>
<tr>
<td>11.</td>
<td>Breast self-examination does not produce an important result.</td>
<td>1.30 ± .53</td>
</tr>
<tr>
<td>12.</td>
<td>During BSE makes me feel so funny</td>
<td>1.70 ± .79</td>
</tr>
<tr>
<td>13.</td>
<td>BSE will be embarrassing to me</td>
<td>1.90 ± .87</td>
</tr>
<tr>
<td>14.</td>
<td>Feel annoying, can’t do BSE one time in a month</td>
<td>2.05 ± .71</td>
</tr>
<tr>
<td>15.</td>
<td>I believe that all females must do BSE</td>
<td>1.79 ± .66</td>
</tr>
<tr>
<td>16.</td>
<td>I believe that BSE is too important for detecting nodes and tumors in their beginning</td>
<td>2.69 ± .60</td>
</tr>
<tr>
<td>17.</td>
<td>I believe that BSE save the lives of many women</td>
<td>2.69 ± .60</td>
</tr>
</tbody>
</table>

The highest scores reported for students’ attitudes toward BSE are for the items “I believe that BSE is too important for detecting nodes and tumors in their beginning”, “I believe that BSE save the lives of many women”, “Early detection and treatment of breast cancer ensure patient’s normal life”, “The majority of women do not know how to perform BSE”, “Adhering to hygienic rules decreases the probability of breast cancer” (Mean [SD] = 2.69 ± .60; 2.69 ± .60; 2.67 ± .61; 2.57 ± .64; 2.57 ± .64) respectively.

Table 3: Mean and standard deviation of students’ practices toward BSE

<table>
<thead>
<tr>
<th>List</th>
<th>Item</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Do BSE one time a month</td>
<td>1.36 ± .57</td>
</tr>
<tr>
<td>2.</td>
<td>Educate the right way of BSE</td>
<td>1.56 ± .68</td>
</tr>
<tr>
<td>3.</td>
<td>Parents advise me to do BSE</td>
<td>1.66 ± .76</td>
</tr>
<tr>
<td>4.</td>
<td>Advise friends to do BSE</td>
<td>1.57 ± .70</td>
</tr>
</tbody>
</table>
There was a statistically significant difference in the score of the participants’ knowledge in the study about signs and symptoms of breast cancer. More than a half have a moderate level of knowledge about the signs and symptoms of breast cancer, the risk factors of breast cancer and the breast self-examination (n = 123; 55.9%). This finding is consistent with that obtained by 8 who found The female high school students had insufficient knowledge about breast self-examination. And consistent with 7

**Conclusion**

Significant differences in students’ knowledges about the signs and symptoms of breast cancer, breast self-examination, and overall knowledges about breast self-examination among grade groups (p-value = .005; .017; .009) respectively.

There is no statistically significant difference in students’ knowledges, attitudes, and practices related to breast self-examination among father’s level of education.

There is no statistically significant difference in students’ knowledges, attitudes, and practices related to breast self-examination among mother’s level of education.

And Students who previously had information about BSE have better knowledges about the signs and symptoms of breast cancer.

**Source of Funding:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Community Health Nursing Department, College of Nursing/Baghdad University-Iraq and all experiments were carried out in accordance with approved guidelines.

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Comparison of the Cyclic Fatigue of Protaper Next, 2Shape and Hyflex EDM Using Glyde

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ABSTRACT

This study aimed to compare the resistance to cyclic fatigue of Protaper Next, 2Shape and HyFlex EDM and assess the effect of glyde. A total of 30 new Protaper Next, 2Shape and HyFlex EDM were tested. From each brand 10 files were tested with glyde. The cyclic fatigue test was performed using a specially designed endodontic motor. Resistance to fracture was determined by recording the time. The study concluded that HyFlex EDM recorded the highest value of resistance to cyclic fatigue than 2Shape and Protaper Next respectively. Glyde may reduce the resistance to cyclic fatigue in all brands of files also was concluded in this study.

Keywords: Cyclic fatigue, Glyde, Reciprocating instruments.

Introduction

Instrument separation is a serious concern in endodontics. Because stainless-steel instruments usually deform before they separate, dentists can inspect them for visible signs of instrument deformation. A deformed instrument usually shows severe bending or unwinding of the flutes, indicating that the elastic limit of the metal has been exceeded and that the instrument should be discarded. Nickel-titanium (NiTi) endodontic instruments were introduced to facilitate instrumentation of curved canals. Ni-Ti instruments are super elastic and will flex far more than stainless-steel instruments before exceeding their elastic limit(1,2). This flexibility is an important property that allows preparation of curved canals while minimizing transportation(3). Despite this increased flexibility separation is still a concern with NiTi instruments and they have been reported to undergo unexpected fracture(4). Separation can occur without any visible signs of previous permanent deformation, apparently within the elastic limit of the instrument. Cyclic fatigue of nickel-titanium engine-driven instruments was studied by determining the effect of canal curvature and operating speed on the breakage of Light-speed instruments. Multivariable analysis of variance indicated that cycles to failure significantly decreased as the radius of curvature decreased from 5 mm to 2 mm and as the angle of curvature increased greater than 30 degree. Scanning electron microscopic evaluation revealed ductile fracture as the fatigue failure mode. These results indicate that for nickel-titanium, engine-driven rotary instruments the radius of curvature, angle of curvature and the instrument size are more important than operating speed for predicting separation.

Materials and Method

Three brands of rotary instrument with tip size 0.25 were used. 10 instruments for each type were tested within the artificial canal. These instruments were tested with glyde.

Group 1 Protaper Next (NiTi rotary instrument tip size 0.25)

Group 2 2Shape (NiTi rotary instrument tip size 0.25)
Group 3 HyFlex EDM (NiTi rotary instrument tip size 0.25)

Each instrument of these groups were subjected to cyclic fatigue testing device specially designed for the purpose that allowed a reproducible placement of the instrument in artificial canal. The instrument rotates freely in a curvature generating tension, compression cycles at the point of maximum flexure until the fracture occurs.

Instruments were tested within the canal (60° angle of curvature) with radius of curvature for all canals was 5 mm and the width of canal was 1.5 mm within a block made from stainless steel with a swiveling glass cover allowed for visualization of the file rotating in the canal and the removal of broken instrument among test. All the instruments were activated with endodontic motor that was connected to a cyclic fatigue test device using (Recipro All) program design. The instance of fracture was based on visual observation of the fracture occurring in the instrument. The time (T) of fracture recorded in second (from starting reciprocating within a canal until fracture occur). An independent t-test was used to compare the cyclic fatigue resistance of Protaper Next, 2Shape and HyFlex in all groups.

**Results**

Descriptive statistic for each file are summarized in Table 1. The mean of cycle to fracture of all HyFlex EDM was greater than 2Shape and Protaper Next (p<0.00). There was a significant difference between Hyflex EDM and Protaper Next also there was a significant difference between Hyflex EDM and 2Shape, but there was no significant difference between Protaper Next and 2Shape when considering the irrigating media (Glyde) as the independent variable.

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protaper Next</td>
<td>10</td>
<td>116.7</td>
<td>68.2</td>
<td>46.7</td>
<td>264.3</td>
</tr>
<tr>
<td>2 Shape</td>
<td>10</td>
<td>137.2</td>
<td>28.6</td>
<td>73.7</td>
<td>173.0</td>
</tr>
<tr>
<td>Hyflex Edm</td>
<td>10</td>
<td>425.9</td>
<td>72.7</td>
<td>337.6</td>
<td>542.5</td>
</tr>
</tbody>
</table>

**Discussion**

Fracturing of rotary nickel-titanium (NiTi) instruments occurs due to torsion or flexural fatigue. Cyclic fatigue failure is reported to occur unexpectedly without any sign of previous permanent deformation. This occurs because of the alternating tension/compression cycles that instruments are subjected to when flexed in the region of maximum curvature of the canal.

Several strategies have been incorporated in the manufacturing process to reduce the incidence of separation of NiTi instruments. These methods include (a) advanced surface treatment or electropolishing that finishes the surface and prevent crack propagation (b) varying the taper within one file and modifying the cross-section, thus reducing the contact area of the instrument with the canal walls (c) heat treatment or thermal processing the optimizes the microstructure of NiTi alloys. Using NiTi instruments in reciprocating motion can enhance the cyclic fatigue resistance. Prptaper Next files (Dentsply Maillefer, Ballaigues, Switzerland) which have been recently launched are designed in such a way that the center of mass or center of rotation is offset. This offset design minimizes the contact between file and dentine in addition it enhances augering debris out of the canal. They are manufactured using M-Wire technology which in combination with the offset design improves the flexibility along the active portion of the file with considerably less iatrogenic error.

The 2Shape file system consist of 2 shaping instruments in continuous rotation increased resistance to instrument fracture. Data from research reported that the resistance of 2shape to cyclic fatigue was 40%. The HyFlex EDM OneFile (HEDM; Coltene/Whaledent AG, Altstatten, Switzerland) is a novel instrument designed and marketed to shape root canals using a single file technique in continuous rotation.

HEDM is manufactured using the technique of electrical discharge machining (EDM). EDM can be used to manufacture all types of conductive materials (eg, metals, alloys, graphite, ceramics and so on) of any hardness with high precision.
The shape of a work piece is changed by building a potential between the work piece and the tools. The sparks initiated in this process are melting and vaporizing the material of the work piece in its top layer.

From the result of the present study it’s clear that the mean cycle to fracture of HyFlex EDM is greater than that of 2Shape and Protaper Next, and that was due to it’s properties as:

1. HyFlex EDM files are produced using an innovative manufacturing process called Electrical Discharge Machining. The EDM process results in a file that is extremely flexible and fracture resistant. In fact HyFle EDM files are up to 700% more resistant to cyclic fatigue compared to traditional NiTi files\(^{(18)}\). While 2Shape files are up to 40% resistant to cyclic fatigue.

2. HyFlex EDM files follow the anatomy of the canal which can significantly reduce the risk of ledging, transportation and perforation.

3. The combination of flexibility, fracture resistance and cutting efficiency of the HyFlex EDM make it possible to reduce the number of files required for cleaning while preserving anatomy.

Finally HyFlex EDM owes its unique properties to a breakthrough technology called ‘Electrical Discharge Machining’. This innovative manufacturing process uses spark erosion to harden the surface of the NiTi file resulting in superior fracture resistance and improved cutting efficiency. HyFlex EDM files offer trusted controlled memory effect and regenerative properties.

**Conclusion**

Cyclic fatigue resistance of HyFlex EDM was higher than that of 2Shape and Protaper Next respectively with the use of Glyde as irrigant solution.

**Source of Funding:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Department of Conservative and Cosmetic Dentistry, Collage of Dentistry, University of Baghdad, Baghdad, Iraq and all experiments were carried out in accordance with approved guidelines.

**REFERENCES**


Assessment of Knowledge and Practices of Pregnant Women Toward Antenatal Care Services at Primary Health Care Centers in AL Hila-City

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¹MSc. Student, Maternity and child health Department, ²Professor, Community Health Nursing Department, College of Nursing, University of Babylon, Hilla City, Iraq

ABSTRACT

Today, it is well-known that knowledge and practices of pregnant mothers about prenatal care are essential for the health of women and fetuses and also through pregnancy, breastfeeding and childbirth. Interventions, education and information, for pregnant mothers is a catalytic process. A descriptive, cross-sectional study design at (10) PHC centers selected randomly from total (48) PHC centers affiliated to first and second health care sector in Al Hilla City from 30/July/2018 to 29/July/2019. A constructed questionnaire was prepared and adopted by the researcher direct (face to face) interview to meet the objectives of the study, it contains : socio-demographic data, reproductive history of the sample, knowledge of pregnant women about importance of antenatal care services and practices of pregnant women toward antenatal care services. Findings of the study revealed that the mean overall knowledge score of the study participants for all domain (2.08) which indicated that the overall knowledge of mothers regarding antenatal care was fair, and the current study also showed that the mean overall practices score of the study responses for all domain (1.93) which indicated that the overall practices of mothers regarding antenatal care was fair.

Keywords: antenatal care, knowledge, practices, pregnant women

Introduction

Pregnancy is a unique and powerful feminine experience. It is a normal process that leads to a series of both psychological and physiological changes in expectant mothers. (1) Pregnant women should receive special care and attention from the health care community and the family. Therefore, Pregnancy is a very important social and medical event (2). The normal gestation period is nine months during this period of external and internal changes in the body of the pregnant mother. The mother is prepared during this period for her new role in motherhood. Gradually move to attend to another object of life (3). Antenatal care services are not just interventions; they are a series of interventions and assessments of expectant mothers by health care providers. However, some developing countries can not apply these services uniformly and effectively (4). Prenatal care means that care during pregnancy by a caregiver at a medical facility or at home, and the need for ANC services by explaining its many benefits, which may include monitoring child mother during pregnancy, anticipating difficulties in birth and pregnancy through first management to reduce maternal and child risk, facilitating better use of emergency obstetric care, and disseminating information health and education (5). In a large number of studies done among pregnant mothers, it was found that mothers who did not receive good care from ANC were more likely to have premature birth, and there was a clear correlation between the quality of poor ANC and infant mortality (6). The World Health Organization (WHO) is advice the mother to take blood, urine, weight, height and blood pressure tests on each visit. The World Health Organization (WHO) urged women to be their first visit within eight to twelve weeks after pregnancy and the second visit between twenty-
four and twenty-six weeks of gestation, the third visit between thirty-two weeks and the fourth visit between thirty-six and thirty-eight weeks (7). In Iraq, according to (Dawood, 2017), it was reported that the antenatal care visits up to 28 weeks every four weeks, (28-36) weeks every two weeks, and from 36 to delivery every week. In addition, the Iraqi Ministry of Health has confirmed the same instructions for visits during pregnancy. (8)

Methodology

Objectives: The purpose of the current study was to assess the knowledge and practices of pregnant mothers regarding antenatal care services at primary health care centers in Al-Hila – City. The current study also aims to determine the association between the knowledge and practices of pregnant mothers toward the antenatal care services with their socio-demographic and personal characteristic such as (age, level of education, economic level)…..etc

Design of the Study: A descriptive cross-sectional study design was conducted from 30/July/2018 to 29/July/2019 to meet the previously mentioned objectives

Study Sample: The study included a non-purposive sample of (432) pregnant mothers who attended PHCCs in Al-Hilla City.

Study instrument: A constructed questionnaire was prepared and modified after a thorough review of the relevant literature. This questionnaire covers four parts:

Part 1: Socio- demographic and personal characteristics which is contained of seven items, that consist of the level of education, age, occupation of pregnant women, husband’s education, husband’s occupation residency and economic status.

Part 2: Reproductive history of the sample which is consisted of (12) items gravidity, age at marriage, parity, age at the first child, number of abortion, gestational age of pregnancy, place of delivery of the last baby, smoking status, smoking status of husband, health problems, obstetric problem and previous mode of delivery.

Part 3: Knowledge of pregnant women about the importance of antenatal care services which is consisted of (19) items.

Part 4: Practices of pregnant women toward antenatal care services which is consist of (13) items

Validity and Reliability: The content validity of the instrument was established through a panel of (12) experts, the reliability of the items was based on the internal consistency of the checklist was assessed by calculating Cronbach Alpha which was= 0.78

Data Collection and Data Analysis: A structured questionnaire used to collect data by direct interview. The approximate interview time was (25-30) minutes was provided for the questionnaire completion. Data collection is performed from Jan.2nd, 2019 to Feb.2nd, 2019 to determine whether the objectives of the study were met, the current study data were analyzed by using SPSS, version 25.

Results and Discussion

Table 1: Distribution of Smoking Status Among Participating Women and Husbands

<table>
<thead>
<tr>
<th>Variable</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking Status (woman)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoker</td>
<td>21</td>
<td>4.9</td>
</tr>
<tr>
<td>Non smoker</td>
<td>411</td>
<td>95.1</td>
</tr>
<tr>
<td>Total</td>
<td>432</td>
<td>100</td>
</tr>
<tr>
<td>Place of Smoking for Woman</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In home</td>
<td>12</td>
<td>57.1</td>
</tr>
<tr>
<td>Outside of home</td>
<td>6</td>
<td>28.6</td>
</tr>
<tr>
<td>Both of them</td>
<td>3</td>
<td>14.3</td>
</tr>
<tr>
<td>Total</td>
<td>21*</td>
<td>100</td>
</tr>
<tr>
<td>Smoking Status (Husband)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoker</td>
<td>108</td>
<td>25.0</td>
</tr>
<tr>
<td>Non-smoker</td>
<td>324</td>
<td>75.0</td>
</tr>
<tr>
<td>Total</td>
<td>432</td>
<td>100</td>
</tr>
<tr>
<td>Place of Smoking (Husband)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In home</td>
<td>18</td>
<td>16.7</td>
</tr>
<tr>
<td>Outside of home</td>
<td>15</td>
<td>13.9</td>
</tr>
<tr>
<td>Both of them</td>
<td>75</td>
<td>69.4</td>
</tr>
<tr>
<td>Total</td>
<td>108**</td>
<td>100</td>
</tr>
</tbody>
</table>

*No. of smoker women
** No. of smoker husbands

Table 2: Overall Knowledge Assessment of the Studied Group

<table>
<thead>
<tr>
<th>Overall Knowledge</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>54</td>
<td>12.5</td>
</tr>
<tr>
<td>Fair</td>
<td>341</td>
<td>78.9</td>
</tr>
<tr>
<td>Poor</td>
<td>37</td>
<td>8.6</td>
</tr>
<tr>
<td>Total</td>
<td>432</td>
<td>100.0</td>
</tr>
</tbody>
</table>
Maternal Age (year)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Statistic*</th>
<th>with Knowledge Score</th>
<th>with Practice score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal Level of Education</td>
<td>R</td>
<td>-0.075</td>
<td>0.291</td>
</tr>
<tr>
<td></td>
<td>P. value</td>
<td>0.118</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Maternal Occupation</td>
<td>R</td>
<td>0.233</td>
<td>-0.526</td>
</tr>
<tr>
<td></td>
<td>P. value</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Husband's Education</td>
<td>R</td>
<td>0.256</td>
<td>0.205</td>
</tr>
<tr>
<td></td>
<td>P. value</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Husband's Occupation</td>
<td>R</td>
<td>0.130</td>
<td>-0.481</td>
</tr>
<tr>
<td></td>
<td>P. value</td>
<td>0.007</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Table 3: Bivariate Correlation Matrix of Demographic Characteristics with Overall Knowledge and Practice of the Studied Group

All through the progression of current study, the research outcomes indicated a total of 432 pregnant mothers were enrolled in this present study, the age of majority of the studied group ranged from (20 to 39) years where 69 women (16%) aged less than 20 years, 173 (40%) aged from (20 – 29) years, 182 (42.1%) aged from (30 – 39) years while only 8 women (1.9%) aged 40 years or above, this finding is supported by Laishram et al., (2013) in India who found that the ages of their study participants ranged from (20-29) years old. Regarding the level of education, not able to read and write represented (5.1%), those who able to read and write were 68 (15.7%), primary school level 103 (23.8%), intermediate 69 (16%), high school 44 (10.2%), institutes 36 (8.3%) and college and above were 90 (20.8%). This result corresponding with a study that carried out by Abdul-ALHusain (2015) in AL-Hilla city, among the total study participants 96 (43.6 %) were educational level attended primary schools only. Concerning maternal occupation distribution revealed that women 192 (44.4%) were housewives, 148 (34.3%) private sector employee 74 (17.1%) government employee and 18 (4.2%) students. This result is supported by the study conducted by Dawood (2017) in Basra city who showed 89 (89%) of his studied sample were housewives. The result of the present study may be associated with their educational level, in which highest percentage of them were graduated from primary schools, accordingly, having job opportunities for them is less. In relation to level of husband education, able to read and write represented 54 (12.5%), primary school level 70 (16.2%), intermediate 69 (16%), high school 64 (14.8%), institutes 57 (13.2%) and college and above were 118 (27.3%), this result similar to study done by Habib et al (2017) in Saudi Arabia, the result of their sample was 678 (41.9%) graduated from college and above, this also reflects that the husband education level for studied sample is good.

In regard to smoking history of husbands (75.0%) were non-smokers. The result of under hand study supported by study titled “Assessments of knowledge and attitudes of pregnant women of antenatal - and post natal care, Al- Seef primary health care center, in Basra city (2017)” that conducted by Dawood, who stated that majority of (88%) were non-smokers. Result of the present study reveals that there is no significant relationship between knowledge with (maternal age, residence, economic status, and having health problem) at p-value ≤ 0.05 as evidenced by not significant difference were found among overall knowledge and its subdomains. While, the current study that indicates there is relationship of knowledge with their level (education) at p-value P<0.001. This is may be due to their low level of education as we found that high percentage of them were attended primary school only. The finding is similar to a study done by Patel et. al., in Maharashtra, (2018) who found statistically relationship of level education and maternal level of their knowledge about antenatal care services in (p-value = 0.001). Moreover, the finding of this study go along with another cross-sectional study that carried out by Laishram et al., (2013), who found that there was statistically significant association between maternal knowledge and their education at status at (p-value <0.05). In regard to husband’s education, the current study indicates significant relationship of husband’s education and knowledge of pregnant women (R = 0.130, P = 0.007). This means the well-educated husbands have an important role in encouraging their wives to learn and to increase their knowledge about antenatal care services. This result is consistent with a study entitled done by Aahirwar (2018) who found that husband’s education have statistically significant association with antenatal women knowledge at (p-value = 0.0001).
Conclusions

It was concluded that the pregnant women have a moderate level of knowledge and practices about antenatal care services. They have a moderate level of knowledge about benefit of tetanus toxoid injection, time of given folic acid during antenatal care and information given to participants about smoking, also moderate level of practice related to: registration during first trimester, breast statues during pregnancy and consult others. They have weak knowledge about many items of antenatal care services such as first antenatal care check-up, time of given Iron during antenatal care and gestational diabetes higher risk of big babies.

Source of Funding: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Nursing, University of Babylon, Hilla City, Iraq and all experiments were carried out in accordance with approved guidelines.

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Evaluation of Echocardiographic Parameters in Patients with White Coat and Masked Hypertension Detected by Ambulatory Blood Pressure Monitoring

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ABSTRACT

The aim of this study was to assess the echocardiographic changes in patients who have masked hypertension (MH) and white coat hypertension (WCH) depending on monitoring of blood pressure by ambulatory method. This study was conducted on (66) subjects in a private clinic in Al-Hilla city; the subjects underwent a (24 hours) ABPM in addition to transthoracic echocardiography. Based on the readings of ABP measurements, average and maximum (24 hours) diastolic and systolic blood pressures (BP) were analyzed during mean nighttime (from 10 p.m. to 6 a.m.) and during mean daytime (from 6 a.m. to 10 p.m.). The echocardiographic parameters included the measurement of left atrial size, left atrial diameter (LAD), posterior cardiac wall thickness (PWT), anterior cardiac wall thickness (AWT), E/A ratio, left ventricular end-diastolic diameter (LVEDD), and isovolumic relaxation time (IVRT). The percentage of patients having WCH was higher than MH 41:66 (62%) vs. (38%) (25:66). Regarding WCH, there were few patients had personal history of hypertension 5 (12%) and most of them had family history of hypertension 36 (88%), while in case of MH, all patients had negative personal history of hypertension and most of them had negative family history 21 (84%) of hypertension.

Keywords: Echocardiographic parameters, ABPMs, white coat hypertension, masked hypertension.

Introduction

Ambulatory blood pressure monitoring (ABPM) was described for the first time since 40 years 1. The ambulatory monitoring tools record blood pressure automatically for (24 hours) duration or more while patients perform the daily activities normally 2. Oscillometric Technique Share used in most monitors. They are tied on a belt and are connected by a plastic tube to the sphygmomanometer cuff on the upper arm 3. The arm of subjects should remain still during inflation of the cuff in addition to avoiding severe physical activities during monitoring 4. The monitor program takes readings every quarter to half hour during the night and the day, thereadings then are downloaded into a computerat the end of the recording period 5, 6.

White coat hypertension (WCH) can be defined as the clinic blood pressure of (140/90 mmHg) or more on at least three visits, with measurements of less than (140/90 mmHg) at least two occasions in non-clinic settings with no target-organ damage 7. The importance of this diagnosis comes from general acceptance that WCH patients have low risk and weekly benefit from antihypertensive drugs [8]. Some WCH patients may develop sustained hypertension, with increased risk of stroke after six years, so the continuous follow-up with ABPM is important [9]. Masked hypertension (MH) is defined as a clinic blood pressure less than (140/90 mmHg) at least three visits and more than (140/90 mmHg) at least two occasions in non-clinic settings by ABPMs 10. The risk of cardiovascular complications of patients with MH is under estimate during the clinic blood pressure measurements 11. This study is aimed to assess the echocardiographic parameters in patients with WCH and MH as determined by ABPMs.

Methodology

This is a cross-sectional study was done in a private clinic in the period from November 2018 to May 2019, it included 66 subjects with no history of hypertension, chronic heart diseases, diabetes mellitus or other chronic diseases. Demographic data were taken from each subject that included age, gender, personal and family history of
hypertension, and the type of hypertension whether MH or WCH, body mass index (BMI) was measured by the dividing the weight (in kg) to height (in square meters). The (24 hours) ABPM was performed during day and night at home, during working days, when the subjects performing their usual activities. It was performed by Medset system (Korea) according to current guidelines. The program of the device was as the following: the readings of BP was obtained at (20-minute) intervals during the day (starting from 6 a.m. to 10 p.m.) with (30-minute) intervals during the night (starting from 11 pm to 7 am), the readings of recordings were then analyzed to give us a (24 hours), nighttime and daytime average diastolic BP (DBP), systolic BP (SBP), and cardiac rate which then down loaded to a personal computer (PC) to be processed with specialized software to obtain the values of nighttime and daytime average diastolic BP (DBP) and systolic BP (SBP).

The echocardiographic parameters were done by using a commercially available ultrasound system (Philips, USA, Clearvue 350 with harmonic probe S 4-1). Left atrial diameter (LAD), LA size, left ventricular end-diastolic diameter (LVED, posterior wall thickness (PWT), anterior wall thickness (AWT), EA ratio and iso-volumic relaxation time (IVRT) were measured by M-mode, a transthoracic echocardiogram were done for all study subjects.

**Statistical Analysis:** The statistical analysis for all results in this study was performed by using the SPSS version18. Some continuous variables expressed as number and percentage while others variables were expressed as mean ± standard deviation (SD) by using descriptive and frequency analysis. Cross-tabulation and T-test was used to analyze some categorical and continuous data. The level of p values< 0.05 was regardeda statistically significant.

**Results and Discussion**

This study enrolled 66 patients, (41 males and 25 females) and the mean age was 44.48 ± 11.147.

**Relation between gender and types of hypertension:** There was no significant relation between gender and types of hypertension as illustrated in table (1).

<table>
<thead>
<tr>
<th>Types of hypertension</th>
<th>Gender No.(%)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Males (No.41)</td>
<td>Females (No.25)</td>
<td>P-value</td>
</tr>
<tr>
<td>White coat hypertension</td>
<td>27 (66%)</td>
<td>14 (56%)</td>
<td>0.2</td>
</tr>
<tr>
<td>Masked hypertension</td>
<td>14 (34%)</td>
<td>44%</td>
<td></td>
</tr>
</tbody>
</table>

**Distribution of hypertension types according to personal and family history of hypertension:** Regarding WCH, Therewere few patients had personal history of hypertension and most of them had family history of hypertension while in case of MH, all patients had negative personal history of hypertension and most of them had negative family history of hypertension as illustrated in table (2) and table (3).

<table>
<thead>
<tr>
<th>Types of hypertension</th>
<th>Personal history of hypertension No. (%)</th>
<th>Total</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive</td>
<td>Negative</td>
<td></td>
</tr>
<tr>
<td>White coat hypertension</td>
<td>5 (12%)</td>
<td>36 (88%)</td>
<td>41(100%)</td>
</tr>
<tr>
<td>Mask hypertension</td>
<td>0 (0%)</td>
<td>25 (100%)</td>
<td>25(100%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Types of hypertension</th>
<th>Familyhistory of hypertension No. (%)</th>
<th>Total</th>
<th>P -value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive</td>
<td>Negative</td>
<td></td>
</tr>
<tr>
<td>White coat hypertension</td>
<td>36 (88%)</td>
<td>5 (12%)</td>
<td>41 (100%)</td>
</tr>
<tr>
<td>Mask hypertension</td>
<td>4 (16%)</td>
<td>21 (84%)</td>
<td>25 (100%)</td>
</tr>
</tbody>
</table>
1. Relation between EA ratio and type of hypertension: Table (4) shows significant relation between EA ratio and type of hypertension (p=0.000) and the ratio was increased more in MH than WCH.

### Table 4: Relation between EA ratio and type of hypertension

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>EA No. (%)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.6</td>
<td>0.7</td>
</tr>
<tr>
<td>White coat hypertension</td>
<td>2 (5%)</td>
<td>26 (63%)</td>
</tr>
<tr>
<td>Masked hypertension</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Total</td>
<td>2 (3%)</td>
<td>26 (40%)</td>
</tr>
<tr>
<td>P-value</td>
<td>0.000</td>
<td></td>
</tr>
</tbody>
</table>

2. Relation between masked and white coat hypertension with echocardiographic parameters: There was significant relation between types of hypertension and all calculated echocardiographic parameters, the changes in MH were more than those in WCH as illustrated in table (5).

### Table 5: Relation between MH and WCH and echocardiographic parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Mean ± SD</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Masked hypertension No. = 41</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White coat hypertension No. = 25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Awt</td>
<td>11 ± 2.03</td>
<td>8.8 ± 0.95</td>
</tr>
<tr>
<td>Pwt</td>
<td>8.93 ± 1.42</td>
<td>7.4 ± 0.96</td>
</tr>
<tr>
<td>EA ratio</td>
<td>0.75 ± 0.10</td>
<td>1 ± 0.00</td>
</tr>
<tr>
<td>LAD</td>
<td>24.10 ± 3.5</td>
<td>20.48 ± 1.5</td>
</tr>
<tr>
<td>IVRT</td>
<td>112.68 ± 32.7</td>
<td>75.80 ± 11.33</td>
</tr>
<tr>
<td>LVEDD</td>
<td>45.88 ± 4.7</td>
<td>42.32 ± 2.07</td>
</tr>
</tbody>
</table>

pwt= posterior wall thickness, Awt= anterior wall thickness, EA= early (E) to late (A) ventricular filling velocities, LAD= left anterior diameter, IVRT = Iso-volumic relaxation time, LVEDD = left ventricular end-diastolic diameter.

3. Relation between masked and white coat hypertension with ambulatory blood pressure readings: There was significant relation between types of hypertension with average and maximum ambulatory measurements of blood pressure during daytime and night as shown in table (6), the readings were higher in MH patients than patients with WCH.

### Table 6: Relation between MH and WCH with ABPM

<table>
<thead>
<tr>
<th>Ambulatory blood pressure readings</th>
<th>Masked hypertension No. = 41</th>
<th>White coat hypertension No. = 25</th>
<th>P-values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean ± SD</td>
<td>Mean ± SD</td>
<td></td>
</tr>
<tr>
<td>ASBP at daytime</td>
<td>126.37 ± 10.51</td>
<td>113.08 ± 10.045</td>
<td>0.000</td>
</tr>
<tr>
<td>ADBP at daytime</td>
<td>75.12 ± 7.82</td>
<td>69.76 ± 9.666</td>
<td>0.01</td>
</tr>
<tr>
<td>ASBP at night</td>
<td>125.83 ± 8.85</td>
<td>116.08 ± 14.384</td>
<td>0.001</td>
</tr>
<tr>
<td>ADBP at night</td>
<td>74.20 ± 8.3</td>
<td>69.92 ± 13.46</td>
<td>0.1</td>
</tr>
<tr>
<td>MSBP at daytime</td>
<td>169.41 ± 24.83</td>
<td>150.64 ± 21.93</td>
<td>0.003</td>
</tr>
<tr>
<td>MDBP at daytime</td>
<td>106.66 ± 24.93</td>
<td>103.68 ± 25.406</td>
<td>0.6</td>
</tr>
<tr>
<td>MSBP at night</td>
<td>149.76 ± 18.64</td>
<td>143.20 ± 23.372</td>
<td>0.2</td>
</tr>
<tr>
<td>MDBP at night</td>
<td>92.12 ± 12.53</td>
<td>95.64 ± 17.15</td>
<td>0.3</td>
</tr>
</tbody>
</table>

ASBP= average systolic blood pressure, ADBP= average diastolic blood pressure, MSBP= maximum systolic blood pressure, MDBP= maximum diastolic blood pressure.
In this study, we provided the new insight to cardiac mechanical dysfunction in WCH and masked hypertensive patients. The highly increased risk of occurrence of cardiovascular events lies behind the clinical importance of MH and WCH. Our study reassured the unfavorable effect of WCH and MH on left ventricular function and structure. The percentage of patients with WCH was larger than MH patients (62% versus 38). There are many mechanisms that illustrate the effect of WCH on cardiac remodeling. One of them is that the humoral mechanisms that include increased stimulation and interactions of the renin-angiotensin-aldosterone system and sympathetic system which can lead to pulmonary vascular hyper-reactivity. There are no definitive cause and mechanisms for MH, some studies revealed that there is correlation between MH and young age, male gender and smoking. Our study showed that subjects who had MH have larger target organ damage than WCH, and this agrees with some longitudinal studies like one of them that revealed patients with MH had more cardiovascular morbidity. In addition to a study performed by Ohasama which revealed that the cardiovascular mortality risk was larger for patients with MH and sustained hypertension than for those patients with established normal blood pressure and WCH patients. The explanation for this finding might be related to the fact that patients with masked hypertension remain for long duration without diagnosis and treatment.

**Conclusion**

This study showed the impairment of LV mechanical function in white coat hypertension and masked hypertension and the effect of MH was greater than WCH in addition to the great benefit of using ambulatory blood pressure monitoring to evaluate those patients which is clinically more superior than traditional blood pressure measurements.

**Source of Funding:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Hammurabi College of Medicine, University of Babylon and all experiments were carried out in accordance with approved guidelines.

**Reference**


The Role of Salivary Cortisol and *Mutans Streptococci* in the Development of Early Childhood Caries

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¹Master Student, ²Assistant Professor, Department of Pedodontics and Preventive Dentistry, ³Professor, Department of Basic Science, College of Dentistry, University of Baghdad

**ABSTRACT**

Hypothalamic-pituitary-adrenal system release salivary cortisol hormone, which may encourage the proliferation of *Mutans Streptococci*. The aim of this study was to assess the impact of salivary cortisol and *Mutans streptococci* on the development of early childhood caries. Eighty children aged 4-5 years old were randomly divided into two groups (forty for each), early childhood caries group and caries free group. Dental caries was determined by measuring the dmfs according to WHO (1987), collection of unstimulated saliva was done and laboratory investigations was carried out to measure the viable count of *Mutans Streptococci*. Salivary cortisol was measured using cortisol kit (electrochemiluminescence immunoassay “ECLIA”). Statistical analysis was done using SPSS version 23. The statistical analysis showed that salivary cortisol and the viable count of *Mutans Streptococci* were significantly higher among the early childhood caries group than that found among the caries free group. Moreover, a significant positive association was found between salivary cortisol and the viable count of *Mutans Streptococci*. Salivary cortisol level was increased in children with early childhood caries so as the viable count of *Mutans Streptococci*, so it may play a role and has an impact on the bacterial proliferation in those children.

**Keywords:** Cortisol, early childhood caries (ECC), Mutans Streptococci (MS).

**Introduction**

Early childhood caries (ECC) is a critical widespread health problem in both industrialized and developing countries. It is defined as the “presence of one or more, decayed non cavitated or cavitated lesions, missing teeth due to caries, or filled tooth surfaces in any primary tooth in a child 71 of months age or younger”². The process of caries initiation in ECC is the same as that found in other type of dental caries. Several etiological factors were identified in the development of ECC e.g., cariogenic microorganisms (flora), susceptible tooth (host), fermentable carbohydrate (diet) and time ³. Feeding practice, stress and socioeconomic status were recognized also to be risk factors ⁴⁻⁹. ECC is a fast-growing form of tooth decay, in which there is intensive infection with *Mutans streptococci* (MS), which sometimes surpass 30 % of the cultivable “plaque-biofilm flora” ¹⁰. *Mutans Streptococci* are the main cariogenic microorganisms associated with this type of disease ¹¹. It had been detected that the level of *Streptococcus mutans* (in plaque and saliva) was higher significantly among children with severe ECC than those who were caries-free ¹². On other hand, it had been reported that highly anxious children had more proximal dental caries in contrast to the low anxious group ¹³. The levels of salivary cortisol give a precise, dependable, and non-invasive evaluation of stress together in children and adult ¹⁴⁻¹⁶, and used appropriately to observe the systemic “adrenocortical-response” to stress ¹⁷. In dentistry, salivary cortisol had been used to measure the role of stress in a variety of settings such as, anxiety from dental treatment, dental caries and periodontal disease ¹⁸⁻²². In Iraq, there is no previous study concerning the relationship between ECC and stress. In addition, there is scarcity of literature on this relationship, so, the current study was designed to assess whether there was any association between salivary cortisol level and *Mutans Streptococci* bacteria in children with ECC in an attempt to evaluate the effect of the stress as a risk indicator for early childhood caries among Iraqi children.
Materials and Method

An approval was gained from the Scientific and the Ethical Committee in College of Dentistry/University of Baghdad/Iraq, after the submission and the reviewing of the study protocol. The study last for 4 months from January until the end of April 2019. Several public kindergartens from (Al-Karkh sector) were visited after getting the permission and an approval from the Directorate of General Education in Baghdad city in order to conduct the study at these kindergartens without any obstacles. Objectives of this study were explained to the kindergartens authority to get their cooperation as much as possible and that was done by a formal documents. Prior to children enrolment, the study design, purposes and probable benefits were explained to the children’s parents, ensuring them for their right to withdraw (if they wanted) from this study at any time they want and a written signed consent was obtained from them regarding their acceptance for the involvement of their children in the current study. Two hundred and fifty child aged between 4 to 5 years old were examined visually and dental caries measurement (dmfs) was recorded according to WHO. Forty child (the study group) were categorized as ECC according to Wyne. Another 40 child had been selected who were free of dental caries (the control group who were matching the study group by age, gender and they were from the same geographical area). A questionnaire was designed concerning the general health of the selected children to ensure that they were free from any systematic disease and did not take any medications for at least the last fifteen days, which could affect the hormone level and MS count.

In the morning between 9–11 AM, unstimulated saliva collection was carried out, in which part of it was used for serial dilution and the other part centrifuged at 3000 rpm/10min and the supernatant stored in deep freeze to be used later for the determination of salivary cortisol. Serial dilution from $10^{-1} - 10^{6}$ was done using (PBS) and then were cultured in the Mitis Salivaris Bacitracin agar (MSB). Simple identification to MS by gram stain, colony morphology, catalase test and manitol fermentation test was taken place, then counting of the MS was done according to Al-Mizraqchi 1998 (25) and the result was represented in colony forming unit (cfu/ml).

Salivary cortisol level was determined using a cortisol kit (electrochemiluminescence immunoassay “ECLIA” which were intended for use on Elecsys and cobase immunoassay analyzer) by following the manufacturer’s instructions and the results were expressed in μg/dL. The impact of salivary cortisol and Mutans streptococci was demonstrated using statistical test (student’s t-test and simple linear regression) relies on SPSS program version 23, if the p value was <0.05 it was considered as statistically significant.

Results

According to the findings of the present study, salivary cortisol level was significantly differed between the two groups (p = 0.002), the lower mean was found among children who were caries free (0.67) compared to the ECC group (0.68). With regard to the viable count of Mutans Streptococci (CFU/ml) ×10⁵ among the two groups, the mean value was found to be higher among the ECC group (160.15 CFU/ml) than that found among the caries free group (41.75 CFU/ml). The statistical analysis showed that there was a highly significant difference between the two groups, p value was (0.000), Table (1).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Early childhood Caries group</th>
<th>Caries free group</th>
<th>Statistical analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salivary Cortisol (μg/dl)</td>
<td>0.68 ± 0.02</td>
<td>0.67 ± 0.02</td>
<td>t-test 3.17 df 78</td>
</tr>
<tr>
<td>Mutans Streptococci CFU/ml×10⁵</td>
<td>160.15 ± 123.43</td>
<td>41.75 ± 24.85</td>
<td>p-value 0.002</td>
</tr>
</tbody>
</table>

By using simple linear regression, a positive significant association was found between the salivary cortisol level (μg/dl) and Mutans Streptococci (CFU/ml×10⁵) (Fig.1)
Many etiological and associated risk factors are responsible for the development of ECC. Therefore, it is considered as multifactorial disease and these factors include, biological (26), psychological and behavioral risk factors (27). Stress may influence the relationship between ECC and the psychological factors. Therefore, a considerable attention had been given for the association between early childhood caries and stress in children (28). Many hormones and neurotransmitter released by the hypothalamic-pituitary-adrenal system in response to a stressful situation, this will suppress the activity in the brain and trigger an emotional response of “fear”. After a stressful stimuli, cortisol hormone secreted to the circulation and act as a key event in the activation of hypothalamic-pituitary-adrenal system. Periodontal diseases strongly associated with many psychological variable like stress, depression and anxiety. The oral cavity affected by chronic stress in many ways, the major salivary glands may undergo atrophic changes because of corticosteroids secretion, altering the total volume and the composition of the saliva, stress may cause reduction of the salivary flow rate. Salivary cortisol can be used as a helpful biomarker of adrenocortical function and as an indicator for stress, even its level correspond to 50–60% of plasma cortisol concentrations (30,31). Saliva collection procedure was found to be non-invasive and the children were found to be more comfortable to it. So that in the present study, salivary cortisol level was used which can be achieved without undue discomfort. Results of the present study revealed that salivary cortisol level among the ECC group was significantly higher than that found among the caries free group. This was came in accordance with the other studies (23). While other study (27), stated an opposite result when it found no significant differences in the salivary cortisol levels between the early childhood caries group and the caries free group. This controversial finding might be due to the differences in the sample size, age, method of analysis and time of saliva collection or it could be due to the differences in the socioeconomic status. Dental caries was increased in children with stressful emotional states; this is because of that stress may cause immunosuppression, which might make those children more susceptible to infection with S. mutans or other.
types of bacteria \(^{19}\). In the present study, the results demonstrated an increase in the mean value of *Mutans streptococci* (MS) among children with ECC, which was significantly higher than its value among the caries free group. This result was in agreement with other studies \(^{33}\). The cariogenicity of *Mutans streptococci* result from its acidogenic and aciduric properties \(^{34}\). There is a strong correlation between the amount of MS and the presence of the decayed teeth. *Mutans streptococci* amount reduced when the decayed surfaces treated with the filling materials. So, it is important to monitor the child’s oral hygiene during early childhood \(^{35}\). Concerning the impact of salivary cortisol level on the viable count of *Mutans streptococci*, there was a positive significant association between these two variables among the study and the control group. No available data was found from previous studies concerning the relation between the salivary cortisol level and the viable count of *mutans streptococci* in children with ECC and those who were caries free. However, the relation between salivary cortisol level and MS bacteria that was contributed to dental caries experience might be explained through several possible reasons like; elevated salivary cortisol level might cause immune suppression in the oral cavity, which induce proliferation of the cariogenic bacteria leading to increase in the incidence of dental caries \(^{7}\). There is a positive association between dental caries and basal salivary cortisol secretion, from a theoretical perspective; salivary cortisol could suppress mucosal immunity against cariogenic bacteria. During stress the body’s cortisol level increase producing “acid” which provide suitable medium for these bacteria, also atrophic change of the major salivary glands caused by corticosteroids which lead to decrease the quantity (volume) and composition of the saliva, decreasing salivary secretion will reduce the clearance of cariogenic bacteria \(^{36}\).

**Conclusion**

In conclusion, the viable count of *Mutans Streptococci* increased in children with ECC. The results of the current study highlight a relationship between ECC and the salivary cortisol level in children. ECC was positively associated with increased salivary cortisol levels and the viable count of MS. Within the limitations of this study, it can be concluded that a definite relationship was existed between salivary cortisol levels and ECC among children.

**Source of Funding:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Department of Pedodontics and Preventive Dentistry, College of Dentistry, University of Baghdad and all experiments were carried out in accordance with approved guidelines.

**REFERENCES**


Association between Family Cohesion and Mental Health–Related Quality of Life for Secondary School Students in Amara City

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ABSTRACT

The aim of the study is to identify the association between students’ age, family’s socioeconomic status, family cohesion, and mental health-related quality of life, and to investigate the differences in students’ mental health-related quality of life between the groups of grade, socioeconomic status, living arrangements, birth order, and academic achievement. A descriptive correlational design. In this study, several variables were examined to determine the association between family cohesion and mental health-related quality of life. The target population for this study was drawn from middle and high school adolescents, aged 11 to 22-years, who were living in Amara City. The Family Relations and Cohesion Scale - Student Survey of Risk and Protective Factors (Social Development Research Group, University of Washington, n.d.) was used to measure family interaction and cohesion, which includes six items. The mean age is 16.08 ± 1.99; more than a half age 17-18-years (n = 202; 33.7%), followed by those who age 15-16-years (n = 176; 29.3%), those who age 13-14-years (n = 142; 23.7%), those who age 19-20-years (n = 68; 11.3%), those who age 11-12-years (n = 8; 1.3%), and those who age 21-22-years (n = 4; 0.7%).

Keywords: Association; Family Cohesion; Mental Health –Related Quality of Life; Secondary School; Students.

Introduction

Family systems theory is one of the main theories in the behavior and sociology disciplines. Family systems theory was advanced by pioneers in family therapy during the fifties of the last century in the wake of perusing dealing with general frameworks hypothesis1. General system and family systems theory hypothesis established the framework for other family speculations. Intergenerational family theories incorporate such hypotheses as Bowen’s family treatment, relevant family treatment, and item relations family treatment2. The intergenerational models all conceptualize families inside generational examples and see change occurring because of understanding these examples. Bowen built up his hypothesis all through his vocation in the wake of working with mother–youngster dyads in which the tyke was determined to have schizophrenia and afterward later working with families without mental judgments3. Various researchers have discussed the reasons for making life quality a focal point for mental health evaluation. Some of the reasons are simply negative, dwelling on all the things which are incorrect in the way that we conceptualize mental disorders and treat people with them; others are more positive, focusing on potential gains to the client, the helping professions and the general community of focusing on life quality issues4. The contents of the Mental health category of quality of life include e.g., positive affect, negative affect (psychopathology—symptoms), affect balance, stress, happiness and morale, Personality, e.g., self-concept, locus of control, extroversion/introversion, Adjustment, social adaptation and personal growth, subjective quality of life e.g., mastery, independence, values5. Inside family frameworks and subsystems, enthusiastic atmospheres create which control how relatives collaborate with one another and how social elements are seen6. There was a positive correlation between adolescents’ report of cohesion and parents’ report of cohesion. However, there was a negative correlation between adolescents’ report of cohesion and parent reports of conflict and impairment. Furthermore, there was a positive correlation between adolescents’ report of conflict and adolescent report of impairment, parents’ reports of conflict and impairment,
and clinician report of impairment. Additionally, there was a negative correlation between parent report of cohesion and parent reports of conflict and impairment and clinician report of impairment. There was a positive correlation between parent report of conflict and parent report of impairment. Consistently, there was a positive correlation between clinician report of impairment and adolescents’ report of impairment and parent report of impairment.

Materials and Method

The research design for this study was a descriptive correlational design. In this study, several variables were examined to determine the association between family cohesion and mental health-related quality of life. The study population included middle and high school students. The target population for this study was drawn from middle and high school adolescents, aged 11 to 22-years, who were living in Amara City and met the inclusion criteria mentioned below. The accessible population included middle and high school students in Amarah City, the center Missan Governorate, southwest a large Midwestern city in the United States. Participants were those who met the previously mentioned inclusion criteria and were willing to participate in the study. Data collection took place at those locations. For the purpose of the present study a questionnaire was designed and developed by the researcher. Demographic data were collected using a form that requests the subject’s age, gender, birth order, living situation, grade. The Measurement properties of the Adolescent Quality of Life Mental Health Scale was used to measure the measure mental health-related quality of life. Data were analyzed using the IBM Statistical Package for Social Science (SPSS) version 21 for Windows©. Descriptive statistical measures of frequency, percentage, mean, and standard deviation were used to demonstrate the participants’ sociodemographic characteristics. Inferential statistical measure of Bivariate Spearman correlation was used to measure variables that can predict variables that influence both family cohesion and mental health-related quality of life.

Results and Discussion

The mean age is $16.08 \pm 1.99$; more than a half age 17-18-years ($n = 202; 33.7\%$), followed by those who age 15-16-years ($n = 176; 29.3\%$), those who age 19-20-years ($n = 68; 11.3\%$), and those who age 21-22-years ($n = 4; 0.7\%$). Concerning father’s level of education, less than a fifth are elementary school graduates ($n = 112; 18.7\%$). Regarding mothers’ level of education, less than a quarter are unable to read and write ($n = 134; 22.3\%$). Concerning household’s monthly income, less than a quarter have an income of less than 300,000 ($n = 142; 23.7\%$). Lastly, less than a third of students came in the first birth order ($n = 184; 30.7\%$), followed by those who came in the second order ($n = 132; 22.0\%$).

Table 1: Correlations among student’s age, birth order, family cohesion and mental health-related quality of life

<table>
<thead>
<tr>
<th></th>
<th>Age</th>
<th>Birth Order</th>
<th>Family Cohesion</th>
<th>MHEQOL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>-</td>
<td>-.030</td>
<td>-.066</td>
<td>-.032</td>
</tr>
<tr>
<td>Birth Order</td>
<td>.030</td>
<td>-</td>
<td>-.026</td>
<td>.020</td>
</tr>
<tr>
<td>Family Cohesion</td>
<td>-.066</td>
<td>-.026</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>MHEQOL</td>
<td>-.032</td>
<td>-.059</td>
<td>.020</td>
<td>-</td>
</tr>
</tbody>
</table>

There is no statistically significant correlation between student’s age, birth order, family cohesion and mental health-related quality of life.

Table 2: Analysis of Variance in the family cohesion and MHRQOL among age groups

<table>
<thead>
<tr>
<th>ANOVA</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family Cohesion</td>
<td>Between Groups</td>
<td>208.673</td>
<td>12</td>
<td>17.389</td>
<td>1.814</td>
</tr>
<tr>
<td></td>
<td>Within Groups</td>
<td>5626.020</td>
<td>587</td>
<td>9.584</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>5834.693</td>
<td>599</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MHRQOL</td>
<td>Between Groups</td>
<td>9571.231</td>
<td>12</td>
<td>797.603</td>
<td>1.300</td>
</tr>
<tr>
<td></td>
<td>Within Groups</td>
<td>360201.269</td>
<td>587</td>
<td>613.631</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>369772.500</td>
<td>599</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
There is a statistically significant difference in family cohesion among students’ age group (p-value = .043). On the other hand, there is no statistically significant difference in students’ mental health-related quality of life among students’ age groups.

**Table 3: Analysis of Variance in the family cohesion and MHRQOL between gender groups**

<table>
<thead>
<tr>
<th></th>
<th>Independent Samples Test</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Levene’s Test for Equality of Variances</td>
<td>t-test for Equality of Means</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>F</td>
<td>Sig.</td>
<td>t</td>
<td>df</td>
<td>Sig. (2-tailed)</td>
<td>Mean Difference</td>
<td>Std. Error Difference</td>
</tr>
<tr>
<td>Family Cohesion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>.000</td>
<td>1.000</td>
<td>.000</td>
<td>598</td>
<td>1.000</td>
<td>.000</td>
<td>.255</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>.000</td>
<td>598.000</td>
<td>1.000</td>
<td>.000</td>
<td>.255</td>
<td>-.501</td>
<td>.501</td>
</tr>
<tr>
<td>MHEQOL</td>
<td>1.353</td>
<td>.245</td>
<td>.315</td>
<td>598</td>
<td>.753</td>
<td>.640</td>
<td>2.030</td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>.315</td>
<td>595.258</td>
<td>.753</td>
<td>.640</td>
<td>2.030</td>
<td>-3.347</td>
<td>4.627</td>
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<tr>
<td>Equal variances not assumed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

There is no statistically significant difference in family cohesion and students’ mental health-related quality of life between students’ gender groups.

**Table 4: Analysis of Variance in the family cohesion and MHRQOL among father’s level of education groups**

<table>
<thead>
<tr>
<th></th>
<th>ANOVA</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Sum of Squares</td>
<td>df</td>
<td>Mean Square</td>
<td>F</td>
<td>Sig.</td>
<td></td>
</tr>
<tr>
<td>Family Cohesion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>261.422</td>
<td>8</td>
<td>32.678</td>
<td>3.465</td>
<td>.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within Groups</td>
<td>5573.272</td>
<td>591</td>
<td>9.430</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>5834.693</td>
<td>599</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MHEQOL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>4554.929</td>
<td>8</td>
<td>569.366</td>
<td>.921</td>
<td>.498</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within Groups</td>
<td>365217.571</td>
<td>591</td>
<td>617.965</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>369772.500</td>
<td>599</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

There is a statistically significant difference in family cohesion among father’s level of education groups (p-value = .001). On the other hand, there is no statistically significant difference in students’ mental health-related quality of life among father’s level of education groups.

**Table 5: Analysis of Variance in the family cohesion and MHRQOL among mother’s level of education groups**

<table>
<thead>
<tr>
<th></th>
<th>ANOVA</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Sum of Squares</td>
<td>df</td>
<td>Mean Square</td>
<td>F</td>
<td>Sig.</td>
<td></td>
</tr>
<tr>
<td>Family Cohesion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>150.876</td>
<td>7</td>
<td>21.554</td>
<td>2.245</td>
<td>.029</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within Groups</td>
<td>5683.817</td>
<td>592</td>
<td>9.601</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>5834.693</td>
<td>599</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MHEQOL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>1958.504</td>
<td>7</td>
<td>279.786</td>
<td>.450</td>
<td>.870</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within Groups</td>
<td>367813.996</td>
<td>592</td>
<td>621.307</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>369772.500</td>
<td>599</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
There is a statistically significant difference in family cohesion among mother’s level of education groups (p-value = .05). On the other hand, there is no statistically significant difference in students’ mental health-related quality of life among mother’s level of education groups.

<table>
<thead>
<tr>
<th>Table 6: Analysis of Variance in the family cohesion and MHRQOL among family’s monthly income groups</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ANOVA</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Family Cohesion</strong></td>
</tr>
<tr>
<td>Between Groups</td>
</tr>
<tr>
<td>Within Groups</td>
</tr>
<tr>
<td>Total</td>
</tr>
<tr>
<td><strong>MHEQOL</strong></td>
</tr>
<tr>
<td>Between Groups</td>
</tr>
<tr>
<td>Within Groups</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

There is a statistically significant difference in family cohesion among family’s monthly income groups (p-value = .001). On the other hand, there is no statistically significant difference in students’ mental health-related quality of life among family’s monthly income groups. There was no statistically significant differences both in family cohesion students’ mental health-related quality of life among living arrangements groups.

There was no statistically significant correlation between student’s age and mental health-related quality of life. There was no statistically significant correlation between student’s birth order, family cohesion and mental health-related quality of life. There was no statistically significant correlation between family cohesion and mental health-related quality of life. There was a statistically significant difference in family cohesion among students’ age group (p-value = .043). On the other hand, there is no statistically significant difference in students’ mental health-related quality of life among students’ age groups. There was no statistically significant difference in family cohesion and students’ mental health-related quality of life between students’ gender groups. There was a statistically significant difference in family cohesion among students’ level of education groups (p-value = .001). On the other hand, there is no statistically significant difference in students’ mental health-related quality of life among father’s level of education groups. There is a statistically significant difference in family cohesion among mother’s level of education groups (p-value = .05). On the other hand, there is no statistically significant difference in students’ mental health-related quality of life among mother’s level of education groups. There was a statistically significant difference in family cohesion among family’s monthly income groups (p-value = .001).

On the other hand, there is no statistically significant difference in students’ mental health-related quality of life among family’s monthly income groups. There was no statistically significant differences both in family cohesion students’ mental health-related quality of life among living arrangements groups.

**Conclusions**

The findings of the present study conclude that the older the age the student, the better the mental health-related quality of life. The prior the birth order, the better the mental health-related quality of life. The better the family cohesion, the mental health-related quality of life. The higher the father’s level of education, the better the family cohesion. The higher the mother’s level of education, the better the family cohesion. The higher the monthly income, the better the family cohesion.

**Source of Funding:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Ministry of Health, Misan Health Directorate and all experiments were carried out in accordance with approved guidelines.

**REFERENCES**


Effects of a Comprehensive, Multiple Health Risky Behaviour Prevention Program on the behaviour of High School Students in Kurdistan Region-Iraq: A quasi-Experimental Study

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1B.Sc., M.Sc., 2MBChB, M.Sc., DTM & H, Ph.D., FFPH, FRCP, 3MBChB, FICMS, FFPH, Department of Community Medicine, College of Medicine, Hawler Medical University

ABSTRACT

School-based health education is an appropriate approach for improving students’ knowledge, and hence practices regarding multiple risk behaviour. The objective of the study was to examine the impact of an educational intervention on the risky behaviours of the students, which will, in turn, motivate the students to take protective measures against the risky behaviours. This quasi-experimental study was conducted on 190 students selected randomly from three high schools in Erbil city, during the academic school year 2017-2018. A self-administered questionnaire on practices assessment regarding multiple risk behaviours was developed and validated by the experts regarding the relevance of the items. A structured teaching program for imparting knowledge on various aspects of health risk behaviours was developed based on extensive review of literature and experts’ opinions. Of the 190 students, 47.9% were males and 52.1% were females. The study revealed a statistically significant improvement in the mean rank of the practice of students following the implementation of a health education program (p<0.001). Implementing a health education program about multiple risk behaviour on high school students in Erbil city is achievable and valuable.

Keywords: multiple risk behaviour; High school; Students; Educational program; Iraq

Introduction

In developing counties, adolescents are the susceptible population in terms of health associated with risk behaviour due to their bio-psycho-social characteristics, and health risk behaviour may appear obviously as potential prominent behaviour with serious results, particularly among adolescents 1,2. Bio-psycho-social changes may lead to unhealthy lifestyles in adolescence, which tend to co-occur and have similar determinants. This has a major impact in terms of disease, disability, death, and high costs to families and the community 3,5. Adolescents are more prone to risk behaviour 6 as it is a critical life-course period during which patterns of health behaviour are formed, before tracking into adulthood, and they experience physical, mental, and social interactional changes during this period 7. Moreover, adolescence is characterized by an increased adventurous tendencies and peer influences. As a result, they are susceptible to new ideas that may lead to risk behaviour 8. Health risk behaviour may also lead to unhealthy lifestyles in adolescence, which tend to co-occur and have comparable determinants. This has the most important impact in phrases of disease, disability, death, and high costs to families and society 9. To avoid unhealthy lifestyles, health promotion programs are performed at schools. These are convenient environments to improve public health that allows contact to higher numbers of adolescents 10. Systematic reviews have been performed to evaluate the effect of school-based interventions regarding nutrition and physical activity 10,12, alcohol consumption 10,13, or violence 14, which found some positive effects of variable magnitude. Knowledge is considered as one of the factors that influence adolescent students’ decision to be involved in risk behaviour [8], with insufficient knowledge about the multiple health risk behaviour and...
its results, a student will be less likely to make a fact-based and informed decision. Studies have shown that providing adolescence with precise information about negative risk behaviour consequences which may encourage abstinence from health risk behaviour. Hence, providing health education in schools about health risk behaviour can encourage students to make positive decisions on their future lives. Accordingly, the purpose of this survey was to examine the impact of an educational school intervention for high school students intended at improving their knowledge for multiple health risk behaviour and its adverse outcomes, which will, in turn, stimulate students to take protective measures against health risk behaviour.

Methodology

Participants: This quasi-experimental (one group; pre, and post-test) design was conducted from November 2017 to June 2018 amongst high school students in Erbil city which is the capital of the Kurdistan Region-Iraq, knowing that the high schools include three stages (10, 11, and 12). According to the data obtained from Erbil Directorate of Education, the total number of high schools in Erbil city was 78 during the academic year 2016-2017. The mentioned schools were categorized according to the gender of the students into three categories: males, females, and mixed schools. One school from each category was selected by simple random sampling technique using the Microsoft Excel computer program. Students of grade 11 from these three schools were the target population for the educational program as the prevalence of risky behaviour was the highest among the students of this grade (according to the results of an unpublished study of the researchers which was done just before this study). In addition to that, students of grade 12 had no time to participate in the program as they were busy with the final exams. A random sample of 190 students was collected from these three schools, using the simple random sampling method, which was done by the Microsoft excel computer program. Students aged 14-18 were included in the study.

The data collection tool: A self-administered questionnaire was developed by the researchers based on the extensive review of the literature. The questionnaire consisted of two sections. The first section is related to socio-demographic items such as age, gender, and socioeconomic status level. The second section was designed to assess the students’ practices that consisted of 15 main questions about risky behaviours. A score of 1 was given if the student practices a risky act. Accordingly, a risk scale of 15 scores was generated which was divided later into three equal categories (5 in each), and these are low, medium, and high risk. It is worth to mention, that the researchers used the same questionnaire of an unpublished study that they conducted just before this study (mentioned above) involving 1000 students, and the internal validity and reliability had been ascertained before conducting the mentioned study.

The Educational Program: A structured educational program for imparting knowledge on various aspects of health risk behaviour especially prevention was developed by the researchers. The content of the educational curriculum was designed based on extensive review of literature and experts’ opinions. The intervention consisted of a series of four educational modules. The module content was created and edited by the researchers; the first module included an introduction to multiple health risk behaviour and historical background, some definitions, side effects, and negative consequences, and causes and risk factors. The second and third modules identified the types of multiple health risk behaviour and the final module described prevention of multiple health risk behaviour. Before the curriculum is finalized, it has been sent to three experts. The three experts have read and edited the content of the curriculum to assure that the program fits local teaching and learning styles.

The procedure: After obtaining the informed consent, the students in the three schools were given the pre-test questionnaires one week before the administration of the educational program. The questionnaires were administered in the classrooms by schools’ social workers (Rabers) in the presence of the primary researcher. Each student was given a serial number to be followed in the second assessment (post-test). After administration of the questionnaires, twelve ‘45 minute-sessions’ were presented using lectures, group discussions, and booklets. These sessions were mainly taught by the “Rabers” during a six months’ period. These “Rabers” were trained properly by the primary researcher on the content of the educational program. As a reminder, each student was provided with a copy of a health education booklet prepared and designed by the primary researcher and named “Know some facts about multiple health risk
behaviours among adolescents”. One week later after the end of session, students were asked (for the second time) to complete the same questionnaires (post-test).

**Data Analysis:** The data were coded and entered into the Statistical Package for the Social Sciences (SPSS) software, version 22. Wilcoxon Signed Ranks Test and McNemar tests were conducted as univariate analysis to compare pre-to post-intervention changes in the percentage of students’ knowledge of each level (low, moderate, and high). Chi-square tests were conducted to compare knowledge attainment with some variables. A P value of ≤ 0.05 was considered as the level of significance.

**Results Discussion**

A total of 190 students (47.9% were males and 52.1% were females) completed a pre and post-intervention survey: The mean age ± SD of the participants was 16.59 ± 0.784 years, ranging from 14-18 years. Table 1 shows that 47.4% of the students were practicing moderate and high-risk behavior before the intervention which decreased to 15.8% after the intervention. The table shows also that the behavior of more than two thirds (67.8%) of those who had practiced moderate and high-risk behavior improved, to fall in the low-risk category (p < 0.001). Before implementing the educational program, no significant association was detected between the age and the risk behaviour (p = 0.248) as presented in Table 2. The prevalence of the medium and high-risk behaviour was 65.9% among males, which was significantly higher than the prevalence (30.3%) among females (p = 0.001). No significant association was detected between the socio-economic status and the risky behaviour (p = 0.733). The same pattern can be applied after the implementation of the educational program as presented in Table 3 which shows no significant association between the prevalence of risky behaviour with age (p = 0.394) and the socio-economic status level (p = 0.247). The prevalence among males (23.1%) was significantly higher than the prevalence (9.1%) among females (p = 0.007). It is evident in Table 4 that all the parameters of the risk scale decreased after the implementation of the educational program. There was a significant decrease in the mean ranks of risk score from 77.87 before the program to 21.5 after the program (p < 0.001). The prevalence of the specific items of the risky behaviour before and after the implementation of the educational program are presented in Table 5 which showed a significant decrease in the prevalence of the majority of the items except for wearing the seat belt (p = 0.368), and bullying (p = 0.500).

**Table 1: Risk behavior of students before and after the intervention**

<table>
<thead>
<tr>
<th>Pre intervention risk</th>
<th>Post-intervention risk</th>
<th>Low (%)</th>
<th>Moderate and high (%)</th>
<th>Total (%)</th>
<th>P†</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low risk</td>
<td>No. 99 (99.0)</td>
<td>1 (1.0)</td>
<td>100 (100.0)</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>Moderate and high</td>
<td>61 (67.8)</td>
<td>29 (32.2)</td>
<td>90 (100.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>160 (84.2)</td>
<td>30 (15.8)</td>
<td>190 (100.0)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Column percentage was calculated. †By McNemar test.

**Table 2: Prevalence of the pre-test risk behavior of the students (N = 190) by their socio-demographic variables**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Low (%)</th>
<th>Medium and high (%)</th>
<th>Total (%)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>No.</td>
<td>No.</td>
<td>No.</td>
<td></td>
</tr>
<tr>
<td>14-15</td>
<td>3 (30.0)</td>
<td>7 (70.0)</td>
<td>10 (100.0)</td>
<td>0.248</td>
</tr>
<tr>
<td>16 – 17</td>
<td>91 (53.2)</td>
<td>80 (46.8)</td>
<td>171 (100.0)</td>
<td></td>
</tr>
<tr>
<td>18 – 19</td>
<td>6 (66.7)</td>
<td>3 (33.3)</td>
<td>9 (100.0)</td>
<td></td>
</tr>
</tbody>
</table>
**Table 3: Prevalence of the post-test risk behavior of students (N = 190) by their sociodemographic variables**

<table>
<thead>
<tr>
<th>Gender of student</th>
<th>Male</th>
<th>(34.1)</th>
<th>60</th>
<th>(65.9)</th>
<th>91</th>
<th>(100.0)</th>
<th>0.001</th>
<th>Female</th>
<th>69</th>
<th>(69.7)</th>
<th>30</th>
<th>(30.3)</th>
<th>99</th>
<th>(100.0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Socio-economic status</td>
<td>Low</td>
<td>39</td>
<td>(49.4)</td>
<td>40</td>
<td>(50.6)</td>
<td>79</td>
<td>(100.0)</td>
<td>0.733</td>
<td>Medium</td>
<td>22</td>
<td>(53.7)</td>
<td>19</td>
<td>(46.3)</td>
<td>41</td>
</tr>
<tr>
<td>High</td>
<td>39</td>
<td>(55.7)</td>
<td>31</td>
<td>(44.3)</td>
<td>70</td>
<td>(100.0)</td>
<td></td>
<td>Total</td>
<td>100</td>
<td>(52.6)</td>
<td>90</td>
<td>(47.4)</td>
<td>190</td>
<td>(100.0)</td>
</tr>
</tbody>
</table>

**Table 4: Risk behaviour scores parameters before and after the educational program**

<table>
<thead>
<tr>
<th>Risk behavior scores</th>
<th>Pre-test</th>
<th>Post-test</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>4.86</td>
<td>2.77</td>
<td></td>
</tr>
<tr>
<td>Median</td>
<td>(4)</td>
<td>(2)</td>
<td></td>
</tr>
<tr>
<td>Minimum</td>
<td>(0)</td>
<td>(1)</td>
<td></td>
</tr>
<tr>
<td>Maximum</td>
<td>(13)</td>
<td>(10)</td>
<td></td>
</tr>
<tr>
<td>Mean rank</td>
<td>(77.87)</td>
<td>(21.5)</td>
<td>&lt;0.001*</td>
</tr>
</tbody>
</table>

*By Wilcoxon signed rank test

**Table 5: Efficacy of the education program in reducing the proportion of students who practice risky behaviours**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Prevalence of risky behavior %</th>
<th>Pre</th>
<th>Post</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Riding a bicycle wearing helmet</td>
<td>(37.9)</td>
<td>(21.1)</td>
<td>0.001</td>
<td></td>
</tr>
<tr>
<td>Riding a skateboard wearing helmet</td>
<td>(21.6)</td>
<td>(10.5)</td>
<td>0.001</td>
<td></td>
</tr>
</tbody>
</table>
Conted…

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Frequency (Study 1)</th>
<th>Frequency (Study 2)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not wearing a seat belt</td>
<td>(61.1)</td>
<td>(56.3)</td>
<td>0.368</td>
</tr>
<tr>
<td>Riding in a car driven by someone who had been drinking alcohol</td>
<td>(16.3)</td>
<td>(6.3)</td>
<td>0.001</td>
</tr>
<tr>
<td>Carried a weapon, such as a gun, knife</td>
<td>(33.7)</td>
<td>(10.0)</td>
<td>0.001</td>
</tr>
<tr>
<td>Physical fighting</td>
<td>(48.9)</td>
<td>(16.8)</td>
<td>0.001</td>
</tr>
<tr>
<td>Physical fight in which you were hurt and had to be treated by a doctor</td>
<td>(12.1)</td>
<td>(1.1)</td>
<td>0.001</td>
</tr>
<tr>
<td>Bullied on school property</td>
<td>(5.3)</td>
<td>(4.2)</td>
<td>0.500</td>
</tr>
<tr>
<td>Electronically bullied through email, chatroom, message, website, or</td>
<td>(15.8)</td>
<td>(6.3)</td>
<td>0.001</td>
</tr>
<tr>
<td>texting (cyber bullying)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attempted suicide</td>
<td>(22.6)</td>
<td>(7.9)</td>
<td>0.001</td>
</tr>
<tr>
<td>Cigarette Smoking</td>
<td>(34.7)</td>
<td>(11.6)</td>
<td>0.001</td>
</tr>
<tr>
<td>Alcohol drinking</td>
<td>(9.5)</td>
<td>(3.2)</td>
<td>0.001</td>
</tr>
<tr>
<td>Have you ever taken steroid pills or shots without a doctor’s prescription?</td>
<td>(2.6)</td>
<td>(0)</td>
<td>N/A</td>
</tr>
<tr>
<td>Physical inactivity</td>
<td>(96.3)</td>
<td>(100)</td>
<td>0.001</td>
</tr>
<tr>
<td>Sleeping improper</td>
<td>(68.4)</td>
<td>(22.1)</td>
<td>0.001</td>
</tr>
</tbody>
</table>

**Conclusion**

A health education program about multiple health risk behaviours is feasible to be implemented in high schools of Erbil. Thereby, proper implementation of this school-based prevention program is critical to strengthening protection and reducing the prevalence of multiple health risk behaviours amongst this part of the population.

**Source of Funding:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the College of Medicine, Hawler Medical University, Iraq and all experiments were carried out in accordance with approved guidelines.

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Comparison of Fracture Resistance of CAD/CAM Interim Dental Bridge and Conventional Interim Resin Dental Bridge

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ABSTRACT

Objective: Evaluate and compare the fracture resistance between CAD/CAM interim dental bridges and conventional interim resin dental bridges. Ideal model of full dental arch was used as a pattern to simulate three units dental bridge with (maxillary first molar and maxillary first premolar) as abutments. This model was then duplicated and resulted cast sectioned by separation disc to produce a small cast that limited to the prepared dental bridge area only. This cast was then duplicated and resulted mold poured by molten wax to produce wax pattern that was modified before casting with the use of radial shoulder finishing line design instead of chamfer finishing line that came with the original ideal model. From this wax pattern, metal master model was produced by casting using lost wax technique. Thirty two impressions for master model with two stage putty- wash impression technique were taken and poured with die stone to produce thirty two stone models. The results showed that the highest mean value of fracture resistance was recorded by Group 1 (735.9N) followed by Group 3 (585N), Group 2 (508.8N) and Group4 (460.8N) respectively. Concerning fracture mode, the connector area showed the weakest and most frequent area of fracture.

Keywords: CAD CAM Interim Dental Bridge, conventional, Fracture Resistance.

Introduction

Interim fixed dental prosthesis (FDPs) are important to protect tooth from physical, biological and mechanical effects until the final prosthesis can be cemented. These restorations could be short-term (until the final prostheses has been fabricated) or long-term (in case of a patient requires a longer treatment period, as in full mouth prosthodontic therapy, orthodontic or endodontic treatments, or in oral surgery)1 Long-term interim FDPs needs materials with mechanical properties that guarantee enough fracture strength and adequate dimensional and marginal accuracy (2-5). Numerous interim materials are used for dental treatment. “Polymethyl-methacrylate (PMMA), a synthetic polymer of methylmethacrylate”, was the most common material due to its high strength & stability of color, and easy repair. On the other hand, PMMA produced significant heat during polymerization, which may lead to polymerization shrinkage and pulpal discomfort (7,8). Using computer-aided design/computer-aided manufacturing (CAD/CAM) to produce interim restoration is of interest for the reason that CAD/ CAM interim therapy uses optical impression which eliminates patient’s discomfort. In addition to that, CAD/CAM interim materials are prefabricated with the use of blocks that are industrially polymerized, that prevent polymerization generated shrinkage and heat (9-11). Interim crowns and bridges are important components of fixed Prosthodontics treatment. Interim restorations should have sufficient mechanical property to support functional and removable forces, that maintain tooth position and exhibit marginal integrity and biological properties conducive to periodontal health12.

Materials & Method

Ideal model of full dental arch made from plastic material prepared by Ivoclar company (figure 1) was used in this study and prepared to act as pattern that simulate three – unit bridge, the maxillary first molar and maxillary first premolar as abutments and the maxillary second premolar is missed.
Figure 1: Ideal model from plastic material

This model then duplicated resulted mold poured by die stone to make a cast that then sectioned using separation disc to produce a small cast that limited to required work only and as shown in figure (2).

Figure 2: The resulted cast

This cast then duplicated to form a mold that poured with molten wax to obtain a wax pattern that modified in its design to make the margins more prominent and shaping from chamfer to radial shoulder finishing line that proved to give more accurate margins. This wax pattern then sprued, invested and casted to obtain the final master model (figure 3).

Figure 3: Master model from metal

Thirty two impressions for master model with two stage putty- wash impression technique were taken and poured with die stone to produce thirty two stone models, then divided into four groups with eight models per group, according to the material and fabrication technique used to produce interim dental bridge and as follow:

Group 1: Ivoclar CAD CAM (Telio CAD).
Group 2: Ivoclar conventional (Telio Lab).
Group 3: Vita CAD CAM (Vita CAD-Temp).
Group 4: Vita conventional (Vita VM CC).

Interim dental bridges fabrication by conventional technique: Group 2 and group 4 samples were fabricated by this technique using Telio lab PMMA and Vita VM CC cold cure acrylic resin materials. First, waxing up for full anatomy to dental bridge was done on every model, and then silicone indexing key was formed on it that registered the fine details of the waxing up. After set, silicone key removed and remaining wax cleaned off, and then separating fluid was applied using fine brush. Mixing powder and liquid in silicone bowl as manufacturer’s instruction was utilized with standard ratio and after reaching dough stage, the silicone key filled with material and seated back on model and placed in polymerizer for about 15 minutes with a pressure of 2 bar and temperature of 40-50°C. After polymerization, finishing and polishing for every dental bridge was made.

Interim dental bridges fabrication by CAD/CAM technique: Group 1 and group 3 samples were fabricated by this technique using Telio CAD PMMA blocks and Vita CAD Temp composite resin blanks. First the models were covered with a scan spray and fixed on the dental scanner (Imes-Icore) and bridge design was by Exocad software and the same design was for both types of materials with cement space of 100um, wall thickness in occlusal of 1.5mm and 0.8 mm circumferentially and connector dimensions was set for 12 mm² for both milled materials that used in the current study. The dental bridges were then milled using CORITEC 250i machine. After milling, dental bridge separated and smoothed.

Before fracture resistance testing and for the metal model to be easily fixed between the jaws of testing machine holder and to prevent any movement from master model during testing, metal model was embedded in auto polymerizing acrylic block that prepared by mixing cold cure acrylic resin in a rectangular shaped split mold that specially designed for it with a dimensions of (3cm x5cm) and height of (3cm). The samples were tested for fracture resistance by the use of three point bending test with a “universal testing machine”(Layree, China). Each sample was positioned with a slight pressure on the metal model and gripped on the testing machine. Steel ball with a diameter of 5mm was used to apply load on samples
and this ball positioned on machine arm that loaded in the dental bridge pontic (in central fossa area) (figure 4) with a speed of (1mm/min.) for the crosshead that applied load until sample fracturing taken place. In order to distribute the applied force over a larger area and to avoid loading stress peaks on the pontic surface, i.e., homogenous stress distribution, rubber piece with 1 mm thickness was positioned between the sample and load tip.

On the computer screen the program window displayed and bending test selected. The increasing compression load applied on the sample and the maximum load at the time of fracture recorded and displayed in Newton (N). At the same time the program set and displayed different curves (stress-strain, load-extension) and a sudden load drop was detected on stress strain curve at the time of fracture. Mode of fracture for samples was evaluated to determine fracture patterns in dental bridge that could happen at different points (pontic, abutment, mesial connector, distal connector or both connectors).

**Results and Discussion**

A total of 32 measurements of fracture resistance from four groups were recorded for two different techniques and two different manufacturers in Newton (N). Table (1) shows the fracture resistance means, standard deviations, minimum and maximum values for the four groups. The fracture resistance results showed that the lowest mean was for Group 4 (460.8 N) and highest mean was for Group1 (735.9 N).

Table 1: Descriptive statistics (mean, standard deviation, minimum and maximum) of fracture resistance for the different groups measured in Newton

<table>
<thead>
<tr>
<th>Groups</th>
<th>No.</th>
<th>Mean</th>
<th>SD</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1 (Ivoclar Cad Cam)</td>
<td>8</td>
<td>735.9</td>
<td>47.0</td>
<td>688</td>
<td>810</td>
</tr>
<tr>
<td>Group 2 (Ivoclar Conventional)</td>
<td>8</td>
<td>508.8</td>
<td>29.0</td>
<td>476</td>
<td>557</td>
</tr>
<tr>
<td>Group 3 (Vita Cad Cam)</td>
<td>8</td>
<td>585.0</td>
<td>28.5</td>
<td>550</td>
<td>620</td>
</tr>
<tr>
<td>Group 4 (Vita Conventional)</td>
<td>8</td>
<td>460.8</td>
<td>31.4</td>
<td>414</td>
<td>501</td>
</tr>
</tbody>
</table>

The highest and lowest fracture resistance means values in Newton of the four groups are shown in Figure (5).

To see whether the difference in the mean value for all groups was statistically significant or not, one way (ANOVA) test was applied. Highly significant difference was founded in fracture resistance among all experimental groups.

LSD test which were applied to know the actual significant levels among all probable pair wised for different groups. There was a statistically significant difference in the fracture resistance mean values between the four groups.

**Modes of Fracture:** The samples were examined under (20x) magnification using light microscope to identify the type of fracture. The frequency of each mode of fracture for all groups was calculated. The identified modes of fracture were (mesial connector, distal connector, both connectors, pontic or in abutment). This analysis indicated
that mesial connector was the most frequent mode of fracture for the tested samples. The improved mechanical properties play an important role when the interim FDPs are expected to function for extended periods of time or when additional therapy is required before completion of definitive treatment like during the prosthetic phase of dental implants and reconstructive procedures, while evaluation of a change in vertical dimension, for orthodontic stabilization, in case of assessing the results of periodontal and endodontic therapies and in cases of bruxism. Interim restorations may fracture throughout construction, functioning, trimming or even after removed from patient’s mouth. This failure often occurs as a result of a crack propagating from a surface flaw, inadequate transverse strength, impact strength, or fatigue resistance. In long span prostheses, connector region subjected to fracture mostly as a result of some functional or para-functional movements that led to localization of stresses inside the prosthesis. Fracture could also happen as a result of voids during construction of prosthesis.

Master Model: Natural teeth have a large variation due to size, age, shape, anatomy and storing periods after their extraction causing difficulty in getting standardized abutments and for that, metal models were used in this study. The advantages of using metal model includes; easy reproduction, standardized preparation, more resistant to destruction, wear or scratching under testing procedure.

Use of Loading Ball and Rubber Foil: Stainless steel ball with a diameter of 5mm was utilized in this study to representing pontic contact pressure by opposing cusps and those were affected by elastic modulus ratio of the sample to loading ball elastic modulus and radius. Rubber piece was placed between the dental bridge sample and loading ball to be as stress stopper that simulating cushion activity of food between upper and lower teeth and help in avoid cone cracks.

Fracture Resistance Testing method: The interim dental bridge samples were subjected to three points bending test (the same test used for bars specimens). Steel ball loaded in pontic at area of central fossa with a speed of (1mm/min.) for the crosshead until dental bridge fracture taken place. Initial fracture was registered as a result of the load application.

Test Results: All fracture resistance test mean values for the dental bridges in the current study were exceeding reported maximum biting force in the premolar region (300N). Hagberg in 1987 reported that the threshold for withstanding occlusal load in the posterior region should be at least (600N). The current study was in agreement with whom made a comparison of fracture strength and failure modes for CAD/CAM interim crowns (Telio CAD, Vita CAD-Temp and Peek) with that of direct interim crowns (Protemp) and concluded that CAD/CAM crowns showed higher fracture strength than direct one’s.

The present study comes in agreement with a study by whom compared the fracture strength of interim FPD’s constructed by direct method and CAD/CAM fabricated interim FPD’s (Telio CAD material) and reported that the PMMA CAD/CAM restorations showed higher fracture resistance than conventionally fabricated PMMA restorations. The present study was in agreement with whom evaluated the impact of connector cross-sectional area on the fracture load of 3-unit CAD CAM (Telio CAD, Vita CAD-Temp and art Bloc Temp) FDPs and compared this with conventionally fabricated ones and concluded that the CAD/CAM resin FDPs revealed significantly higher fracture load values than conventionally fabricated FDPs and showed a significant increase in fracture load with the increase of the cross sectional area.

Effect of fabrication technique on fracture resistance: CAD/CAM resin blocks exhibit high quality concerning its mechanical characteristics and microstructure for the fact that they were industrially fabricated under constant high pressure and heat (polymerization taken place during these fabrication steps only). This permits prosthesis to be fabricated with high fracture strength when compared with traditionally fabricated materials.

Commonly, interim restorations were fabricated from self-cured resin material either in shape of paste (resin composite) or powder and liquid system (PMMA). Interims that were fabricated by direct method uses self-cured composites and those that were fabricated by indirect method uses PMMA based acrylic resins that their polymerization takes place in a polymerizer device. Parameters for polymerization of interim FPD’s were essential for their mechanical characteristics. When compared with CAD/CAM constructed FPD’s, conventional interim FPD’s were influenced by polymerizing device, operator, polymerization duration and mixing ratio.
PMMA materials fabricated by conventional technique are uneven in shape, size and have grainer consistency and those were as a results of air bubbles incorporation, the way that materials were dispensed in the mold and insufficient mixing of the material which led finally to the lower fracture resistance values. There is important factor that may influencing the conventional technique materials inferior results concerning fracture resistance, which is the incorporated micro cracks and voids that reduce its fracture resistance significantly during mechanical and thermal processes.

**Fracture Modes:** The most frequent fracture mode in the current study was through connector area. Direction of the propagation was obliquely attaching load point of pontic at occlusal area with gingival embrasure area of the connector. The most area of fracture in all four groups was in mesial connector. This mode has observed clinically and attributed to a cantilever effect as a result of fractured connector in occlusal aspect following the initial fracture from gingival region. Crack propagation line resulted from stress concentration that simulates cracks in way perpendicular to principal tension long axis. When the axial load applied on the pontic, compressive stress were initiated in occlusal embrasure region first, and then followed by tensile stresses at gingival embrasure region. Connectors represent the region of least cross section across the bridge, and thus are at high risk for fracture, because of the concentration of stresses in this region during flexure under occlusal loading. According to Tinschert, fractures of dental bridges typically occur between the abutment and the pontic. In the study of Fischer et al., finite element analysis indicated that the connector between the bridge abutment and the pontic was the critical bridge area.

**Conclusions**

Cad/Cam groups showed higher fracture resistance than conventional groups. Group 1 (Ivoclar Cad Cam) showed highest fracture resistance than other groups. The weakest and the most frequent fracture point in all groups is the connector. Accordingly, for long span and long term interim treatment; Cad/Cam fabricated interim dental bridges are recommended.

**Source of Funding:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the College of Dentistry, Mustansiriya University, Baghdad, Iraq and all experiments were carried out in accordance with approved guidelines.

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Prevalence and Some Epidemiological Symptoms of Molluscum contagiosum Virus Infection in Al-Najaf Province

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¹Microbiology, Faculty of Science, University of Kufa, Iraq

ABSTRACT

Molluscum contagiosum virus causes a widely spread infection worldwide. Which can affect immunocompetent as well as immunocompromised individuals. Corresponding native studies are still rare. Current study targeted the screening of the mcv infections among patients visited Al-Sadr Teaching Hospital in Al Najaf Province. During the study period a total of 619 patients were clinically diagnosed with the virus from 3699 patients who visited the dermatology clinic, Furthermore histological study was carried out to investigate the age effect on developing the infection. patients with MCV comprised 349 males, and 270 females. According to age patients were divided into six age groups, the 0-5 years age group occupied the first order with 173 patients. Regarding the month of the study, April was the first recording 110 patients. Regarding the histological study the higher the age was the more the inclusion bodies to be noticed. Molluscum contagiosum virus can infect various age groups of both genders. Different samples taken from different ages showed common features of MCV cytopathic effects but with different density of their numbers in each sample.

Keywords: Molluscum Contagiosum, Inclusions bodies, Skin infection, Iraq

Introduction

Molluscum contagiosum, is a DNA virus belongs to the poxvirus family. taxonomically Molluscum contagiosum for now is the only member of the poxvirus family which causes significant disease in humans (1,2), the only known hosts for MCV are Humans. ³ Molluscum contagiosum virus (MCV) causes a superficial infection of the dermis as a lesions in the skin and mucous membranes which represents a benign self-limiting infection observed by the healthy individuals. This condition is characterized by the formation of distinctive, persistent dermal lesions that may disappear within several weeks to several months. Autoinoculation play an important role in prolonging time of infection due to accidental transmission of the virus to other parts of the body that is associated with circumstances involving skin-to-skin contact (e.g., sports such as wrestling, sexual activity, and so on ⁴ Infection appears on face, arms, legs and anogenital regions as a single or multiple umblicated papules or nodules ⁵ MCV infects both children as well as adults,⁶ although children seem to be the most targeted category ⁷. In adults most MCV occurs in people with an immunosuppressive immune status, but it can also be seen in immunocompetent adults,⁸ in the latter cases they are mostly self-liming, while in the earlier cases they are tend to be prolonged and more severe like with patient HIV infection⁹. Lesion of the virus is typically characterized by the absence of inflammation even though containing high titers of live virus which reflect the remarkable ability of the virus to inhibit the human innate immune response.¹⁰ People with dermal allergy, atopic dermititis show more extent lesions and course of the infection as compared with patients suffering from MCV alone ¹. Attempts to culture the virus had been failed instead the lesion and the virus particles has been studied extensively by electron microscope.¹¹,¹². Diagnosis of the virus does not depend on laboratory investigations alternatively, it could be done clinically ¹, besides other methods like dermoscopy that may resolve diagnosis of misdiagnosed cases within shorter time and with accurate results. ¹3 Various approaches have been used to treat MCV infections, physical methods : cryotherapy, laser treatment, chemical methods : iodine,
lactic acid, Imiquimod, besides the antiviral drugs like cidofovir\[14\]. Recent years have witnessed an increase in number of patients suffering from MCV infections. In Al Hussein teaching hospital the second common dermal disease was the viral diseases including MCV infections\[15\]. Conducting studies on MCV infections in Iraq generally and particularly in Najaf province still insufficient if found at all. This study was planned to achieve the following aims: detection of cases of MCV that are diagnosed clinically by estimating number of MCV patients visited Al Sadr teaching hospital/dermatology clinic during the study period, monitoring common approaches for treating MCV cases, and histological comparison of three randomly selected MCV patients from three different age groups.

**Materials and Method**

**Patients’ Data:** During the study period; from beginning of January 2018 to the end of June 2018, regular visits had been made to Al-Sadr teaching Hospital/dermatology clinic in order to collect outpatients data whose clinically diagnosed as MCV patients.

**Histological study:** From three different age groups, samples (MCV papule) of three patients whose dermatologist recommended proceeding curettage had been collected in sterile tubes containing 10% neutral-buffered formalin for fixation. The 2-3 mm diameter samples then transported to laboratory of histological preparations in science faculty/university of Kufa, where they were processed and paraffin embedded then cut into sections with 5 µm thickness, finally stained with Hematoxylin and eosin. Diagnosis was done by professional histologist at Al-Sadr teaching hospital.

**Results**

**MC outpatients Data analysis:** During the study period 619 patients were clinically diagnosed as Molluscum contagiosum patients, from 3699 patients visited the dermatology clinic at Al-Sadr Teaching Hospital, comprising 349 males and 270 females with an overall percentage 56.4% and 34.6% for both respectively.

**Table 1: Characterization of MC Cases According to Gender**

<table>
<thead>
<tr>
<th>Gender</th>
<th>Number</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>349</td>
<td>56.4</td>
</tr>
<tr>
<td>Female</td>
<td>270</td>
<td>34.6</td>
</tr>
<tr>
<td>Total</td>
<td>619</td>
<td>100</td>
</tr>
</tbody>
</table>

The following figure shows distribution of patients’ gender according to the study month where April witnessed the highest number of patients, while May recorded the lowest. Obviously no significant differences were observed regarding the month of study between male and female patients.

![Figure 1: Distribution of patients according to months comprised in the study](image-url)
Regarding age, patients were grouped into six age groups measured in years: (0-5), (6-15), (16-20), (21-30), (31-40), (41≥), ranging from six months age to 65 years. During the study period the highest group was the first one recording 173 (27.9%) patients followed by the second group with 144 (23.3%) patients, next was the fourth one with 111 (17.9%) patients, while the third group represented the lowest number of patients with 50 (8.1%) patients. (figure-2)

Figure 2: Distribution of patients according to age

Histological study: In order to examine the effect of age on development of the histological changes within the infected tissue, three biopsies were surgically removed from three different aged patients (6, 26, 42) years old, and submitted for sectioning and staining to evaluate the differences if found. Grossly, selected viral lesions had the typical appearance specifically the white round shape with central depression. Histologically, The three samples showed the classical appearance of molluscum contagiosum lesion which characterized by the intracytoplasmic acidophilic inclusion bodies the so-called molluscum or Henderson-Paterson bodies as shown below.
Figure 3: Hematoxylin and Eosin stained histological sections of three different samples

Sample 1: taken from a patient of 6 years old
Sample 2: taken from a patient of 26 years old
Sample 3: taken from a patient 42 years old

Discussion

The infection of MC is considered as benign and has little significant clinical manifestations, this made the actual prevalence underestimated. This study spotted a light on the prevalence of MCV in Al-Najaf province where the results were similar to the findings of 4, regarding gender.

Also it revealed that the least aged patients were the highest frequency of infection where MCV infection is said to be one of the three most common skin infections caused by viruses in children 16 while 17 differently showed the highest incidence in the age group of (1-4) years.

The infection among children can be attributed to either of explanations: first it could be due to the relationship between the age and the efficiency of the immune system, where it does not work optimally at both ends of lifetime. Besides researches refer to the ability of the MCV to inhibit the immune system by producing evasion molecules 16, second children could be more potential to internally disseminate the virus because of their relatively poor self-hygiene care. While in progressive age there is weak response to activation and proliferation of T-cells similarly the B- cells show weak response to some of viral infections 17

We also noticed that different sites of the body could be infected with the virus, but sites more affected than others are traumatic or skin injured 8. The biopsy excision is highly beneficial particularly in overlapping cases that may lead to misdiagnosis by the physician, furthermore it provides significant tool in studying histological changes caused by the MCV 18. Skin infection of MCV is characterized with fleshy colored umbilicated dome shaped papule. When microscopically examined typically shows the molluscum bodies (MB), MCV replicates in the stratum spinosum of the epidermis within the keratinocytes specifically in the cytoplasm, which result in their hypertrophy and increase in numbers producing the formerly mentioned inclusion bodies 19, current study clarified that the density of number of inclusion bodies were varied according to age were we notice that they are more dense in the elderly patient as compared with younger ones

Conclusion

Molluscum contagiosum virus can infect various age groups of both genders. Different samples taken from different ages showed common features of MCV cytopathic effects but with different density of their numbers in each sample.

Conflict of Interest: All authors have no conflict of interest

Source of Funding: Source of fund for this project was the authors themselves

Ethical Clearance: After the approval of protocol by the Ethical Review Board for human studies, Faculty of Nursing/University of Kufa/Iraq (No. 10-04/01/2015) and before enrollment, all the subjects gave their written informed consent.

REFERENCES


The Role of Hyperglycemia and Coexisting Hypertension in the Development of Diabetic Nephropathy in Type II Diabetes Mellitus

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ABSTRACT

Background: Diabetic nephropathy (D.N) is an important cause of morbidity and mortality and now the most common cause of end stage renal failure ESRF worldwide but especially in developed countries.

Objectives: The aim of the study is to know the role of hyperglycemia and co-existing hypertension HTN in the development of D.N. among patients with type II Diabetes Mellitus(DM).

Patients and Method: One hundred and twenty one diabetic patients were enrolled in a prospective observational study. Sixty six patients were females and fifty five were males. Besides full history and physical examination data were collected according to a format. At the end, these data were collected and analyzed statistically. The average age was (54 ± 2.1) year, female to male ratio 66 to 55 (1.2:1) the number of patients with hyperglycemia was 90. Average random blood sugar R.B.S was 259 ± 1.6 mg/dL. number of patients with hypertension was 71, the average of systolic blood pressure BP was 158 ± 6.1mmHg and diastolic was 10.2 ± 1.1, the average duration of D.M. was (10.5 ± 4.2) year, the average of glycosylated hemoglobin HbA1c was 9.8 ± 2.1. the number of patients with D.N was 77.

Keywords: Diabetic Nephropathy, Type II Diabetes Mellitus, Hyperglycemia, Co-Existing Hypertension.

Introduction

Diabetes Mellitus D.M is defined as fasting blood sugar (F.B.S) at or more than 126 mg/dL or a random blood sugar (R.B.S) at or more than 200 mg/dL. Plus signs and symptoms of DM plus glycosuria and recently by estimation of glycosylated hemoglobin (HbA1c) ¹. Diabetes Mellitus is a heterogeneous disorder or syndrome because overtime it results in damage or dysfunction of multiple organ-system including the kidney causing diabetic nephropathy ². Diabetic nephropathy DN is pathologically defined as changes occurring in the kidney as result of DM ³ with thickening of basement membrane of glomeruli, widening of the slit membrane of the podocytes, an increased number of mesangial cells, and matrix which invade the glomerular capillaries and eventually produces nodular deposits called kimmelstiel-wilson nodules ⁴. Chemically high blood sugar leads to formation of advanced glycation end products and cytokines which are implicated in the mechanism of development of D.N ⁵. Clinically D.N. is characterized by excretion of abnormal amount of albumin in the urine, Plus at the end stage renal failure other signs and symptoms like; tiredness, edema, frequency of urination, pallor, puffiness of the eyes and ankles, anorexia, nausea, and vomiting etc… Diabetic nephropathy can be monitored by testing urine regularly for urinary albumin, urinary creatinine and serum creatinine (S.Cr). the amount of the protein in the urine reflects the degree of damage to the any still functioning glomeruli. The value of S.cr can be used to estimate the glomerular filtration rate(GFR). The most common cause of (ESRF) specially in the developed countries is D.N., that affect approximately one quarter of adults with D.M in united states ⁶ and also associated with an increased risk of death in general population.

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particularly from cardiovascular disease (9,10-13). Diabetes Mellitus with co-existing hypertension HTN induce pathophysiological change in the kidney including inappropriate activation of the renin-angiotension-aldosterone system, inflammation, increased sympathetic nervous system activation, increased oxidation stress and other mechanisms which eventually share in the damage of the kidney. Women with D.M have a higher incidence of HTN than men (12,13,14). The earliest evidence of D.N is a microalbuminurea which means the presence of small quantities of albumin in the urine (30-300)mg per 24hours, this stage is called incipient nephropathy because the patient looks clinically healthy and biochemically the kidney function expressed by glomerular filtration rate GFR is preserved. The disease then progressed with increased excretion of albumin to more than 300mg/24h (macroalbuminemia), and ultimately progressed to renal impairment and failure. this stage is called overt nephropathy, in which the patient feels ill and unwell, looks pale with puffiness of the face and ankles, dry, itchy skin and frequency of urination. Regular examination of albumin is a good monitoring test to discover the disease progress. The use of dipsticks is a useful but insensitive way for quantitative albumin measurement, the efficient way is by radioimmunoassay method (15-16-17). The progress of D.N can be delayed, stopped, or even reversed if early discovered by; strict glycemic control, aggressive blood pressure control (below 130/80 mmHg) with the use of angiotension converting enzyme inhibitors (ACEI) or angiotension receptor blockers (ARBs), quit smoking, life style modification, control of obesity, the use of statins and aspirin etc... (18,19).

Patients and Method

The study involved 121 patients (66females and 55 males) who were proved to have type II D.M in the diabetic clinic of Al-Hussein medical city Teaching hospital – kerbala holly city from first October 2017 to first April 2019. 5mL of Blood and urine samples were collected from patients during their visit to the diabetic clinic. Data were collected according to the formula which included; Age, Sex, duration of D.M, RBS HTN, HbA1c, S. creatinine, B. urea, urine albumin and creatinine, ACR (albumin creatinine ratio) . urinary albumin in mg/dL measured by turbidmetric end point method by l-chroma instrument. Urinary creatinine measured by spectrophotometer in mg/dL. ACR is the ratio of urine albumin in mg/dL to urine creatinine in gms. HbA1c was measured by clover A1c system, any values more than 6.5% was considered high, any value of RBS equal or more than 200mg/dL was considered high i.e diabetic range. Values of ACR 0-29 mg/g were considered normal. values of 30-300mg/g were considered as microalbuminuria, and values above 300mg/gm were considered as macroalbuminuria. At the end data results were entered in to SPSS statistical software, p-values less than 0.05 was considered significant and less than 0.01 was highly significant.

Results and Discussion

The total no. of patient was 121 (66females and 55 males) and the ratio of female to male was 1.2:1, the age ranged between 30-80 years with an average of 54 ± 2.1. age and sex distribution was shown in table1. The no. of patients with hyperglycemia i.e. R.B.S at or more than 200mg/dL of the both sexes was 86. The no. of patients with microalbuminurea ACR 30-300 mg/g in the total samples was 41, the no. of patients with macroalbuminurea ACR more than 300mg/g in both sexes was 36. This means that the total no. of D.N patients was 77 (63.63% of the total sample) which is the prevalence of D.N in the total sample. Details seen in table 2. The no. of females with D.N was 41, for male it was 36, both sexes were distributed according to age groups, details seen in table 3.

Persistent hyperglycemia represented by raised HbA1c the relation between ACR and HbA1c was seen in table 4. The relation of pre-existing HTN and its effect on ACR was shown in table 5, the relation between chronicity of D.M and the development of D.N is shown in table 6 this table shows that in the first five years after diagnoses of D.M one patient would have D.N microalbuminurea but when more than 20 years has passed since diagnoses of D.M 19 patients would have D.N out of 20 (95%). Women are more liable to develop D.M and HTN than men this is probably due to the increase in their waist circumference and body mass index (BMI) compared with men (13,20). In addition the no. of patients with D.M increases with age (see table1) which shows the female to male preponderance 1.2:1. Although not classically: in this study hyperglycemia plays a great role in the development of D.N because it induces pathophysiological changes in the glomeruli e.g by inducing activation protein-kinase C and other product
mentioned earlier which induce mesangial expansion and glomerular basement membrane thickening etc. The usual story is that patients with DM usually start as normoalbuminuric whether controlled or uncontrolled. By the passage of time (chronicity) especially if remained uncontrolled, some of them will pass to the stage of microalbuminuria. If action would not be taken to control, stop or reverse the risk factors, they would pass to the stage of macroalbuminuria and finally, to the end stage renal disease (ESRD)… Table 2). Practically at the time of diagnosis about 1 in 8 (12.5%) of people have microalbuminurea and 1 in 50 (2%) have macroalbuminurea (22), while in this study for comparison only one patient out of (21) had microalbuminurina at the time of diagnosis (table 6), and after 10 years of having DM, 8 patients out of 26 (30.7%) had microalbuminuria and 6 out of 26 (23.1) had macroalbuminuria. Sixteen to twenty years after diagnosis, 10 patients out of 30 (33%) had microalbuminuria and 18 out of 30 (60%) had macroalbuminuria, table 6. If DM is poorly controlled for a long period of time, this would be reflected by increased HbA1C, and this would be a risk factor to develop DN. There is good correlation between the level of HbA1C and DN represented by ACR, Table 4. Hypertension (HTN) is also an important risk factor if it co-exists with DM….. Table (5). The association of HTN and DM increases the pathophyeiological changes in the kidney which eventually share in the damage of the kidney tissue (22-23-24). In 2008 (67%) of American adults aged 20 years & over with DM had BP greater than 140/90 mmHg and hence type 2 DM and high BP increase the risk of developing diabetes related diseases such as kidney disease (or DN). In short female sex increasing age, increasing duration of D.M (chronicity) with persistent hyperglycemia and co-existing HTN are the major risk. Factors which play a great role in the deterioration and damage resulting into ESRD. In addition we have not to forget the role of other factors which contribute or assist in the damage of the kidney such as smoking, obesity, hyperlipidemia, genetic factors and race (26-27-28-29-30-31).

Table 1: Age and Sex distribution of the study sample n = 121

<table>
<thead>
<tr>
<th>Age group in years</th>
<th>Female</th>
<th>Male</th>
<th>Total</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>30-39</td>
<td>5</td>
<td>4</td>
<td>9</td>
<td>7.4</td>
</tr>
<tr>
<td>40-49</td>
<td>21</td>
<td>16</td>
<td>37</td>
<td></td>
</tr>
<tr>
<td>50-59</td>
<td>17</td>
<td>18</td>
<td>35</td>
<td>90.1</td>
</tr>
<tr>
<td>60-69</td>
<td>21</td>
<td>16</td>
<td>37</td>
<td></td>
</tr>
<tr>
<td>70-80</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>2.5</td>
</tr>
<tr>
<td>Total</td>
<td>66</td>
<td>55</td>
<td>121</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 2: The relation between hyperglycemia (according to elevated R.B.S) and ACR in mg/gm p-value>0.01

<table>
<thead>
<tr>
<th>Value of ACR</th>
<th>No.of normglycemics</th>
<th>No.of hyperglycemics</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-29</td>
<td>4</td>
<td>40</td>
<td>44</td>
</tr>
<tr>
<td>D.N 30-300</td>
<td>1</td>
<td>38</td>
<td>39</td>
</tr>
<tr>
<td>More than 300</td>
<td>0</td>
<td>38</td>
<td>38</td>
</tr>
<tr>
<td>Total</td>
<td>5</td>
<td>116</td>
<td>121</td>
</tr>
</tbody>
</table>
Table 3: Age and Sex distribution in patients with D.N represented by ACR (30 mg/gm and over).

<table>
<thead>
<tr>
<th>Age group in years</th>
<th>Sex</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Female</td>
<td>Male</td>
</tr>
<tr>
<td>30-39</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>40-49</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td>50-59</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>60-69</td>
<td>16</td>
<td>14</td>
</tr>
<tr>
<td>70-80</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>41</td>
<td>36</td>
</tr>
</tbody>
</table>

Table 4: The relation between persistent hyperglycemia represented by HbA1C and ACR in mg/gm. p-value>0.001

<table>
<thead>
<tr>
<th>ACR</th>
<th>Average HbA1C</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-29</td>
<td>7.28</td>
</tr>
<tr>
<td>30-300</td>
<td>8.88</td>
</tr>
<tr>
<td>More than 300</td>
<td>11.38</td>
</tr>
</tbody>
</table>

Table 5: The relation between pre – existing HTN and ACR in mg/gm. p-value>0.01.

<table>
<thead>
<tr>
<th>Value of ACR</th>
<th>No. of patients with pre – existing HTN</th>
<th>Percentage of PTS with HTN to the total no. of the sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-29</td>
<td>18</td>
<td>14.87</td>
</tr>
<tr>
<td>30-300</td>
<td>25</td>
<td>20.66</td>
</tr>
<tr>
<td>More than 300</td>
<td>28</td>
<td>23.14</td>
</tr>
<tr>
<td>Total</td>
<td>71</td>
<td>58.67</td>
</tr>
</tbody>
</table>
Conclusion

Sixty six patients were females and fifty five were males. Besides full history and physical examination data were collected according to a format. At the end, these data were collected and analyzed statistically. The average age was \((54 \pm 2.1)\) year, female to male ratio 66 to 55 \((1.2:1)\) the number of patients with hyperglycemia was 90. Average random blood sugar R.B.S was \(259 \pm 1.6\) mg/dL. number of patients with hypertension was 71, the average of systolic blood pressure BP was \(158 \pm 6.1\) mmHg and diastolic was \(102 \pm 1.1\), the average duration of D.M. was \((10.5 \pm 4.2)\) year, the average of glycosylated hemoglobin HbA1c was \(9.8 \pm 2.1\). the number of patients with D.N was 77.

Source of Funding: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Dept. Of Nursing, Alsafwa University College, Karbala, Iraq and all experiments were carried out in accordance with approved guidelines.

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Emotional Duality in Preparatory School Teachers

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ABSTRACT

The current research consists of a fundamental concept: Emotional Duality, which is the contradiction or internal conflict of the individual between what he wishes to express about his feelings of selfishness and fear of the consequences or consequences of such expression. The aim of the research is to identify the emotional duality of the teachers of the preparatory stage and the differences in the emotional duality of the teachers of the preparatory stage according to sex variables (males, females), and specialization (scientific, humanitarian). The researchers followed the descriptive approach. The study is based on a sample of 420 school teachers. After the extraction of honesty, consistency and objectivity, the tool was applied to the basic sample of 520 teachers and schools from the preparatory stage in the center of Babil Governorate. The results of the research show that teachers have a double emotional in the performance of their tasks to correspond with the school climate.

Keywords: individual, preparatory stage, emotional expression.

Introduction

This is consistent with Rogers’ suggestion that the need for positive respect and self-protection is present in every individual, and when the individual gets it he feels satisfied, and if it does not, it leads to frustration. All these behaviors and others have introduced some in conflicts and resort to crooked methods to get rid of the cases of frustration and psychological defeat and the state of oppression or retaliation for what was exposed to the person from the cases of weakness and defeat and crush dignity, which in turn leads to waste his energies and his professional giving to the feeling of insecurity and psychological disorder. Which may reflect negatively on the performance of the professional and the educational process as the personality of the teacher is an example role after the parents, with the confirmation of many studies on the seriousness of this aspect, as the disorders that may affect the emotional side or the ability to understand emotions and expression commensurate with the Stopping leads to negative outcomes such as loss of social support, disintegration of groups, and failure to achieve mental efficiency. This is consistent with the study of E. Baum & A. Becker has reached a correlation between the feelings of contradiction and the increase in the negative impact on the individual and exposure to stressful events, forcing him to resort to methods incompatible, such as emotional duality, especially the groups of actors in society, including junior high school teachers. Because of the difficulties and challenges in their professional work they may resort to duplication in dealing with their peers teachers or students. When their desires conflict with the constraints of society or when they are drawn by opposing forces and the conflict intensifies and they fail to reach their goals, each individual responds with a particular response of conflict and frustration. This is what Frum has emphasized that society seeks to make individuals realize their desires in the way society wishes, breaking the will of its members without being aware of it through tyranny, oppression, humiliation, punishment and other ideologies. This makes them follow their wishes and they are unconscious. The theory developed by King and Emmons states that the contradiction in emotional expression can reflect a state of internal conflict between the individual’s need to express emotions and The current situation and the demands of this position, and the desire not to show or express emotions or emotions and self-expression where this internal contradiction - in terms of showing emotions or emotions in certain situations or not to show - is exhausting and is a source of abnormal psychological processes, especially if not failure Show fatigue T emotional this is just a modification or short-term...
behavior inhibition, but cognitive mechanism unusual or permanent (Emmons, R. A. & King, L. A. 1988: 1040). King and Emmons assume that individuals who use such abnormal psychosocial mechanisms have difficulties in communicating their emotional needs or express them clearly, and they face more problems in relationships that may lead to harmful social consequences. This, in turn, can increase the level of stress, thus leading to reduced social support and reduced self-esteem. In the view of King and Emmons that the contradiction in emotional expression can show itself in different ways: people who use these mechanisms may wish to express their emotions, but feel that they are unable to do, or may be expressed, but do not want to do so, or may regret having expressed their emotions later. The main component of emotional expression is the motivation to express it, as any goal coupled with a desire to discourage it is likely to have devastating physical and psychological consequences for the individual. It has been assumed that the emotional dissonance in which the individual is located is a crucial element in distinguishing the healthy and unhealthy way of expressing emotion, so it is not only that the individual expresses emotions or does not express them. Expression of emotions can manifest itself within any of the emotional states of the individual, whether positive or negative, it is the outcome of the expression of emotions. The weakness or lack of expression of emotions is repressed and not shown to others while the contradiction in their expression is seen as an interactive inability in relationships between individuals who suffer from this contradiction in expression because either they cannot express their emotions fully, or they are expressing it but regretting their expression soon after. Thus, they are in contradiction or internal conflict because of the expression or fear of not expressing their emotions. Emotional expression is thus perceived as socially inappropriate but beneficial in terms of health to the individual. The owners of this theory that each individual goals specific to him may get in some cases that there is a conflict or conflict between these goals with other goals and therefore the discouragement of such goals and not achieve or express it will lead to the effects of chronic involuntary and psychological collapse of the individual in end of the day. When these objectives are incompatible with social norms or other goals, the individual may suffer from the harmful effects of this, whether expressed or meaningless. As such conflict leads to the individual’s sense of contradiction which can be in direct contact with his physical and psychological well-being, as emotional inhibition undermines the psychological well-being.

**Methodology**

The research methodology followed in this research is the descriptive and associative approach in the process of data collection and analysis to suit this approach, which is the subject of study in the current research. Research Community: The current research community is represented by middle school teachers in the center of Babil governorate for the academic year (2018 - 2019) male and female. (2177) were distributed to (53) schools. The research sample was selected in random stratified manner with a proportional distribution of the teachers of the preparatory stage in the schools of the center of Babil province. The total number of teachers (420) teachers and schools (167), including males and (253) of females and the (197) scientific specialization and (223) humanities. Research tool: the measure of emotional duplication: to achieve the objectives of research and after defining the theoretical definition of the variable of emotional duality based on the theory. The measure of emotional duality was built for the teachers of the preparatory stage consisting of (41) paragraphs. The balance of the response: a balance of response was placed in front of each paragraph consisting of five alternatives (applied to quite, very often, rarely, never applicable) and the score (applied to exactly/5) and the alternative (much/4) The alternative is seldom/2 The alternative does not apply to the first/1) The highest degree that can be obtained by the teacher is 205 and the lowest grade is obtained. Where he asked the members of the sample to answer them honestly and frankly for the purpose of scientific research, and stated that there is no need to mention the name, and that the answer will not be seen by anyone but the researcher. This is to reassure individuals of the confidentiality of the answer. Validity of paragraphs: The paragraphs were presented to (30) experts in psychology and psychological measurement to judge their validity in measuring what was put to measure. After taking into account the observations of experts and the validity of each paragraph in measuring emotional duality, Experts and thus became the measure consists of (41) paragraphs. Statistical analysis of the paragraphs of the measure of emotional duplication: For the purpose of statistical analysis of the paragraphs and to find their strength and the degree of internal consistency and to find the validity of the measure and stability and then identify the emotional duality in the teachers of the preparatory stage was applied in the final form on a sample of (420) teachers and schools. After collecting the data, The two distinguishing features:
a) The discriminating force of the emotional duality scales: In order to extract the discriminating power of the double-standard clauses, the scale was applied to the statistical analysis sample of (420) teachers and schools. When the significance of the differences between the upper and lower groups was tested, the values of the paragraphs ranged between (2.597 - 24.756), which is greater than the scale value of (1.96). Therefore, they are statistically significant at (0.05) and freedom (218). The relationship of the degree of the paragraph to the total degree of the measure The relation of the score of the paragraph to the total score of the emotional duality index using the Pearson correlation coefficient was calculated for the statistical analysis sample of (420) teachers and schools. All correlation coefficients were (0.051) and the degree of freedom (419), ranging between (0.121-0.731) because the degree of correlation is greater than the value of the table (0.098) and thus the number of paragraphs of the measure of emotional duplication. The validity of the scale: A - The truth of the scale: Two types of honesty have been found for the current measure: Virtual honesty: verifying the apparent honesty by presenting the paragraphs of the scale to (30) of the arbitrators in the educational and psychological sciences and psychological measurement.

Results and Discussion

In order to achieve this objective, the emotional duality scale was applied to the sample. After correcting the scale and conducting the statistical analysis of the data, it was found that the mean of the scores was 164.37 and with a standard deviation of (9.184) and the mean (123). To find the difference between the arithmetic average and the arithmetic average, Use the TEST test for one sample. The results showed that the calculated T value was (10.723) degrees. Which is greater than the tabular T value of 1.96. Therefore, it is statistically significant at the significance level (0.05) and the degree of freedom (519). Table (1) shows this.

Table 1: Shows the arithmetic average, the mean mean and the T value of the measure of emotional duality

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number of sample members</th>
<th>Average</th>
<th>Standard deviation</th>
<th>SMA</th>
<th>T value</th>
<th>Significance at level or less 0,05</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotional duality</td>
<td>520</td>
<td>164.37</td>
<td>9.184</td>
<td>164.37</td>
<td>10.723</td>
<td>1.96</td>
</tr>
</tbody>
</table>

According to Kink and Emmons (1990), emotional duality is the state of emotional contradiction, as a result of exposure to circumstances or psychological pressures or responsibilities above the possibility of the individual, the solution is duplication, in order to reconcile with the reality and escape from the experience that prevented the individual’s compatibility with himself. Excessive suppression works on duplication, and on the other hand, the characteristics of the organization of independence, is one of the most important factors associated with emotional duality, as independence in the work leads to reduce pressure, as well as to reduce the contradictory feelings, and since independence is positively linked to job satisfaction duplication can exist Teachers have a low rate of job satisfaction which leads them to emotional duality and this is consistent with the stud10. This is consistent with Van.Di.Bearg’s view that the source of emotional duality is society in its cultural context and also agrees with the study of MICHAEL HARRIS BOND (2005: 67). The mean mean of males (164.28), female (164,34), standard deviation of males (9.061), females (9.264), calculated value (0.069) and Comparing them to the tabular value of (1.96) at the significance level (0.05) is statistically insignificant, and Table (2) shows this.

Table 2: Differences in emotional duality according to gender variable

<table>
<thead>
<tr>
<th>Gender</th>
<th>Arithmetic mean</th>
<th>Standard deviation</th>
<th>T calculated value</th>
<th>T value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>164.28</td>
<td>9.061</td>
<td>-0.069</td>
<td>1.96</td>
</tr>
<tr>
<td>Female</td>
<td>164.34</td>
<td>9.264</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table (2) shows that there are no statistically significant differences in the differences between males and females according to gender. The result is that the environment requires that women be equal to men and bear the same responsibilities. Both teachers and teachers work in the same conditions and for them The
roles they do are no different subject to the same laws and lived in the same conditions.

This is consistent with Micheal I. Raulin’s assertion that the degree to which any cohabitation ends in a poetic or unconscious form will affect how the partners deal with the conflict between them if two persons have a relationship that determines their nature according to context.

Objective 3: Differences in emotional duality among middle school teachers (by specialization variable).

<table>
<thead>
<tr>
<th>Specialization</th>
<th>Tissue value</th>
<th>Calculated value</th>
<th>Standard deviation</th>
<th>Arithmetic mean</th>
<th>Statistical significance 0.05</th>
</tr>
</thead>
<tbody>
<tr>
<td>Function</td>
<td>1.96</td>
<td>2.844</td>
<td>7.117</td>
<td>161.00</td>
<td>scientific</td>
</tr>
<tr>
<td>Function</td>
<td>9.849</td>
<td></td>
<td>158.47</td>
<td></td>
<td>Humanitarian</td>
</tr>
</tbody>
</table>

Table 3: Differences in emotional duality according to specialization variable

From Table (3) we find that there are statistically significant differences in the relationship of emotional duplication according to specialization (scientific - human) for the benefit of scientific specialization, and this result is due to the fact that emotional duality is a psychological variables that are much influenced by specialization. It is exposed to the attitudes and frustrations associated with the nature of the materials that teach the scientific specialization in terms of the nature of teaching and the material and the need of mental processes in how to deliver the material, all this puts pressure on the teacher, which raises the contradiction in the behavior.

Results

Teachers have a double emotional in the performance of their tasks to correspond with the school climate. There are no statistically significant differences in the relationship of emotional duality according to sex (male – female). There are statistically significant differences in the relationship of emotional duality according to specialization (scientific – human).

Conclusion

There are no statistically significant differences in emotional duality according to gender. There are statistically significant differences in emotional duality according to specialization (scientific - humanitarian). The researchers came out with a number of recommendations, including the use of the research tool in other studies dealing with the same fields. And the establishment of seminars to highlight the emotional duality and its impact in the educational process. In addition to a number of proposals, including conducting a study similar to the current study on university professors to check their emotional duality, in the light of a number of variables, such as: age, moral thinking, decision-making, and self-organization. They are tired of exhaustion, misery and loss of meaning in everything in their lives, because they are always frustrated and despairing.

Source of Funding: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the University of Babylon/College of Education for Human Sciences/Department of Educational and Psychological Sciences and all experiments were carried out in accordance with approved guidelines.

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**Malva parviflora and Medicago sativa in vitro Anti-fungal Activity and Bioactive Chemical Compounds of Using FTIR Spectroscopic Technique**

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**ABSTRACT**

The objectives of this study were analysis of the secondary metabolite products and evaluation of Anti-fungal activity. The FTIR analysis of *Malva parviflora* proved the presence of functional group assignment Alkenes, Alkyl halides, Aromatic, Amide, and Alkane with Intensity 70.282 (Strong), 71.720 (Strong), 77.439 (Strong), 66.259 (Strong), 82.894 (Strong), 85.533 (Strong), 85.135 (Strong), 85.999 (Medium), 85.109 (Medium), 85.991 (Strong), 81.181 (Strong), and Peak (Wave number cm⁻¹) 667.37, 690.52, 788.89, 999.13, 1029.99, 1226.73, 1417.68, 1454.33, 1516.05, 1539.20, 1645.28, 2854.65 and 2924.09. The FTIR analysis of the *Medicago sativa* proved the presence of functional group assignment Alkenes, Alkyl halides, Amide, and Alkane with Intensity 77.367 (Strong), 66.277 (Strong), 72.897 (Strong), 83.166 (Strong), 80.730 (Bending), 87.443 (Strong) and Peak (Wave number cm⁻¹) 717.52, 1020.34, 1093.64, 1234.44, 1604.77, and 2920.23. In the current study, the anti-fungal activity of *Malva parviflora* and *Medicago sativa* methanolic extract was evaluated by determining the zone of inhibition against fungi. *Malva parviflora* was very highly active against *Aspergillus terrus* (5.012 ± 0.19). *Medicago sativa* was very highly active against *Aspergillus flavus* (4.791 ± 0.17).

**Keywords:** *Malva parviflora, Medicago sativa, Anti-fungal Activity, Bioactive Chemical Compounds.*

**Introduction**

*Malva parviflora* is an annual or perennial herb that is native to Northern Africa, Europe and Asia and is widely naturalised elsewhere. ¹ Common names include cheeseweed,¹ cheeseweed mallow, Egyptian mallow, ¹ least mallow, ² little mallow, ³ mallow, ⁴ marshmallow, ³ small-flowered mallow, ⁴ small-flowered marshmallow ⁸ and smallflower mallow. ³ M. parviflora leaf extracts possess anti-inflammatory and antioxidant activities. ⁶ It has a decumbent or erect habit, growing up to 50 cm in height. ⁴ The broad leaves have 5 to 7 lobes and are 8 to 10 cm in diameter. ⁴ It has small white or pink flowers with 4 to 6 mm long petals. The whole plant is emollient and pectoral. It can be used as a poultice on swellings, running sores and boils. They are used in the treatment of coughs and ulcers in the bladder. A decoction of the roots or leaves has been used as a hair rinse to remove dandruff and to soften the hair. *Malva parviflora* L. (Malvaceae) is widely distributed throughout Africa. Traditional healers and herbalists use *M. parviflora* leaves and roots to clean wounds and sores. A hot poultice made from leaves is used to treat wounds and swelling, and incorporated into a lotion to treat bruised and broken limbs. Screening of medicinal plants used in Lesotho for anti-bacterial and anti-inflammatory activity. Leaves of this plant are used in the treatment of boils. Herbal drugs have received greater attention in recent times because of their diversity of curing diseases, safety and being well tolerated remedies when compared to the conventional medicines. Development of resistance against antibiotics has further emphasized the necessity of research for alternative antimicrobial agents (Bax

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Hillah city, Iraq
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Email: imad_dna@yahoo.com
and Mullan 2000). Malva parviflora L. and Malvastrum coromandelianum L. belong to the family Malvaceae which has been famous for medicinal properties for many years. The plants of this family are well known for their antibacterial and antifungal activities due to the presence of alkaloids, essential oils and phenolic quinolside. The *Medicago Sativa* known as alfalfa. *Medicago Sativa* is a medicinal plant belonging to Fabaceae family. This herb is rich from substances called saponins. Recent studies have shown that saponins produce many effects in the body that can boost the immune system, have anti-tumor effects, helps detoxification due to the combination with bile acid, as well as antimicrobial effects such as antibacterial, antifungal and also has an antiviral effect (10,11). In most cases, numerous scientific investigations have led to the confirmation of therapeutic value of medicinal plants. *Medicago Sativa* used to be known/ named as the Queen of Plants and Green Gold (12). The plant is rich in various proteins, calcium, mineral elements, various vitamins in group B, vitamins A, C, D, E, K and amylase enzyme, emulcer, invertase and pectinase, as well as very small amounts of arsenic and silica (13-17). In the taste of people, there is a greater tendency to use plant compounds instead of chemical drugs. while, many researchers believe that the side effects of taking herbal drugs are much fewer than chemical drugs. Due to the wide distribution of medicinal plants in our country, studies on their antimicrobial properties provide a suitable basis for using the results of these studies to replace the natural drugs to control and treat bacterial infections. It can reduce the use of chemical drugs and their complications. In this research, the antimicrobial effects of alfalfa extract on common bacteria in sinusitis and bronchitis are investigated. *M. sativa* has a long tradition of use as Ayurvedic and homeopathic medicine in central nervous and digestive system disorders, and for the treatment of various other ailments. However, only limited research has been conducted on this plant species. The present review emphasizes the traditional uses and phytopharmacological potential of *M. sativa*. Additionally, sporadic pharmacological work has so far been carried out to prove its traditional claims. Through this review, the authors hope to attract the attention of natural product researchers throughout the world to focus on the unexplored potential of *M. sativa*.

**Materials and Method**

**Collection and preparation of plant material:** The leaves were purchased from local market in Hilla city, middle of Iraq. After thorough cleaning and removal foreign materials, the leaves were stored in airtight container to avoid the effect of humidity and then stored at room temperature until further use.

**Preparation of sample:** About 20 grams of the plant sample powdered were soaked in 100 ml methanol for 16 hours in a rotatory shaker. Whatman No.1 filter paper was used to separate the extract of plant. The filtrates were used for further phytochemical analysis. It was again filtered through sodium sulphate in order to remove the traces of moisture.

**Fourier transform infrared spectrophotometer (FTIR):** The powdered sample of *Malva parviflora* and *Medicago sativa* was treated for FTIR spectroscopy (Shimadzu, IR Affinity, Japan). The sample was run at infrared region between 400 nm and 4000 nm.

**Determination of antimicrobial activity of crude bioactive compounds of Malva parviflora and Medicago sativa:** The test pathogens were swabbed in Müller-Hinton agar plates. Sixty µL of plant extract was loaded on the bored wells. Antifungal activity was evaluated by measuring the zone of inhibition against the test microorganisms. Methanol was used as solvent control (51-55). Amphotericin B and fluconazole were used as reference antifungal agent. The tests were carried out in triplicate. The antifungal activity was evaluated by measuring the inhibition-zone diameter observed after 48 h of incubation.

**Results and Discussion**

**Identification of biochemical compounds:** The FTIR analysis of *Malva parviflora* proved the presence of functional group assignment Alkenes, Alkyl halides, Aromatic, Amide, and Alkane with Intensity 70.282 (Strong), 71.720 (Strong), 77.439 (Strong), 66.259 (Strong), 63.849 (Bending), 82.894 (Strong), 85.533 (Strong), 85.135 (Strong), 85.999 (Medium), 85.109 (Medium), 85.991 (Strong), 81.181 (Strong), and Peak (Wave number cm⁻¹) 667.37, 690.52, 788.89, 999.13, 1029.99, 1226.73, 1417.68, 1454.33, 1516.05, 1539.20, 1645.28, 2854.65 and 2924.09. (Table 1; Figure 1). The FTIR analysis of *Medicago sativa* proved the presence of functional group assignment Alkenes, Alkyl halides, Amide, and Alkane with Intensity 77.367 (Strong), 66.277 (Strong), 72.897 (Strong), 83.166 (Strong), 80.730 (Bending), 87.443 (Strong) and Peak (Wave number cm⁻¹) 717.52, 1020.34, 1093.64, 1234.44, 1604.77, and
In the current study, the anti-fungal activity of *Malva parviflora* and *Medicago sativa* methanolic extract was evaluated by determining the zone of inhibition against fungi. *Malva parviflora* was very highly active against *Aspergillus terrus* (5.012 ± 0.19). *Medicago sativa* was very highly active against *Aspergillus flavus* (4.791 ± 0.17). Malva genus is widespread in tropical and temperate region belongs to the family Malvaceae. They possess efficient role in coughing, intestinal infections, colitis, tonsillitis, gastroenteritis, cholesterol and lipid-lowering, antihypertensive, antioxidant, analgesics, emollient, pectoral girdle and arteriosclerosis treatment. Malva parviflora Linn. is widely distributed in Uttarakhand. It is originated from the Mediterranean region of Europe and temperate Asia. *M. sativa*, produces secondary metabolites, such as coumarins, isoflavones, naphthoquinones, alkaloids and saponins, that have nematocidal, cytotoxic and antimicrobial effects. Infrared spectroscopy provides a useful method for herbal analysis and elucidate the compounds structures as well as for quantitative analysis of drugs. Recently, a number of plants have been reported for antibacterial properties across the world. It is hoped that this study would direct to the establishment of some compounds that could be used to invent new and more potent antibacterial drugs of natural origin. Further work will emphasize the isolation and characterization of active principles responsible for bio-efficacy and bioactivity.

### Table 1: FT-IR peak values of solid analysis of *Malva parviflora*

<table>
<thead>
<tr>
<th>No.</th>
<th>Peak (Wave number cm⁻¹)</th>
<th>Intensity</th>
<th>Type of Intensity</th>
<th>Bond</th>
<th>Type of Vibration</th>
<th>Functional group assignment</th>
<th>Group frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>667.37</td>
<td>70.282</td>
<td>Strong</td>
<td>=C–H</td>
<td>Bending</td>
<td>Alkenes</td>
<td>650-1000</td>
</tr>
<tr>
<td>2.</td>
<td>690.52</td>
<td>71.720</td>
<td>Strong</td>
<td>=C–H</td>
<td>Bending</td>
<td>Alkenes</td>
<td>650-1000</td>
</tr>
<tr>
<td>3.</td>
<td>788.89</td>
<td>77.439</td>
<td>Strong</td>
<td>=C–H</td>
<td>Bending</td>
<td>Alkenes</td>
<td>650-1000</td>
</tr>
<tr>
<td>4.</td>
<td>999.13</td>
<td>66.259</td>
<td>Strong</td>
<td>=C–H</td>
<td>Bending</td>
<td>Alkenes</td>
<td>650-1000</td>
</tr>
<tr>
<td>5.</td>
<td>1029.99</td>
<td>63.849</td>
<td>Strong</td>
<td>C–F</td>
<td>Stretch</td>
<td>alkyl halides</td>
<td>1000-1400</td>
</tr>
<tr>
<td>6.</td>
<td>1226.73</td>
<td>82.894</td>
<td>Strong</td>
<td>C–F</td>
<td>Stretch</td>
<td>alkyl halides</td>
<td>1000-1400</td>
</tr>
<tr>
<td>7.</td>
<td>1417.68</td>
<td>85.533</td>
<td>Strong</td>
<td>C–F</td>
<td>Stretch</td>
<td>alkyl halides</td>
<td>1000-1400</td>
</tr>
<tr>
<td>8.</td>
<td>1454.33</td>
<td>85.135</td>
<td>Strong</td>
<td>C–F</td>
<td>Stretch</td>
<td>alkyl halides</td>
<td>1000-1400</td>
</tr>
<tr>
<td>9.</td>
<td>1516.05</td>
<td>85.999</td>
<td>Medium</td>
<td>C=C</td>
<td>Stretch</td>
<td>Aromatic</td>
<td>1400-1600</td>
</tr>
<tr>
<td>10.</td>
<td>1539.20</td>
<td>85.109</td>
<td>Medium</td>
<td>C=C</td>
<td>Stretch</td>
<td>Aromatic</td>
<td>1400-1600</td>
</tr>
<tr>
<td>11.</td>
<td>1645.28</td>
<td>78.585</td>
<td>Bending</td>
<td>N-H</td>
<td>Stretch</td>
<td>Amide</td>
<td>1550-1640</td>
</tr>
<tr>
<td>12.</td>
<td>2854.65</td>
<td>85.991</td>
<td>Strong</td>
<td>C–H</td>
<td>Stretch</td>
<td>Alkane</td>
<td>2850-3000</td>
</tr>
<tr>
<td>13.</td>
<td>2924.09</td>
<td>81.181</td>
<td>Strong</td>
<td>C–H</td>
<td>Stretch</td>
<td>Alkane</td>
<td>2850-3000</td>
</tr>
</tbody>
</table>
Table 2: FT-IR peak values of solid analysis of *Medicago sativa*

<table>
<thead>
<tr>
<th>No.</th>
<th>Peak (Wave number cm⁻¹)</th>
<th>Intensity</th>
<th>Type of Intensity</th>
<th>Bond</th>
<th>Type of Vibration</th>
<th>Functional group assignment</th>
<th>Group frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>717.52</td>
<td>77.367</td>
<td>Strong</td>
<td>=C–H</td>
<td>Bending</td>
<td>Alkenes</td>
<td>650-1000</td>
</tr>
<tr>
<td>2.</td>
<td>1020.34</td>
<td>66.277</td>
<td>Strong</td>
<td>C-F</td>
<td>Stretch</td>
<td>alkyl halides</td>
<td>1000-1400</td>
</tr>
<tr>
<td>3.</td>
<td>1093.64</td>
<td>72.897</td>
<td>Strong</td>
<td>C-F</td>
<td>Stretch</td>
<td>alkyl halides</td>
<td>1000-1400</td>
</tr>
<tr>
<td>4.</td>
<td>1234.44</td>
<td>83.166</td>
<td>Strong</td>
<td>C-F</td>
<td>Stretch</td>
<td>alkyl halides</td>
<td>1000-1400</td>
</tr>
<tr>
<td>5.</td>
<td>1604.77</td>
<td>80.730</td>
<td>Bending</td>
<td>N-H</td>
<td>Stretch</td>
<td>Amide</td>
<td>1550-1640</td>
</tr>
<tr>
<td>6.</td>
<td>2920.23</td>
<td>87.443</td>
<td>Strong</td>
<td>C-H</td>
<td>Stretch</td>
<td>Alkane</td>
<td>2850-3000</td>
</tr>
</tbody>
</table>

Figure 2: Fourier-transform infrared spectroscopic profile solid analysis of *Medicago sativa*

**Conclusion**

Medicinal property of *Malva parviflora* and *Medicago sativa* methanolic extract is due to presence of secondary metabolites. Ninety phytoconstituents were identified by (FT-IR) analysis. This plant derived bioactive compounds used as source of antibiotic properties and pharmaceutical industries used for drug formulation. *M. parviflora* fruit extracts have moderate antibacterial properties against selected microorganisms. The bioactivity of fruit extracts was confirmed by the results of phytochemical analysis. This can be utilized in respiratory tract illnesses caused by studied microorganisms.

**Source of Funding:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** In our research, all protocols were approved under the Department of Biology, College of Science for women, University of Babylon, Hillah city, Iraq and all methods were carried out in accordance with approved guidelines.

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Pharmacognostical Study and Antibacterial Activity of Cardio Active Glycoside of Iraqi Yellow Oleander (Thevetia Peruviana L.)

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¹Department of Basic Sciences, College of Dentistry, ²Department of Pharmacognosy and Medicinal Plants, College of Pharmacy, Mustansiriyah University, Baghdad, Iraq

ABSTRACT

Objective: Thevetia peruviana consider from the toxic plants for all vertebrates because the major active constituents are cardio active glycosides and caused many poisoning for humans the toxins active constituent such as thevetin A and thevetin B. The aim of this study was isolation of the major active compound which found in the leaves of Iraqi plant which cultivated in Iraq environments and investigated the biological activity of it on different pathogenic bacteria. The plant anatomical results were reference to Anomocytic stomata type in the leaves, Unicellular unbranched covering of trichomes, fibers and starch present in the leaves of the T. peruviana plant. Which confirms that isolated compound from preparative TLC is thevetin. According to the results as shown in Pharmacognostical and phytochemical studies. The pathogenic bacteria which used for investigated the bioactivity of leaves extract of yellow oleander were E coli, pseudomonas aeruginosa, Streptococcus spp., Staphylococcus epidermidis, Enterococcus faecalis, Klebsiella pneumoniae and Staphylococcus aureus. The different concentrations of cardioactive glycosides extract from leaves (1000,500,250,125,63.5µg/ml) were found active for all microorganisms strain in concentration 1000 µg/ml while inactive in 63.5 µg/ml concentration exception Enterococcus faecalis effected in this concentration

Keywords: Thevetia peruviana leaves, phytochemical screening, Antibacterial activity

Introduction

Apocyanaceae family is a most important family contain many genera most of them tropics and subtropics. There are two important genera belong this family both of them very closed relative Nerium oleander and Thevetia peruviana which called yellow oleander or lucky nut. Yellow oleander is cultivated as ornamental tree in gardens and parks because it’s a evergreen flowering shrub or tree. The major active constituent was found in all parts of plant Nerium oleander and Thevetia peruviana contain cardio active glycoside which effect like digoxin effect on heart muscle its increase the tone of heart muscle as positive inotropic effect. T. peruviana consider from the toxic plants for all vertebrates because the major active constituents are cardio active glycosides and caused many poisoning for humans the toxins active constituents are thevetin A, thevetin B, Peruvoside, Neriifolin, Thevetoxin and Ruvoside. These types of cardenolides are stable to heat and drying and don’t destroyed by drying or heating. These contains found in milky sap. T. peruviana consider as medicinal plant which use for a large pharmacological activity like Antimicrobial activity, antifungal, piscicidal, antispermatogenic and anti-termite. The antibacterial activity of the leaf extract of T. peruviana was more sensitive with pathogenic bacteria which isolated from food borne such as Salmonella typhimurium while the minimum activity was against E.coli bacteria. The seeds oil of T. peruviana act as antimicrobial activity against many pathogenic microbial strain such as Staphylococcus aureus, Bacillus subtilis and Escherichia coli examples of bacteria and Candida albicans as fungi.
Material and Method

Collection of plant material: The leaves of plant *T. peruviana* were collected from Baghdad city and was authenticated by professor Ibrahim S. AL-jubory/ Department of Pharmacognosy and Medicinal Plants/ College of Pharmacy, Mustansiriya University.

The plant material was collected during September-October and then washed by tap water to remove the dust and soil and then about two week leave it for drying at room temperature in the shade after drying the leaves were ready for extraction the active constituents and for phytochemical analysis.

Pharmacognostical evaluation: By standard method for investigation of types of trichomes, stomata, phloem, starch, fibers the leaves of plant were immersed in chloral hydrate solution for several minutes for lost its color and pigments. Examine the epidermis and stomata with fresh leaves and another components with dried leaves and finally investigation under microscope.

Preliminary phytochemical investigation: Depending on standard methods of investigation the active compounds. we were investigated the phytochemical profile of leaves of *T. peruviana* plant by used many reagents special for the active compounds dragendorffs and moyers for alkaloids, ferric chloride test solution for tannins, foam test for saponins, baljet test for cardio active glycosides, borntragers test for anthraquinone glycoside and Lieberman-burchard test for sterols and triterpenes.

Extraction of glycosides: The leaves powdered of *T. peruviana* (20 g) were extracted by using soxhlet extractor and the solvent used 70% ethanol for about 8 hours until exhaustion. and then under reducing pressure using rotary evaporator concentrated the ethanolic and then the glycosideic linkage broken by 4N HCL and heated under water bath and the hydrolyzed extract partitioned with chloroform (50mL) and allowed to settle over night. The lower organic layer (100mL) was collected which is dried with anhydrous magnesium sulphate, the organic layer was concentrated by rotary evaporator.

Bacterial isolates: The isolated pathogenic bacteria which used in this study from urinary tract infection samples, were patients collected suffered from different problems with UTI and many clinic symptoms. *E. coli*, *pseudomonas aeruginosa*, *Streptococcus spp.*, *Staphylococcus epidermidis*, *Enterococcus faecalis*, *Klebsiella pneumoniae* and *Staphylococcus aureus* were isolated from patients urine.

Culture media: There are different cultures media which used to grown the different pathogenic bacteria such as Blood, mac conkey, chocolate agar media the prepared depended on the instructions of the Hi-media –India company.

Extract dilutions: The dilutions were prepared from yellow oleander ethanolic leaves extract include (1000, 500, 250, 125, 63.5) mg/ml. all those diluted were determined on the different pathogenic strains of UTI bacteria and shown the effect of it and used the DMSO as control.

Antibacterial activity: The effect of ethanolic extract of yellow oleander leaves was determined by well diffusion method. all type of pathogenic bacteria was grown on muller-hinton agar plate and blood agar and then 100µl volume of ethanolic extract of yellow oleander leaves from different diluted submitted in wells into media. Incubated the plates at (37°C for 18-24h.). the inhibition zone determined which surrounding the wells.

Fourier Transform Infrared Spectrometry (FTIR): The method of FTIR was implemented on a spectrophotometer system and registered as KBr disc, which was used to identify the distinguishing peaks values of the thevetin isolated compound.

Results and Discussion

The plant anatomical results were reference to Anomocytic stomata type in the leaves. Unicellular unbranched covering of trichomes, fibers and starch present in the leaves of the *T. peruviana* plant (figure 3,4,5,6).
The phytochemical profile results of active constitutes were referenced to many active compounds were presented such as tannin, saponins, flavonoids, steroid and cardioactive glycoside which isolated and purified Table (1).

The pathogenic bacteria which used for investigated the bioactivity of leaves extract of yellow oleander were E coli, pseudomonas aeruginosa, Streptococcus spp., Staphylococcus epidermidis, Enterococcus faecalis, Klebsiella pneumoniae and Staphylococcus aureus. The different concentrations of cardioactive glycosides extract from leaves (1000,500,250,125,63.5µg/ml) were found active for all microorganisms strain in concentration 1000 µg/ml while inactive in 63.5 µg/ml concentration exception Enterococcus faecalis effected in this concentration. The largest inhibition zone found in Enterococcus faecalis in all concentrations while the smallest inhibition zone found in Staphylococcus epidermidis bacteria. In obtained results shown that yellow oleander extract effect for all types of bacteria that mean this extract has good potency against all tested bacteria seen in table (2) and figure (2).

The thevetin structure illustration by FT-IR showed the presence of Phenols ArO-H bonded at 3392 cm⁻¹, also Carboxylic acid around the region 2922 cm⁻¹ and 2850 cm⁻¹ presence Ester RCOOR 6-ring at 1735 cm⁻¹ and Alkanes RCH2CH3 at1462 cm⁻¹ seen in table (3) and figure (7). The spectral data are agreement with standard of the same compound.

### Table 1: Phytochemical screening of leaves extract of *Thevetia peruviana* L.

<table>
<thead>
<tr>
<th>Test</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tannins</td>
<td>+ve</td>
</tr>
<tr>
<td>Saponins</td>
<td>+ve</td>
</tr>
<tr>
<td>Flavonoids</td>
<td>+ve</td>
</tr>
<tr>
<td>Anthraquinone</td>
<td>-ve</td>
</tr>
<tr>
<td>Cardioactive glycoside</td>
<td>+ve</td>
</tr>
<tr>
<td>Terpenoid</td>
<td>-ve</td>
</tr>
<tr>
<td>Steroid</td>
<td>+ve</td>
</tr>
</tbody>
</table>

### Table 2: Antibacterial activity of yellow oleander leaves extract dissolved in DMSO

<table>
<thead>
<tr>
<th>Pathogenic bacteria</th>
<th>Inhibition zones (mm), concentration (µg/ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1000</td>
</tr>
<tr>
<td><em>E coli</em></td>
<td>23</td>
</tr>
<tr>
<td><em>pseudomonas aeruginosa</em></td>
<td>21</td>
</tr>
<tr>
<td><em>Staphylococcus aureus</em></td>
<td>26</td>
</tr>
<tr>
<td><em>Streptococcus spp.</em></td>
<td>19</td>
</tr>
<tr>
<td>Staphylococcus epidermidis</td>
<td>13</td>
</tr>
<tr>
<td><em>Klebsiella pneumoniae</em></td>
<td>37</td>
</tr>
</tbody>
</table>

### Table 3: Characteristic FT-IR absorption bands of the isolated thevetin from *Thevetia peruviana*

<table>
<thead>
<tr>
<th>Bands (cm⁻¹)</th>
<th>Interpretation of functional group</th>
</tr>
</thead>
<tbody>
<tr>
<td>3392 cm⁻¹</td>
<td>Phenols ArO-H bonded</td>
</tr>
<tr>
<td>2922 cm⁻¹</td>
<td>Carboxylic acid C=C-CO-OH</td>
</tr>
<tr>
<td>2850 cm⁻¹</td>
<td>Carboxylic acid C=C</td>
</tr>
<tr>
<td>1735 cm⁻¹</td>
<td>Ester RCOOR 6-ring</td>
</tr>
<tr>
<td>1462 cm⁻¹</td>
<td>Alkanes RCH2CH3</td>
</tr>
<tr>
<td>1246 cm⁻¹</td>
<td>Carboxylic acid RCO-OH</td>
</tr>
</tbody>
</table>

**Conclusion**

The Iraqi medicinal plants needs more studies and isolate the active compounds specially thevetin compound and measured it as a source for product used as natural health.

**Source of Funding:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Faculty of Dentistry, University of Babylon, Hillah city, Iraq and all experiments were carried out in accordance with approved guidelines.

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Phylogenetic Profile of *Staphylococcus aureus* mec A and ica A genes Associated with UTI Patients

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¹Ministry of Health, ²Pathological Analysis Department, Science College, Thi-Qar health office, Iraq

ABSTRACT

The latest years indicated an upsurge in the urinary tract infections (UTIs) occurrence instigated by *Staphylococcus aureus* at the ward of urology. A total of 50 *S. aureus* isolate from UTI patients during the period from August to December 2018 at the AL-Hussein Teaching Hospital in Nassaryiah City, Southern Iraq were assayed to find the presence of mec A & ica A genes by Polymerase Chain Reaction technique. Selection of six PCR products of mec A and ica A genes named primarily (No1, No2, and No3 for each gene) was done and further exposed to the partial sequencing of DNA to aid the targeted genes for following up their probable relation amongst the global records of Genbank and local isolates. The phylogenetic tree that was created by MEGA 6.0 version software showed closed different molecular relationships among the local *S. aureus* isolates with similar ones around the world of mec A (No.1-No.3) which were closely related to NCBI-BLAST *S. aureus* strain MRSA 365325 (MH798858.1) at total genetic changes (0.0005-0.0025%). while, ica A gene in local *S. aureus* human urine isolate (No.1-No.3) showed close interrelation to the NCBI-BLAST *S. aureus* strain Pn2301 (FJ004990.1) at the total genetic changes of about 0.2-1.0%.

Keywords: *Staphylococcus aureus*, Urinary tract infections, Gene sequencing, Virulence factors.

Introduction

Urinary tract infections (UTIs) are triggered by microorganisms’ growth and presence anywhere in the urinary tract. This might be the only most communal bacterial infection in humans. In unindustrialized countries, the UTI infections indicates the utmost significant health problem’s effects in the population of all age groups. Since the pathogens appearance along with the up surging antimicrobial agent’s resistance, it has become challenging to treat the UTI. It occurs much more frequently in females than males due to the proximity of the urethra to the anus. Its yearly global occurrence is of nearly 250 million. From most common pathogens are associated with UTIs Staphylococcus, particular *S. aureus* which is a major human pathogen and a widespread contaminant in hospitals. Though, in several patients, the *S. aureus* isolation from the sample of urine is frequently subordinate to the escalating Staphylococcal bacteremia somewhere else for example endocarditis cases. Likewise, the ascending colonization of urinary tract and infections are instigated by *S. aureus*. The foremost *S. aureus* pathogenicity is linked to its capability of a number of virulence factors’ production, most specifically extracellular factors as well as toxins’ synthesis, adherence ability and biofilm formation on host surfaces and lastly causing a resistance to the phagocytosis. Moreover, the pathogenic bacteria’s molecular typing comprising *S. aureus* can be beneficial to support the controlling measures of infections, for suspected outbreaks’ investigation and nosocomial transmission prevention. The recent study targeted the investigation of molecular characterization of genes ica A and mec A in various isolates of *S. aureus* from patients of UTI in the city of Nassaryiah.

Materials and Method

Samples Collection, Isolation and Identification: Current research utilized 50 total *S. aureus* isolates that were collected from the UTI patients in AL- Hussein Teaching Hospital in Nasiriyah City, Southern Iraq from August to December 2018. Identification of all *S. aureus* isolates was done depending on Gram’s stain; Mannitol salt agar (MSA), cultural characteristic and conventional biochemical tests. API system as well as Vitek2 compact (BioMerieux, France) was used to confirm the diagnosis of bacteria. A latex agglutination test was used as per
the manufacturing (Remel, UK) company’s directions to serologically diagnose the proteins A for all *S. aureus* isolates.

**Antibiotic susceptibility test for *S. aureus* isolates:**
The total isolates of *S. aureus* were exposed to the susceptibility of antibiotics with the help of disc diffusion procedure. Moreover, the interpretation and measurements of diameters of inhibition zone were carried out conferring to.

**Detection of mec A and ica A genes by Polymerase chain reaction:** *S. aureus* isolates were exposed to the identification of methicillin mecA & biofilm icaA genes by conventional PCR technique using specific primer pairs (Table 1). The amplification was conducted in a thermal cycler (BioRad, USA) that has been automated as follows: with one cycle, the initial denaturation stage was done at 95°C for five minutes. Whereas, amplification with 30 cycles was executed by following conditions: 30 seconds denaturation at 95°C, 30 seconds annealing at 58 and 59°C, one minute extension at 72°C and lastly five minutes final extension at 72°C. These conditions were designed by the researcher in this study.

**DNA sequencing:** The *S. aureus* six PCR products were dispersed into three ica A & mec A genes that were selected for further sequencing. The sequencing of each genes’ reverse and forward primers was done in Macrogen, Korea outside of Iraq. While Basic Local Alignment Search Tool analysis (BLAST) led to the algorithm of BLAST by (www.ncbi.nlm.nih.gov/BLAST) site. The sequences of samples labelled as (No1, No2 and No3 for mec A - No1, No2, and No3 for ica A) were further aligned, edited & related with reference sequences by using Unweighted Pair Group Method with Arithmetic Mean (UPGMA tree) with MEGA6 software. Thus, MEGA 6.0 version was used to construct the every gene sequences’ phylogenetic tree.

The PCR primers were designed online and provided by (Macrogen, Korea) using NCBI Gene Bank and primers 3 plus as follows (Table 1).

### Table 1: Primer sequences of mec A and ica A genes in *S. aureus*.

<table>
<thead>
<tr>
<th>Gene</th>
<th>Primer Sequences(5'-3')</th>
<th>Product size (bp)</th>
</tr>
</thead>
<tbody>
<tr>
<td>mec A</td>
<td><em>F</em> TGGCACAGAAATGGGTGGT</td>
<td>215</td>
</tr>
<tr>
<td></td>
<td><em>R</em> TGAAGCAACCATCGTTAGGA</td>
<td></td>
</tr>
<tr>
<td>ica A</td>
<td><em>F</em> CTTGCTGCGCACTCAATAC</td>
<td>213</td>
</tr>
<tr>
<td></td>
<td><em>R</em> GCGTTTGGCAAGACCTC</td>
<td></td>
</tr>
</tbody>
</table>


**Results and Discussion**

**Phenotypic characterization of *S. aureus* isolates:** Sex hundred urine samples were collected from complaints of UTI patients at AL-Hussein Teaching Hospital. The finding of the present study showed that 380 (63.67%) isolates recorded positive growth. While 220 samples (36.33%) showed no significant growth. The present results agreed with who reported (57.9%) positive urine culture and (39.3%) were showed no growth. Our study was non compatible with, which showed (41.6%) positive culture. Specimens showed a positive culture as *S. aureus* on MSA, biochemical test and API-20 *Staph*. In addition, Vitek2 system and serological diagnosis were used in the present study to confirm the diagnosis. All isolates gave positive results for all tests which recorded a total percentage of *S. aureus* infection with 13.15%. These results of *S. aureus* agreed with the results of the study of who found *S. aureus* isolate from UTI were (13.71%). The results of the present study were incompatible with where was *S. aureus* accounted for only 0.5% of all isolates.

**Detection of mec A and ica A genes:** The present study tried to shed light on the prevalence of two of *S. aureus* virulence factors while molecularly detecting the biofilm of ica A gene and of methicillin (mec A) gene extracted from the patients of UTI from Nassryria City, Southern Iraq. The entire fifty *S. aureus* isolates from UTI patients were precisely recognized as per former methodologies utilized for DNA extraction while agarose gel electrophoresis was used to identify
the results. Molecular detection of the two selected genes among all *S. aureus* isolates showed that 95/100 amplified mecA gene, having the molecular weight of roughly 215 bps (Figure 1,2). Amplification of icaA gene showed the positive results by all *S. aureus* isolates for the targeted gene having an approximate 213bp molecular weight (Figure 3). Despite the ongoing debate about the role of different *S. aureus* virulence factors, a lot of reports tend to believe that the resistance mechanism against methicillin includes the acquisition of the mecA gene, a determinant of penicillin-binding protein has lowered affinity for the β-lactams where to play a major role in *S. aureus* pathogenesis 16. Recent results disagree with the result of 17 showing that 68 isolates 75% of MRSA had mecA gene. While, it agreed with local study performed by 18 that recorded a complete percentage of the target gene 100% in all MRSA isolates. The present results agree with the results of various research works for instance from Iran 19, Iraq 21 and Egypt 28 who revealed that all MRSA isolates had mecA gene. The outcomes of recent study differ with the studies showing a different percentages of mecA gene in *S. aureus* isolates (22,23) showed a percentage of 90.9% and 71.5%, respectively. These variations may be due to many factors, such as the sources and amount of clinical samples used, geographic distribution, and the sensitivity of different techniques used. However, the variability of this gene distribution among *S. aureus*, globally, continue to be dissimilar and this is obviously, reflected by different reports around the world. On the other hand, for identification and confirmation of biofilm producing strains, the present research subjected these strains to PCR for determination of icaA gene. Results confirmed that staphylococcus biofilm-producing strains showed positivity for the gene icaA. These result is in agreement with those of 24,25,26,27 whom reported that all biofilm synthesizing strains contained *S. aureus* which designated a significant icaA genes role as virulence markers for infections of *Staphylococcus* related to the urinary tract infections. In this study, there was a highly significant association between icaA gene presence in *S. aureus* strains and resistance to various antibiotics. The results of our study do not agree with 16 that reported in their study that 72% of the isolated MDR *Staph. strains carry the icaA. From the previous results, we can conclude the great correlation between biofilm formation and icaA gene presence in *S. aureus*. Furthermore, there is a great correlation between MDR *S. aureus* and icaA gene carriage. MDR isolates of *S. aureus* usually carry icaA gene has the capability for the formation of strong biofilm while giving the higher antibiotic resistance a contribution. Thus, a rapid diagnosis is significant for these strains and to administer prophylactic antibiotic and for eliminating planktonic bacteria before they can form a biofilm.

**Sequencing analysis:** The PCR products of six isolates of *S. aureus* were sequestered from the urine & were further referred to the South Korean Company Macrogen to sequence the partial gene mecA and icaA. While, these were further blasted in contrast to the *S. aureus* standard strains in NCBI to record these bacteria in NCBI data to obtain the accession number of each gene of isolate in the NCBI-Genbank. Moreover, the specific selected three molecular & phenotypic methicillin isolates were exposed to the sequencing of particle DNA for mecA gene.

To discover the potential genotypic variations, the files of FASTA format comprising of local strain sequences were utilized for evaluating the molecular association amongst the Nassaryiah City isolates of Southern Iraq and Genbank submitted universal sequences. Thus, the local urine isolates No.1 and No.3 of *S. aureus* strain revealed an association with the NCBI-BLAST *S. aureus* strain MRSA 365325 (MH798858.1). The Phylogenetic tree shows that the study isolates on the mecA gene appeared in the tree as a single tone and the closest genetic group is (MH106551.1, and MH798858.1) from Pakistan, and Italy respectively, at total genetic changes (0.0005-0.0025%) (Figure 4). On the other hand, the present study investigate the phylogeny analysis of other three *S. aureus* icaA sequences. As shown in Fig. 5, the local urine isolate of *S. aureus* Number 1 into Number 3 represented a close relation with the NCBI-BLAST. The icaA gene marker was related to the *S. aureus* local isolate which was further correlated to the *S. aureus* strain of gene Pn2301 and partial gene sequence (FJ0049901) of NCBI-BLAST as well as the *S. aureus* ATCC 6538 *S. aureus* strain (CP020020.1) from India and Germany respectively, at total genetic changes (0.2-1.0%).
Figure 1: Agarose gel electrophoresis image that shows the PCR product analysis of methicillin antibiotics resistance mec A gene in positive isolates of S. aureus. Where M represents the marker (100-2000bp), lane (1-12) positive S. aureus mec A gene at (215bp) PCR product size.

Figure 2: In positive isolates of S. aureus, the methicillin antibiotic resistance mec A gene PCR product analysis has been shown in image of agarose gel electrophoresis. However, M is the Marker having 100-2000 bp while, 1-32 lanes of positive S. aureus mec A gene at (215bp) PCR product size. With the exception, two strain was negative for mec A gene (isolate 26,27).

Figure 3: The image of Agarse gel electrophorosis presented the analysis of the product of PCR in isolates of S. aureus for formation of ica A gene biofilm. M represents the Marker ladder with 100-2000bp while lane 1-12 showed positive S. aureus isolates with ica A gene having 213bp of product size.
Figure 4: The sequences No. 1-No.3 of urine isolates of local S. aureus’ phylogenetic diversity indicated a closed relatedness with the S. aureus NCBI-BLAST strain MRSA 365325 (MH798858.1) at total genetic changes (0.0005-0.0025%).

Figure 5: Phylogenetic diversity of the locally S. aureus urine isolate sequences (No.1 - No.3) revealed a close relationship with S. aureus strain Pn2301 (FJ004990.1) of NCBI-BLAST at total genetic change of (0.2-1.0%).

Source of Funding: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Ministry of health-Thi-Qar health office, Iraq and all experiments were carried out in accordance with approved guidelines.

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